BUILD PODER
2019 CSUN MASTER MENTOR LIST

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College of Humanities

Department of Asian American Studies

Edith Chen

Mentor Bio – Edith Wen-Chu Chen joined the Asian American Studies department in 2001. She received her Ph.D. in Sociology from UCLA, and undergraduate degree from University of Texas at Austin. Trained as a sociologist, her teaching and research interests include Chinese Americans, Asian Americans, immigration, and health, with a focus on type II diabetes and obesity. She has published a number of chapters and articles on the struggles and challenges of Asian Americans and Pacific Islanders in their assimilation and adjustment in the U.S. She has collaborated on publications such as "Physical Activity in Asian American Populations," in Physical Activity in Diverse Populations, edited by Melissa Jean Bopp, (Taylor and Francis, 2018) and "Festival Foods in the Immigrant Diet," Journal of Immigrant Minority Health (2013 Oct). Born and raised in Texas, she is a daughter of Chinese immigrant parents and has travelled with them to Taiwan, Hong Kong, and China for business trips and to see family members over several decades. As one of the few Chinese American families in the predominantly White suburb of Arlington, Texas, her family's home served as the gathering place for father's graduate students from Taiwan, Hong Kong, and China. She also spent six months in Shanghai in 2009 teaching culture of English-Speaking countries to Chinese university students. She has previously taught classes on Asian Americans, Food, Culture, and Health at CSUN and UCLA. You can find her regularly teaching AAS 100 (Intro to Asian American Studies) and AAS 340 (Asian American Women). She was a visiting scholar at Asian American Research Center on Health, University of California, San Francisco in 2015.

Title of Research Project — Is Assimilation Costing Asian Americans their Health?: Type 2 Diabetes in Asian American Populations, Funded by the National Institute of Minority Health and Health Disparities, National Institute of Health, Grant Number: 1R15MD011666-01.

Background & Purpose — The diabetes rates for Asian Americans has been increasing over the last twenty years, with over 1 out of 5 Asian Americans having diabetes, almost twice the rates to their White counterparts (Lee et al., 2011; Menke et al., 2015). More worrisome is that about fifty percent of Asian Americans with diabetes are not aware they have the disease (Menke et al., 2015). Studies have shown that Japanese in Hawai'i, Los Angeles, and Seattle were more likely to have diabetes than their counterparts in Japan (Fujimoto, 1995). A more recent study that collected blood samples from Chinese, Korean, Vietnamese, and Hmong living in Sacramento found that all had significantly higher diabetes rates than those in their country of origin (Stewart et al., 2016). Additionally, those that had spent more than 50% of their life in the U.S. were more likely to have diabetes than those that spent less time, although the results were not statistically significant. We know little about what are the causes of these health disparities, and why the rates of the immigrants and the growing second generation segment are more at risk than in their respective Asian countries. Together, these observations suggest that assimilation, or the process of becoming American, may put immigrant minority groups at risk for diabetes and other chronic diseases (Oza-Frank et al 2011; Popkin & Udry, 1998). This project is interested in understanding the specific social processes underlying the growing rates of Type 2 diabetes in Asian American subpopulations-Chinese American, Japanese, American, Filipino American, Korean American, Vietnamese American, and South Asian.

Method – Working with faculty in Health Sciences, this mixed methods approach includes a sequential quantitative and qualitative analysis. In the first phase, we examine data from the population-based California Health Interview Survey to determine the relationship between generation, ethnicity, income, education, language maintenance and acculturation and type 2 diabetes in six Asian American populations- Chinese American, Japanese, American, Filipino American, Korean American, Vietnamese American, and South Asian. Currently, we are beginning the qualitative data collection phase which enriches the understanding of the associations determined in the quantitative component. Working with our community partner, Asian Pacific Islander Forward Movement (API FM), we will conduct focus groups with Chinese, Korean, and Filipino Americans living in Los Angeles. This includes the construction of bilingual questionnaires complemented by individual interviews based upon the statistical findings from analysis of the California Health Interview Survey.

Student Roles — Students can play a role by conducting literature review, creating excel tables, helping to conduct focus group research and analysis. They will receive training in questionnaire development, qualitative research design, and qualitative data analysis.

Expectations — Students with strong writing skills and interest in learning about Asian American research methods are encouraged to apply. Familiarity with Chinese, Filipino, and Korean populations is highly desirable. Coursework in any of the areas of study is helpful: social sciences, Asian American Studies, ethnic studies, public health, epidemiology, and/or health education. Other important qualities include good work ethic, able to meet deadlines, and an ability to collaborate with others. Students will gain training in conducting health research with Asian American populations.

Conferences Typically Attended — Association for Asian American Studies; American Public Health Association; American Sociological Association

Selected Publications

Chen, Edith Wen-Chu; Yoo, Grace; Musselman, Elaine; Jih, Jane; "Physical Activity in Asian American Populations," in Physical Activity in Diverse Populations, edited by Melissa Jean Bopp, (Taylor and Francis, 2017), pp. 84-101.

Azar, Kristen; **Chen, Edith;** Holland, Ariel, & Palaniappan, Latha; "Festival Foods in the Immigrant Diet," Journal of Immigrant Minority Health, Journal of Immigrant and Minority Health, volume 15 issue 5 (30 September 2013), pages 953-960.

Chen, Edith & Arguelles, Dennis, "Bamboo Ceilings, the Working Poor, and the Unemployed: The Mixed Economic Realities of Asian Americans and Pacific Islanders " in Asian Pacific Americans: Past, Present, and Future (Eunai Shrake and Edith Wen-Chu Chen (eds.) (Kendall-Hunt Publishers, 2012), pp. 69-77.

Chen, Edith Wen-Chu & Hune Shirley, "Asian American Women Faculty in the Pipeline," in Women of Color in Higher Education: Changing Directions and New Perspectives, Gaetane Jean-Marie Brenda Lloyd-Jones (eds.), (Bingley, UK: Emerald Group Publishing, 2011), 163-190.

Chen, Edith Wen-Chu, "Transforming Racism: Asian Pacific American Women in African American Sororities," in Black Greek-Letter Organizations, 2.0: New Directions in the Study of African American Fraternities and Sororities, Matthew W. Hughey and Gregory S. Parks (eds.) (Jackson, MS: University Press of Mississippi, 2011), pp. 139-159.

Chen, Edith Wen-Chu and Kwong, Peter, "Chinese Americans," Encyclopedia of Asian American Issues Today, eds. Edith Wen-Chu Chen and Grace J. Yoo, (Santa Barbara: Greenwood Press, 2010), pp. 15-23.

Chen, Edith Wen-Chu "'You are like us, you eat platanos': Chinese Dominicans, Race, Ethnicity, and Identity." Afro-Hispanic Review vol. 27, no. 1, Spring 2008, (pp. 23-40). Special Issue "Afro-Asia" of Afro-Hispanic Review, Editors: Evelyn Hu-Dehart and Kathleen López.

Chen, Edith Wen-Chu, "Asian Americans in Sororities and Fraternities: In Search of a Home and Place." in Brothers and Sisters: Diversity in College Fraternities and Sororities, (edited by Craig L. Torbenson and Gregory Parks.). Fairleigh Dickinson University Press, 2008.
Chen, Edith Wen-Chu, "Reclaiming a Forgotten Past: The San Fernando Valley Japanese American Oral History Project," in Promoting Social Justice: How Service-Learning Can Shape Positive Social Change, edited by Dr. Gerald Eisman, Stylus Publishers. 2007, pp. 225-241.
Chen, Edith Wen-Chu, "Deconstructing the Model Minority Thesis: Asian Pacific Americans, Race, Class, Gender, and Work," in Teaching about Asian Pacific Americans: Effective Activities, Strategies, and Assignments for Classrooms and Workshops, (Rowman & Littlefield, 2006).

Key Words – Asian Americans, health disparities, immigrant health paradox, social determinants of health, immigrant and minority health, race, gender and class.

College of Health & Human Development

Department of Child & Adolescent Development

Tissyana Camacho *Pending Mentor Training*

Mentor Bio — Dr. Camacho obtained a B.A. in Psychology from CSU Northridge and an M.S. and Ph.D. in Developmental Psychology at the University of Michigan. Her research examines ethnic identity development among students of color across the educational pipeline, with a focus on Latino college students.

Research Project — My research examines the developmental nature of ethnic identity (i.e., how ethnic identity changes over time), how ethnic identity develops (i.e., the experiences that contribute to changes in ethnic identity), and how ethnic identity is related to psychological and academic outcomes. I study these topics using multiple methods (e.g., longitudinal survey data and semi-structured interviews) and with ethnically and racially diverse adolescent and young adult populations. My BUILD PODER research assistants will focus on a mixed-methods project where approximately 30-40 self-identified Latino/a college students were interviewed regarding their ethnicity-related experiences in college. The purpose of this project was to explore how academic and social experiences in college contribute to how one understands his or herself in terms of ethnic identity. For this project, research assistants will be expected transcribe audio files, code semi-structured interview data, and conduct quantitative and qualitative data analysis under the my supervision.

Conferences — I primarily attend the Society for Research in Child Development (SRCD) conference and the Society for Research in Adolescence (SRA) conference. In the future, I expect to attend the Society for the Study of Emerging Adulthood (SSEA) conference and the Western Psychological Association (WPA) conference.

Publications — Previous publications can be found on my Google Scholar Page

Kandice Grote

Mentor Bio — The opportunity to mentor students through the research process, at the undergraduate level, is a part of my career that has proved to be an invaluable opportunity. I am a developmental cognitive research psychologist by training. At my previous institution (UC Merced), I mentored 8 students and 12 students from CSUN who have gone onto successful graduate careers.

Title of Research Project – The cognitive flexibility of bilingualism.
Lab website – www.csunorangelab.com

Background & Purpose — The current research examines cognitive flexibility and benefits of bilingualism and possible mechanisms related to advanced cognition by which such benefits operate. Although older balanced bilinguals (proficient in two languages) display several cognitive advantages (Bialystok, 2001; Hakuta & Gould, 1987) when compared to monolinguals, less is known about when such benefits begin during early development. In an effort to examine potential advantages of early bilinguals, this research utilizes a series of visual-spatial memory (spatial cues to remember where missing objects are located), executive functioning tasks, and growth mindset. In addition, this research investigates the influence of several methodological factors on cognitive performance including socioeconomic status (SES), age, and language group.

Research Questions/Hypothesis
#1: What possible visual-spatial memory and executive functioning advantages exist among early bilingual children vs. monolingual children? #2: Is there a relationship between executive functioning and advanced visual-spatial memory? #3: What is the relationship between components of growth mindset and bilingual cognitive flexibility?

Method — Mixed method designs. Tools include: SPSS, experimental designs. Please see "Student Roles" for more information.

Expectations – Mentees should be excited to share their own expertise and apply their on-training. I expect mentees to have an 'evolutionary approach' to their experiences in my lab and be excited to learn and contributed to their own research training.

Student Roles — All students (regardless of school year) will have an opportunity to participate in all aspects of the research process, including literature review (e.g. how to identify relevant articles and summarize findings), experimental design and stimuli creation (e.g. collaborative discussion of experimentation methodology), working with participants (e.g. how to recruit participants, obtaining consent, executing research protocols), and coding/SPSS analysis (e.g. how to transcribe, code, and analyze data). All language group performances are coded for success on each task within each experiment.

Conferences Typically Attended — Association for Psychological Sciences (APS) Society of Research in Child Development (SRCD) Cognitive Development Society (CDS) Western Psychological Association (WPA)

Shu-Sha Angie Guan

Mentor Bio — Dr. Guan earned her BA in Psychology at UC Berkeley and her Ph.D. in Developmental Psychology at UCLA. She studies the psychology & physiology of social bonding across contexts (e.g., cultural contexts, technology/digital media contexts), particularly among ethnic minority and immigrant adolescents and young adults. Please check out my lab website for more info on projects & people: http://angiesguan.wixsite.com/guancultrelab.

Title of Research Project — Social Experiences and Relationships on Cross-Cultural Health (SEARCH)

Purpose and background — Social relationships have a powerful effect on well-being, such that supportive experiences can get "under the skin" to affect physical health outcomes (Guan, Bower, Almeida, Cole, Dahl, Irwin, Seeman, & Fuligni, 2016). Positive social relationships may affect health by buffering against the negative effect of stress on physiological, stress-response systems (e.g., neuroendocrine, cardiovascular, immune). However, individuals from different cultural backgrounds may have different support needs and norms (Guan & Fuligni, 2015).

Research Questions or Hypothesis — The study examines how receiving and providing social support affects stress reduction among young adults from diverse backgrounds within an experimental paradigm.

Method — We use primary quantitative methods. Within the experimental design, we collect survey, behavioral, and physiological data.

Student Roles — Students have opportunities to be involved in many various steps of the scientific method -- from reviewing literature, designing a study, analyzing data, writing up the results in an APA-formatted presentation or manuscript.

Expectations — My research assistants meet with me regularly. They learn to collect, analyze, and interpret empirical data. They practice the craft of research methods in developmental psychology.

Conferences Typically Attended — Western Psychological Association (WPA), American Psychological Association (APA)

Publications — Please check out my faculty page for more publications.

Rika Meyer *Pending Mentor Training*

Mentor Bio – Dr. Meyer received her BA in Psychology at UCLA and her MA and PhD in Developmental Psychology at University of Michigan, Ann Arbor. Her research interests include health, chronic pain, trauma, and stress in children, adolescents, and their families. She explores ways to promote academic success and well-being from childhood to emerging adulthood.

Title of Research Project – Trauma and Mindfulness Study conducted by the Child and Adolescent Trauma, Chronic Pain, and Health (CATCH) Lab in collaboration with Children's Hospital Los Angeles (CHLA)

Background & Purpose – Children and adolescents who have been exposed to multiple Adverse Childhood Experiences (e.g., child abuse, domestic violence, alcoholic parents) are at risk for developing a number of negative outcomes such as suicidality (Dube, Anda, Felitti, Chapman, Williamson, & Giles, 2001), violent behavior (Duke, Pettingell, McMorris, & Borowsky, 2010), and other negative mental health outcomes (Chapman, Dube, & Anda, 2007). Mindfulness has been shown to be an effective intervention for adolescents who are under stress (Biegel, Brown, Shapiro, & Schubert, 2009; Brown, West, Loverich, & Biegel, 2011; Ciesla, Reilly, Dickson, Emanuel, & Updegraff, 2012; Edwards, Adams, Waldo, Hadfield, & Biegel, 2014; Sibinga, Kerrigan, Stewart, Johnson, Magyari, & Ellen, 2011; White, 2012). However, there is currently limited amount of studies that have rigorously examined the effectiveness of mindfulness interventions on children and adolescents with significant traumatic experiences, like child abuse. Therefore, the current study will examine the effectiveness of a mindfulness intervention with children and adolescents who have experienced trauma and a high number of ACEs.

Research Aims –The current study will employ a Randomized Control Trial comparing two treatment groups: 1) Treatment as Usual (TAU) and 2) Mindfulness Mobile Application + TAU. Standardized measures and qualitative open-ended questions will be collected weekly to determine the comparative effectiveness of the treatment groups.

Method – Quantitative (Surveys); SPSS

Student Roles – Students will complete a variety of research tasks to build their skills by: 1) Conducting literature reviews, 2) Leading data collection (e.g., conducting consent conferences, administering surveys), 3) Taking part in Data Entry, Cleaning and Analysis, 4) Developing individual and group research projects, and 5) Presenting data findings at conferences and assisting with write-ups of publications.

Expectations – Mentees in this lab should: Have experience working with children and adolescents; Have experience with data entry in SPSS; Be passionate about learning research processes; Work well in a group setting; Be respectful, punctual, and accountable. I strive for all my mentoring relationships to be a positive and productive learning experience. Therefore, we will check in weekly to make sure that tasks are being completed, but also to make sure that students are getting what they need out of the experience. I work to maintain a comfortable environment where mentees feel at home, foster new academic and professional connections, and build their skills in a supportive atmosphere.

Conferences Typically Attended – SRCD, SRA, ISTSS, WPA, APA

Publications – Selected Relevant Publications

Yang, E., Schamber, L., **Meyer, R.**, Gold, J. I. (2018). Happier Healers: Randomized-controlled trial of mobile mindfulness for stress management in medical students. *Journal of Alternative and Complementary Medicine*.

Morrison, C., Mahrer, N. E., **Meyer, R**. M. L., & Gold, J. I. (2017). Mindfulness for novice pediatric nurses: Smartphone application versus traditional intervention. *Pediatric Nursing, 36*, 205-212.

Meyer, R. M. L., Gauthier, T., Grefe, D., & Gold, J. I. (2015). An on-the-job mindfulness-based intervention for pediatric ICU nurses: A pilot. *Journal of Pediatric Nursing*. doi:10.1016/j.pedn.2014.10.005

Meyer, R. M. L., Gold, J. I., Beas, V. N., Young, C., & Kassam-Adams, N. (2014). Examining the Psychometric Properties of the Child PTSD Symptom Scale Spanish Version. *Child Psychiatry and Human Development*. doi: 10.1007/s10578-014-0482-2.

Key Words – Chronic pain, Trauma, Stress, PTSD, Children, Adolescents

Nancy Miodrag

Mentor Bio — Autism Spectrum Disorders and Intellectual Disabilities; Maternal Health and Wellbeing; Psychological Stress; Positive Psychology. **Ph.D.** 2010, McGill University **M.A.** 2004, Concordia University **B.A.** 1999, Brock University

Purpose & Background — To: (1) enhance the health and psychological well-being of individuals with Autism Spectrum Disorder (ASD) and their caregivers; and (2) evaluate the effectiveness of a 10-week mindfulness intervention for mothers of children with ASD using psychosocial measures and activity tracking devices (i.e., Fitbit).

Research Question(s) or Hypothesis — This is an applied research project working with families and children.

Method — We will explore both quantitative and qualitative data on psychological stress, coping, and various health outcomes in female caregivers of individuals with ASD.

Student Roles — BUILD PODER students will participate in all aspects of the research including weekly meetings with Dr. Miodrag and an interdisciplinary team of CSUN researchers, research design, assessments, data collection, data entry, analysis, and dissemination of findings.

Expectations — Students will gain valuable research skills including analytical thinking by analyzing data; critical thinking by reviewing and synthesizing literature; effective communication through public speaking in meetings, at conferences (i.e., local and national conferences in the social sciences), and with families; and team work by collaborating with other students and faculty on the project. Participation on this project can also help facilitate lifelong learning skills such as scholarly writing, work ethics, time management, and organization.

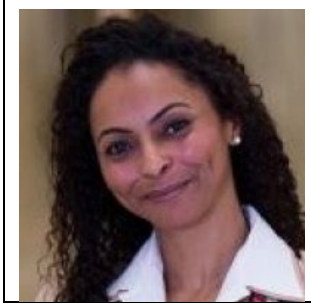
Emily Russell

Background and Purpose — In the language development lab, our research seeks to understand better the ways bilingual children build their vocabularies. We are currently comparing monolingual and bilingual children's word-learning behavior and vocabulary content using experimental and survey-based studies.

Student Roles — Students at every level are involved all aspects of the research process, including: study planning, participant recruitment, data collection and analysis (using Excel and SPSS), and sharing of findings with the wider scientific community at local and national conferences (e.g., Cognitive Development Society, Society for Research in Child Development). I encourage students to gain independence and increase their responsibilities as they advance in the lab.

Expectations — Students who join our team have the opportunity to increase their knowledge of the research process, form instructor-to-peer and peer-to-peer mentorship relationships, and gain experience working with 15- to 30-month-old children and their families. Lab members will learn more about the development of children from a diverse array of language backgrounds; they may also gain insight into their own development. We are particularly interested in English-Spanish bilingual students applying to join our lab—though all applicants will be considered.

April Taylor



Mentor Bio — Ph.D. 2001, University of California Los Angeles. B.A. 1993, Pomona College

Purpose & Background — Motivational researchers have consistently documented that as students move into middle school many experience a decline in academic achievement and orientation towards school. This is particularly the case for ethnic-minorities who experience disproportionate declines in academic indicators compared to their non-ethnic minority counterparts.

Research Question(s) or Hypothesis — Guided by the expectancy-value framework this work examines 1) perceptions of barriers and achievement values as mediators for the relationship between experiences with discrimination and academic outcomes, and 2) how this mediational model may be moderated by ethnicity.

Method — Analyses will include sociometric and nonparametric analyses, multilevel regressions, and multivariate analyses of variance.

Student Roles — Undergraduates will participate in recruitment, data collection, analysis, reporting, and presentation

Department of Communication Disorders and Sciences

Vickie Yu

Purpose & Background — The way in which speech sounds are perceived and produced depends on the nature of individual's language experience. My study aims to investigate the acoustic aspect of the speech features in second language (L2) learners of English to better understand how the different phonetic components between their native language and English affect their speech production in English. The findings would provide useful reference for improving efficacy on pronunciation enhancement in the clinic and ESL settings.

Research Question(s) or Hypothesis — 1) What phonetic components affect speech intelligibility in speakers who learn English as a second language? 2) What is the relation between the English speech production and perception patterns in L2 learners of English?

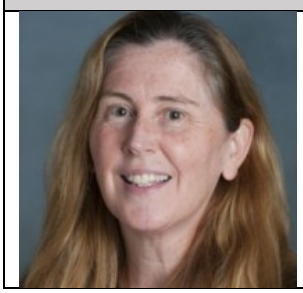
Method — This study will involve both auditory perception and speech production tasks. L2 adult learners will complete both tasks. Native English speakers will be also recruited as control. Participants' language background information will also be collected. The analysis of this study will involve acoustic analysis on vowels and consonants and speech intelligibility measures.

Student Roles — Students involved in this study will engage in different types of research activities in line with the progress of the project. The students will learn how to: Conduct literature review (i.e., what to look for in a research article to help them understand and think beyond the article and summarize findings), Understand the process of designing experimental tasks, Conduct data collection (e.g., how to recruit participants, obtaining consent, executing research protocols), Perform data analysis (e.g., transfer/backup data, code, and analyze data), Present/Report the results (e.g., learn how to make interpretations based on the results and to relate the current findings to evidence in the literature, how to write a summary of the findings and how to make a scientific research presentation).

Expectations — Prior knowledge of phonetics is recommended, though all applicants will be considered. The students in this study will receive an intensive training on acoustic analysis for speech sounds (consonants and vowels) using an acoustic tool. Students will be encouraged to create a research project, collect data and present their studies as a poster at the conference.

Conferences Typically Attended — American Speech-Language, and Hearing Association (ASHA), The Acoustical Society of America (ASA).

Department of Environmental & Occupational Health



Nola Kennedy

Mentor Bio — Dr. Kennedy is a graduate of UC Berkeley and UCLA. She is currently the EOH Internship Coordinator. She is interested in occupational health and most of her research has focused on the quantification of exposures. She has worked on grants from NIOSH and NIH and currently has a grant from NIEHS to train undergraduates seeking a career in research. She is a board member of the Southern California section of the American Industrial Hygiene Association

and of the California Industrial Hygiene Council. **Ph.D.** 2000, University of California Los Angeles **M.S.** 1997, University of California Los Angeles **B.A.** 1984, University of California Berkeley.

Purpose & Background — The objective of this project is to evaluate environmental exposure to noise experienced by dance students. Current understanding of non-occupational exposures to noise is limited because these exposures are often accepted as part of the recreational experience.

Research Question(s) or Hypothesis — The investigation seeks to measure (1) noise exposure levels and (2) exposure durations. The research will investigate control technologies for reducing noise exposures in the dance studio environment.

Method — Health outcomes, related to noise exposure, will be evaluated using a questionnaire. Students will work with the collection and analysis of noise exposure data, including dosimetry and octave band source characterization. These data will be analyzed using statistical analyses for correlation, variance and significance.

Student Roles — Students will be responsible for survey scheduling, data collection, interaction with test subjects, data analysis and presentation.

Expectations — Students will gain a broad set of research-related skills, including survey management, environmental mentoring, equipment calibration, data analysis and public communication of findings.

Department of Family & Consumer Sciences

Annette Besnilian, Executive Director of the Marilyn Magaram Center

Mentor Bio — Annette Besnilian's dedicated academic leadership focuses on serving and educating the next generation of dietitians, public health nutritionists, and food scientists. Today, she serves as the Executive Director of the Marilyn Magaram Center for Food Science, Nutrition, and Dietetics (MMC) and works tirelessly to provide robust educational and professional opportunities for students, who like her, have the passion to advance the understanding of nutrition, dietetics, and food in diverse communities. In addition, at CSUN she is the Dietetic Internship Program Director; and faculty teaching Nutrition and Dietetic Classes to graduate students in the Department of Family and Consumer Sciences. She is a Fellow of the Academy of Nutrition and Dietetics, a Registered Dietitian Nutritionist (RDN), and a Certified Lactation Educator (CLE). She also serves as a NIH BUILD PODER Mentor for CSUN. For more than seventeen years she has obtained research and program development grants that have resulted in more than $3,000,000 in funds. She has been a DI Director for over 16 years and has trained and graduated approximately 160 dietetic interns and Registered Dietitians/Registered Dietitian Nutritionists (RDs/RDNs) in both Community and Nutrition Therapy Concentrations.

Purpose & Background — The research project goals are to implement, evaluate and conduct follow up to determine the effectiveness of school-based and community childhood obesity and diabetes (chronic disease) prevention programs (e.g., parent/family nutrition and activity workshops, cooking demonstrations, gardening programs, educational theater) designed to affect healthful behavior in parent participants and their families in schools with a high percentage of Latino families in LAUSD and the low income families in LA County. The programs focus on increasing awareness and providing guidelines on healthy nutrition choices, food-label reading, recipe modification, smart shopping, and related nutritional and healthy lifestyle information. Other research projects include body composition testing and education for athletes, and testing of antioxidant levels, sensory analysis, microbial content and growth in hydroponics, aquaponics, and conventionally grown plants. Additionally, a peer mentorship program has been developed to ensure student success and increase diversity in the field of dietetics.

Method — Baseline, Six-month and one-year follow-ups will determine long-term effects of school-based and community obesity and diabetes (chronic disease) prevention programs. Research variables are: participants' knowledge regarding nutrition, cooking, physical activity, gardening, sodium (pretest, posttest, follow up); cooking, eating, gardening, physical activity behaviors at pretest, posttest and follow up; changes in body mass index (BMI) and percent

body fat, three-six months and one-year follow-ups. Focus groups and one on one interviews with participants to determine changes they have made to their eating, cooking, gardening and physical activity.

Student Roles — Students will assist with data collection, taking field notes, taking height, weight and calculating BMI. Students will learn to administer surveys, analysis and interpretation; organization skills, professional development, curriculum development, use SPSS, Compusense, Genesis and Esha Computer software. They will also learn to conduct body composition testing using the BodPod in the Health assessment lab. They will learn to conduct antioxidant level testing in the food chemistry labs and biology microbial testing in the microbiology labs. They will learn to conduct focus groups and interviews, coding and determining themes.

Publications — See Dr. Besnilian's profile on the BUILD PODER HHD Mentor page.

Nelida Duran *Pending Mentor Training*

Nellie Duran, is an Assistant Professor in the Department of Family and Consumer Sciences. She is a registered dietitian with extensive experience in maternal and child health, and HIV/AIDS care. Her research interests include arctic indigenous food systems, global environment change and its impact on food and nutrition security, the role of nutrition in eliminating health disparities, and the translation of nutrigenetics, nutrigenomics, and epigenetics in clinical and public health nutrition.
Education: Ph.D. 2015, University of California Los Angeles, M.S. 2000, California State University Los Angeles, B.S. 1998, California State University Los Angeles

Dena Herman-Mendes

Mentor Bio — Dr. Herman's research has focused on improving dietary quality and food security among low-income, ethnically diverse populations. Her earlier projects focused on the assessment of dietary quality of mothers and families participating in the WIC program. Her site-randomized trial of an economic intervention to increase fruit and vegetable intake, demonstrated the efficacy of adding fruits and vegetables to the Special Supplemental Nutrition Program for Women, Infants and Children (WIC) food package became national policy and was initiated in California in October 2009. Her current research endeavors focus on childhood obesity prevention and its relationship to the microbiome. As a registered dietitian, she has worked with children with special needs, women getting ready to get pregnant (preconception care), and is now working with patients and their families in UCLA's FIT for Healthy Weight Program. **Ph.D.** 2002, University of California Los Angeles **M.P.H** 1997, University of California Los Angeles **B.S.c.** 1993, Fredrich-Wilhelms University

Purpose & Background — The goals of the LA ROCCS evaluation project are to: 1) Reduce the prevalence of childhood obesity among children 3-5 years of age participating in an intervention to inform parents of children's weight status using a parent BMI letter; and 2) To evaluate if a provider training on healthy lifestyle habits results in lower BMI values for children ages 3-5 years attending child care services in Los Angeles County.

Methods — The primary variables are: Body mass index (BMI) (kg/m2); knowledge, attitudes, and beliefs of child care providers regarding their personal healthy lifestyle habits including: healthy eating, exercise, and screen time; and demographic variables (e.g., age, race, education, and income).

Student Roles — Students will work with survey data including the variables listed above, and they will be responsible for measuring and weighing children, data entry, recruitment of childcare sites.

Expectations — Students will gain skills in anthropometry, experience in community-based participatory research, data management.

Yoko Mimura

Mentor Bio: I grew up in Japan and received Ph.D. from the University of Georgia. Starting with master's thesis preparation, I have been involved in social science research for over 20 years. I joined CSUN in 2012. My research primarily focuses on intergenerational transmission of financial values and advantages.

Title of Research Project: Intergenerational Transmission of Values and Advantages

Purpose & Background: The aim of our work is to better understand the conditions that promote bias, so that we can ultimately create interventions that might attenuate stereotyping and prejudice.

Research Question(s) or Hypotheses: What do people learn about certain values, such as money and health, from their parents when growing up?

Methods: Quantitative and Qualitative. Data collection - survey & interview. Data analysis - multivariate statistics, grounded theory

Student Roles: literature review, working with the data, among others

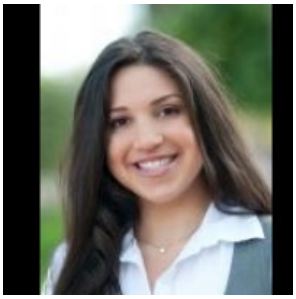
Expectations: I expect my students bring in new perspectives. Students can expect personal attention from me. The skills the students may gain will depend on what we both see as beneficial and interests to the students.

Conferences Typically Attended: American Council on Consumer Interests

Publications: Selected Publications on Household Finance

Mimura, Y., Yi, C., Tonyan, H., & Koonce, J. (Forthcoming). Resource well-being among family child care business owners. Journal of Family and Economic Issues. doi:10.1007/s10834-019-09620-8
Mimura, Y., Koonce, J., Plunkett, S. W., & Pleskus, L. (2015). Financial information source, knowledge, and practices of college students from diverse backgrounds. Journal of Financial Counseling and Planning, 26(1), 63-78. Access here.
Mimura, Y. (2014). The relationship between life satisfaction among wives and financial preparedness of households in Japan. Journal of Family and Economic Issues, 35(4), 532-541. DOI: 10.1007/s10834-014-9390-7. Access here.
Mimura, Y. (2014). Family characteristics and educational expenditures in Japan and the United States. The Japanese Political Economy, 40(1), 1-23.DOI: 10.2753/JES2329-194X400101. Access here.
Mimura, Y. (2013). Variations in retirement account holdings among women: Native and immigrants in the U.S. International Journal of Business and Finance Research, 7(5), 11-22. Access here.

Elizabeth Sussman, Graduate Coordinator, Department of Family and Consumer Sciences



Mentor Bio — My research focuses on nutritional deficiencies in kidney failure patients. As a member of the medical advisory board for the National Kidney Foundation of AZ, I've partnered with them to evaluate the effectiveness of their nutrition assistance program in malnourished dialysis patients. As a Registered Dietitian and a CardioRenal Society of America Board of Directors member, I work to improve the health of people with Chronic Kidney Disease. **Ph.D.** 2013, Arizona State University **M.A.** 2010, Teachers College Columbia University **B.A.** 2006, California State University Long Beach.

Research Project Title — Effectiveness of the Patient Assistance Nutritional Supplementation Program in Dialysis Patients in Arizona

Background & Purpose — Poor adherence to the renal diet within end stage renal disease (ESRD) patients leads to further complications, and can result in mortality. Additionally, an inverse association has been established between nutritional status and mortality among this patient population, as measured by albumin and equilibrated normalized protein catabolic rate (nPCR). The above normal energy requirement and decrease in appetite ESRD patients experience is associated with poorer clinical outcomes, quality of life and mortality, making it difficult for them to obtain the necessary energy requirement. For over fifteen years, the National Kidney Foundation of Arizona (NKF AZ) has implemented the Patient Assistance Program for Nutritional Supplementation to help patients achieve their protein and caloric needs. When malnourished patients were deemed eligible for the program, they received a 2-month supply of calorie-protein supplements at a maximum of $100 per fiscal year. The purpose of this study isto investigate the effectiveness of the NKF AZ's nutritional supplementation program.

Hypothesis — We hypothesize the use of the nutritional supplements will improve nutritional status in Arizona dialysis patients.

Methods — Quantitative. Evaluation of the NKF AZ's Patient Assistance Nutritional Supplementation Program is being conducted using variables already collected by the NKF AZ. These variables are cleaned, coded and analyzed for change.

Student Roles — Students will help with literature reviews (to understand why we are doing this study), data coding and analyzing, and publication preparation and submission.

Expectations — Students will learn the importance of research, how it's conducted, analysis of variables, and how research stimulates future projects.

Conferences Typically Attended — Dr. Sussman attends the International Society of Renal Nutrition and Metabolism's Congress on Renal Nutrition every two years.

Department of Health Sciences

Stephanie Benjamin

Mentor Bio — Stephanie Benjamin, Ph.D., M.P.H. is an Associate Professor in the Health Sciences Department at California State University, Northridge. She earned her Ph.D. and M.P.H. in epidemiology from Tulane University and her B.A. in biological basis of behavior from the University of Pennsylvania. Prior to this position, Dr. Benjamin worked as an epidemiologist in the Division of Diabetes Translation at the Centers for Disease Control and Prevention. Dr. Benjamin's research interests include diabetes, obesity and college health.

Title of Research Project — Behaviors that Influence the Health of College Students

Purpose & Background — College is a critical period of transition when students must balance the demands of obtaining a college degree while adapting to their increasing autonomy and responsibility. Research suggests that college students are an especially vulnerable subset of the population for risky behaviors, such as substance use and misuse. These types of behaviors can threaten students' ability to successfully navigate challenges faced in college and can have lasting implications for future employment and health.

Research Question — Do CSUN students have a high prevalence of risky behaviors (such as substance abuse)?

Method — Data from the American College Health Association - National College Health Assessment (a nationally recognized research survey that is conducted at CSUN periodically and provides precise data about students' health habits, behaviors, and perceptions) will be analyzed.

Student Roles — Literature review and analysis of data using SPSS software

Expectations — Students will gain experience in conducting a literature review and analyzing data. Prior experience with SPSS software is necessary.

Conferences Typically Attended — American Public Health Association Conference

Publications — Forster, Myriam & Grigsby, Timothy & Rogers, Christopher & M. Benjamin, Stephanie. (2017). The relationship between family-based adverse childhood experiences and substance use behaviors among a diverse sample of college students. Addictive Behaviors. 76. 10.1016/j.addbeh.2017.08.037.

Kacie Blackman *Pending Mentor Training*

Mentor Bio — Dr. Kacie Blackman is an Assistant Professor in the Department of Health Sciences at CSUN. She is an expert in health literacy, maternal and infant health and health related behaviors (e.g., infant feeding practices, physical activity, healthy eating). Additionally, she has experience in physical environment retail observations to assess marketing of products (foods, tobacco, etc) and developing culturally appropriate technology-based interventions for underserved populations.

Title of Research Project — Marketing Influences of Infant Formula in Stores located in African American neighborhoods and non-Hispanic White neighborhoods in Los Angeles

Title of Lab — Health Opportunities M-health Mamas Equity

Background & Purpose — Though breastmilk is considered the optimal infant feeding practice for the first six months of an infant's life, exclusive breastfeeding rates are still disproportionately low among certain populations. One aspect of my research program aims to understand the various social ecological factors (marketing/advertising, health claims, social networks, policies) that influence infant feeding practices such as breastfeeding or breastmilk substitutes. Some of my priority populations include CSUN students, staff, faculty and communities external to CSUN. The purpose of this project is to examine infant formula advertising and marketing strategies via in-store observations

Research Questions or Hypothesis

Aim 1: To examine the marketing (price, product, promotion, and placement) of infant formula in stores in African American neighborhoods compared to stores in non-Hispanic White neighborhoods. **Hypothesis** — There will be more marketing of infant formula in stores in African American neighborhoods compared to stores in non-Hispanic White neighborhoods and will provide more evidence as to why breastfeeding rates are lower in African American neighborhoods.

Aim 2: To determine if differences in marketing of infant formula exist between the types of stores (convenience stores, discount grocery stores, pharmacies). **Hypothesis —** There will be more marketing of infant formula in discount grocery stores compared to the other types of stores.

Aim 3: To determine if differences in marketing of infant formula exist between stores that have a visible WIC/SNAP-Ed sticker compared to those that do not have a visible WIC/SNAP-Ed sticker. **Hypothesis** — There will be more marketing of infant formula in stores that have a visible WIC/SNAP-Ed sticker compared to those that do not.

Aim 4: To determine if differences exist in messaging of health claims on infant formula products in stores in African American neighborhoods compared to stores in non-Hispanic White neighborhoods. **Hypothesis** — Stores in African American neighborhoods will have infant formula that contains more health claims compared to infant formula sold in stores in non-Hispanic White neighborhoods.

Method — Store observation tools. Focus groups. Surveys.

Student Roles — Conducting literature reviews. Communicating with research participants. Collection and management of research data. Assistance with coding and analyzing data

Expectations — The best mentoring programs are mentee-driven. They allow new students/research assistants to bring questions, concerns, or problems to someone who listens, supports, informs, and sympathizes without judgment, criticism, advice, or comparison. **What my mentees can expect from me:** Respect their time, listen more than talk, and address states needs as best as I can. I create opportunities for my mentees to bring up issues of race/ethnicity/sexual orientation or other areas of discrimination/prejudice as they arise. I encourage my mentees to think about how the research relates to their own lived experience. I provide help by serving as a learning broker, and be a sounding board for

issues relating to the mentee's career goals and development. I hope to be a catalyst for mentee developing his/her own network, and point to others he/she might reach out to and engage. **What I expect from my mentees:** Take the initiative in the relationship. Invite me to meet with you, suggest topics to discuss, ask for what you need. Use email, phone, and time in person. Bring questions, confusions, concerns, and problems, but also bring successes, alternatives, and ideas. Be open to discussions and constructive alternative ways to handling research and professional responsibilities. Honesty is essential. Be clear what you need, and if an activity or suggestion just isn't of interest, say so. Also be honest about any minor concerns regarding the mentoring relationship. If things are just not working, face facts and follow a "no fault" separation policy if the mentoring period is not over; you can get a new mentor or just use informal support.

Conferences Typically Attended — American Public Health Association, Society of Behavioral Medicine, BreastfeedLA.

Stephan (Kyusuk) Chung

Mentor Bio — Dr. Chung's research focuses on issues related to health disparities, such as end-of-life care in medically underserved communities. He has produced a video featuring a Mexican-American patient at the end stage of Alzheimer's, along with her primary caregiver, husband, and hospice interdisciplinary team. Appointed as a 2018 CSUN Research Fellow, he has been able to devote his time to disseminating the video to clinics and hospitals in predominantly Latino communities in Southern California to support timely referrals to hospice (the video can be found here: http://csunshinetoday.csun.edu/media-releases/csun-spanish-language-video-explores-end-of-life-care-options/). He was selected as a health disparities scholar at NIH in 2013. He served as a consultant for the Illinois Department of Public Health from 2002 to 2009, helping to amend Certificate of Need program regulating new healthcare services and facility construction, generating $1 million in research grants. He has published more than 30 peer-reviewed journal articles and given more than 60 presentations. One of his recent papers was cited in a Washington Post article ("Terminal neglect? How some hospices decline to treat the dying" May 3, 2014). He is working on three projects: 1) looking at state policies on hospice providers; 2) analyzing the cancer (SEER)-Medicare joint dataset to investigate the reasons underlying live hospice discharge; and 3) promoting the awareness of hospice care among the Hispanic population. **Ph.D.** 1999, University of Illinois at Chicago **M.S.** 1991, Wayne State University **B.S.** 1986, Chonnam National University

Background & Purpose — Racial difference in healthcare use pattern is well documented: Minorities are less likely than their white counterparts to use preventive and primary care and more likely to use aggressive inpatient care at the end of life. My recent research has been focused on barriers for Latinos to the use of end of life care options including hospice care. In particular, I look for explanations for low hospice use among beneficiaries of In-Home Support Service (IHSS) program. IHSS is the largest long-term care program with nearly 50,000 low-income individuals with disabilities and another 50,000 caregivers. Half of the caregivers are beneficiaries' own family members who are paid for their care services.

Research Question(s) or Hypothesis — Latino IHSS beneficiaries who died without hospice did so 1) because they were mistaken that they would lose IHSS benefit if they enrolled in hospice; 2) because they were not aware of hospice availability; 3) because they were concerned about hospice cost.

Method — Focus group meetings and telephone/in-person interview targeting (1) IHSS caregivers; (2) hospice workers; (3) hospital discharge planners. Data will be analyzed through qualitative analysis of interviews using Nvivo

Student Roles — Conduct Literature review. Develop a survey questionnaire, Conduct a focus group meeting/phone/in-person interview. Analyze qualitative data collected and identify themes. Write a method/result section for a journal manuscript. Write an abstract to submit for a conference.

Expectations — Students will gain:

(1) Opportunities to present/publish research findings at national level conference/journals.

(2) A promising career in long-term care research and policy as the old population rapidly increases over the next two decades.

(3) An experience with various research methods—for example, students from the CTVA and Journalism departments recently collaborated with me to produce a video featuring a Mexican-American patient at the end stage of Alzheimer's, along with her primary caregiver, husband, and hospice interdisciplinary team.

Conferences Typically Attended — American Public Health Association and Academy Health

Publications — I have published more than 30 peer-reviewed journal articles and given more than 60 presentations at professional health services research conferences.

Bobbie Emetu

Mentor Bio — Dr. Bobbie Emetu's research focus is in sexual transmitted infections (STIs) and HIV/AIDS risk behaviors. Her research interests include condom use errors, innovative methods for STI testing, HIV-related stigma, and the association between sexual abuse and sexual risk behaviors. She continues to conduct applied research within the areas of health education, disease prevention, and sexual health. **Ph.D.** 2014, Indiana University **M.P.H** 2014, Indiana University **M.L.S** 2009, University of Wisconsin **B.S.** 2007, Middle Tennessee State University.

Background & Purpose — Research conducted on male sexual minorities are limited to disease or sexual behavior, even though the definition of sexual health incorporates other dimensions. The aim of this study was to examine the physical, emotional, and mental sexual health components of young men who have sex with men (YMSM) with a previous history of childhood sexual abuse (CSA). The data was collected in the Midwest. Participants had to be a male, ages of 18-29, with a history of CSA, and currently engaging in same-sex behaviors.

Research Question(s) or Hypothesis — **1.** What is the meaning of other sexual health components such as physical, emotional, and mental sexual health to YMSM who have experienced CSA? **2.** What are the perceived risk factors related to the physical, emotional, and mental components of sexual health among YMSM with CSA histories?

Method — Phenomenology is both a conceptual framework and a methodology (Marton, 1986; Moustakas, 1994). Semi-structured interviews are the primary method of data collection for phenomenological studies (Creswell, 2012; Merriam, 2002). The interview guide consisted of questions that covered the comprehensive components of sexual health. During the interview, notes were taken and an audio recorder was utilized to assure accuracy of interview responses. The face-to-face interviews lasted approximately an hour. Sixteen (N=16) interviews were conducted. The data collection and transcription are completed for this study. The data will be analyzed and prepared for two journal submissions through the context of the physical, emotional, and mental components of sexual health. A semiotic phenomenological procedure will be used for analyzing the data. The semiotic procedure is the methodological schema of description-reduction-interpretation (Merriam, 2002). As part of thematic and content analysis to develop independent themes, preliminarily themes will be further analyzed by the utilization of NVivo (qualitative data analysis software). The first manuscript will focus on the physical components of sexual health, and the second manuscript will highlight the emotional and mental components of sexual health among the participants of this study.

Student Roles — The assistance of one student is needed for this project. Regardless of college level, the selected student will be trained by the researcher on qualitative methods and analysis, including NVivo (qualitative data analysis software). Then, the selected student along with the researcher will analyze the data separately, and afterwards will compare results. The researcher and student will reanalysis the data using NVivo. After the thematic analysis, the student will assist with the manuscript development.

Expectations — This project will provide an opportunity for a student to become familiar with qualitative methods and manuscript development. Also, the student could potentially be included in a publication and an opportunity to attend and present at a conference

Conferences Typically Attended —American Public Health Association; American Association of Behavioral and Social Sciences; Ethnographic and Qualitative Research; Society for the Scientific Study of Sexuality; Society of Public Health Education

Claudia Toledo-Corral *Pending Mentor Training*

Mentor Bio – Claudia Toledo-Corral is an Assistant Professor in the Department of Health Sciences at CSUN and an Adjunct Assistant Professor at the University of Southern California (USC). Dr. Toledo-Corral has a background in biological sciences, health psychology, and anthropology/cultural studies, and obtained her M.P.H. and Ph.D. in Preventive Medicine from USC. She has a long-standing research agenda in the field of obesity and associated disease risk in minority populations. Dr. Toledo-Corral's past work includes the study of the biological underpinnings of pediatric obesity and diabetes risk, assessing the efficacy of clinical diagnostic methods of diabetes, and examining the physiological role of stress on obesity and cardiometabolic risk.

Title of Research Project – Metabolism and Stress Assessment (MeSA) pilot study

Background & Purpose – Everyday life stressors and community level burdens have been shown to alter brain biology. Psychoendocrinology literature shows compelling evidence that stress-induced changes to the body may contribute to obesity and metabolic diseases. Specifically, psychosocial and environmental stressors can disrupt hypothalamic-pituitary-adrenal (HPA) axis activity, which in turn will alter cortisol levels throughout the day. Disrupted cortisol patterns have been shown to be associated with increased risk for obesity and type 2 diabetes. Work in this area of research has implications for public health and health care practitioners by raising awareness of health risks associated with stress and the need for stress-reduction programs and interventions.

Research Questions or Hypothesis – The overarching research aim of the MeSA pilot study to understand the complex relationship between various stressors, HPA-axis activity, and body fat. In this effort, we will characterize perceived, community, and biological stress and assess their relationships with body fat measures.

Method – Since our lab is grounded in clinical epidemiological design, we only use quantitative methods. Our data are collected via self-reported surveys, health behavior assessments, and physiological measures from biospecimens.

Student Roles – Depending on the stage of the research project, students may participant in a variety of tasks including: assisting in the field research (working directly with the participants), conducting literature reviews, data management and cleaning, designing secondary research questions, analyzing data and writing up results for local and possibility national level conferences.

Expectations – Enthusiasm, commitment, and an open mind are three key expectations of potential mentees. As a mentor, I strive to provide context to the research environment and opportunity to excel in the research field for young investigators.

Conferences Typically Attended – American Public Health Association (APHA), American Psychosomatic Society (APS), American Diabetes Association (ADA), The Obesity Society (TOS)

Publications – For full-list of publications, please visit her Publons profile.

Kathleen Young

The main goals of this research are to provide comprehensive breast health services (prevention education and health screening programs) for low income and uninsured women (marginalized populations) throughout the LA-Region and to also advocate for marginalized populations at the local, state, and federal level(s). I take students to Sacramento and Washington D.C. yearly to receive training in order to advocate for the key public health bills that effect the nation as a whole (e.g. Patient Protection and Affordable Care Act: P.L. 111-148; REACH U.S. Racial & Ethnic Approaches to Community Health (provide funding for line item via CDC's National Center for Chronic Disease Prevention & Health Promotion). Our goal in this is two-fold (1) provide public health education students with formal health advocacy training and (2) advocate for health equity policies, programs and best practices that address the nation's health across all populations.

Students will work closely with me and other members of various research teams utilizing the Community Based Participatory Research Model (Minkler & Wallerstein, 2012). This may include (but not be limited to) community needs assessment(s), program implementation, evaluation, data analyses, and dissemination of findings. Students will gain exposure and hands-on work in research and program development, implementation, and outcome assessment(s). Students are also required to create dissemination materials, assist in publication and conference abstracts.

Department of Kinesiology

Sean Flanagan

Mentor Bio — Sean P. Flanagan received a B.S. degree in Exercise Science (emphasis in Athletic Training) from Penn State University, an M.S. in Exercise and Sport Science (emphasis in Exercise Physiology) from the University of Dayton, and a Ph.D. in Biokinesiology (emphasis in Biomechanics) from the University of Southern California. He is certified as an Athletic Trainer (NATA), Strength and Conditioning Specialist (NSCA), and Exercise Physiologist (American College of Sports Medicine). **Ph.D.** 2004, University of Southern California **M.S.** 2000, University of Dayton **B.S.** 1990, Pennsylvania State University

Background & Purpose — The main purpose of my research is to understand how the various joints of the body work together as an integrated chain. I am particularly interested in how these joints must work together to maintain a healthy and robust locomotor system, and how impairment at one joint may lead to compensatory motion and/or injury at another.

Research Question(s) or Hypothesis — Which joint motions and torques are necessary for a given task? How do the joints involved in the movement compensate for one another? What are the implications of these compensations?

Method — 1) simple models of kinematic chains; 2) experiments; and 3) complex musculoskeletal models. I use simple models to uncover fundamental principles of multi-joint movement, which are then tested via experiments with human subjects. Some of the experiments involve quantifying coordination and compensation amongst different joints during fundamental movement patterns, while others involve creating an artificial impairment (such as a decrease in strength, range of motion, etc.) and examining the consequences of that impairment. Experiments make use motion capture and force platforms to conduct 3-D analysis of a movement. Since there is a limitation to the extent in which you can create an artificial impairment on people, the next step is to use complex musculoskeletal models to examine the role of an impairment and/or compensatory motion in producing injury. Students work with several types of data, including: motion capture, inverse dynamics, computer simulation, electromyography, and strength and range of motion assessments.

Student Roles — Students are gradually responsible for data collection and computer modeling techniques (sophomore/junior/senior), hypothesis generation and testing (junior/senior), experimental design (junior/senior), and teaching less experienced students (junior/senior). Additionally, seniors have the opportunity to conduct an independent investigation of their own design. Students gain skills that are applicable to research in such diverse fields as biomechanics, motor control, orthopedics, and biomedical engineering.

Expectations — I like to tailor lab experiences to individual student interests, and hope that by doing so we can learn together and from each other in a dynamic and fun environment.

Conferences Typically Attended — Typical conferences I attend include: American College of Sports Medicine (ACSM), American Society of Biomechanics (ASB), National Athletic Trainers' Association (NATA), and National Strength and Conditioning Association (NSCA).

Danielle Jarvis

Mentor Bio – Dr. Jarvis teaches courses in biomechanics, dance, research methods, and athletic training. Her research interests are in movement coordination during skilled activities. Specifically, she studies lower extremity joint demands and her current research focuses on lower extremity biomechanics during dance jumps, as well as movement patterns in individuals with and without Autism Spectrum Disorders. She also regularly choreographs and performs with the Los Angeles-based dance company LA Unbound, and is an avid football and hockey fan.

Background & Purpose – My current research focuses on examining movement coordination during skilled athletic activities. My work investigates the strategies underlying complex movement patterns and compensations in movement patterns that may contribute to or result from injuries. Specifically, my current projects investigate the effects of fatigue on movement patterns, different methods for quantifying movement, and the mechanical demands that dance movements place on the human body.

Research Questions or Hypothesis – Some projects I am currently working on include:

(1) Determining the effects of a dance-specific fatigue protocol on jumping performance in dancers, as measured by lower extremity joint motion (kinematics) and joint forces (kinetics);
(2) Examining the differences in movement and coordination patterns during gross motor skills performed by college students with and without autism spectrum;
(3) Comparing measurement of joint motion using traditional 3D motion capture and portable inertial sensors;
(4) Comparing the differences in lower extremity dynamics during walking, running, and jumping when using different methods of marking and tracking the foot.

Method – My research uses a computer aided video motion analysis system and force plates to collect data regarding kinematics and kinetics. Markers are placed on subjects and video data is collected as movements are performed. Software is then used to process the data and draw conclusions about motion and forces, particularly at lower extremity joints such as the hip, knee, ankle, and toes. I am also implementing a portable inertial sensor based system to collect similar data outside of a laboratory setting, in a gymnasium, dance studio, or outdoors.

Student Roles – Students will learn how to collect biomechanical data, process the data using specialized software programs, and analyze and interpret the results. Software programs used include Cortex (Motion Analysis), Visual3D (C-Motion), MATLAB (Mathworks), and SPSS.

Expectations – Students will be exposed to the entire research process, including the presentation of the results in the forms of posters, presentations, and publications. Seniors will also have the opportunity to develop and investigate their own biomechanical research question. I work closely with mentees early on and am looking for students who are interested in taking on more independent projects as they gain the skills to investigate questions. I enjoy spending time in the lab with students and try to create an open, welcoming space for all!

Conferences Typically Attended – Conferences I typically attend include American College of Sports Medicine (ACSM), International Association for Dance Medicine & Science (IADMS), American Society of Biomechanics (ASB), and National Athletic Trainers' Association (NATA).

Publications

Jarvis, D.N., & Abergel, R.E. (2019). What do we know about how acute physical fatigue affects movement in dancers? A systematic review of the literature. *Medical Problems of Performing Artists.* (In Press)
Mikkelsen, P., **Jarvis, D.N.,** & Kulig K. (2018). Heeled shoes increase knee work demand during repeated hopping in dancers. *Medical Problems of Performing Artists.* (In Press)
Jarvis D.N., & Kulig, K. (2016). Lower extremity biomechanical demands during saut de chat leaps. *Medical Problems of Performing Artists*. 31(4), 211-217.

Jarvis, D.N., & Kulig, K. (2016). Kinematic and kinetic analyses of the toes in dance movements. *Journal of Sports Sciences.* 34(17), 1612-1618.

Key Words – jumping, athletes, dance, injuries, fatigue, ASD, biomechanics

Taeyou Jung

Mentor Bio — Dr. Taeyou Jung is the Executive Director of the Center of Achievement, which provides internationally recognized clinical exercise programs. He is a professor in the Department of Kinesiology and an adjunct professor in Assistive Technology Engineering Program. He earned his doctoral degree in Kinesiology with emphases on Sports Medicine and Adapted Physical Activity at the University of Virginia. Prior to joining CSUN in 2003, he had worked at the Gait and Motor Performance Laboratory in the Kluge Children's Rehabilitation Center and the McCue Sports Medicine Center in Virginia.

Dr. Jung enjoys mentoring aspiring future researchers in Kinesiology, Neuroscience, Rehabilitation Science, and Biomedical Science & Engineering. An active group of graduate researchers and interns participate in various projects at the Adapted Motor Performance Laboratory. Many of his former mentees have successfully advanced to and completed a doctoral training. They are currently working as academic faculty or a research scientist in various institutions, such as NIH, NYU, University of Delaware, University of Alabama Birmingham, and CSUF. His research interests focus on investigating movements of people with disabilities and clinical outcomes following therapeutic interventions. Some of recently published works include a) 3D gait analysis of children with cerebral palsy on treadmill, b) underwater 3D gait analysis in people with traumatic brain injury, c) cardiorespitory responses to aquatic walking in people post-stroke and d) post-exercise hypotensive response following aquatic exercise in people post-stroke.

Background & Purpose — Current research projects include:

1) Study of brain activity corresponding to exercise via functional neuro-imaging tool (fNIRs):

a) To analysis cortical hemodynamics during forced cycling in people with Parkinson's disease (PD)
b) To compare prefrontal lobe activity of people post-stroke when using chopsticks vs. fork
c) To examine motor cortex activity during backward walking in people-post stroke

2) Clinical investigation of using Virtual Reality (VR) applications in rehabilitation:

a) To study the effect of VR on pain and fatigue during exercise in people with spinal cord injury
b) To examine the use of VR game for improving reaction time of people with PD

3) Evaluation of gait and balance outcomes following various locomotive training modes:

a) To investigate the effect of backward walking on gait and balance in people post-stroke
b) To compare energy expenditure among various locomotive training modes in people with PD
c) To examine gait and balance outcomes following elliptical training in people with PD

Research Question(s) or Hypothesis — Each research group is to address: 1) How does the brain response to various modes of exercise?; b) Can the use of VR be effective for rehabilitation?; and c) Which locomotive training would be most effective for improving motor and fitness outcomes?

Method — Various biomedical research instrumentations are used, including neuroimaging device for brain study, 3D motion analysis system for gait study, posturographic system for balance evaluation, and telemetric metabolic system for energy expenditure study, and VR equipped workstation.

Student Roles — Students will learn to use research instruments and participate in projects of their interest while assisting literature review, data collection & analysis, and manuscript preparation.

Expectations — Students will develop clinical research skills from data collection to data analysis. They will learn how to utilize biomedical research instruments for clinical trials. They are expected to deliver professional presentations in collaboration with graduate researchers and faculty mentors.

Conference typically attend with students — ACSM: American College of Sports Medicine Annual Meeting, ISAPA: International Symposium on Adapted Physical Activity, NAFAPA: North American Federation of Adapted Physical Activity Conference, GCMAS: Gait and Clinical Movement Analysis Society Annual Meeting, NASPSPA: North American Society of Psychology of Sports and Physical Activity.

Keywords — Adapted Physical Activity, Sports Medicine, Rehabilitation Science, Neuromotor control, clinical biomechanics, Neurocognitive research, Motion analysis

Recent publications with students: (selected from last 5 years & * *CSUN student*)

- Wagatsuma, M.* Kim, T.*, Sitagata, P.*, Lee, E.*, Vrongistinos, K. and **Jung, T**. (2019) "Biomechanical investigation of the relationship between balance and muscular strength in people with chronic stroke" Topics in Stroke Rehabilitation Feb. 11:1-7. doi: 10.1080/10749357.2019.1574417
- **Jung T**., Kim Y.*, Lim H.*, and Vrongistinos K. (2018) "The influence of water depth on kinematic and spatiotemporal gait parameters during aquatic treadmill walking." Sports Biomechanics Jan 16:1-11 DOI: 10.1080/14763141.2017.1409255
- Lim H.*, Jeng B.*, Azurdia D.*, and **Jung T.** (2018) "Influence of water depth on energy expenditure during aquatic walking in people post-stroke" Physiotherapy Research International Jan. 23. DOI: 10.1002/pri.1708
- Jeng B.*, Fujii T.*, Lim H.*, Vrongistinos K. and **Jung T.** (2017) "Cardiorespiratory responses to pool floor walking in people post-stroke." Achieves of Physical Medicine and Rehabilitation 99 (3) 542-547 DOI: 10.1016/j.apmr.2017.09.112
- Kim, Y.*, Todd, T., Fujii, T.*, Lim, J.*, Vrongistinos, K. & **Jung, T**. (2016) "Effects of Taekowndo intervention on balance in children with autism spectrum disorder." Journal of Exercise Rehabilitation 12 (4): 314-319,
- **Jung, T.,** Kim, Y.*, Kelly, L., & Abel, M. (2016) "Biomechanical and perceived differences between overground and treadmill walking in children with cerebral palsy." Gait and Posture, V. 45 p. 1-6
- Lai, B., Jeng, B., Vrongistinos, K., & **Jung, T.** (2015) "Post-Exercise Hypotensive Responses Following an Acute Bout of Aquatic and Overground Treadmill Walking in People Post-Stroke: A Pilot Study." Topics in Stroke Rehabilitation, DOI: 10.1179/1074935714Z.0000000016
- Smith, K., Lange, A., Narasaki-Jara, M., Todd, T., Vrongistinos, K. & **Jung, T.** (2015) "Effects of Aquatic Exercise on Balance of People with Multiple Sclerosis." Medicine and Science in Sports and Exercise 48(1):381 DOI: 10.1249/01.mss.0000486151.32566.85
- Hurtado I.*, Lopez M.* Knudtson A.*, Jara M., Vrongistinos K., and **Jung T.** (2015) "Effects of Treadmill Walking with Visual Feedback on Gait Outcomes in People Post-Stroke" Medicine & Science in Sports & Exercise 47:465 DOI: 10.1249/01.mss.0000477710.69548.df
- Lim J.*, Guzman U.*, Mache M., Todd T., and **Jung T.** (2015) "Postural Control Outcomes following Videogame-based Intervention in Youth with Autism Spectrum Disorder" Medicine & Science in Sports & Exercise 47:67 DOI: 10.1249/01.mss.0000476583.51607.75
- Nishiyori, R., Lai, B., Lee, D., Vrongistinos, K., & **Jung, T.** (2014). "The Use of Cuff Weights for Aquatic Gait Training in People Post-Stroke with Hemiparesis." Physiotherapy Research International. DOI: 10.1002/pri.1617

Teri Todd

Background and Purpose — The main goal of my research is to increase physical activity levels of children and adults living with a developmental disability, in particular, autism spectrum disorder (ASD). I am interested in identifying barriers to being physically active. Presently we are studying balance and physical activity levels in individuals with ASD, and physical activity habits of college students on the autism spectrum.

Student Roles — Students assisting in the balance study work with data generated by force plates and accelerometers as well as physical activity diaries. Data from the study with college students consists of weekly diaries, anxiety scale readings and anxiety assessments. Students have a variety of responsibilities including data collection and analysis. Students working on these projects will gain knowledge of ASD and implications to motor performance, use of specialized equipment, data analysis, and presentation skills.

College of Social & Behavioral Sciences

Department of Africana Studies

Aimee Glocke *Pending Mentor Training*

Mentor Bio — Dr. Aimee Glocke is a Professor of Africana Studies at CSUN. Her education includes: **B.A.** in English, Sociology, and Racial and Ethnic Studies from the University of Wisconsin, La Crosse. **M.A.** in Afro-American Studies from UCLA. **Ph.D.** in African American Studies from Temple University. Her research interests include African/Black Literature, African/Black History, African/Black Dance, African/Black Psychology.

Background & Purpose — Although there has been research published on how Black Studies (i.e. Black History) positively affects Black students in K-12 (Banks, 1969; Hare, 1969; Roth, 1969; Adams, 1970), most of the studies have focused on the affect Black Studies has on university students (Black and Non Black) because that is where Black Studies is most pervasive (Clements, Jr., 1970; Carey and Allen, 1977; Johnson, 1984; Livingston et al, 2010). However, little research has been published on teaching Black Science in grades K-12 or, more specifically, on teaching Black Science in an African Centered Way to Black and Non Black (i.e. Asian, Latino/Chicano, American Indian, European, etc.) K-12 students. Therefore, this project will help to fulfill the original mission of Black Studies by training BUILD students to use their background and experience in science (i.e. Psychology, Sociology, Biology, Biochemistry, Chemistry, Physics, etc.) to teach African Centered lessons on Black Science in grades K-12 in order to increase the students' cultural consciousness, cultural awareness, and cultural identity.

Research Question or Hypothesis — How does learning about Black Studies, or more specifically Black Science, in an African Centered Way, in grades K-12, increase not only Black students' cultural consciousness, cultural awareness, and cultural identity; but, all students'?

Method — Contact the principals of K-12 schools near CSUN with a significant Black and Non-Black student population and offer to teach lessons in Black Science. Meet with the teachers to discuss ideas for lessons; have BUILD students research, design, and teach the lessons to the K-12 students; test the results using mixed methods; analyze the results to confirm if the research supports our hypothesis that learning about Black Science in an African Centered Way increases the cultural consciousness, cultural awareness, and cultural identity of both Black students and Non Black students.

We will use mixed methods, both qualitative and quantitative, to measure the results including surveys of the K-12 students (pre and post the lessons); observations of the K-12 students during the lessons; and interviews after the lesson(s) with the K-12 students, teachers, parents, principals, and BUILD students.

Student Roles

Sophomores and Juniors — Learn African Centered Pedagogy; conduct research on Black Science topics; develop age appropriate/African Centered lesson plans; teach lessons under student/faculty supervision; learn quantitative and qualitative research design and analysis to assist with surveys and observations.

Seniors — Additionally: review and offer feedback on the lesson plans of the younger students; teach lessons without faculty supervision; help design the survey; analyze survey data; observe students during lessons; analyze observation data; assist in interviews with K-12 students, teachers, parents, principals, and BUILD students; analyze interview data.

Conferences Typically Attended — Conferences usually attended: National Council for Black Studies (NCBS), African Heritage Studies Association (AHSA), National Association of African American Studies (NAAS).

Publications — View select publications & presentations

Theresa White

Mentor bio — Dr. White is the current Chair of the Department of Africana Studies. Dr. White is the Director and Producer of educational documentary films that offer narratives and perspectives from marginalized groups including, Buckism to Barackism: Re-Imagining Black Masculinity and Manhood; Muslim Women and Girls: Searching for Democracy and Self Expression; Developing Media Savvy Adolescent Girls in the Fight Against Childhood Obesity (M.I.S.S.); RIMI-An Interview with Dr. Carrie Saetermoe. She is in post-production for Battling Beauty: Re-Presenting Global REELatiies in the Search for Self. **Community Engagement** – The former Co-Director of the Civil Discourse and Social Change (CDSC) Initiative, Dr. White works with faculty, students and community organizations to create a culture where social justice is a permanent part of the institutional make-up, by engendering a community of consciousness, academic engagement, and advocacy. She is the former Director of the DuBois Hamer Institute for Academic Achievement, where she developed innovative community engagement projects addressing Female Health Literacy, African American Male Empowerment and Media Literacy. **Health Disparities for Minority Populations** – An active member of the RIMI Research Infrastructure for Minority Institutions (RIMI) at CSUN, she has developed community-based programs for African American and Latino adolescent and tween girls. Her most recent project is Developing Media Savvy Adolescent Consumers in the Fight Against Childhood Obesity, for which she received the prestigious NIH (RIMI) Tiered Mentor Scholar Award. Referred to as the M.I.S.S. (Media Inspired Savvy Sisters) program, it is an after-school psychosocial, nutritional, media intervention for at-risk African American tween (8-11) females at the Challengers Boys and Girls Club in Los Angeles. It aims to empower girls, while placing emphasis on eating in normal and healthful ways, developing increased levels of self-esteem and media/advertising literacy. The project also examines the effects of food marketing on children, focusing on how they respond to, and perceive commercials embedded in the online environment of selected videogames, media platforms and outdoor advertising. **Student Collaboration** – Dr. White is the founding faculty advisor for the CSUN student research group, C.A.P.T.U.R.E.D. (Creative Awareness Productions Through Universal Research and Educational Documentaries), and is the faculty editor for the C.A.P.T.U.R.E.D. Multi-Media Student Journal. She has also co-authored several peer-reviewed articles with CSUN students.

Education includes – Ph.D. University of California, Los Angeles,(UCLA), 2008; M.A. University of California, Los Angeles, (UCLA), 1999; B.A. University of Southern California (USC), 1992. For more, view her CSUN Biography

Research interests — Film Criticism; Feminist Theory; Cultural Studies; Visual Culture; Documentary Film Production; Race, Gender and Media Representations; Critical Media Literacy; Sexuality; Masculinity, Self Image/Self Esteem and Health Disparities for Minority Populations.

Selected Publications — For more visit her CSUN profile.

Parental Support and Psychological Control in Relation to African American College Students' Self-Esteem." Africology: The Journal of Pan African Studies, 9(4), 199-218. 2016. (Plunkett, S., **White, T.,** Carter, D. B., & Horne, M.E.F.)

"The Changing Landscape of Race, Culture and Family Life: Interracial Couples' Contribution to the Conversation." World Journal of Social Science Research. 2(1). 2015. (**White, T.,** Love, S., DeBose, H.).

"A Glance at Herstory: African American Female Documentarians: Navigating Beyond the Normative Constraints in A Question of Color and My Mic Sounds Nice: The Truth About Women in Hip Hop." In Novotny,

L. (Ed.). Documenting the Black Experience: Non-narrative Cinema & African American History, Culture, and Identity. (pp. 229-252). Jefferson, NC: McFarland Press. 2014. (**White, T**., Tekle, S., & Shaw, M.).

"Exploring the Sexuality of African American Older Women." British Journal of Medicine & Medical Research. 4(5), 1129-1148. 2014. (Lagana, L., **White, T**., Bruzzone, D. & Bruzzone, C.).

Department of Anthropology

Chin-Hsin Liu

Mentor Bio — I am a biological anthropologist specialized in bioarchaeology- the study of human skeletal remains from archaeological context. Paleodietary reconstruction using stable isotope analysis and paleopathology are my main methods. Key geographic foci are Southeast Asia (Thailand, Philippines) , East Asia (Taiwan), and West Mexico (project in development). **Ph.D.** 2012, University of Florida **M.A.** 2005, University of Florida **B.A.** 2002, National Taiwan University

Background & Purpose — Bioarchaeology is the study of human skeletal remains in archaeological context. By observing skeletal and dental pathologies and reconstructing dietary patterns, human skeleton can inform us about past life history, community organization, movement, identity, social structure, and environmental change, just to name a few. These topics are relevant to our current societal discourse as we face impacts of globalization, migration, and climate change. Keywords: Archaeology, human skeleton, bone chemistry, paleopathology, health, prehistory

Research Question(s) or Hypothesis — This project aims to explore issues of skeletal health disparity, recourse procurement, migration pattern, and regional interaction of the people once lived during the Post-classic period in modern day West Mexico. This area was a key corridor of interaction in terms of material trade, ideology, and biological admixture both before and after the abandonment of major Maya cities (Post-classic Maya). Despite being at the crossroads of cultural and biological exchange between North and Central America, this area has received relatively less scholarly attention, especially in bioarchaeology, than other Maya and peripheral sites.

Method — These research interests will be addressed by analyzing the human skeletal remains excavated from five archaeological sites in West Mexico. The collection is currently curated in the Fowler Museum (UCLA). The analytic process has three phases, with heavy involvement of scientific methods and medical concepts. An inventory of the remains will first be conducted by identifying and recording the skeletal elements available and their state of preservation. Macroscopic observation of paleopathology and health markers (e.g., trauma, congenital abnormalities, development/nutritional stress markers, infectious diseases, etc.) will follow. Microscopic and histological studies will be conducted to enhance differential diagnosis when warranted. The third phase will involve sample selection and laboratory work to extract collagen and purify hydroxyapatite for stable isotope analysis in the mass spectrometry. Statistical analyses will be performed after viable data are collected.

Student Roles — Students have the opportunity to assist in conducting literature research to understand geographic and temporal context of the sites. I will provide training on handling human skeletal remains and laboratory safety before helping with inventory, paleopathological observation, and bone chemistry lab work. Students will learn how to estimate sex and age of a skeletal individual, identify pathology and health markers, and perform basic statistical analyses.

Students will also participate in the preparation of manuscripts for publication and have opportunities to present in conferences

Expectations — I welcome students who are motivated, disciplined, and responsible. Students must be able to follow directions well and are expected to behave professionally when conducting research on human skeletal remains. Students with backgrounds in anthropology, biology, museum studies, or Central American history and culture are preferred but not required. Students who are interested in pursuing higher degrees or careers in anthropology, museum curation and management, forensic sciences, criminal justice, biochemistry, and medical professions are highly encouraged to participate in this project.

Conferences Typically Attended — Western Bioarchaeology Group Meeting, Annual Meeting of Paleopathology Association, Society for American Archaeology, and American Association of Physical Anthropologists (particularly in the Undergraduate Research Symposium).

Department of Geography

Luke Drake

Mentor Bio — To date, I have conducted research at neighborhood, urban, and national scales through studies in Florida, New Jersey, California, and through a U.S. and Canada national survey. Current projects are located in Southern California and the South Pacific country of Vanuatu. **Ph.D.** 2015, The State University of New Jersey, **M.A.** 2010, University of Miami, **B.S.** 2002, University of North Carolina

Title of Research Project — My research contributes to CSUN BUILD PODER objectives through theoretically-informed and empirically-grounded investigation of urban food systems. Food access and nutrition are two issues that are underscored by geographical disparities. Interventions often include gardens and farmers' markets, whose health benefits have been noted through inter-disciplinary research. However, relatively little knowledge about the geographies in which these interventions are proposed and carried out.

Background & Purpose — My research aims to create knowledge on 1) which places should be targeted for interventions such as gardens and markets; 2) how and why these interventions serve the neighborhoods they are intended to serve, and 3) the processes through which garden and markets succeed or fail to deliver health outcomes.

Research Question(s) or Hypothesis — What are the spatial patterns of food access and distribution that may lead to uneven health outcomes? Where are farmers' markets, gardens, and food retail located, and are they associated with demographic trends? Is the food distributed at the locations consumed by residents of those neighborhoods or elsewhere? Do urban residents acquire food from markets or gardens, and if so, where? Why and how do these spatial patterns form? Why do farmers choose certain farmers' markets over others? How do urban residents become involved in and sustain garden efforts? What processes lead to urban residents taking up or rejecting participation in food security interventions?

Method — These research questions require the use of mixed methods. My research has employed qualitative and quantitative methods, including interviews, participant observation, focus groups, archival research, surveys, spatial statistics, and geographic information systems (GIS). Primary data collection through fieldwork, as well as secondary data collection from federal, state, and local sources is used. I have also developed and used web-based mobile mapping and GIS applications. Analytical methods include the identification of themes from coded qualitative data through NVivo software, discourse analysis of archival materials, spatial statistics in GIS and SPSS software. Since my research draws on multiple epistemologies and not just mixed methods, analysis with rely in some cases on statistical significance through large sample size and in others on analytical generalization through the small sample size and context provided by case studies.

Student Roles — Data collection opportunities for students include the selection and pre-processing of secondary datasets using Microsoft Excel and ArcGIS; fieldwork to collect location and attribute data on urban food systems; advanced students can also assist in the collection of qualitative data through interviews and observations. Data analysis opportunities include the processing and management of data; tabulation of descriptive and inferential statistics using Excel, SPSS, and ArcGIS; transcription and coding of qualitative data using NVivo. Advanced students can assist in many-to-many database design and management, web programming, advanced GIS analysis and modeling, cartography in Adobe Illustrator, and the design and maintenance of web-based data tools such as ArcGIS Online and ArcGIS Collector.

Expectations — This research should be of interest to students interested in the intersection of health and related topics such as urbanization, sustainability, environmental justice, and economy.

Conferences Typically Attended — California Geographical Society; Association of Pacific Coast Geographers; American Association of Geographers.

Edward Jackiewicz

Mentor Bio — Research interests include Urban, Tourism, and Migration/Transnationalism. **Ph.D.** 1998, Indiana University, **M.A.** 1993, Temple University, **B.S.** 1983, Arizona State University

Background & Purpose — My research examines the spatiality of health disparities in California, looking not only at racial and ethnic divides, but also socioeconomic and geographical (rural, suburban and urban). I am interested in the inequities in both how health services are accessed and delivered.

Research Question(s) or Hypothesis — Are certain diseases and health issues more prominent in certain locations? What are the barriers to a more equitable health system? Which groups are more prone to inferior health treatment? How has the Affordable Care Act altered previously existent health disparities? How can the healthcare experience for undocumented individuals be improved?

Method — Research will be conducted using both existing (secondary) data and by gathering primary data through surveys as well as more in-depth interviews with various stakeholders as well as community members.

Student Roles — Students can participate in this research through various activities from the very early stages of a project such as reading relevant literature, writing literature reviews, designing surveys, manipulating and analyzing data, collecting data, mapping geographic phenomenon, and writing publishable articles.

Conferences Typically Attended — There are several conferences that I frequently attend, including: The Association of American Geographers (Spring), Association of Pacific Coast Geographers (Fall), California Geographical Society (Spring), and the National Health Disparities Conference.

Regan Maas

Mentor Bio — **Ph.D.** 2010, University of California Los Angeles **M.A.** 2005, California State University Northridge **B.S.** 2001, Iowa State University **B.S.** 1998, University of Iowa

Background & Purpose — My specific research area is focused within Minority Health Disparities (specifically Hispanic populations), emphasizing Spatial Demography, Urban Neighborhood Dynamics, and GIS applications. This research focuses on both compositional and contextual variables, including socioeconomic measures, health outcomes measures, as well as neighborhood contextual measures such as social networks, residential choice and mobility, and spatio-temporal activity space.

Research Question(s) or Hypothesis — My research projects test the idea of spatially segmented cultural adaptation as a framework for unraveling the spatial and cultural differences in health outcomes across Hispanic/Latino neighborhood contexts and its relationship to the 'Hispanic health paradox'.

Method — Datasets include cutting-edge geospatial data. Spatial and non-spatial statistical techniques as well as geographic information systems (GIS).

Student Roles — Students would be exposed to working with large datasets including work with cutting-edge geospatial data. Students would be responsible for collecting and analyzing data using both spatial and non-spatial statistical techniques as well as geographic information systems (GIS). Students would gain skills in data collection/manipulation, hypothesis building, and data analysis for minority health disparities research through the lens of the geospatial sciences.

Meeta Banerjee

Mentor Bio — Dr. Meeta Banerjee received her Ph.D. in Ecological-Community Psychology with a specialization in Applied Developmental Science from Michigan State University in 2012. Her research employs both integrative and ecological frameworks to understand the influence of contextual factors on early and late adolescent developmental trajectories in ethnic minority families. Research Interests include Racial/ethnic discrimination; Racial-ethnic socialization; academic achievement; academic engagement; mental health. She is especially interested in exploring the interaction between ecological contexts and race-related parenting practices. **Ph.D.** 2012, Michigan State University **M.S.W** 2003, University of Michigan **B.A.** 2001, University of Michigan.

Background & Purpose — The purpose of this research is to examine how different contextual factors such as racial/ethnic discrimination during high school or even in college can influence ethnic minority youth's academic achievement or other academic related outcomes. In addition, I am interested in understanding how neighborhood factors may influence these academic and mental health outcomes.

Research Question(s) or Hypothesis — The aims of the current study include 1) To examine how racial discrimination in high school or currently in college influences school motivation or academic engagement. 2) To explore how racial/ethnic discrimination is associated with psychosocial outcomes such as depression or anger. 3) To investigate the relation between racial/ethnic discrimination, academic outcomes and mental health. I predict that youth who experience higher amounts of racial discrimination by teachers or peers will be less engaged in academic courses and have lower achievement. Similarly, I hypothesize that neighborhoods with less resources and negative characteristics may be related to lower engagement and achievement.

Method — Currently, we have a data collected from over 200 African American youth from the Midwestern United States. I am planning to collect data from a sample of ethnic minority youth (e.g., Asians, African Americans and Latinos) in the next year. Analysis with this study can be as preliminary as helping to conduct descriptives and correlations on the study variables. However, there will be opportunities to conduct more advanced analyses such as regression, ANOVAs and hierarchical regressions.

Student Roles — Students will have opportunities to work on helping to build a research project from the ground up. They will get experience helping with literature reviews, learning about online data collection, actively collecting, coding and cleaning data, learning how to run statistical analyses and possibly even putting together a proposal for research conferences. In addition, they will have the opportunity to conduct secondary data analysis on previously collected data. Students of all three levels (e.g., sophomores, juniors and seniors) will have the opportunity to get involved in different ways depending on their research skills and knowledge.

Expectations — Students applying can have any level of experience, but should have at least a B average in their classes. If you are interested in applying to graduate school and receiving research experience, I strongly urge you to apply.

Conferences Typically Attended — Usually I attend Society for Research on Child Development (SRCD); Society for Research on Adolescence (SRA); International Society for Social and Behavioural Development (ISSBD); Association for Psychological Science (APS) and American Psychological Association (APA).

Thomas Chan *Pending Mentor Training*

Mentor Bio – I was raised in a Chinese restaurant by immigrant parents and grandparents. I was always at the intersection between older adults, the community, and technology. My work reflects this intersection by finding ways to leverage community assets and technology to promote engaging lifestyles and behaviors for underserved aging adults and their families. I received my Ph.D. in Positive Developmental Psychology from Claremont Graduate University—where I learned the science of "the good life." Then I have received funding from The National Institute of Health/National Institute on Aging to sponsor my Postdoctoral Fellowship in Epidemiology, Biostatistics, and Mental Health of Aging at Johns Hopkins Bloomberg School of Public Health—where I honed my abilities to develop and evaluate engaging technologies to improve the health and well-being of at-risk aging adults and their families.

Title of Research Project – The Positive Aging Research and Development (PAR-D Lab; www.par-d.com), develops and evaluates immersive technologies that aim to enhance health and well-being. We created the World's First MagicLeap Augmented Reality marriage proposal (https://www.youtube.com/watch?v=l5goSpBuwZY&t=). We are currently teaming with medical institutions, community organizations, and technology companies to develop augmented reality applications to improve mental health and functional outcomes for people in the San Fernando Valley and Greater Los Angeles areas.

Background & Purpose – Immersive and mobile technologies are changing the way we live and go about our day. The mass of these technologies and applications are designed for people who are privileged enough to afford them. The PAR-D Lab's focus is to flip the script on how technology applications are designed by creating scalable win-win interventions based on the needs of underserved aging adults and their families.

Research Questions or Hypothesis – (a) How do we leverage augmented reality technologies to improve the mental health and well-being of aging adults and their families? (b) How do we create physically and cognitively engaging activities that boosts mental and functional health outcomes? (c) How do we develop augmented reality solutions to improve the quality of life of people who are suffering from cognitive impairments? (e.g., mild cognitive impairments, Alzheimer's Disease)?

Method – I leverage a mixture of applied methodologies (e.g., qualitative, ethnographic, and quantitative methods, along with eye tracking) to answer research questions on user experience, psychological engagement, user buy-in, usability, value, and effectiveness. I also use structural equation modeling and growth mixture modeling to explore mechanisms and subpopulations.

Student Roles – Computer science students with experience in coding (e.g., C#, Unity, Java Script) will be trained to develop applications to improve health outcomes. Engineering students with experience with sensors will be trained to create scalable methods of early detection of diseases and disabilities. Psychology students with experience in research and statistics will be trained to evaluate community-based interventions and user experiences. Art and design students with experience in animation and special effects will be trained to design characters and animations for augmented reality and mobile platforms.

Expectations – Must be able to work in a start-up-like environment—fast-pace, many unknowns, open-minded, willing to learn anything—and be passionate about the PAR-D Lab's mission to improve the lives of people who come from underserved communities.

Conferences Typically Attended – The Gerontological Society of America (www.geron.org); Society for Neuroscience (www.sfn.org); International Positive Psychology Association (www.ippanetwork.org); Unity Conference (www.unity3d.com); Cognitive Aging Conference (http://cac.gatech.edu/cognitive-aging-conference); Alzheimer's Association Interventional Conference (https://www.alz.org/aaic/overview.asp).

Selected Publications – For more information, see Dr. Chan's CV.

Chan, T., Parisi, J.M., Moored, K.D., & Carlson, M.C. (2018). Variety of enriching early life activities linked to late life cognitive functioning in urban community-dwelling African Americans. *Journals of Gerontology: Psychological Sciences.*

Moored, K.D., **Chan, T.**, Varma, V.R., Chuang, Y., Parisi, J.M., & Carlson, M.C. (in press). Engagement in Enriching Early Life Activities is Associated with Larger Hippocampal and Amygdala Volumes in Community-Dwelling Older Adults. *Journals of Gerontology: Psychological Sciences*

Chan, T. (2019, February). *Making aging magical: Using augmented reality for promoting health interventions and engaging medical assessments*. Symposium presented at Medical Design & Manufacturing West Conference, Anaheim, CA.

Carlson, M.C., **Chan, T.,** Adam, A., Ahmad, O., Roy, P., Rosano, C., Rosso, A., Krakauer, J. (2018, November). *Piloting a virtual reality application to promote executive function and community mobility in aging adults*. Symposium presented at Gerontological Society of Aging Annual Scientific Meeting, Boston, MA.

Key Words – #augmentedreality #community-basedinterventions #immersivetechnology #mixedreality #magicleap #spatialcomputing #psychologicalengagement #flowtheory #positivepsychology #biotech #mentalhealth #cognitivehealth #preventionintervention

Gabriela Chavira, Co-PI of BUILD PODER

Mentor Bio — Dr. Chavira is one of the Principal Investigators of BUILD PODER, focusing on the student core. All of her research projects focus on successful transitions to adulthood for immigrant and ethnic minority youth. **Ph.D.** 2003, University of California Santa Cruz **B.A.** 1994, California State University Northridge. View her faculty profile.

Current Research Projects:

"Developing College Awareness and a College-Going Identity in Latina/o Youth"

(Current Status: recruiting a 2nd cohort of participants; follow-up with 1st cohort).

For this project, we developed a series of workshops for Latina/o parents and their adolescent youth (early adolescence through late adolescence) with the aim to a) increase their college knowledge, b) provide instrumental support and guidance navigating the college application process, and c) increase the number of Latina/o youth who apply for and enroll in four-year colleges and universities. Workshops will be conducted in Spanish and English for parents and in English for Latina/o youth. We will be examining psychosocial factors that may contribute to their retention in the workshop series and persistence towards college enrollment.

"Adolescent Academic Achievement: Psychological Functioning and Cultural Discontinuity Project"

(current status: coding, analyses, and report-writing).

This research project, funded by the National Center on Minority Health and Health Disparities (NCMHD), a branch of the National Institutes of Health's Research Infrastructure in Minority Institutions (RIMI), focuses on the *cultural discontinuity* or "mismatch" between the home and school environments and how these may contribute to the underachievement and psychological dysfunction of Latino youth. This dataset includes three waves of data collection. We are currently entering interview data in preparation for coding and analyses.

"Mentoring Matters Research Study"

(Current status: analyses and report-writing)

This research project has partial support by the National Institutes of Health (NIH) Enhancing the Diversity of the NIH-Funded Workforce Initiative. The goal of this study is to understand the mentor-mentee relationship in biomedical and behavioral sciences at CSU Northridge. I posit that if the NIH wants to increase the number of students who pursue graduate studies in the sciences, we needed to understand the current climate of mentoring at our university. This project is now complete, but we are currently analyzing the results in preparation for report-writing.

Method — Qualitative and Quantitative

Student Roles — For all of research projects, students will learn how to: (a) conduct a literature review and annotate bibliographies, (b) code and analyze data (quantitative and qualitative), and (c) prepare presentations for regional and national professional conferences. In specific projects students will learn to: (a) translate and transcribe interviews of families, (b) recruit participants, (c) participate in data collection and data entry, (d) develop codebooks for analyses, (e) use software (NVivo, SPSS, Qualtrics).

Publications — View publications at her CSUN faculty profile.

Stefanie Drew

Mentor Bio – I received my doctorate from the University of California, Irvine in Cognitive Psychology. After getting my Ph.D., I completed post-doctoral work in a neuroimaging lab where I conducted neuroimaging research utilizing functional magnetic resonance imaging (fMRI) of the human visual cortex. Subsequently, I completed a NIH funded post-doctoral position at Western University of Health Sciences College of Optometry, where I was trained in utilizing oculomotor measurements to examine symptoms of asthenopia, or visual discomfort. After this position, I was delighted to join the faculty at CSUN and now run the Visual Information Sciences and Neuroscience (V.I.S.N.) Lab in the Department of Psychology. I take great joy in teaching, mentoring students, playing video games and training in krav maga.

Title of Research Project – An inter-disciplinary investigation of the impact of immersive virtual reality practice on visual abilities. Visual Information Sciences and Neuroscience (V.I.S.N.) Lab (check out the V.I.S.N. lab's website).

Background & Purpose – New virtual reality systems have recently emerged on the commercial market and are being used across a wide variety of disciplines, from job training to physical therapy, biological imaging to psychological therapy. However, little is known about the impact of these new systems on the user. We aim to examine the impact of these systems on the oculomotor and cognitive functions of the user before and after training in virtual environments.

Research Questions or Hypothesis – We anticipate a greater negative impact on those trained in virtual reality environments compared to those trained in the real world.

Method – We collect quantitative data and analyses on a variety of measures. These include optometric measurements, eye tracking recordings, neuroimaging output, behavioral responses (i.e. reaction times) as well as self-report survey data.

Student Roles – Students in my lab are trained on a variety of techniques that include optometric measurements, eye tracking and neuroimaging. Students will be involved in data collection and analysis, as well as dissemination though poster presentations and possibly manuscripts.

Expectations – I am looking for students that are passionate about research and eager to learn and gain experience with neuroimaging, eye tracking or virtual reality. We have weekly lab meetings with my entire team in a collaborative environment where students work together on different projects. Students will have the opportunity to be involved in multiple projects as well as be the lead researcher on projects and design a study with me if they develop their own question of interest in one of our areas of research.

Conferences Typically Attended – My students and I typically present at annual meetings of Society for Neuroscience (SFN) and Association for Psychological Science (APS)

Publications – please view a sampling of our work at www.csun.edu/~sdrew

Key Words – electroencephalogram (EEG), neuroimaging, virtual reality, VR

Tara Fahmie

Mentor Bio — Dr. Fahmie is a behavior analyst with over 10 years of experience providing assessment and intervention services to children, adolescents, and adults with a variety of abilities. Her current passion is to study the development and prevention of behaviors like aggression and disruption in young children. Please check out her website.

Title of Research Project — Strategies to prevent the development of severe problem behavior in children

Background & Purpose — The purpose of this research is to design effective tools for the screening of emerging problem behavior and the prevention of severe problem behavior in young children with and without intellectual and developmental disabilities.

Research Question(s) or Hypothesis — We hypothesize that paying close attention to the immediate consequences of problem behavior in young children will enhance early detection and prevention strategies. These tools ultimately will enhance the quality of life for children and families of many abilities and backgrounds.

Method — Mixed method (primarily quantitative). Targeted skills will be assessed using direct observation and behavioral measurement systems. Specifically, students will observe children during arranged activities and will collect data on functional skills (e.g., communication, play) and problem behavior (e.g., aggression, disruption) using iTouches running ABC DataPro software. In addition, students will record measures of experimenter integrity to identify whether the intervention is being implemented as planned. Data will be analyzed using graphic display of behavior change over time and will be discussed during weekly lab meetings.

Student Roles — All research occurs off site, at established community partnerships. Students will be responsible for traveling to the site of the research, fostering collaborations with the community partner, collecting and analyzing data, graphing results, and discussing data during weekly meetings. Students will gain experience in direct observation, behavioral measurement, single-subject experimental design, and visual analysis of data.

Expectations — Students can expect to participate in all levels of my community-based action research. This includes assisting with the: design of the study, implementation of sessions with children, in-vivo and video data collection, data review and analysis, and dissemination (via posters and presentations at local, national, and perhaps international conferences). Students can expect me to be a hands-on mentor who is closely monitoring their progress and tailoring their experience to best meet their personal goals. Students can also expect a lot of open, honest feedback in both directions (me to them, and them to me).

Conferences Typically Attended — California Association for Behavior Analysis, Applied Behavior Analysis International, CSUNPosium

Publications — All of my publications can be found and full texts can be requested at ResearchGate. Also, please see my website for my CV and link to full texts of my publications.

Elise Fenn

Mentor Bio — I am a cognitive psychologist, and am interested in understanding cognitive mechanisms such as memory and decision-making, broadly. Specifically, I am interested in two main lines of research: (1) how the understanding of cognitive mechanisms can be applied towards improving the legal system (specifically investigative interviewing and detecting deception), and (2) investigating factors that bias judgments of truth when making truth judgments rapidly, such as in a social media environment. I received my PhD in 2015 from Claremont Graduate University. I have been working as a faculty member at California State University Northridge since 2015 teaching Cognitive Psychology of Memory at the graduate and undergraduate level, and Research Methods for Psychology. Here is a link to my research gate profile page: https://www.researchgate.net/profile/Elise_Fenn.

Project Title — Cognitive and Social Factors that Impact Truth Biases in a Social Media Environment

Background & Purpose — Human make rapid judgments of truth daily, such as when scrolling through social media feeds. While these rapid judgments of truth may seem meaningless in the moment, the potential long-term consequences may impact meaningful areas of life, from health choices, to political decisions, to understanding news headlines. During these rapid judgments, the availability of "non-probative" information can increase bias to believe the information is true. For example, a series of studies found that presenting a related, but uninformative photo (e.g., a photo of a turtle) alongside a trivia statement ("turtles are deaf") increased bias to believe that information was true. In this research project, we investigate whether the effect of non probative information persists within a social media environment, and what

cognitive mechanisms underlie this effect. Further, we examine methods for reducing the unintended influence of nonprobative information on truth biases.

Research Question(s) or Hypothesis — In this research project, I am interested in answering the question, "What cognitive mechanisms underlie the effects of non probative information on truth biases in a social media environment?" and "What methods can be used to reduce the influence of non probative information on truth biases in a social media environment?" A particular emphasis will be places on understanding the influence of non probative information in several applied areas, including: health behaviors, political beliefs, memory for news headlines, and jury decision-making.

Method — This research is Quantitative. The method of data collection will most likely be designing an experiment via in-person and online methods. You may develop surveys and also design materials to be administered on a computer screen via programs such as Inquisit or EPrime software. You may also analyze data using SPSS, Excel, or R software.

Student Roles — Students will be responsible for conducting hypothesis-driven literature reviews, collecting data in-person or online, designing and creating materials using computer software programs such as Qualtrics, Inquisit, or EPrime, analyzing data using SPSS, R, Excel software, presenting and disseminating data at regional or national conferences, and the opportunity to publish in peer-reviewed journals pending student contributions to the project.

Expectations — I expect students to have an interest in understanding cognitive psychology, and experimental psychology. Student in lab will gain knowledge on all aspects of the research project, from project creation to project dissemination. I hope to provide students with a supportive lab environment and help them accomplish their goals of becoming psychological scientists.

Conferences Typically Attended — American Psychology-Law Society, Association for Psychological Science, Society for Applied Research in Memory and Cognition, Psychonomic Society, Western Psychological Association

Publications — Please see my research page.

Stephanie Hood

Mentor Bio — Dr. Hood is a behavior analyst with over 10 years of clinical and research experience. She has worked with children, adolescents, adults, and older adults. Her current research in practice interests have been related to determining the extent to which efficacious teaching procedures produce socially important behavior change and promote maintenance and generalization, and expand the reach of behavior-analytic services. **Ph.D.** 2015, University of Nebraska Medical Center **M.S.** 2011, Southern Illinois University Carbondale **B.S.** 2008, University of Minnesota Duluth. Please check out her website.

Research Project Title — Evaluating the Effects of Behavioral Skills Training on Identifying and Conversing about Common Interests Between Conversation Partners

Background & Purpose — The purpose of this research is to design effective interventions to teach complex social skills to adolescents and young adults with disabilities or social skill deficits. In addition, it is important to evaluate the extent to which interventions produce robust changes such that individuals engage in these newly acquired skills in other contexts. Effective interventions to teach complex social skills is essential for adolescents and young adults with disabilities to become fully functioning members of the community (e.g., independent living, success in higher education, and employment).

Research Question(s) or Hypothesis — We will be evaluating interventions for specific conversation deficits such as discriminating and responding to sarcasm, identifying common interests, and discussing past experiences with individuals to whom the activity was shared and individuals whom did not share the same experience.

Methods — Mixed Method (primarily quantitative). We will directly observe the participants social skills and measure their performance. Specifically, students will observe participants target social skills (e.g., following non-preferred conversation, changing the topic of conversation following indicies of uninterest, ending the conversation, and talking about common and uncommon topics). Students will also record the researchers integrity of implementing the research procedures as designed. Data will be analyzed through visual inspection of graphical data to show change over time.

Student Roles — Students in my research lab will have the opportunity to get involved in all aspects of applied research. Students will collect data on social behaviors and researchers' integrity, interact with research participants, conduct research sessions, graph and analyze data, and discuss data during weekly meetings. Students will learn how to visually inspect data and use single-subject experimental designs. Students will have the opportunity to work directly with participants and foster relationships with their caregivers. Students will have the opportunity to co-author a poster or symposium presentations at local, regional, and international conferences for behavior analysis such as California Association for Behavior Analysis and Association for Behavior Analysis International.

Student Expectations — My research lab is a collaborative environment. Students can expect to work with other undergraduate and graduate students, and myself. Students will assist in research design, implementation of sessions with participants, data collection, data analyses, graphing the data, and discussion of each project in our weekly lab meeting. I also encourage students to be active in disseminating our research through presentations at local, regional, and international conferences. I expect students to come with motivation and willingness to learn. In developing professionalism, I expect students to be dependable, ask questions, and communicate effectively with the team. Also, I hope students are excited about the important work we are doing as a team. It is my commitment to try and tailor these experiences to aid students in meeting their individual career goals.

Conferences Typically Attended — California Association for Behavior Analysis and Association for Behavior Analysis International, CSUNPosium.

Publications — All of my publications and CV can be found and full texts can be requested at my lab website.

Sun-Mee Kang

Mentor Bio — I am a social and personality psychology with expertise on statistical data analyses and research methods. I have been mentoring students at UC Davis, University of Notre Dame, and CSUN for over 20 years. All of my research projects focus on the psychological factors that contribute to social adaptation, including emotion, personality, social working memory, and acculturation strategy.

Research Projects — Two projects are currently undergoing in my research lab, (1) Alexithymia, emotion information, and EEG, (2) Racial discrimination and emotion recognition accuracy.

Project 1: "Alexithymia, emotion information, and EEG"

Background & Purpose — The current study is designed to understand how individuals with alexithymia would process emotion information using the Electroencephalogram (EEG). Alexithymia is a term coined by Sifneos (1973) that describes a personality trait in which individuals have difficulty identifying feelings, difficulty describing feelings, and an externally oriented cognitive style. Although a number of studies have been conducted to explore a possible neural basis for alexithymia, very few attempts have been made to understand how individuals with alexithymia would process emotional information using the EEG. The current project is designed to address this issue.

Research Question(s) or Hypothesis —Past research has demonstrated that individuals with high degrees of alexithymia (HDA) show an early processing deficit compared to individuals with low degrees of alexithymia (LDA) by focusing on P100 and P300 peaks in the Event-Related brain Potential patterns. However, their study did not explore differences in the amplitude of N170. Literature has shown that N170 marks the point in processing when a visual stimulus is consciously interpreted as a face and its occurrence depends on our past experience of what is a 'face' (Rossion 2014). The main purpose of the current study is to further explore differences in N170 amplitudes between individuals with HDA and LDA, when they process facial expressions.

Method — Quantitative method. We are using an experimental design. We present study stimuli on a computer monitor using E-prime (by Psychology Software Tools. This is a comprehensive software available for behavioral research) and record brain waves using Brainvision recorder while participants take computerized tests.

Project 2: "Racial discrimination and emotion recognition accuracy"

Background & Purpose — While overt racial discrimination has decreased, subtle forms of discrimination continue to persist in US. Modern day discrimination, also known as racial microaggression, is defined as daily verbal and noverbal behaviors that convey negative racial slights and insults (Sue & et al., 2007). Due to its subtlety, when minority members are treated unfairly, they have difficulties to label the situation as racial discrimination (Noh & et al., 2007). Given the complexity of racial discrimination in current society, how individuals process such ambiguous experiences and what impacts it would have on psychological and physical health are not well documented.

Research Question(s) or Hypothesis —Our lab is exploring whether people have subconsciously learned to focus on nonverbal cues, such as facial expressions, when anticipating that they may be discriminated against. To address this question, we are currently evaluate the effects of priming minority status on emotion recognition accuracy tests among people of color, using the implicit and explicit priming methods.

Method — Quantitative method. We are using an experimental design. We present an emotion recognition test and other computerized tests using Inquisit Lab (a powerful tool for designing and administering psychological tests and experiments on computers).

Student Roles — Students who are involved in these projects will receive comprehensive training to be a qualified research assistant including how to run an EEG study and analyze EEG data. They will also learn how to design a study using Inquisit Lab or E-prime for the racial discrimination and emotion recognition project. Students will learn how to do a literature review and comprehend empirical papers by weekly lab meetings. They will learn how to write an abstract for presentation and how to present their studies at various conferences. They will be also invited to write a manuscript together for publication.

Expectations — Our lab is looking for students with strong motivation, persistence, passion, and dependability, and maturity.

Conferences Typically Attended — Society for Neuroscience, Association for Psychological Science, American Psychological Association, Society for Personality and Social Psychology, International Association for Cross-Cultural Psychology, Western Psychological Association, UCLA Psychology Undergraduate Research Conference

Justin Kantner

Mentor Bio — Most of the decisions we make are based on some form of supporting evidence from memory, yet memory is notoriously faulty. My research examines the biases that help us come to decisions (often erroneously) when evidence from memory is incomplete. My focus is on recognition memory judgments, which entail a decision as to whether a presented stimulus was also encountered earlier in the experimental session (an "old" item) or was not encountered earlier (a "new" item). In a recognition memory task, participants may exhibit a bias to err on the side of "old" responses (a liberal bias), "new" responses (a conservative bias), or neither (a neutral bias). My research (Kantner & Lindsay, 2012, 2014) demonstrated that recognition bias is relatively stable within an individual and behaves like a cognitive trait, one with potentially broad significance for cognition and behavior. **Ph.D.** 2011, University of Victoria **M.A.** 2005, Indiana University **B.A.** 2000, Purdue University.

Background & Purpose — A number of studies have examined the relationship of response bias to neural and behavioral pathologies, with strikingly consistent results: compared to appropriate controls, recognition criteria are more lax in elderly individuals, patients with Alzheimer's disease, patients with dementia, patients with schizophrenia, individuals with mental retardation, and individuals with panic disorder. These findings strongly suggest that interventions aimed at improving decision making in these populations should focus on this lax tendency, which may indicate a degraded ability to engage top-down control mechanisms that normally keep individuals from making memory decisions based on weak evidence. Such individuals may adopt false beliefs (e.g., accepting false claims as true or false memories as accurate) that might be averted with the use of a stricter criterion when evaluating the evidence for those beliefs. Training in the use appropriate decision criteria does not require improvements in memory acuity per se (which may be difficult or impossible in some individuals) and could substantially improve decision making in individuals with these conditions. Such training

may also be applied in the domains of eyewitness memory, medical diagnosis, security, and law enforcement, settings in which errors due to inappropriate decision criteria can carry disastrous consequences.

Method — Two experiments will test the relationship between decision bias and false memories and false beliefs. Another will use a technique called "content analysis" to understand the rationale behind the decisions of lax versus strict recognizers. A fourth will test novel procedures for training decision bias when recognition decisions are extremely difficult.

Student Roles — Students have the opportunity to assist in multiple experiments related to understanding decision bias and training it in memory impaired individuals. Students at any level can assist in all phases of the research, from experimental design and gathering of stimuli to running participants in experiments, conducting descriptive and inferential data analyses using common statistical software packages, and, potentially, preparation of manuscripts and presentations at conferences such as the Psychonomic Society and Association for Psychological Science annual meetings.

Ellie Kazemi

Mentor Bio — I have had the privilege of mentoring students during my Ph.D. program at UCLA and as a member of the faculty at CSUN for the past 10 years. I have a very active research lab. You can see our current members and our work by going to my lab website.

Title of Research Project — Leveraging Technology for Simulation-based Learning.

Purpose & Background — We have several projects in my lab, all focused on effective, efficient training that provides hands-on experience to participants. We use technology to develop simulations and to gain efficiency in training. For example, we use a humanoid robot to simulate a child with problem behaviors during teaching sessions so that we can study how teachers, parents, and other caregivers respond under such circumstances and how we can provide more effective trainings to such individuals so that they feel better equipped before working with real children.

Research Question(s) or Hypotheses — Can a humanoid robot serve as a child simulator for simulation-based learning as well as research? Can we use Artificial Intelligence to provide hands-on, safe training to practitioners?

Methods — We use group and single-subjects designs with direct observational data.

Student Roles — Students are involved in all aspects of various research projects depending on their interests. They may develop creative behavior patterns for the robot, add emotions or lifelike characters our existing behaviors, develop computer-based training material, edit videos, develop animations, observe and record data, conduct experiments, conduct literary searches, develop posters or symposia material, and much more.

Expectations — Mentorship is a two-way relationship. I expect open communication and honesty from my mentees. I expect them to help me guide them and to work with me in reaching their goals. I expect them to find learning reinforcing and to solicit feedback from and their peers, and myself, in lab to help them improve and grow.

Conferences Typically Attended — California Association for Behavior Analysts (CalABA), Association of Behavior Analysts International (ABAI), Human-Robot Interaction (HRI)

Publications — Almost all of my publications are with student co-authors and can be found at our lab website.

Luciana Lagana

Mentor Bio — I am an experimental and a clinical psychologist with nine degrees, post-docs, and specializations, and about 40 peer-reviewed publications. Students (at sophomore, junior, senior, and graduate levels) who join my research team often acquire one or two research presentations, and at times a publication (or more if they are highly motivated): this contributes to making their applications to doctoral programs stronger. Some of my former students are completing their doctoral degrees at prestigious Universities or have become faculty at highly-regarded Universities.

Purpose & Background — My research goals include contributing to the understanding of 1) average physical pain levels across major ethnic/racial groups, 2) risk and protective factors for pain

in older age, and 3) psychopathology associated with relational and sexual health problems. I also conduct studies in the developing field of narrative medicine research, testing whether original social impact films created in collaboration with some of my students (on topics including LGBTQ discrimination and physical pain under-treatment of ethnic/racial minorities) are successful at a) reducing stereotypes and b) increasing empathy towards discriminated minorities of different kinds. My current grant funds innovative research on older women living with diverse levels of pain regarding their medical collaboration with their physicians and their engagement in advised health behaviors that could contribute to lower pain levels. I will also test my new model of physical pain in older age. Moreover, to fill gaps in the psychometric literature, I create and validate measures to assess psychopathology and aspects of the relationship between patients and their health care providers. I have a variety of cross-sectional and short-term longitudinal, self-report survey data.

Student Roles — At present, a graduate student and a CSUN Presidential Scholar undergraduate student are involved in exciting narrative medicine research efforts. In my "Adult Behavioral Medicine Laboratory," using SPSS and other programs, students collect, enter, verify, code qualitative data, and analyze data on the physical/medical, psychosocial, and sexual needs of cognitively high-functioning, community-dwelling women and men of all ages and from diverse ethnic/racial backgrounds. Also, they co-write quantitative and qualitative research posters and manuscripts on the findings of our research. Moreover, they attend a variety of research conferences at locations such as Honolulu and Palm Springs, where they present our research findings and make connections that could lead to identifying potential future mentors in strong doctoral programs.

Expectations — Students who are interested in 1) giving a voice to neglected minorities via video/film and 2) testing whether this film can have a positive impact on people's attitudes typically find participating in this type of research fulfilling via creatively combining social impact filmmaking with research work. These projects compete in many film festivals in the U.S. and worldwide, and have won several festival awards. Furthermore, a social impact show created in collaboration with one of my students has been featured in April 2015 by the *American Psychological Association* next to the work of renowned psychologist Albert Bandura. My research in the field of ethnogeriatrics has been funded by NIH since 2002.

Debbie Ma

Mentor Bio — My research focuses on stereotyping and prejudice. In my lab, we utilize implicit measures of stereotyping and prejudice to reveal unconscious biases that people may have. More recently, we have also been collaborating with Dr. Just Kantner's lab to explore research surrounding racial categorization of racially ambiguous individuals, such as those who might be low in racial prototypicality or those who are biracial/multiracial.

Title of Research Project — Stereotyping & Prejudice and Biracial Face Perception

Background & Purpose — The aim of our work is to better understand the conditions that promote bias, so that we can ultimately create interventions that might attenuate stereotyping and prejudice.

Research Question(s) or Hypothesis — What facial features correspond with accurate racial categorization? Why is it difficult for people to correctly categorize biracials as biracial? What are some individual differences that might moderate how a person racially categorizes others?

Method — Quantitative. In-lab experiments, online experiments.

Student Roles — students can take on a host of responsibilities from data collection, analysis, writing up research, presenting posters, and in some cases coming up with novel research questions and co-authoring papers.

Expectations — I expect lab members to be involved, reliable, and willing to learn. Students should be able to dedicate 5-10 hours a week to data collection, lab meetings, and other lab-related projects.

Conferences Typically Attended — Society of Personality and Social Psychology

Publications

Scott, K., **Ma, D. S**., Sadler, M. S., & Correll., J. (in press). A social scientific approach toward understanding racial disparities in police shooting: Data from the Department of Justice (1980-2000). Journal of Social Issues.
Ma, D. S., Webster, C., Tachibe, N., & Gressis, R. (2017). 21% versus 79%: Explaining Philosophy's Gender Disparities with Stereotyping and Identification. Philosophical Psychology. Link
Ma, D. S., Correll, J., & Wittenbrink, B. (2016). Context Dependency at Recall: Decoupling Context and Targets at Encoding. Social Cognition, 34, 119-132. PDF download
Correll, J., Hudson, S. M., Guillermo, S. & **Ma, D. S.** (2014), The Police Officer's Dilemma: A Decade of Research on Racial Bias in the Decision to Shoot. Social and Personality Psychology Compass, 8, 201-213. PDF download
Ma, D. S. & Devos, T. (2013). Every Heart Beats True, for the Red, White, and Blue: National Identity Predicts Voter Support. Analyses of Social Issues and Public Policy. doi: 10.1111/asap.12025. PDF download

Jonathan Martinez

Mentor Bio — Ph.D., 2013, UCLA (Clinical Psychology) **M.A.,** 2009, UCLA (Clinical Psychology) **M.A.,** 2007, SDSU (Psychology) **B.A.,** 2002, UCI (Psychology)

Purpose & Background — In child psychotherapy, parents' active participation in their child's mental health (MH) treatment is imperative, with children faring better when parents are actively engaged in treatment relative to individual child treatment (Dowell and Ogles 2010). Yet, when families - particularly those from ethnic minority and socially disadvantaged backgrounds - initiate services, they often experience significant barriers to therapy engagement (Kazdin, 1996). Knowledge and beliefs about MH problems and treatments, referred to as *MH literacy*, appear to be among the most common and explanatory barriers (Jorm, 2000). Thus, developing engagement strategies to target MH literacy gaps are needed. *Psychoeducation*, an evidenced- based practice used to present factual information about MH problems and treatments (Lukens & McFarlane, 2004), may be a successful strategy for targeting MH literacy barriers and engaging families in care. The proposed research plan has an overall aim of developing and pilot testing a psychoeducation-based **enhanced-intake procedure (PEP)** for engaging families entering child MH services, with the following specific aims and questions.

Research Question(s) or Hypotheses — (Aim #1) Develop and refine the PEP in collaboration with community partners. Using a collaborative, iterative approach, feedback from community partners is expected to increase the validity, feasibility, and acceptability of the PEP in usual care (UC) settings, and will answer the following: *What difficulties do providers encounter in attempting to engage families in care, and what strategies are used? What are potential benefits/challenges to using PEP?* **(Aim #2)** Examine the feasibility and acceptability of the PEP in a small-scale pilot study. The PEP will be evaluated for feasibility, fit, relevance, utility, and will be refined as needed for UC settings. This will answer the following: *Do families and providers find the PEP beneficial in promoting family engagement? How can the PEP be modified to increase feasibility, helpfulness, and utility for engaging families, particularly ethnic minority families?* **(Aim #3)** Implement the PEP in a pilot randomized trial. The feasibility, acceptability, and fidelity of the PEP will be evaluated, as well as the comparative effectiveness of the PEP vs. UC. This randomized trial will answer the following: *Does the PEP promote family engagement in care compared to UC? Are there specific subgroups of families (ethnic minority status, SES, acculturation) that benefit more/less from the PEP?*

Student Roles — 1) Observational coding of therapy session recordings. Students will be trained on a coding system to document therapist behaviors/strategies used to engage families, as well as parent/family behaviors that are indicative of engagement. **2)** Semi-structured interviews with participants. Students will be trained on providing semi-structured interviews to participants to document participant perspectives on the PEP. **3)** Focus groups with participants. Students will assist the focus group facilitator, and when effectively trained, lead their own focus group with participants.

Expectations — Students will have the opportunity to participate in several facets of research, and will be integral to the success of this research program.

Conferences Typically Attended — This research will give students the opportunity to present study findings at conferences, such as: American Psychological Association, Western Psychological Association, Association for Behavioral and Cognitive Therapies, and UCLA Psychology Undergraduate Research Conference.

Mark Otten *Pending Mentor Training*

Mentor Bio — I grew up in Davis, California, and thus cheer for the greatest teams in the history of sports, the San Francisco Giants and the Sacramento Kings. I will also accept Dodger and Laker fans into my lab, however. For education, I graduated from UC Davis with an undergraduate degree in statistics in 2001, and from UCLA with a PhD in psychology in 2007.

Title of Research Project — Studies of Performance Under Pressure in Sports and Beyond. My lab is called the CSUN Sport Psychology Lab

Background & Purpose — The purpose of our research is to study sport and exercise psychology, broadly. Historically, we have studied pressure and performance. Currently, we are also interested in studying performance in a non-sport context, such as when taking an exam.

Research Questions or Hypothesis — How might an athlete prepare mentally to give a successful, clutch performance under pressure? Will a short session of exercise before taking an exam help with performance? Also as a side project, what can we do to stimulate interest in sports on a college campus, and what impact will fan activity have on students and teams?

Method — primarily quantitative, on both experimental and archival data. Some qualitative analysis.

Student Roles — Study design, data collection, attendance at lab meetings, working on papers, and submitting posters to conferences.

Expectations — I am always available as a mentor, and happy to provide friendly tips on research, professional development, etc. I try to help students find their way, and encourage them to pursue their truest interests.

Conferences Typically Attended — Association for Applied Sport Psychology, Western Psychological Association

Publications — View my publications at my website.

Scott Plunkett

Mentor Bio — Ph.D. 1997 in Family Relations and Child Development, Oklahoma State University. M.Ed. 1992 and B.A. in Psychology and Speech/Theater 1986, Northwestern Oklahoma State University.

Title of Lab — Adolescent & Adult Adjustment (A Lab). https://www.csun.edu/plunk/

Background & Purpose — The goals of my research are: **(1)** to examine family, school, peer, and community influences on emerging adults' mental health from diverse backgrounds (e.g., SES, ethnicity, deaf, LGB). **(2)** to examine ecological validity of mental health measures in emerging adults from diverse backgrounds. **(3)** to evaluate campus programs (e.g., programs to increase retention/graduation of students) and community programs (nutrition classes, gardening classes, free tax help for low-income community).

Methods — Qualitative and quantitative data. Self-report surveys, focus groups, interviews, pretest/posttest designs, cross-section and experimental designs.

Student Roles — Students work by task in the lab so that they get experience with many different types of research and projects. They will also get experience with Qualtrics, SPSS, R, running various statistical analyses, coding qualitative data, editing research reports, presenting at conferences, etc.

Expectations — Since my office and lab are the same space, I am in the lab 3 days a week with the students, so I spend lots of time with students. My students have been very successful.

Conferences Typically Attended — American Psychological Association, Association for Psychological Sciences, National Council on Family Relations, National Council on Measurement in Education, Society for Research on Child Development, Society for Research on Adolescents, Association for Behavioral and Cognitive Therapies

Publications & Presentations — http://www.csun.edu/plunk/documents/scholarship_plunkett.pdf

Jill Quilici

Mentor Bio — Jill Quilici has 18+ years of experience mentoring high school, undergraduate, and graduate students in research and has previously been Co-Director of a program (with Dr. Saetermoe) designed to prepare under-represented students to pursue doctoral level studies in mental-health related research. **Ph.D.** 1997, University of California Santa Barbara **M.A.** 1994, University of California Santa Barbara **B.A.** 1992, California State University Chico.

Background & Purpose — Jill Quilici studies the relationship between self-regulation and decision-making, focusing on developing and testing interventions to improve self-regulation capabilities. Difficulties with self-regulation have been implicated in many health issues, particularly obesity. This topic is of great significance because of the current obesity epidemic in the United States, which is associated with serious health conditions, including heart disease, stroke, and type II diabetes.

Research Question(s) or Hypothesis — Some questions her lab is exploring include: Is self-regulation a limited resource which can be depleted or are self-regulation failures due to changes in motivation and/or attention? How do we improve self-regulation capabilities? How do we manage decision-making when faced with conflicting goals (e.g., choosing what to eat when we want to eat healthy, but we also want to eat something very tasty)?

Method — Most research studies in the lab use an experimental approach. A typical study might involve asking participants to carry out a task which involves self-regulation (e.g., controlling emotional expression while watching an intense video or holding one's arm in icy water as long as possible). Then, some participants participate in an intervention designed to improve self-regulation, while other students (control group) do not. Finally, participants are asked to complete another self-regulation task (e.g., choosing between a healthy vs. unhealthy snack). If the intervention group outperforms the control group on the second self-regulation task, this would be evidence that the intervention is effective. Data analysis would be primarily quantitative—usually involving analysis of variance or multiple regression.

Student Roles — Students assisting in Dr. Quilici's lab get experience conducting literature review, experimental design, development of stimulus materials, quantitative data collection, data scoring, data entry, data analysis, and writing up and presenting research findings. Students at the sophomore, junior, and senior levels can participate in all of these activities.

Expectations — It is expected that students will become more independent as they progress in the lab and will take on more of a leadership role, eventually mentoring more junior students.

Conferences Typically Attended — Dr. Quilici's lab presents at a variety of conferences, such as Western Psychological Association, Association for Psychological Science, Society for Behavioral Medicine, and Society for Personality and Social Psychology.

Jill Razani

Mentor Bio — Dr. Razani has worked with a number of NIH Fellowship students, such as those in MARC, RISE, and COR programs and will be happy to mentor students and/or faculty in the BUILD program. She is currently the chair of the psychology department. http://www.csun.edu/~ljr77544/

Research Projects — Dr. Jill Razani has two major research projects in the area of health disparities.

The first study is to assess the relationship between neuropsychological test performance and everyday functional abilities of patients with early-stage dementia. The purpose of this study is to better characterize and

find predictors of functional abilities of patients with dementia and those with mild cognitive impairment. Additionally, this study aims to better understand the relationship between patient functioning and caregiver burden.

The second study in Dr. Razani's lab is designed to examine cultural and acculturation factors that impact neuropsychological test performance of individuals from immigrant backgrounds. Factors such as bilingualism and level of acculturation are examined as they relate to neuropsychological performance in first, second and third generation immigrants.

Method — We will assess these factors over a one-year period to understand the rate of decline in neuropsychological and daily functioning, as well as caregiver burden.

Student Roles — Dr. Razani's lab has research assistants at all levels from freshmen to master's students. All students will learn the test battery for each project (i.e., the neuropsychological test battery) and those who master test administration, will be given the opportunity to administer the tests to research participants. All interested students will co-author a presentation to a regional scientific conference within their first year in the lab, and those students who continue in the lab past one year, will most likely present at national and/or international scientific conference.

Expectations — As students gain mastery in the lab, they will work more independently with scoring, data entry, data analysis, and dissemination of the findings (e.g., conference presentations or possibly journal publications).

Abraham Rutchick

Mentor Bio — Hello! I grew up in Massachusetts, got my PhD at UC Santa Barbara, taught at Syracuse University, and have now been at CSUN for 10 years. In addition to the work on psychology and technology, students in my lab work on health psychology, political psychology, moral psychology, priming, and social perception. Visit my website for more information.

Title of Research Project — Social Psychology and Emerging Technology

Background & Purpose — The technology that shapes our daily lives is changing more quickly than ever. My lab works on understanding how new technologies change the way we think, feel, and act, and also on how fundamental psychological theories can inform the way we interact with new technologies.

Methods — Mostly quantitative. We use a variety of methods, including lab experiments, surveys, archival analyses, and more.

Student Roles — My BUILD students work on all aspects of projects, including literature reviews, data collection, and study design. Typically they start by working with me on a project that I initiate (by designing stimuli and conducting the study) and progress to developing an independent research project.

Expectations — I expect my students to engage passionately with their research questions. The most important qualities - that I can't teach or help with - are curiosity and work ethic. If a student is excited and curious and passionate and works hard, they'll probably do very well. We'll work on writing, critical reading, statistical techniques, scientific communication, scientific thinking, and so on.

Conferences — SPSP (social psychology), APS (Association for Psychological Science), JDM (Judgment and Decision Making), the other APS (American Psychosomatic Society), SAA (Society for Ambulatory Assessment), SBM (Society for Behavioral Medicine).

Publications — Visit http://rutchick.com/research/ to view my publications.

Omar Ruvalcaba

Mentor Bio — I grew up in Inglewood, and I'm a proud first-generation student. My parents came to the United States from Zacatecas, Mexico and decided to stay in Mexico to provide their children with educational opportunities. I completed my Bachelor's degree in Psychology at UCLA with minors in education and Chicana/o studies. I was interested in research that could change the lives of other first-generation students. I then went on to completed my developmental psychology Ph.D. with an emphasis in cultural psychology at UC Santa Cruz.

In my research, I take a cultural strengths approach to understand the relationships between culture, institutional barriers, and access to higher education opportunities. My current research focuses on the experiences of first-generation students in pursuing higher degrees and their experiences in the workplace. For example, in one study I focus on studying how Latinx students participate and seek help university contexts. My research takes an approach that is aware of gender, culture, and race. A second line of my research focuses on understanding access to technology careers in underrepresented communities (with a focus on Latinx and women). This research includes research that focuses on the experiences of underrepresented students in computer science (Latinx and women) and the experience of these individuals once they join the tech workforce. Another project focuses on women's experiences during online gaming.

Research Website http://www.tecc-lab.com. **Personal Website** www.omarruvalcaba.com.

Title of Research Project — 1st Generation Immigrant Women and Men's Experiences & Women's Experiences While Gaming Online (or spending time online)

Background & Purpose — The purpose of the research is to help address issues of equity regarding access to higher education and careers. Research in this lab draws on Psychology, Learning Sciences, and Educational research.

Research Question(s) or Hypothesis — How do first-generation immigrant women and men navigate institutional barriers and family responsibility to succeed in the university? What cultural strengths do different ethnic groups draw on to succeed at the college level? What are women's experiences in online and in-person gaming circles?

Method — Qualitative, Interview, some Quantitative Analysis

Student Roles — study design, data collection, interviews, submitting posters to conferences.

Expectations — I expect that students come to my lab with a willingness to learn and go beyond their comfort zone. In addition, I expect that students will always follow through, feel comfortable asking questions, are excited or interested research that gives back to underserved communities.

Conferences Typically Attended — American Educational Research Association, Society for Research in Child Development, Society for Research on Adolescence, American Association of Hispanics in Higher Education, International Conference in the Learning Sciences.

Publications — http://www.tecc-lab.com/references/

Carrie Saetermoe, Co-PI of BUILD PODER

Mentor Bio — I have dedicated my career to social equity in education, health, and disability. I am one of the Principal Investigators (PI) of BUILD PODER, focusing on the Faculty Core. I have conducted extensive research on variations in Latina/o familial reactions to the transition to adulthood of youth with and without disabilities in Los Angeles, Guatemala, and in Juarez, Mexico. Specialty Areas: Developmental Psychology, Health Psychology, International Disability Studies, Latin@s and Education. Ph.D. 1988, University of California Riverside M.A. 1983, California State University Long

Beach B.S. 1981, Michigan State University. https://www.csun.edu/social-behavioral-sciences/psychology/carrie-saetermoe

Background & Purpose — Professor Carrie Saetermoe studies two central populations: (1) Chican@s and their families as they negotiate education in the U.S., and (2) youth with disabilities as they transition to adulthood.

Method — For project 1, interviews from a 3-year longitudinal study of middle and high school Chican@ students are analyzed qualitatively using Grounded Theory analysis. For project 2, data (quantitative, interview, focus groups) from the U.S. and Guatemala are analyzed with a cultural lens to detect strengths and barriers in the transition to adulthood for youth with physical disabilities.

Student Roles — Students meet with their faculty mentor weekly and conduct contextual analyses for presentation and publication.

Publications — Visit my CSUN faculty profile for a list of representative publications.

Holli Tonyan

Mentor Bio — Dr. Tonyan has been a member of the Department of Psychology since 2007. This appointment follows three years as a Lecturer in Early Childhood Education at Monash University in Australia and two years as a Postdoctoral Fellow in Psychology at the University of California, Santa Cruz. Dr. Tonyan has also served as a consultant, conducting program evaluations for higher education and non-profit agencies. **Ph.D.** 2001, UCLA. Psychological Studies in Education. **M.A.** 2000, UCLA. Psychological Studies in Education **B.A.** 1996, Carleton College (MN). Psychology. Visit her CSUN webpage for more.

Title of Research Project – Are You In? Family Child Care Providers' Experiences with Quality Improvement. View the project website.

Background & Purpose — 7.1 million children are cared for outside of their home or child care centers in family child care (FCC) homes by approximately 3.7 million caregivers. Many are among the nation's most vulnerable: children of color, children in poverty, and children whose parents work non-traditional hours. My research documents the ecological (e.g., physical and material conditions) and cultural (e.g., beliefs, priorities) features of FCC. Daily routines are key determinants of children's school readiness, close relationships and healthy habits.

Research Question(s) or Hypothesis — In my lab, we address the overarching question: under what conditions do FCC providers reflect on and improve the quality of the care they provide children? Specifically, we ask: What are FCC providers' working conditions, beliefs, and sustainability of daily routines as related to opportunities for children's learning and development. In addition, we examine how the above are related to FCC providers' choices when they do or do not participate in formal opportunities for professional learning that are available to them?

Method — A very brief quantitative Regional Survey distributed to all licensed FCCP in selected service areas examines providers' needs and interests in the regions studied. In-depth Case Studies of 54 FCCP in Los Angeles County and 30 FCCP in Sacramento County include (a) a field visit to the FCC; (b) a survey that includes information about the providers and the children they serve and standardized measures of stress, motivation, etc; (c) an in-depth interview about daily life in FCC, including questions about photos that the providers take of their activities with children. Using a mixed-method approach, we create descriptive, quantitative profiles of characteristics and needs of providers in selected regions (i.e., many participants, with little information about each participant) which we compare to larger, more representative surveys to understand how our samples fit into the broader landscape of child care providers in the state and nation. We can then relate qualitative, emergent codes with standardized measures and quantitative indicators (e.g., income, stress, professionalism).

Student Roles — All students learn skills in qualitative analysis and have to work with me to develop a system for more advanced analysis (quantitative and qualitative) including establishing their own coding system for a topic of interest identified in consultation with the PI. Students have opportunities for mixed-method analyses that examine

associations between qualitative codes and standardized measures once they become familiar with the many different types of data available from a recently ended project.

Expectations — I seek students who are curious about cultural approaches and methods and looking to take advantage of the many resources I've developed to help them learn about quantitative and qualitative methods. Through group lab meetings and one-on-one meetings, students start with structured research practice and work their way toward independent projects.

Conferences Typically Attended — Society for Research in Child Development, Child Care Policy Research Consortium, International Conference of Infant Studies, Research Conference on Early Childhood.

Publications – View all her publications at her CSUN webpage.

Key Words – child care, family child care, sociocultural theory, ecocultural theory.

Yolanda Vasquez-Salgado *Pending Mentor Training*

Mentor Bio — I grew up in Oxnard, California, and I am proud to be a first-generation college student and daughter of immigrant parents from Mexico. I believe that my background and experiences continue to serve as a strength in my research inquiries of which I am very passionate. My program of research centers on investigating the role of sociocultural forces (i.e., sociodemographic, cultural mismatch) in underrepresented students' health and academic adjustment during the transition to college. I received my Ph.D. in Developmental Psychology, with a minor in Culture, Brain and Development, from the University of California, Los Angeles. I am also a proud graduate of the Bachelors and Masters programs in Psychology at California State University, Northridge.

Title of Research Project — Cultural Mismatch, Neurobiology and Adjustment During the Transition to College (Culture, Health and Development Laboratory)

Background and purpose — Cultural mismatch occurs when collectivism learned at home mismatches with the individualism of the university environment. In order to investigate this phenomena, I have utilized a triangulation of methods (qualitative, survey, behavioral experiment). I have discovered that cultural mismatch varies in form (e.g., family obligations-academic obligations, peer-peer), impacts health (mental, physical) and academics (inability to concentrate or study, poor grades) and is experienced by Latinx first-generation college youth as well as first-generation college students from diverse backgrounds.

Research Questions:
1. How does cultural mismatch unfold and impact adjustment (health, academics) over time?
2. Does cultural mismatch impact neurobiology?
3. Do neurobiological patterns serve as a mediating force between cultural mismatch and subpar adjustment?

Method — A longitudinal study will be employed. Across 3 separate time-points, freshmen will complete an online survey that assesses various types of cultural mismatch and adjustment outcomes, complete an at-home health activity that measures the stress hormone, cortisol, and take part in an in-person session where we will gather several indicators of health as well as brain activity. Analytic techniques include correlation, regression, mediation and profile analysis. There may also be opportunities to conduct more advanced statistical modeling.

Student Collaborator Roles — Students will be expected to aid with literature reviews, as well as the collection, organization and processing of data. They will also learn how to analyze and interpret data. There

will be opportunities for students to present the results of the data in the form of an APA-formatted presentation or manuscript.

Expectations — My office and lab are both located within close proximity in Lilac Hall; given their close proximity, I see my students on a frequent basis. Students in my lab receive a lot of training and mentoring.

Conferences — Potential conferences that we may attend are the Society for Research in Adolescence (SRA), Society for Personality and Social Psychology (SPSP), Society for the Study on Emerging Adulthood (SSEA) or the Society for the Psychological Study of Culture, Ethnicity and Race, Division of the American Psychological Association.

Department of Social Work

Allen Lipscomb

Mentor Bio —I grew up in the San Fernando Valley and completed my K-12 grade education from LAUSD. Upon completing high school I attended Santa Monica College and earned my Associates of Arts degree in Liberal Studies. I then transferred to UC Santa Barbara where I double majored in both Psychology and Black Studies. Following my studies at UCSB I got accepted at USC where I ultimately earned a master's degree in Social Work. Five years after receiving my MSW degree, I decided to go back to school to get my doctorate in clinical psychology (PsyD) with an emphasis in marriage, family and child psychotherapy from Ryokan College. In addition, Dr. Lipscomb earned a post-doc. certification in Diversity and Inclusion Practices from Cornell University. If it were not for my mentors over the years who modeled and believed in me—I would not be where I am today as an educator, researcher and practitioner. I am a clinical psychologist by highest degree obtained and a Licensed Clinical Social Worker in the state of California. In addition, I am a social scientist and my areas of research are centered around the psychiatric epidemiology among racialized and marginalized individuals who have experienced trauma (i.e. complex trauma, traumaticgrief and race-based trauma). Specifically, I have conducted and advised numerous qualitative research studies (clinical case studies, interviews, ethnographies, etc.) on racialized Black identified men across the Black/African Diaspora (specifically in the United States) exploring their grief, loss and complex-trauma experiences (i.e. special attention to physical health and mental health). And finally, I am an author and published a book titled: Black Male Grief Reaction to Trauma: A Clinical Case Study of One Man's Treatment.

Title of Research Project — The Mis-bereavemet of the Formerly Incarcerated Black Male: A Photovoice Project

Background & Purpose — The purpose of this research is to explore the lived experiences of formerly incarcerated Black Males (with specially attention on physical health, mental health and resiliency) in Los Angeles County. Through narrative qualitative methods and digital photography technology, fifteen formerly incarcerated Black Males will have the opportunity to share stories about their lives before, during and after incarceration via right brain emotive expression (digital technology). The goal is to enhance public understanding and heighten consciousness of the unique experiences of formerly incarcerated Black Males in Los Angeles County, to promote appropriate health, mental and community reintegration programs.

Research Question(s) or Hypothesis — What are the unique experiences of formerly incarcerated Black men before, during and after incarceration? How do formerly incarcerated Black men narrate their familial relationships, health, mental health and community reintegration experience?

Method — Qualitative (Interview, Narrative and focus groups), photovoice and Mixed-methods analysis

Student Roles — Data collection, transcribing data, interviews, focus groups, submitting posters to conferences.

Expectations — I expect students to come ready to learn innovative ways to conduct research with marginalized communities who are often left out within scholarly spaces. In addition, to learn how to be an anti-oppressive researcher.

Conferences Typically Attended — African American Mental Health Conference; National Association of Social Workers Conference; National Association of Black Social Workers Conference; International Conference on Health, Wellness and Society; Ethnographic and Qualitative Research Conference.

Publication — See CSUN webpage

Department of Urban Studies and Planning

Zeynep Toker

Mentor Bio — As a proponent of community design, I have been working with communities in different cultural settings helping them shape their built environments. My experience of working with communities includes projects such as Designing Dynamic Environments for the Performing Arts in Cambridge, UK; Sandhills Community Center in Spring Lake, NC; Laguna Child and Family Education Center in Laguna, NM; Programming of County Office Buildings in Pamlico County, NC; and Urban Revitalization of Downtown Mebane, NC. I have also designed and participated in research projects utilizing different methodologies with quantitative and qualitative methods of data collection. My research agenda aims to understand spatial representations of cultural, social and gender identities in everyday lives of individuals and communities, both placeless and place-bound. My research interests focus on the ways to accommodate user needs and preferences generally in built environment, especially in housing. **Ph.D.** 2004, North Carolina State University, **M.A.** 2000, Middle East Technical University Turkey, **B.A.** 1998, Middle East Technical University Turkey**.**

Research Question(s) or Hypothesis — The goal of the proposed research to investigate how physical environment characteristics and physical activity patterns interact in neighborhoods with different socioeconomic status (SES).

Method — The variables include perceived pedestrian environment characteristics and objective pedestrian environment characteristics to measure physical environment, destination and time spent for recreational walking to measure physical activity, and income and education to measure SES. Students will work with mixed methods data. Perceived pedestrian environment characteristics and destination of recreational walking are qualitative data. Objective pedestrian environment characteristics, time spent for recreational walking, income, and education are quantitative data.

Student Roles — Students will utilize different tools to measure these variables in different SES neighborhoods, and will conduct questionnaires and audits to collect data and analyze qualitative and quantitative research.

Expectations — Students will become familiar with the most popular tools utilized in public health research for physical activity in relation to the built environment. They will also learn how to conduct qualitative data analysis and quantitative data analysis with corresponding software.

Publications in peer-reviewed journals

Toker, Z. (2015) "Walking beyond the Socioeconomic Status in an Objectively and Perceptually Walkable Pedestrian Environment" Urban Studies Research, vol. 2015, Article ID 919874, 15 pages.

Toker, Z., Minassians, H. (2012) "Good cities and healthy communities in the United States" Urban Design and Planning Journal, Special Issue on Quality of Life. 165:3, 137-145.

Toker, Z., Pontikis, K. (2011) "An Inclusive and Generative Design Process for Sustainable Urbanism: The Case of Pacoima" Journal of Urbanism: International Research on Placemaking and Urban Sustainability 4:1, 57-80.

Toker, Z. (2010) "New Housing for New Households: Comparing Cohousing and New Urbanist Developments with Women in Mind"Journal of Architectural and Planning Research 27:4, 325-339.

Toker Z. (2007) "Recent Trends in Community Design: The Eminence of Participation" in Design Studies. 28.3, 309-323.

Toker, Z., Toker, U. (2006) "Community Design in its Pragmatist Age: Increasing Popularity and Changing Outcomes." METU Journal of the Faculty of Architecture 23:2, 155-166.

Toker, Z. (2001) "Influences of Cultural Differences on the Formation of 'Home' Constructs," in International Association for People-Environment Studies (IAPS) Autumn 2001 Issue of the Bulletin of People-Environment Studies: Special Issue on Housing.

For more publications and conference presentations, visit CSUN faculty page.

Mintesnot Woldeamanuel

Mentor Bio — Dr. Mintesnot Woldeamanuel enjoys all aspects of urban planning but he is most interested in the functional relationship between urban land use and transportation. He has conducted extensive research and written on the relationship among travel behavior, the environment and urban form focusing on transportation mode choice and spatial analysis. His research interest includes public transportation policies and its impact on the environment, spatial and network analysis, mode choice, urban transportation service quality assessment and application of Geographic Information systems (GIS) for transportation. He is also interested in comprehensive urban transportation planning, urban land use planning, travel behavior analysis, community development and sustainability. Prior to joining California State University, Northridge, he worked as an Assistant Professor in the Planning and Community Development Program of Saint Cloud State University, and as a Research Fellow in Transportation Research Institute of German Aerospace Center (DLR). **Ph.D.,** 2007, Hokkaido University, Urban and Environmental Engineering/planning **M. Eng**., 2004, Hokkaido University, Urban and Environmental Engineering/planning **B.Sc**., 2001, Ethiopian Civil Service University, Urban Planning **Adv. Diploma**, 1996, Ethiopian Civil Service University, Urban Engineering.

Background & Purpose — Our cities face increases in obesity, and deceases in walking, bicycling and physical activity. The built environment that encourages automobile use and sedentary living is one of the factors responsible for the poor health outcome of urban residents.

Research Question(s) or Hypothesis — The goal of this research is to create correlational and causal relationship between walkable/bikable communities and health outcomes. The primary dependent variable is Obesity (measured in BMI) and the independent variables include built environment variables that encourage physical exercise (such as sidewalk quality, availability of biking infrastructure, neighborhood density, distance between activity places, availability of parks etc.).

Method — The data include a survey, filed observation on the physical characteristics of the built environment and secondary data on health outcomes.

Student Roles — Students are responsible for designing surveys, gathering primary and secondary data and making statistical and spatial analysis.

Expectations — Students will develop research and critical thinking skills that will help them succeed in their academic and professional endeavors.

Publications

Mintesnot Woldeamanuel (2016). "Concepts in Urban Transportation Planning: The Quest for Mobility, Sustainability and Quality of Life", McFarland Publishers. https://mcfarlandbooks.com/book-2.php?id=978-0-7864-9966-3

Mintesnot G. Woldeamanuel. (2011). "Planning and Decision Models for an Integrated Public Transportation: Tools for a Developing City", VDM publishing

For a full list of publications in peer-reviewed journals and conference presentations, please visit his CSUN faculty page.

College of Science & Mathematics

Department of Biology

Lisa Banner

Mentor Bio — I received my B.S. in Microbiology from San Diego State University. My interest in the nervous system began when I worked as a research technician in the Neurobiology Department at USC. There, I was exposed to and very involved in basic research. In choosing a graduate program I wanted to learn about molecular biology but still be involved in neuroscience. As a graduate student at USC, I studied the molecular biology of Coronaviruses. These large RNA viruses are responsible for some common colds but some can also infect the nervous system. As a postdoctoral research fellow at Caltech, I was able to apply my background in molecular biology to the study of the nervous system and began studies looking at the role of cytokines in the nervous system. I was able to show that the cytokine LIF, functions as a neural-immune molecule following injury to the nervous system. Upon my arrival at CSUN I began a research program aimed at understanding how cytokines regulate the neural-immune axis using a mouse model of diabetes.

Research Project Title — Determine the role of cytokines in the neural damage that occurs in prediabetes.

Background and Purpose — My laboratory is interested in understanding how the nervous system and immune system interact. My approach to this question analyzes the regulation of cytokines known to function in both the nervous and immune systems using a mouse model of prediabetes. Diabetes is a major health and economic burden in the United States. According to statistics from the American Diabetes Association there are more than 30 million people (9.4% of the population) in the US with diabetes. One of the most common complications is damage to the nervous system, a condition known as diabetic neuropathy. It is becoming clear that the damage to central nervous system (brain) can occur even in a prediabetic state. Diet-induced obesity is an increasingly common occurrence that predisposes individuals to type-2 diabetes and contributes to complications including those of the nervous system and the immune system. Increased body mass and type-2 diabetes significantly increases the risk for neurodegeneration and dementia and changes in hippocampal plasticity and spatial learning among others have been documented. While the exact mechanism has yet to be fully understood, neuroinflammation is thought to be an important factor in impaired cognitive function. Cytokines involved in the inflammatory response are elevated in brains of animals fed a high fat diet and a variety of anti-inflammatory/anti-oxidant treatments can reduce this expression and alleviate the cognitive changes. What is not well understood is how the progressive nature of cognitive defects, such as memory loss, manifests itself early in the process at the pre-diabetic stage and we seek to understand the role that cytokines play in this process. Specifically we are interested in the role of interleukin (IL)-6 because of its known role in inflammation and memory.

Research Question/Hypothesis — Through the use of wildtype and interleukin-6 knockout mice we will test the hypothesis that interleukin-6 and other cytokines play a role in the nervous system of prediabetic obese mice.

Method — We use a variety of techniques to address our questions. To study learning and memory we utilize behavioral tests such as the Morris Water Maze and Novel Object Recognition. To understand events at the molecular level we perform techniques such as RT-PCR, Western blots, ELISAs, and Immunohsitochemistry.

Student Roles — Students at all levels are very involved in the experimental process from design through implementation and writing.

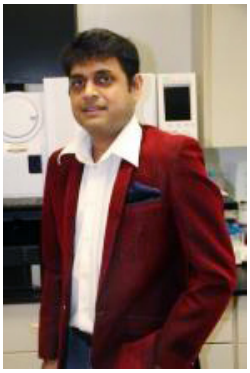
Expectations — Students will play an active role in all areas of the lab. Sophomores and Juniors will learn from more senior members of the lab but by their Senior year, if not earlier, students will work on their own independent projects. Students are expected to present their research findings at local and/or national meetings.

Conferences Typically Attended — My laboratory attends the annual Society for Neuroscience meeting.

Publications — View her NCBI Profile.

Key Words — Diabetes, Obesity, Prediabetes, Immunology, Neuroscience, Cytokines, Brain, Mice

Chhandak Basu



Mentor Bio — My doctoral work involved investigation of foreign gene expression in various plant tissues. In my postdoctoral work, I studied the incorporation and expression of the reporter gene (jelly fish green fluorescent protein or GFP) in herbicide tolerant weed species. Currently I am working in the field of biotechnology based biofuel development. My lab focuses on genetic transformation of plants and bacteria to produce biofuel like compounds. **Ph.D.** 2003, University of Rhode Island **M.A.** 1998, Montana State University **B.S.** 1996, B.C.K.V

Background & Purpose — The overall goal in the lab is production of genetically engineered plants for trait enhancement and modification. In particular, we are interested in producing biofuel/biodiesel-like compounds in plants and bacteria. We are also interested in differential gene expression plants in various abiotic stressful conditions. Our final goal is cloning abiotic stress induced genes and transforming plants with these genes to produce environmental stress resistant genetically engineered plants

Research Question(s) or Hypothesis — 1) Overproduction of terpenes lead to production of biodiesel-like compounds in bacteria and plants; 2) Overexpression of abiotic stress induced genes will produce environmental stress tolerant plants.

Method — We use *Agrobacterium tumefaciens*, a soil borne bacteria to transform plants. We sequence the transcriptome of plants using the RNAseq technique and we analyze the transcriptome using bioinformatics software. Production of biofuel/biodiesel-like compounds will be analyzed by gas chromatograph-mass spectrometer. Global energy crisis (Problem) → Overproduction of terpenes lead to production of biodiesel-like compounds in bacteria and plants (Hypothesis) → Production of transgenic plants and bacteria (Experiment) → Analyze transgenic plants and bacteria for potentials for biofuel production (Data analysis) → Optimize best experimental approach to produce transgenic plants and bacteria for production of biofuel (Strategy development to address the problem)

Student Roles — Students will be involved in experiments as described. It is expected that students will present their data in scientific conferences and involved in writing manuscripts. All students will be expected to learn fundamentals of gene cloning and plant genetic engineering.

Expectations — Students are encouraged to enroll in BIOL 470 (Biotechnology) and Recombinant DNA (BIOL 572)

Conferences Typically Attended — America Society for Plant Biologists, Society for In Vitro Biology, International Plant and Animal Genome Conference

David Bermudes

Research Focus #1 – Microbiome

Background and Purpose — The primary goal of my microbiome research is to understand the role of secreted bacterial protease inhibitors. It has long been understood that the human microbiome has numerous bacteria that secrete proteases, some of which play roles in inflammation, however, there has been little attention to protease inhibitors that may play a role in stasis and the maintenance of normal skin and gut ecologies. My lab is employing novel screening methods for isolation and analysis of bacteria producing secreted protease inhibitors to determine which bacteria produce them and what types of inhibitors they produce.

Student Roles — Students in my lab learn basic isolation of bacterial strains, analysis of protease inhibitor production, PCR, 16sRNA sequencing, SDS-PAGE, reverse zymography and preparation of protein samples for protein sequence analysis (MALDI-TOF). Students will gain skills in and are responsible for performing PCR, DMA sequencing and analysis, protein and protease inhibitor analysis. Sophomores are expected to be able to plate bacterial samples from human skin to obtain single colony isolates and to screen them by performing protease inhibitor assays. Juniors are expected to be able to identify bacteria by performing PCR and sending the DNA out for sequencing and

analyze the DNA sequence. They are also expected to perform basic microscopy and bacteria biochemical tests used in identification. Seniors are expected to conduct SDS-PAGE gels and reverse zymography, to prepare protein samples for protein sequencing (MALDI-TOF) and to analyze the protein sequence data.

Research Focus #2 – Cancer

Background and Purpose — The primary goals of my cancer research are to use bacteria as therapeutic vectors for the treatment of tumors. *Salmonella* have many of the desirable properties of a cancer therapeutic delivery vector, including targeting of multiple tumors from a distant inoculation site, selective replication within tumors, tumor retardation, and the ability to express effector genes with antitumor properties directly within the tumor. My lab engineers genetic modifications to *Salmonella* and selects for suppressor mutations that are designed to enhance their antitumor properties and/or the ability to kill cancer cells.

Student Roles — Students in my lab learn basic DNA manipulation, gene expression techniques and microbial genetics in order to generate strains with the potential for enhance anticancer properties. Students will gain skills in and are responsible for designing PCR primers, performing PCR, cloning DNA, transforming *Salmonella* and assessing genotypic and phenotypic changes. Sophomores are expected to be able to screen cloning reactions (ligations and transformations) by performing plasmid minipreps, conducting restriction endonuclease reactions, separation by gel electrophoresis and analysis of the resulting gel. Juniors are expected to be able to design and conduct cloning experiments and work with sophomores. Seniors are expected to be able to design PCR primers, carry out PCR reactions, clone and prepare DNA for DNA sequencing, be able to analyze the DNA sequence, and work with sophomores and/or juniors.

Maria Elena de Bellard

Mentor Bio — My passion for science started early, my father was one of the last explorers of Venezuela and our home was more a freeloading zoo than a regular house for 6 children. I went on to do my undergraduate school at a small, Caltech-like University in Caracas (Universidad Simon Bolivar) then worked for 4 years in a lab studying the Venezuelan Equine Encephalitis (which by the way you do not want to get infected with as I was due to a lab accident! But that is another story). I then decided to risk it all and got on plane and came to New York to start a Ph.D. program in biology. I was lucky that because my father's friendships with the Herpetologists at the American Museum of Natural History, I was able to volunteer for one year there helping a renowned herpetologist, Janis Roze classify snakes from the tropics. After this fun experience I entered a Ph.D. in Molecular, Cellular & Developmental Biology at the City University of NY and worked under the leadership of an extraordinary Irish woman, Marie T. Filbin. Her mentorship solidified my interest in neural research and from there I moved to Caltech to do a Post-doctoral Fellowship with another extraordinary woman: Marianne Bronner. Finally I began as a Biology Faculty at the Biology department at CSUN on 2005.

Research Projects — "Look at neural crest markers through evolution in sharks, snakes and lampreys" & "Identify molecules that determine the specific migratory pathways decisions by neural crest cells." Visit https://mariadebellard.wixsite.com/debellardlab for all projects.

Background & Purpose — My lab focuses on understanding the molecular and cellular mechanism underlying the earliest events in neural crest cell migration.

Research Question(s) or Hypothesis

1) Identify molecules that determine the specific migratory pathways decisions by neural crest cells.

The neural crest is a migratory population of cells but we know very little about the migratory clues that guide the neural crest for the rest of their path. It is the goal of this study to find which other molecules are capable of guiding the neural crest along their migratory routes. For this purpose I had set out to screen a group of neurotrophic factors that are expressed at the same time that the crest is migrating through the embryo and which have been shown to be important in neural crest migration by analyzing the corresponding knockout mice (5).

2) Look at neural crest markers through evolution in sharks, snakes and lampreys.

The neural crest appearance in evolution is critical for cranial formation and the development of the peripheral nervous

system. The question my lab addresses is: How similar are the migratory routes of neural crest across evolution? We hypothesize that there are more similarities than differences.

Method — My lab is interested in studying neural crest cell migration under many angles. With the help of highly driven undergraduates my lab has been able to develop new methods for studying neural crest cell migration in vitro and has set a reputation as a place to learn cell and neural crest biology/development among colleagues. We carry out classic cell biology experiments (cell migration, cancer analysis, molecular signals for migration), embryology studies (neural crest migration in live embryos, genetic manipulations) and the evo-devo of the neural crest across early vertebrates (snakes, turtles, geckos, sharks, rays). In chemoattraction project students live image and track cells migrating; then they gather parameters (i.e. velocity and direction) and compare with control or other chemicals. In the evo-devo project, students analyze their data is by comparing their observations (morphological location of their stem cells in embryos) with what is known for other, more common organisms.

Student Roles — Sophomore and junior students are part of the in-training cohort on their first year. Senior students are generally working on their individual project and helping more junior undergraduates.

Conferences Typically Attended — Society for Neuroscience, CSUPERB and Society for Developmental Biology.

Publications — Please visit https://mariadebellard.wixsite.com/debellardlab/publications for all of deBellard's publications.

Robert Espinoza

Mentor Bio — Robert Espinoza earned his BS in Biology at San Diego State University and Ph.D. in Ecology, Evolution, and Conservation Biology at the University of Nevada, Reno. He spent a year as a post-doctoral fellow at the Carnegie Museum of Natural History and began his academic career at CSUN in 2001. He is currently a Professor of Biology and an Associate Dean of the College of Science and Mathematics. His research interests are in the physiology, ecology, and evolution of amphibians and reptiles. **Ph.D.** 2002, University of Nevada Reno **B.S.** 1990, San Diego State University

Background & Purpose — Research in our lab is broadly concerned with understanding the physiological mechanisms that underlie animal diversity. In short, we seek to answer the "how" questions that pertain to animal function. Although most studies are at the whole-organism level, recent research has drawn on inferences from biochemical properties of cell membranes, to tissue-level processes, to populations and communities. Our research is also integrative and comparative, which means for we draw from several fields of inquiry (physiology, ecology, behavior, evolution) and include multiple species or populations in each investigation. Most of our research focuses on amphibians and reptiles, because these two groups of vertebrates are very diverse (>7800 and >10,600 species, respectively) and possess many adaptations and specializations that capture the fascination of scientists and the general public alike. The evolutionary relationships are also well resolved for most groups of amphibians and reptiles, allowing us to test broad hypotheses concerning organismal diversity in an evolutionary framework.

Research Question(s) or Hypothesis — Current research themes in our lab include: (1) thermal adaptation, (2) diet evolution, (3) the mechanisms underlying successful colonization by invasive species, and (4) the evolution of sociality. As ectotherms ("cold-blooded"), amphibians and reptiles are good models for studies of thermal adaptation because most aspects of their biology are closely linked to their abiotic environments. Reptiles are well suited to studies of diet evolution because closely related species often have different diets. This can help us identify the potential forces selecting for diet evolution, while testing the mechanisms underlying those shifts in diet, and the consequences of those shifts on morphology, physiology, behavior, and interactions with other species. Invasive species are ideally suited for testing rapid evolution in behavior, physiology, and ecology, as successful invasives can become establish in climates that are radically different from their native ranges.

Method — We use a diverse array of methods and analytical tools to address the broad range of studies conducted in our lab, often in collaboration with other labs at CSUN, across the US, and internationally. These include: genetics (currently: multilocus phylogenetic analyses, microsatellites, metagenomics, and genomics), physiology (metabolism, thermal

tolerances, temperature-dependent performance, supercooling and freeze tolerance, evaporative water loss, digestive efficiency, passage rate, etc.), morphology (gross dissections, histology, SEM/TEM), microbiology (genetically characterizing the microbiomes of host guts), and niche modeling and biogeography. Nearly every new study brings with it new analytical tools, and we embrace new projects that offer new opportunities for collaboration with other labs and add new tools to our toolbox.

Student Roles — In weekly lab meetings we practice giving presentations, write and review manuscripts and grant proposals, and discuss research papers. Participation is mandatory, although the lead responsibility rotates weekly. I also meet with students individually to identify research and career goals and create a plan to help them achieve these goals.

Expectations — Students from sophomores to grads to postdocs have worked in our lab. New undergraduates are mentored by me or a senior undergrad or grad until responsibility and proficiency are established, then given the opportunity to develop their own project. Our lab has also hosted several postdocs and visiting scientists from Argentina and Brazil from three months to a year.

Conferences Typically Attended — Members of our lab usually attend the Joint Meetings of Ichthyologists and Herpetologists each summer. If I am not in the field, I attend the Society for Integrative and Comparative Biology meetings in January. We attend regional meetings from time to time as well.

Publications — Most of our lab publications can be viewed on our lab website (http://www.csun.edu/~ree77914/) or at ResearchGate (https://www.researchgate.net/profile/Robert_Espinoza2).

Gilberto Flores

Mentor Bio — I am an interdisciplinary scientist who specializes in microbial ecology, exploring the diversity and function of microbial communities in a wide range of environments. I use a combination of cutting-edge molecular biology/bioinformatics tools (such as high-throughput sequencing and genomics) and more traditional microbiological techniques (e.g. cultivation, fluorescent microscopy) to address fundamental questions about the ecology and evolution of microorganisms. I have worked in a wide array of environments including deep-sea hydrothermal vents, terrestrial hot-springs, public restrooms and the human body. **Ph.D.** 2011, Portland State University **M.S.** 2006, University of Idaho **B.S.** 2001, Humboldt State University. Visit his website.

Research Projects — "Integrated Studies Into the Genomic, Metabolic, and Cultivable Diversity of the Human Gut SymbiontAkkermansia muciniphila" & Dietary Drivers of the Human Gut Microbiome.

Background & Purpose — The human gut is home to trillions of microorganisms that collectively are known as the gut microbiome. These microorganisms perform functions that are essential for normal human physiology but changes in the types of microorganisms in the gut have been associated with several diseases including obesity. Although numerous other factors play a role in the development of obesity, the composition of the gut microbiome is now considered an important environmental factor and a potential therapeutic target for treatment of obesity. Much of what we know about the association between the gut microbiome and obesity has been gleaned through observational studies of adult humans and from manipulative experiments using model organisms like mice. Given that childhood obesity has more than doubled over the past 30 years particularly in ethnic minorities in the USA, identifying if an association also exists in children would strengthen our understanding of the pathophysiology of obesity.

Research Question(s) or Hypothesis — Research in my lab seeks to identify the factors that influence the composition of the gut microbiome in both healthy and overweight/obese children. Factors of interest include both long-term and short-term dietary habits, and antibiotic use.

Method — To address these questions, we utilize cutting-edge genomic techniques coupled with more traditional microbiological methods to characterize the microorganisms at the community and species levels.

Student Roles — Students working in my lab will gain valuable hands-on experience in both wet-lab (e.g. DNA extraction, PCR, DNA sequencing, bacterial cultivation, etc.) and bioinformatics based methods.

Expectations — Students working in my lab are expected to develop independent projects with my guidance but can also expect to work collaboratively with other graduate and undergraduate students. I also expect students to immerse themselves in the primary literature outside of their designated laboratory times so long as it does not interfere with their coursework.

Conferences Typically Attended — Conferences typically attended by students and myself include the American Society of Microbiology General Meeting (every May/June), the International Society of Microbial Ecology Meeting (even years in August), and the ASM Conference on Beneficial Microbes (even years, September).

Publications — To see a full list of Dr. Flores' publications, writings and press coverage, please visit: https://gilbertoflores.weebly.com/publications.html

Yoshie Hanzawa

Mentor Bio — A primary goal of my research is to understand the genetic bases of reproductive transition of plants (flowering) in response to environmental signals, and to clarify how these mechanisms have evolved. My research currently focuses on the evolution of the flowering gene network in Arabidopsis and soybean, taking an interdisciplinary approach encompassing molecular genetics, genomics, biochemistry, population genetics and systems biology, with an ultimate goal of plant improvement for higher adaptation to diverse and changing environments.

Background & Purpose — Phosphatidylethanolamine-binding proteins (PEBP), also known as Raf-kinase inhibitor proteins, play critical roles in the regulation of diverse signaling pathways controlling cell growth and differentiation in bacteria, plants and animals and affect a range of diseases including cancer metastasis, pancreatitis as well as Alzheimer's disease, which makes PEBP a particularly suitable target for precision medicine and individualized therapy. In plants, FT and TFL1 in the PEBP family govern a unique and simple molecular switch that modulates the activity of the transcription factor FD and determines the fate of meristematic cells in reproductive transition (flowering), offering the novel molecular mechanisms to engineer PEBP signaling cascades for disease-specific therapeutic intervention.

Research Question(s) or Hypothesis — Both FT and TFL1 bind FD and modulate expression of the floral meristem identity genes that control development of the reproductive organs. However, FT and TFL1 act in an opposite manner; the FT-FD complex induces this process, while TFL1-FD represses. Our preliminary work identified that FD phosphorylation at Threonine 282 in the C-terminus is responsible for the transcription activator action of FD, and that multiple Calcium-Dependent Protein Kinases (CPKs) phosphorylate FD at T282. We hypothesize that FD phosphorylation may be regulated by FT and TFL1. Alternatively, FT and TFL1 may control subsequent cellular actions of FD depending on FD's phosphorylation status.

Method — Epitope-tagged FD and mutant FD (T282A and T282S) will be coexpressed in protoplast cells of *Arabidopsis* with FT, TFL1 or control and the biochemical and cellular actions of FD and mutant FD will be examined, including phosphorylation by CPKs, interaction with FT and TFL1, organelle localization, stability and transcription activity. The function of FD, mutant FD and CPKs in flowering transition will be tested by creating transgenic *Arabidopsis* plants overexpressing these proteins or carrying mutations using the latest CRISPR/Cas9 systems available for plants. Data analysis: Protein abundance, phosphorylation and immunoprecipitation will be observed using Western Blotting and quantification by biotin or 32P labeling, and localization and interaction using fluorescent or confocal microscope. Transcription of downstream genes will be examined using quantitative RT-PCR. Flowering phenotypes will be assessed by the numbers of days and leaves produced before flowering and statistical analyses will be conducted using Excel or SAS.

Student Roles — All levels of students will participate in cloning, Western, plant transformation and screening, expression studies and phenotypic analyses. In addition, junior and senior students will contribute to experimental design and interpretation of results, and senior students to training of sophomore and junior students and presentation of results at conferences and in peer-reviewed journals.

Expectations — Students in this project will learn in-depth knowledge in signaling mechanisms controlling diverse diseases and techniques in emerging molecular genetic, biochemical and genome editing approaches that are extensively applied to biomedical research including precision medicine solutions.

Conferences Typically Attended — American Society for Plant Biologists, International Conference on Arabidopsis Research, Society for Molecular Biology and Evolution, Genetic Society of America

Publications

Wu, F. and **Hanzawa, Y.** (2017) A Simple Method for Isolation of Soybean Protoplasts and Application to Transient Gene Expression Analyses. Journal of Visualized Experiments. In Press.

Wu, F., Sedivy, E.J., Price, W.B., Haider, W. and **Hanzawa, Y.** (2017) Evolutionary trajectories of duplicated FT homologs and their roles in soybean domestication. The Plant Journal. 90(5):941-953.

Sedivy, E.J., Wu, F. and **Hanzawa, Y.** (2017) Soybean domestication: the origin, genetic architecture and molecular bases. New Phytologist. doi: 10.1111/nph.14418

Serrano-Mislata, A., Fernández-Nohales, P., Doménech, M.J., **Hanzawa, Y.,** Bradley, D. and Madueño, F. (2016) Separate elements of the TERMINAL FLOWER 1 cis-regulatory region integrate pathways to control flowering time and shoot meristem identity. Development. 143(18):3315-3327.

Baumann K., Venail, J., Berbel, A., Domenech, A.J., Money, T., Conti, L., **Hanzawa, Y.,** Madueno, F. and Bradley, D. (2015) Changing the spatial pattern of TFL1 expression reveals its key role in the shoot meristem in controlling Arabidopsis flowering architecture. Journal of Experimental Botany. 66(15):4769-4780.

Wu, F. and **Hanzawa, Y.** (2014). Photoperiodic control of flowering in plants. Handbook of Plant and Crop Physiology. the 3rd edition, ch.4, CRC Press, Taylor & Francis Group, LLC.

Wu, F., Price, W.B., Haider, W., Seufferheld, G., Nelson, R. and **Hanzawa, Y.** (2014). Functional and Evolutionary characterization of the CONSTANS gene family in short-day photoperiodic flowering in soybean. PLOS ONE. 9: e85754.

Rosas, U., Mei, Y., Xie, Q., Banta, J., Seufferheld, G., Gerald-Martinez, S., Chou, L., Bhambra, N., Parks, J.D., Flowers, J., McClung, C.R., **Hanzawa, Y.** and Purugganan, M.D. (2014). Variation in Arabidopsis flowering time associated with cis-regulatory variation in CONSTANS. Nature Communication. 5:3651-3658.

Ray Hong

Mentor Bio — Joined CSUN Biology Department 2008. He is a post-doc fellow at the Max-Planck Institute for Developmental Biology (Tuebingen, Germany). **Ph.D.** Biology UC San Diego 2002 **B.A.** Biology Pomona College 1996.

Research Projects — Our research primarily involves the use of the nematode model Pristionchus pacificus, which has been used to study the evolution and developmental programs required for host finding behavior at the molecular and genetic level. https://rayhonglab.wordpress.com/research

Background & Purpose — To understand the chemosensory genes involved in the interaction between invertebrates.

Research Question(s) or Hypothesis — The beetle-associated nematode (a round worm) *Pristionchus pacificus* represents a model system to study nematodes that associate with insects. In particular, our research sought to identify host factor that affect nematode behavior and development, with the long-term goal of translating basic research knowledge into improving treatments against parasitic nematodes.

Method — Molecular biology and genetics involving PCR, recombinant DNA technology, genetically modified organisms, bioinformatics. Data analysis is reductive and quantitative. We try to isolate factors to characterize genetic function. Data collection and processing is quantitatively intensive.

Student Roles — **Sophomores**: genetic screens, DNA extraction, PCR. **Juniors**: genetic crosses, advanced PCR, recombinant DNA "cloning" **Seniors**: independent project involving the above techniques

Expectations — **Sophomores**: strong performance in BIOL106; will be paired with a more senior student (undergraduate or masters) on specific projects. **Juniors**: strong performance in BIOL107; BIOL360 Genetics; ready to be part of a team. **Seniors**: strong performance in BIOL380 Cell Biology and other advanced courses in biology. Ready to work on an

independent project.

Conferences Typically Attended — CSUPERB conference (CSU Program for Education and Research in Biotechnology)(January), CSUNposium (April), CSUN Sigma-Xi Research Symposium (April), International C. elegans Conference (June), Society for Developmental Biology (July)

Publications — For a full list of publications, visit his Wordpress website.

Mariano Loza-Coll

Mentor Bio — I went to university in Buenos Aires, Argentina, where I majored in Biology and specialized in animal physiology. For my PhD, I moved to Canada, and received my degree from the Department of Medical Biophysics at the University of Toronto, where I studied cancer cell biology. Then I came to the United States (first to San Diego, and then Los Angeles), where I trained as a postdoc investigating the genetics basis of asymmetric cell decisions using the fruit fly Drosophila melanogaster as an experimental model system. In the Fall 2015 I joined the Department of Biology at CSUN, where my students and I are currently investigating the genetic control of stem cells in flies. You may visit our lab's website at: https://lozacollcsunbio.wordpress.com

Title of Research Project — Genetic regulation of adult stem cells in Drosophila melanogaster

Background & Purpose — In order to remain functional, many of our organs can replace cells that are lost to injury or wear, thanks to the activity of adult stem cells. Like their embryonic counterparts, adult stem cells undergo "asymmetric self-renewing divisions", generating a new copy of themselves (to maintain a healthy stem cell pool) and a cell that differentiates into a specific cell type that replaces missing cells in the organ. A long-term objective of my laboratory is to characterize the genetic regulatory mechanisms and networks that control adult stem cells across tissues.

Research Question(s) or Hypothesis — One of the general hypotheses that we are actively investigating at this time is that systemic stress can affect the genetic regulation of stem cells, impairing the capacity of their host tissues to maintain homeostasis and/or properly recover from injury.

Method — We normally combine classical Drosophila genetics, tissue dissections and high resolution microscopy to determine how stressful stimuli may affect major genetic pathways controlling the number, activity and responsiveness of diverse adult stem cell populations in flies. We also try to identify new genetic modules and pathways through the bioinformatics, integrating public datasets from genome-wide screens related to stem cells. In a typical experiment, we would subject flies that carry cell-type specific markers and genetic activity reporters to any of a number of forms of systemic stressors (e.g. heat shocks, intoxication, reproductive isolation). After several days, we dissect relevant organs/tissues out of the fly, and analyze the expression of the cell type and activity markers through microscopy, which allows us to not only quantify adult stem cells in a tissue, but also the identity and function of their progeny.

Student Roles — None of the techniques used in our lab (setting up and caring for Drosophila crosses, dissecting tissues and preparing samples for microscopy) demand any special skills or prior training, nor do they involve hazardous reagents or equipment. Therefore, students at all levels (sophomore, junior and senior) can and will be involved in each and all steps of our experiments. While I encourage teamwork within our group, I also expect that my students can work independently and develop a sense of ownership and pride in their projects.

Expectations — I expect my students to take the project and themselves very seriously, because I also take them both very seriously. For us to maintain a productive and meaningful mentorship relationship, I mostly need to see that our lab is a top priority for the student. From me, students can expect respect, patience, dedication and a profound passion for doing science. In my lab, students will learn how to set up genetic crosses, predict their outcomes, dissect tissues and carry out fairly sophisticated fluorescence microscopy. But much more importantly, they will learn to think independently as scientists, evaluate evidence critically, and formulate testable hypotheses. In addition, I strongly advocate the communication of scientific progress, challenges and approaches to society at large. I have spearheaded several science communication and outreach projects, including the development of a website for the dissemination of science news to a broad readership (www.science4everybody.com). Regardless of their future career choices, science

majors will be our science ambassadors, interpreters and advocates in society. Therefore, besides providing my students with the best experimental genetics training that I can offer, I will passionately mentor them to develop sound communication skills.

Conferences Typically Attended — CSUNposium, CSUPERB, GSA Drosophila Research Conference. We may also sporadically attend the Society for Developmental Biology Meeting, and the American Society for Cell Biology Conference.

Publications

Loza-Coll MA, Jones DL. Simultaneous control of stemness and differentiation by the transcription factor Escargot in adult stem cells: How can we tease them apart? Fly (Austin). 2016 Apr 2;10(2):53-9.
Loza-Coll MA, Southall TD, Sandall SL, Brand AH, Jones DL. Regulation of Drosophila intestinal stem cell maintenance and differentiation by the transcription factor Escargot. EMBO J. 2014 Dec 17;33(24):2983-96.
Voog J, Sandall SL, Hime GR, Resende LP, **Loza-Coll M**, Aslanian A, Yates JR 3rd, Hunter T, Fuller MT, Jones DL. Escargot restricts niche cell to stem cell conversion in the Drosophila testis. Cell Rep. 2014 May 8;7(3):722-34.
Solek CM, Oliveri P, **Loza-Coll M**, Schrankel CS, Ho EC, Wang G, Rast JP. An ancient role for Gata-1/2/3 and Scl transcription factor homologs in the development of immunocytes. Dev Biol. 2013 Oct 1;382(1):280-92.
Rast JP, Smith LC, **Loza-Coll M**, Hibino T, Litman GW. Genomic insights into the immune system of the sea urchin. Science. 2006 Nov 10;314(5801):952-6. Review.

Rachel Mackelprang

Mentor Bio — **Ph.D.** 2006, University of Washington **B.S.** 2001, University of Utah. Keywords: Permafrost, climate change, genomics, genetics, metagenomics, bioinformatics, microbiology.

Background & Purpose — Our lab is broadly interested in understanding microbial populations by integrating next-generation tools such as high-throughput DNA sequencing with traditional microbiology approaches. Our overarching goals are two-fold. Microbial life exists in many extreme environments including permafrost, soil in the arctic that has been frozen for thousands of years. Understanding how permafrost microorganisms survive and grow can give us insights into exobiology, global warming, and antibiotic resistance.

Research Question(s) or Hypothesis — **(1)** Exobiology— A fundamental goal of exobiology is to investigate the boundaries at which life can exist to inform the search for habitable environments and life outside Earth. Since six of the eight other planets in our solar system, as well as their moons, asteroids, and comets are permanently frozen, life—if it exists—on these other celestial bodies is most likely to be found in a sub-zero environment. On Earth, permafrost acts as analogue to Mars and other cryogenic bodies. If we can understand how microbial life survives in permafrost on Earth, it will help us understand how life may survive on other planets in our solar system and beyond.

(2) Climate change— One quarter of the earth's terrestrial surface is underlain by permafrost, or perennially frozen soils. Permafrost soils contain approximately 25% to 50% of the total global soil carbon pool. Permafrost carbon is protected from microbial degradation by freezing temperatures. However, rising global temperatures are causing the permafrost to thaw. As the permafrost thaws, it is predicted that microorganisms will become more active and that organic matter will become increasingly accessible for microbial degradation, releasing large amounts of greenhouse gasses into the atmosphere. We study how permafrost microbes degrade carbon in order to predict its contribution to climate change.

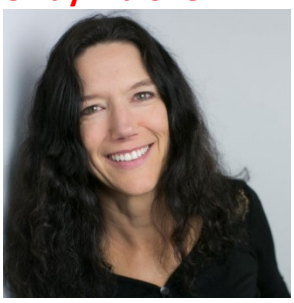
(3) Antibiotic resistance—Antibiotics were discovered more than 70 years ago and revolutionized medicine. Growing antibiotic resistance due to misuse is threatening the effectiveness of these medications. We study the history of antibiotic resistance by studying antibiotic resistance genes in microbial communities that have not been exposed to antibiotics—those that have been trapped in permafrost for thousands of years.

Method — Our lab uses a large number of techniques including standard laboratory procedures (ex: DNA extraction & manipulation, PCR, culturing of bacteria) and computational analysis of large-scale genomic data sets. Students may select lab or computer based studies.

Conferences Typically Attended — Members of the lab have attended the following conferences: American Society of Microbiology, International Society for Microbial Ecology, and the International Conference on Permafrost.

Publications — For a full list of publications, visit her lab website.

Cindy Malone



Mentor Bio — Dr. Malone earned her B.S in Biology at Illinois State University and her PhD in Microbiology and Immunology at UCLA. She continued her Post-doctoral work at UCLA in Molecular Genetics. Dr. Malone is the Director of the $6.1M CSUN-UCLA Bridges to Stem Cell Research Program funded by the California Institute for Regenerative Medicine. Dr. Malone's own research in her CSUN lab is aimed at understanding how genes are regulated through genetic mechanisms that alter gene expression. https://www.csun.edu/science-mathematics/biology/cindy-malone

Check out her Elite Gene Team App, E-Portfolio, and Youtube Channel.

Background & Purpose — Appropriately controlling when and where genes are turned on and off is essential for cells to function normally and avoid becoming cancerous or dying prematurely. The expression of a gene is usually controlled by adjacent DNA sequences, called the gene promoter that functions essentially as an "on/off switch". In a previous study, we linked a set of genes to both an aggressive cancer and non-aggressive/indolent cancer by an analysis of genes expressed (turned on) in an aggressive mantle cell lymphoma (MCL) compared the genes to the expressed non-aggressive small lymphocytic lymphoma (SLL). We study the promoter regions of these genes to determine why and how they are expressed or not in our lymphoma tumor samples. Our study will provide new insight for how these lymphoma associated genes are controlled and may increase the knowledge of how gene expression is controlled in general. Enhanced understanding from our studies should provide information for why certain cancers are very aggressive and others are less aggressive and therefore have a higher long-term survival rate.

Research Question(s) or Hypothesis — We hypothesize that these identified lymphoma-associated genes are dysregulated in these cancers and therefore play a role in their aggressive or non-aggressive natures, respectively.

Method — Promoter analysis of these genes, first in an epithelial cell line and subsequently in MCL and SLL cell lines, will identify how these genes are regulated and will lead to in vivo promoter regulation studies. We use bioinformatics (computer analysis) first, to identify the promoter regions of the lymphoma associated genes we found, then we isolate the promoter DNA region and determine how they are turned on and off. Molecular genetics techniques such as PCR, subcloning, restriction digest analysis, gel electrophoresis, cycle sequencing, site-directed mutagenesis, transient transfection, and dual luciferase analysis are used.

Student Roles — Students of all levels can run their own project from start to finish. Students choose a gene from the list of lymphoma-associated genes, identify and design PCR primers to the promoter region, PCR and subclone. After they verify their promoter by sequencing, they will perform transient transfections dual luciferase analysis. Site-directed mutagenesis and subsequent transient transfections and analysis will be performed to identify how the promoter is turned on and off.

Expectations — Students present their work at conferences and are integral in the manuscript and publication submission process. Students performing research in my laboratory often go on to CSUN UCLA Bridges to Stem Cell Research Program, PhD programs, industry jobs, and professional schools.

Conferences Typically Attended — CSUPERB, CSUN symposia, Sigma Xi Symposia, UCLA Stem Cell symposia, CIRM Bridges Trainee meeting, Gordon conferences, ISSCR.

Publications — For a full list of publications, please visit: https://www.csun.edu/science-mathematics/biology/cindy-malone

Rheem Medh

Mentor Bio — Ph.D. 1990, University of Texas **M.S.** 1984, University of Bombay **B.S.** 1982, University of Bombay

Lab website — Molecular Genetics of Cell Death.

Background & Purpose — My primary interest is in understanding how cells die. There are multiple forms of cell death; the one I am most interested in is called 'apoptosis' or 'programmed cell death'. It is a form of cellular suicide, where the dying cell activates within itself a series of well-orchestrated events including activation and repression of precise sets of genes, which modulate the execution. Excessive apoptosis, or a defect in the process has been implicated in diseases such as neurodegenerative disorders like Alzheimer's, autoimmune disorders, and cancer. My long-term goal is to understand the biochemical and molecular basis of apoptosis and to utilize this information to design therapeutic strategies to alleviate or overcome human diseases, particularly cancer.

Research Question(s) or Hypothesis — Using both conventional methods and microarray technology, we have identified a set of genes that may modulate leukemic cell apoptosis. We are testing the hypothesis that these genes play a crucial role in early steps of chemotherapy-induced apoptosis of leukemic cells. The molecular pathway for apoptosis involving each of these genes is being systematically studied, along with potential cross-talk among them.

Method — We are studying the molecular events associated with apoptosis of leukemic cells in response to therapeutic agents such as glucocorticoid hormones, immunosuppressants and anti-proliferative agents, in parallel models of glucocorticoid-sensitive and -resistant human lymphoblastic cells. This work involves the use of modern cell and molecular biology techniques such as mammalian cell culture, morphological and biochemical characterization of cells; DNA and RNA isolation and characterization by restriction digestion, Southern and Northern blotting and polymerase chain reaction; protein expression and analysis by Western Blotting; protein-protein interaction and DNA-protein interaction studies etc. Various anti-cancer drugs are being tested in cell culture models of cancer for their ability to alter gene expression, and induce apoptosis. Key gene regulatory events that trigger apoptosis are being identified. Students will perform experiments to generate data on drug-induced cell death, apoptosis and gene regulation. Data will be analyzed through standardized methods.

Student Roles — There are a number of potential projects for undergraduate and graduate students interested in this field of research. Student projects vary depending on the qualifications, background and goals of the student. Students obtain training in research methodology, scientific thinking, critical analyses as well as learn diverse techniques including cell culture, SDS-PAGE and Western blotting, DNA/RNA extraction and purification, Restriction enzyme digestions, PCR, DNA cloning, Northern hybridization, reverse transcription, get mobility shift assays, reporter gene assays, cell proliferation assays, apoptosis assays and flow cytometry.

Expectations — Under my mentorship, students are expected to perform experiments, interpret data, and discuss their research outcomes among peers in laboratory meetings, write reports summarizing their data, and present their research findings at local, regional, and national conferences.

Conferences Typically Attended — Early stages: department/college/campus-wide research symposia. Intermediate: CSU-wide biotechnology symposium, CSUPERB. Advanced: Annual meetings of the Endocrine Society and The American Association for Cancer Research.

Publications — For a full list of publications, please visit her website.

Sean Murray

Mentor Bio —**B.S**., 1997 Biology and Psychology, Summa Cum Laude, Montclair State University, NJ **M.S**., 1999 Biology,Yale University, New Haven, CT, **M.Phil.,** 2000 Biology, Yale University, New Haven, CT **Ph.D. 2003** Yale University **2003-2007** Postdoctoral Fellow in Dr. Lucy Shapiro's laboratory at Developmental Biology Department, Stanford University, Stanford, CA **2004 J. Spangler Nicholas Prize** for best Ph.D. thesis in Molecular, Cellular and Developmental Biology at Yale University.

Research Interests — The dimorphic bacterium Caulobacter crescentus is a model organism for studying the bacterial cell cycle. Its asymmetric cell division results in one swarmer and one stalked cell progeny. Motile swarmer cells can not undergo DNA replication until they differentiate into stationary stalked cells. If sufficient nutrients are available, swarmer cells eject their polar flagellum and build a stalk (with adhesive at its end; for attaching to a surface near nutrients) at the same pole formerly occupied by the flagellum. Stalked cells are competent for DNA replication and cell division. During cell division, a flagellum is placed at the pole opposite that of the stalk. Caulobacter's obligate cell cycle is controlled by oscillating master regulators that control different genetic modules in space and time. As a result of this carefully orchestrated process, a flagellum is synthesized only when needed (just prior to cell division) and is placed at the pole opposite that of the stalk. Likewise, a new stalk is synthesized only at the pole previously occupied by a flagellum. Our lab studies the roles of lipid biosynthesis in this process, using pharmacological, genetic, and molecular approaches. Only by further elucidating the control mechanisms of bacterial cell division can we advance the development of new antimicrobial compounds. Lipid biosynthesis is essential for cell viability and bacterial fatty acid synthetic enzymes have been suggested as antibiotic targets. In fact, compounds specific to bacterial fatty acid biosynthetic compounds have been generated. Most previous studies on bacterial lipid metabolism have focused on E. coli, a gamma-proteobacteria. Caulobacter in contrast, as an alpha-proteobacteria, is closely related to human pathogenic bacteria, such as Brucella and Rickettsia.

Background & Purpose — The purpose of my research is to study how cells enter and exit the bacterial cell cycle in response to stresses such as starvation or antibiotic treatment.

Research Question(s) or Hypothesis — My research questions include:

1) What genes are differentially regulated during starvation?

Methods: RNA will be extracted from starved bacterial cells. cDNA libraries will be created and deep-sequencing will identify changes in transcript abundance in bacterial cultures grown under various conditions. CSUN students will analyze the data using bioinformatic computational tools. Murray Lab members will confirm the changes in gene expression using real-time qPCR or transcriptional reporters.

2) Which of the starvation-upregulated genes contribute to persistence during starvation?

Methods: A subset of differentially regulated genes identified through deep-sequencing will be selected for gene knock-outs. The gene knockout strains will be tested for survival during starvation. Gene knock-outs will be confirmed using molecular genetic techniques. The strains will be tested for survival during starvation using direct counts, colony formation, and live/dead stains.

3) Do the starvation-upregulated genes contribute to persistence during antibiotic treatment?

Methods: A subset of differentially regulated genes identified through deep-sequencing will be selected for gene knock-outs. The gene knockout strains will be tested for survival during starvation. Gene knock-outs will be confirmed using molecular genetic techniques. The strains will be tested for survival during antibiotic treatment using direct counts, colony formation, and live/dead stains.

Student Roles — Sophomores will make bacterial growth media and solutions, culture bacteria using the aseptic techqnique, and clone PCR products into vectors to create transcriptional reporters. Juniors will confirm gene transcription using transcriptional reporters and create geneknockouts. Seniors will use real-time qPCR to validate

differentially-regulated genes during starvation and will test gene knock-out strains for persistence in starved- or antibiotictreated cells.

Expectations — The Murray laboratory offers excellent training for students who are interested in becoming clinical laboratory scientists or public health microbiologists

Conferences Typically Attended — Murray lab members have recently attended the CSUPERB Annual Meeting, the CSUN research symposium, an EMBO meeting on alpha-proteobacteria in Germany, and plan to attend the American Society for Microbiology Conference on Prokaryotic Development in Washington DC in June 2015.

Publications — For a full list of publications, please visit his CSUN webpage.

Jeanne Robertson

Mentor Bio — My research is focussed on the microevolutionary processes that mediate population and lineage diversification, mostly in amphibians and reptiles. Specific areas of interests include: natural selection, behavior and sexual selection, spatial patterns of diversity, the evolution and functional significance of color pattern, population genomics and phylogeography, the California Channel Islands, speciation, and biogeography of Central America. I teach the Introductory Biology course (106) for Biology majors - this course is part of the myCSUN tablet initiative - we use the iPad in class to engage with course material during lecture - thus creating a student-centered learning environment! I also teach Molecular Markers in Evolutionary Studies (BIOL452) – a course which introduces students to the lab techniques and concepts used in Molecular Ecology. Ph.D. 2008, Cornell University M.S. 2001, Southern Illinois University Carbondale B.S. 1993, University of California Davis. Visit her website.

Research Project Title — Genomic and behavioral basis of speciation in field crickets

Background & Purpose — Research in the Robertson Lab focusses on the evolutionary processes that mediate lineage diversification speciation, including the relative roles of gene flow and selection A Build PODER student will examine the evolution of reproductive isolation in two divergent lineages of crickets that co-occur in narrow contact zone, and will determine the extent of hybridization in these two lineages using an integrated field and molecular genetic research approach. The two cricket species are nearly indistinguishable except for color and habitat preference. While G. saxatilis is uniformly black in coloration and prefers rocky outcrops, G. navajo exhibits color polymorphism, ranging from black to red, and occurs on red, sandy substrate.

Research Question(s) or Hypothesis — **Aim 1:** We predict that the black color form of G. navajo morphs represent a hybrid cross with G. saxatilis in the contact zone. **Aim 2:** We expect that natural selection acts on color morph in the contact zone of Goblin Valley, Arizona.

Method — Mixed method. Molecular Ecology & Ecological Field-based research. **Aim 1**: A high-throughput sequencing approach (RADseq) will be used to genotype individuals of both G. navajo and G. saxatilis, with a focus on contact zone populations. RADseq data will be filtered through abioinformatics pipeline. We will conduct a suite of analyses including genetic diversity estimates, genetic clustering analyses (e.g., STRUCTURE, PCA) to determine genetic groupings. The program NewHybrids will be used to examine the extent of hybridization; this metric will allow us to estimate the extent of hybridization in the wild and distinguish among multiple hybrid generations. **Aim 2:** Students will perform field-based measure of natural selection in the contact zone. Enclosures will test for survival of crickets that are both cryptic and conspicuous. We will uncover a signal of strong selection if survival is higher in cryptic color forms.

Student Roles — This research includes both field and molecular laboratory research. At all levels, students will conduct fieldwork in the summers of 2018-2019 in Utah, Arizona and California (natural selection studies, field

sampling). Advanced students (Juniors/Seniors) will have the opportunity to work alongside a graduate student and PI to perform bioinformatics. Students will be mentored in all aspects of manuscript preparation and submission.

Expectations — The student can expect to gain experience in both field, experimental laboratory, and molecular genetics. In the lab, the student will learn: DNA extraction, DNA quantification and all aspects of library construction for next-generation sequencing. Both the heritability and molecular components of this research will help students develop skills that can be broadly applicable to all biotechnology and medicine fields.

Conferences Typically Attended — A BUILD PODER student will present findings at the CSUN student research symposium, held annually and will be expected to attend one of the scientific conferences: Society for Integrative and Comparative Biology (SICB); Evolution; and/or the Ecological Society of America (ESA).

Publications — For a list of publications, please visit: https://jrobertsonlab.wordpress.com/publications/

Crystal Rogers (No longer available, lab is full)

Mentor Bio — Originally from the wine country in Northern California, I moved to Southern California in 1997 to attend UCLA. I received my B.S. in biology from UCLA in December of 2001. After I graduated I worked with J. Patrick Johnson at Cedars Sinai for a year and a half and then took a big leap and moved across the U.S. to attend graduate school at Georgetown University. I began graduate school in August of 2003 and quickly joined the lab of Elena Casey in the Department of Biology. I was in the Casey lab for five and a half years studying early neural development in the African claw-toed frog, Xenopus laevis. I received by PhD from Georgetown in 2009 and moved to the California Institute of Technology in January of 2010 where I was a postdoctoral fellow in the lab of Marianne Bronner in the Division of Biology and Biological Engineering. Currently, I am an assistant professor in the Department of Biology at CSUN. www.crystalrogersphd.com.

Research Projects — My lab studies the molecular mechanisms that drive neural crest cell development in chicken (Gallus gallus) and axolotl (Ambystoma mexicanum) embryos. More specifically, I am interested in identifying and characterizing genes and proteins involved in the specification of these tissues as well as those controlling the epithelial to mesenchymal transition (EMT), a process that occurs naturally during development and also during cancer transformation.

Background & Purpose — Neural crest (NC) cells are a unique vertebrate stem-cell population that originates in the developing dorsal neural tube and eventually detaches and migrates throughout the developing embryo forming multiple derivatives such as the craniofacial skeleton, pigment cells and the peripheral nervous system. Not only does aberrant neural crest development cause one of the most common birth defects (cleft palate), these cells provide an excellent model system for studying molecular mechanisms that are involved in the epithelial to mesenchymal transition (EMT) in a nonmalignant developmental environment. The process of EMT occurs normally in developing embryos, but also occurs during cancer metastasis. Despite the similarities in morphology and gene expression between embryonic and cancer cells undergoing EMT, little is known about the functional conservation of the molecular pathways that regulate changes in adhesion during EMT. Recent studies from our lab suggest that the process of EMT may include two steps, detachment and mesenchymalization. We have shown that NC cells can lose apicobasal polarity and exhibit breakdown of the basement membrane, but fail to complete the process of EMT if cadherin proteins are dysregulated (Rogers, 2013). Few in vivo studies have focused on the function of cadherin proteins that may be important in this process.

Research Question(s) or Hypothesis — Our current projects will explore the transitioning roles of Ncad, Ecad, Cad11 and Cad7, their transcriptional inputs such as Sip1, and possible interacting factors during cranial NC EMT. Here, we propose to test the hypothesis that Ecad, Cad11 and Cad7 play important roles in NC EMT and migration. In addition, we will also identify the role that cadherins play in NC cell proliferation and survival. We have previously shown that Ncad and Ecad function together heterophilically in the neural tube prior to neural crest EMT, and this project directly follows up to determine if Ecad functions coordinately with Cad11 or Cad7 in the migratory crest to complete EMT.

Method — Our aim with this project is to accumulate preliminary data about the roles of the cadherin proteins during EMT and neural crest migration. To this aim, we will perform gain and loss of function experiments in avian embryos by

electroporating either full-length or truncated cytoplasmic versions of the cadherin protein constructs, or translation blocking morpholino oligomers, into the presumptive NC prior to EMT. Subsequently, we can use quantitative RT-PCR, in situ hybridization, biochemistry and immunohistochemistry to elucidate the effects on early development. We will also perform co-immunoprecipitation experiments and proximity ligation assays to identify functional binding partners. Overall, these experiments will detect which genes require specific cadherin expression, and how these proteins function to regulate neural crest EMT.

Student Roles — Students at all levels are welcome to apply for our lab as our research is highly amenable to undergraduate participation. Students will learn molecular and developmental biology techniques that will assist them in medical school, graduate school and beyond. They will also be encouraged to attend national conferences.

Conferences Typically Attended — Society for Developmental Biology and American Society of Cell Biology national meetings.

Publications — For a list of publications, please visit: https://www.crystalrogersphd.com/publications.html

Cristian Ruiz Rueda

Mentor Bio — Adjunct Assistant Professor (2015–). Dept. Microbiol. & Immunol., Weill Cornell Medical College, New York, NY. Research Associate (2013–2015) with Dr. Francis Barany, Dept. Microbiol. & Immunol., Weill Cornell Medical College, New York, NY. Research Associate (2009–2012) / Postdoctoral fellow (2006–2012) with Dr. Stuart Levy, Dept. Molecular Biol. & Microbiology, Tufts University School of Medicine, Boston, MA. Ph.D. cum laude in Microbiology (2005) with Dr. Pilar Diaz, Dept. Microbiol., University of Barcelona, Barcelona, Spain. M.Phil. Microbiology (2001). Dept. Microbiol., University of Barcelona, Barcelona, Spain. B.S. Biology (1999). University of Barcelona, Barcelona, Spain. View his website.

Background & Purpose — The ultimate goal of my research is to develop novel ways of preventing and treating infectious diseases caused by bacteria resistant to multiple antibiotics. These bacteria have become a major problem in the U.S. and abroad, from failed treatment of previously curable diseases to increased hospital costs. There are approximately 2 million hospital-acquired infections in the U.S. each year, with more than 99,000 deaths occurring mostly due to antibiotic resistant pathogens. World health leaders have described antibiotic resistant pathogens as “nightmare bacteria that pose a catastrophic threat to people in every country in the world”.

Research Question(s) or Hypothesis — I am especially interested in the physiological role of multidrug efflux pumps such as AcrABTolC, the main multidrug efflux pump in Escherichia coli and many other pathogenic enterobacteria.

Method — My laboratory uses a multidisciplinary approach that includes bacterial genetics and biochemistry, molecular biology, gene expression experiments, and "omics" to study resistance to multiple antibiotics in bacteria, to ultimately identify new antimicrobials and targets; as well as to develop novel detection methods.

Student Roles — By combining global transposon mutagenesis and untargeted metabolomics, students will identify regulatory and metabolic pathways that reduce the expression or activity of multidrug efflux pumps. Students will then use genetics, gene expression and biochemical methods to further characterize these pathways and pinpoint the cellular metabolites that affect these pumps. They will also determine their mechanism of action, whether they are pump substrates, and their potential as therapeutics capable of preventing antibiotic efflux. Students will also use this knowledge to develop novel molecular detection methods capable of identifying pathogens and their resistance genes in raw samples or metagenomic DNA. I organize research so students participate in different projects and learn different techniques such as antibiotic susceptibility testing, mutagenesis, gene deletion, gene cloning, DNA and protein electrophoresis, PCR, LDR, qPCR, RT-qPCR, Next Generation Sequencing and bioinformatics. As students gain experience, they can then choose on which projects to focus.

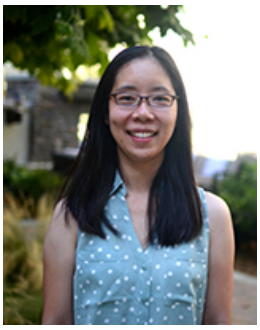
Expectations — My final goal is that my students learn the techniques and develop the critical thinking and communication skills that will make them successful in pursuing their careers in the biomedical and health sciences.

Conferences Typically Attended — I encourage my students to use their results to prepare communications for conferences they will be attending, such as CSUPERB Annual Meeting, the American Society for Microbiology General

Meeting, and the Interscience Conference on Antimicrobial Agents and Chemotherapy Meeting; as well as to write publications for peer-reviewed journals.

Publications — For a list of publications and patents, visit his website.

Melissa Takahashi *Pending Mentor Training*



Mentor Bio – I received my B.S. in Chemical Engineering from UC Davis and M.S. from Stanford. Following my masters, I worked in the diagnostics and lab-on-a-chip industry in Northern California for five years. At that point, I wanted to change industries and focus more on research, which led me to graduate school at Cornell University. My graduate work was in the field of RNA synthetic biology, where I focused on engineering RNA gene regulators for use in controlling bacteria. I followed up my graduate work with a postdoc at MIT where I again engineered RNA regulators, but this time for use in nucleic acid diagnostics. See my lab website: www.takahashi-lab.org.

Title of Research Project – Discovering novel antimicrobial agents that target sRNA regulated antibiotic resistance mechanisms.

Purpose and Background - The increase in antibiotic resistant pathogenic bacteria represents a major threat to human health and necessitates a demand for novel treatment strategies. Particularly important is bacteria's ability to adapt to the presence of antibiotics, thus limiting its efficacy. This presents a major challenge because while we can identify effective antimicrobial agents, bacteria can adapt to minimize their effect. One way bacteria adapt to the presence of antibiotics is through regulation of genes by sRNAs. For example, the sRNA MicF modulates antibiotic resistance in E. coli by regulating the production of OmpF, a porin involved in antibiotic uptake. Deletion of micF increases susceptibility to the antibiotics cephalosporin and norfloxacin. Therefore, trans-acting sRNAs have the potential to be new targets for antimicrobial compounds.

Research Questions/Hypotheses - In this project, we will determine if peptides can be designed to inhibit sRNAs and used in a combination therapy to counteract bacteria's natural adaptation mechanisms thus increasing the efficacy of existing antibiotics.

Methods - We will utilize a cell-free gene expression system to develop a platform to rapidly produce and screen candidate peptides for their ability to interfere with sRNA binding to its target. A fusion of the target mRNA to GFP will allow for simple determination of sRNA function. Specific binding interactions between peptides and sRNAs will be determined using designed sRNA mutants. Successful peptide candidates will then be tested for efficacy in E. coli.

Student roles - Students will learn all laboratory skills involved in the project including: molecular cloning, PCR, cell-free lysate production, cell-free experiments, and determining MICs. More experienced students will be encouraged to design and interpret experiments independently.

Expectations – Students working in my lab will be set up with their own individual project. This may range from smaller sub-projects for newer students to bigger, year-long projects for more experienced students. Students can also expect to work together with other students and are encouraged to help each other in the lab. My goal is to provide my students with the tools they need to succeed in their future whether that be graduate school, industry, or otherwise. To that end, I encourage ongoing conversations about goals and what we can do to reach them.

Conferences typically attended – Synthetic biology: Engineering, Evolution & Design (SEED), Gordon Research Conference on Synthetic Biology.

Publications – For a full list of publications please see my website.

Casey terHorst

Mentor Bio – Casey started as a biology professor at Cal State Northridge in the Fall of 2013. Before that, he completed a post-doc at Michigan State University and a Ph.D. at Florida State University. He is happy to be back at the same institution where he received his Master's degree. At CSUN, he teaches Biol 106 (Biological Principles I), Biol 427L (Principles of Ecology), and Biol 502 (Biometry). In his free time, Casey spends a lot of time trying to improve his mediocre sports skills. He is generally interested in how the rapid evolution of species traits alter interactions between species.

Title of Research Project – Does rapid evolution and dispersal alter local bacterial communities? Eco-Evo Lab (ecoevolab.com)

Background & Purpose – Research in our lab focuses on evolution that happens so quickly that it affects interactions between species and their environment. Although we often think about evolution on the scale of millions of years, because microbes have such short generation times, they have the potential to evolve over the course of days or weeks. Such rapid evolution may affect their ecological interactions with other species, including competitors, predators, and mutualists. As we understand the role that microbes play in human health more and more, understanding the eco-evolutionary dynamics of microbial species is key to understanding how we treat infection and disease.

Research Questions or Hypothesis – The current project in my lab seeks to understand how eco-evolutionary interactions at the local scale (e.g., within one human body) might be affected by dispersal at the regional scale (e.g., transmission of microbes among people). We hypothesize that a little bit of dispersal might make selection very important, as it will select for or against the new migrants into the population. However, at higher migration rates, this may prevent any effects of natural selection.

Method – We are using the community of bacteria and protozoa that live within the leaves of carnivorous pitcher plants as a model system to examine these eco-evolutionary interactions. We conduct experiments in laboratory microcosms in which we manipulate the selection environment on microbial species. The quantitative methods we use are all conducted in the R Statistical environment, a platform being used commonly by most scientists today.

Student Roles – Students in the lab will be able to conduct their own experiments using this system, but will also be trained in molecular techniques that we use to sequence DNA and identify the bacterial species that are present. Students will learn how to culture microbes, how to extract DNA from cultures, and molecular techniques, such as Polymerase Chain Reaction (PCR). Students also have the option to learn bioinformatics that we use to identify microbial species. Students in the lab will be encouraged to attend and present their research at scientific conferences.

Expectations – We look for students in the lab that can work independently and are interested in exploring their own individual projects, with sufficient guidance from the faculty and graduate students in the lab. Schedules can be somewhat flexible, but require reliable students. Students can expect to receive all the help they ask for, both in terms of research methods and in mentorship about how to navigate the scientific world. Students are given a fair amount of independence, but guidance is available whenever needed. Most of the people in the lab are first-gen college students from diverse backgrounds, so most people can relate to the experiences of CSUN students.

Conferences Typically Attended – Students in the lab will be encouraged to attend and present their research at scientific conferences. Students typically present at the CSUNposium on campus. However, past students have also presented research at the Ecological Society of America annual meeting, the Evolution conference, or more locally, the Western Society of Naturalists annual meeting.

Publications – For a list of publications in the lab, please visit http://www.ecoevolab.com/publications/

Key Words – rapid evolution, ecology, species interactions, bacteria, pitcher plants, carnivorous plants, protozoa

Cheryl Van Buskirk

Mentor Bio — Ph.D. 2000, Princeton University, **B.S** 1993, University of Calgary. I grew up in Calgary, Canada and received my Bachelor's degree in Biochemistry from the University of Calgary in 1993. I fell in love with genetics thanks to a great teacher, and I've been doing genetics ever since. I went to Princeton to study developmental genetics in Drosophila under Trudi Schupbach, then to Caltech to study behavioral genetics in C. elegans under Paul Sternberg. Here at CSUN I strive to pay forward the inspiration given to me by my professors and mentors along the way.

Name of Lab — FIRE (Full Immersion Research Experience)

Background & Purpose — The purpose of our lab's research is to understand the origin and function of sleep. We do this by studying one of the simpler organisms known to enter a sleep state: the nematode C. elegans. This animal is highly amenable to molecular-genetic analysis, and importantly, shares conserved sleep-regulating pathways with vertebrates. We expect that our work in C. elegans will shed light on the function of sleep in humans. Our lab has recently shown that, in response to stressful conditions such as heat, high salt, and toxin exposure, C. elegans will enter a sleep-like state. Importantly, we have shown that this sleep state enhances survival following extreme stress.

Research Question(s) or Hypothesis — We posit that perturbations of cellular homeostasis drive sleep behavior, which in turn allows allocation of resources toward restoration of homeostasis.

Method — We are testing our hypothesis using mutants that are known to be either defective in, or abnormally good at, restoration of protein folding. We are performing molecular-genetic analyses to characterize the signaling pathway that mediates stress-induced sleep behavior.

Student Roles — Students examining sleep behavior will collect data on the sleep responses animals at various times following various stressors, and analyze the data using appropriate statistical methods. Students examining the molecular mechanism of cellular stress-induced sleep will examine gene expression, perform molecular cloning, RNA-mediated interference (RNAi), PCR, and other standard molecular techniques. Each student has the opportunity to choose from among several projects based on their interests. We perform molecular cloning as well as organismal/behavioral assays, all contributing to our overall goal of understanding the function of sleep. Junior students can work as part of a team with more experienced students in the lab, learning techniques and gaining knowledge of the scientific method. More senior students develop independent research projects that often contribute to publications from the lab, which looks very good on their CVs!

Expectations — Undergraduate students involved in my research program have been very competitive for PhD programs, as well as for entrance to health professional schools.

Conferences Typically Attended — Students in the lab have presented their work at CSUPERB (each January in California), CSUN symposia, the Society for Neuroscience (SFN) meeting, the Gordon conference on Sleep Regulation, and the international C. elegans meeting (in June of every other year at UCLA).

Publications — You can find an easy-reading article and a podcast about my research.

Jeremy Yoder

Mentor Bio — The fundamental hypothesis of evolutionary biology is that things that happen in a single growing season ultimately create the patterns of biological diversity that emerge over millions of years. As an evolutionary ecologist, I use field studies, mathematical models, and population genomic data to understand how the ecological effects of different habitats, climates, and biological communities create and maintain biodiversity. My doctoral dissertation research with Olle Pellmyr at the University of Idaho applied theoretical, phylogenetic, and population genetic approaches to examine the origins and evolutionary trajectories of species interactions, with particular focus on the obligate pollination mutualism between Joshua tree (Yucca brevifolia) and yucca moths (Tegeticula spp.). As a postdoctoral researcher with Peter Tiffin at the University of Minnesota I used genome-scale

genetic data to examine patterns of local adaptation to climate and mutualistic rhizobial bacteria in the model legume Medicago truncatula, as part of the Medicago Hapmap Project. I am currently a postdoctoral fellow with Sally Aitken at the University of British Columbia, studying the genetic architecture of adaptation to climate by lodgepole pine (Pinus contorta) and interior spruce (Picea glauca, P. engelmannii, and their hybrids) with the AdapTree project. View my lab website.

Background & Purpose — Most multicellular organisms host communities of microbes that provide supplementary nutrients, physiological services, even defense against natural enemies (1–3). Many host species manage their symbionts to prevent the evolution of "cheaters" that take the benefits of symbiosis without reciprocating, yet the sanctions hosts deploy against cheaters rarely eliminate symbionts that provide substandard services (4). Recent theory suggests variation in symbiont quality can persist when hosts select symbionts via signals separate from the benefit symbionts provide, as they do in many real-world cases (5). This simple model may not fully reflect real-world dynamics, however — it models host sanctions and symbiont effects on hosts as simple genetic effects rather than continuously varying quantitative traits, and limits the variation possible in the signals symbionts send to hosts. Demonstrating that host-symbiont signals maintain variation in symbiosis outcomes under more realistic circumstances can help understand how signaling shapes real-world outcomes in medical and agricultural systems.

Research Question(s) or Hypothesis — We will test the linked hypotheses that (1) host sanctions against poorly cooperative symbionts, modeled as a continuous quantitative trait, can select for more cooperative symbionts and that (2) host recognition of symbiont signals, modeled as infinitely varying rather than with a small number of alternate signal types, can maintain variation in host sanctioning ability and symbiont cooperation quality.

Method — We will develop a novel mathematical model of host-symbiont coevolution extending the model of ref (5), in which symbionts' effect on host fitness varies from negative (antagonistic) to beneficial (mutualistic), and hosts are able to respond by sanctioning or rewarding symbionts based on these effects. We analyze this model algebraically, and program individual-based computer simulations to test its dynamics without the simplifying assumptions necessary for mathematical tractability in the algebraic model.

Student Roles — Students will learn to develop and analyze algebraic models of dynamic systems to help model host-symbiont coevolution in Mathematica; write code for individual based simulations and run simulations to validate algebraic results; and contribute to analysis, visualization, and presentation of model and simulation results.

Expectations — Results from this project should be suitable for publication in internationally-recognized journals of ecology and evolution, such as the *Proceedings of the Royal Society B,* the *American Naturalist*, or *Evolution*.

Conferences Typically Attended — The annual Evolution meeting, Western Society of Naturalists meeting.

Publications

Godsoe W, JB Yoder, CI Smith, and O Pellmyr. 2008. Coevolution and divergence in the Joshua tree/yucca moth pollination mutualism. The American Naturalist 171(6): 816-23. doi: 10.1086/587757
Hembry DH, JB Yoder, and KR Goodman. 2014. Coevolution and the diversification of life. The American Naturalist. 184(4): 425-438. doi: 10.1086/677928
Smith CI, CS Drummond, WKW Godsoe, JB Yoder, and O Pellmyr. 2009. Host specificity and reproductive success of yucca moths (Tegeticula spp. Lepidoptera: Prodoxidae) mirror patterns of gene flow between host plant varieties of Joshua tree (Yucca brevifolia: Agavaceae). Molecular Ecology 18(24): 5218-29. doi: 10.1111/j.1365-294X.2009.04428.x
Yoder JB, CI Smith, DL Rowley, WKW Godsoe, and O Pellmyr. 2013. Effects of gene flow on phenotype matching in two varieties of Joshua tree (Yucca brevifolia; Agavaceae) and their pollinators. Journal of Evolutionary Biology 26(6): 1220-33. doi: 10.1111/jeb.12134

Department of Chemistry & Biochemistry

Ravinder Abrol

Mentor Bio — Dr. Ravi Abrol's research lab is focused on developing and using computational methods to probe how protein structure and biochemical (protein-ligand and protein-protein) interactions of G protein-coupled receptors (GPCRs) determine cellular signaling and physiology, as well as how this knowledge can be used for the rational design of drugs targeting GPCR signaling pathways. GPCRs are integral membrane proteins that form the largest superfamily in the human genome. The activation of these receptors by a variety of bioactive molecules regulates key physiological processes (e.g., neurotransmission, cellular metabolism, secretion, cell growth, immunity, differentiation), through a balance of G protein-coupled and beta-arrestin-coupled signaling pathways. This has made them targets for ~50% drugs in the clinic. A molecular and structural understanding of these GPCR signaling pathways will have a broad impact on our understanding of cellular signaling and on drug discovery efforts targeting GPCRs. Research in the Abrol Lab lies at the interface of Chemistry and Biology, where they are using computational biophysics and structural bioinformatics based methods to gain mechanistic insights into the biochemistry of GPCR signaling. **Ph.D.** (Chemistry), California Institute of Technology, Pasadena, CA. **M.Sc.** (Chemistry), Indian Institute of Technology, Kanpur, India. **B.Sc. Honours** (Chemistry), University of Delhi, India. View his CSUN Faculty profile.

Research Project Title — Structural Mechanisms of GPCR Signaling

Background & Purpose — GPCR Complexity: G protein-coupled receptors (GPCRs) comprise the largest superfamily of integral membrane proteins that interact with G proteins, GPCR Kinases (GRKs), and arrestins, to convert extracellular signals into multiple intracellular signaling cascades. This critical role of GPCRs makes them therapeutic targets for ~50% of all modern drugs. Pleiotropic signaling of GPCRs targeted by drugs can cause on-target side-effects, so a molecular understanding of this pleiotropy is essential for rational drug discovery to minimize those side-effects. Integrated Approach: The conformational flexibility of GPCRs plays a mechanistic role in their pleiotropic function. Our research is focused on the development and application of methods in computational biochemistry, biophysics and evolutionary/structural bioinformatics to provide this mechanistic link between receptor sequence and signaling.

Research Question(s) or Hypothesis — We are pursuing three focused complementary themes to answer the following questions centered on the sequence-structure-signaling nexus of GPCRs:

1. How do GPCRs exert their allosteric and pleiotropic effects in signal transduction?
2. What is the structural basis of receptor-G protein selectivity and G protein vs □arrestin selectivity?
3. How have GPCR paralogs (products of gene duplication events activated by same/similar chemical signals) evolved to increase the repertoire of GPCR function?
4. How do sequence variations map to downstream signaling cascades and pathophysiology?

Method — We are developing following methods to answer these questions:

1. Our previous conformational sampling algorithms are being combined with Markov State Models to identify physiological important conformations.
2. We are combining evolutionary relations of closely-related paralogs with their structures to understand functional divergence.
3. We are combining evolutionary approaches with conformational methods to understand the evolution of GPCR structural plasticity.

Methods are validated against available experimental data and then applied to interesting GPCR systems. The results generated in our lab are being combined with data from public datasets to create a GPCR Knowledgebase (http://www.gpcrkb.org), available to the worldwide research community.

Student Roles — In the beginning, the students are trained in the computational methods used in the lab and they are responsible for learning one programming language during this time. After this phase, each student is assigned a project that they take ownership of and that they are fully responsible for. They interact with me regularly and also with any experimental collaborator as an active participant. The students get to write the manuscripts for publication and they also get a chance to present their research at one of the conferences listed below.

Expectations — I have mentored many undergraduate STEM students (freshman to senior). The computational nature of our research enables both short and long term projects to be designed based on student interests. Our lab has a broad range of reading/study resources to get any undergraduate ready for research. The students learn about GPCR signaling, computational methods, programming, and using protein visualization/analysis tools. Students are not required to have any programming experience, however, they need to be open to learning some programming.

Conferences Typically Attended — GPCR-Keystone; Molecular Pharmacology Gordon; Biophysical Society; Intelligent Systems for Molecular Biology; Protein Society, CSUPERB

Publications — For a full list of publications, visit his faculty profile.

"Identifying multiple active conformations in the G protein-coupled receptor activation landscape using computational methods"; Dong S, Goddard WA 3rd, Abrol R (2017), G Protein Coupled Receptors Part A (Methods in Cell Biology Book Series), Ed. Arun K. Shukla (Elsevier), Vol.142, pp. 173-186. [PMID: 28964335]

Aziz Boulesbaa

Mentor Bio — Aziz Boulesbaa Is an assistant Professor of Chemistry & Biochemistry. He joined CSUN in 2017. Prior to that, he worked at Oak Ridge National Laboratory (ORNL). He conducted his PhD studies in Physical-Chemistry at Emory University and Temple University. He obtained BSc and MSc degrees in Physics from USTHB and Université Sorbonne Paris Cité, respectively.

Title of Research Project — Nanomaterials for Photothermal Therapy at the Molecular Level

Student Roles — Students prepare nanomaterials, carry out measurements, analyze data, present data at conferences, and draft manuscripts for publication.

Expectations — Students are expect to learn various techniques and concepts. They will be closely mentored during the first phase, but they progress, they will become more independent. PODER students will work closely with graduate students.

Conferences Typically Attended — American Chemical Society National Meeting, American Physical Society National Meeting, Photonics West.

Publications — View his website: www.sites.google.com/view/boulesbaa/publications

Key Words – Photothermal Therapy, Nanomaterials, Lasers, Spectroscopy

Karin Crowhurst

Mentor Bio — I grew up in western Canada (Calgary and Vancouver) but traveled east to pursue my university degrees. I received Bachelor's and Master's degrees in Chemistry before moving into the field of Biochemistry at the University of Toronto where I completed a PhD in Biochemistry and Biomolecular Structure in the Forman-Kay lab. In 2003 I moved to Los Angeles to join the Mayo lab at Caltech for my postdoc. I started as a tenure-track faculty member at CSUN in 2007. **Ph.D.** 2003, University of Toronto, **M.Sc.** 1997, University of Toronto, **B.Sc.** 1995, Queens University Kingston.

Crowhurst Lab — http://www.crowhurstlab.com/

Background & Purpose — The overarching goals of our research are to study the structure and function of proteins to better understand their mechanism of action and the specificity of their interactions with target proteins. This can lead to improved understanding of specific diseases, and may point toward more targeted therapies than are currently available.

Research Question(s) or Hypothesis — Of particular interest in the Crowhurst lab is HdeA, a protein that is largely responsible for the successful proliferation of dysentery, in that it aids in the survival of pathogenic bacteria as the organism travels through the stomach on its way to infect the intestines. Dysentery disproportionately impacts lower-income parts of the world; research in this area (that improves our understanding of the mechanism of HdeA activity and might lead to therapies or vaccines) would therefore provide a valuable contribution towards reducing health disparities between different cultural groups. One of the very unique characteristics of HdeA is that it is inactive in its folded form and becomes activated only when it unfolds at the low pH of the stomach. This is in direct conflict with our traditional understanding of how proteins function. Our primary aims with this project are to use high resolution techniques to investigate the changes in structure and flexibility of HdeA with decreasing pH. This will shed light on fundamental protein folding questions and provide us with a better understanding of the mechanism by which the protein becomes activated.

Method — The wetlab component of our work primarily involves preparing protein samples for study. This includes recombinant protein expression and purification, as well as some DNA work. Our primary analytical tool is NMR (nuclear magnetic resonance) spectroscopy, which permits study of these proteins with atomic resolution. We have numerous specialty techniques such as preparing selectively and uniformly isotopically labeled proteins for NMR analysis, and we may also do some in-cell NMR experiments.

Student Roles — Students will collect many different types of data with their protein samples using the NMR spectrometer. This can include data that provides information on structure, internal flexibility, binding with other proteins, and unfolding processes. Students will learn how to use specialized software for analyzing the data as well as spreadsheet programs for displaying the results. There may also be some computational component work involving molecular simulations to better visualize our results.

Expectations — Students in the Crowhurst lab will learn many marketable and translatable skills, including wetlab skills (relating to the techniques and equipment required to make and purify proteins in advance of NMR studies), computer and analytical skills (in processing and interpreting NMR data), and the "softer" skills of learning to work with others, recover from setbacks, troubleshoot problems and present scientific data in front of an audience.

Conferences Typically Attended — CSUPERB Symposium, the Protein Society meeting, ASBMB.

Publications — To view all publications, please visit the Crowhurst lab website.

Paula Fischhaber

Mentor Bio — **B.A.** Biochemistry, University of Colorado, Boulder. **Ph.D.** University of Washington, Seattle

Background & Purpose — Dr. Fischhaber's group is investigating the protein biochemistry of DNA repair in S. cerevisiae (baker's yeast). In human beings, failure to repair covalent modifications to DNA (DNA damage) by the biologic repair pathways results in genetic mutations and cancer, particularly skin cancer. DNA damage is ubiquitous in living cells and much of it is unavoidable, so DNA repair pathways are crucial for survival.

Research Question(s) or Hypothesis — The spatial and temporal relationships of several important DSB Repair proteins from *S. cerevisiae* will be investigated *in vivo* using fluorescence microscopy. Fluorescence microscopy data from the PI's laboratory demonstrate that Rad10 is recruited to spatially localized I-*Sce*I-induced DSBs in a *RAD51*-, *RAD52*- and *SAW1*-dependent fashion and that *SAW1* is required for the Synthesis-Dependent Strand Annealing (SDSA) pathway. The proposed experiments will build on these findings by investigating the necessity of longer DNA flaps in the requirement of Saw1 for Rad10 recruitment to sites of Single-strand Annealing (SSA) and similarity between yeast and human Rad52 in downstream recruitment. These experiments will determine whether Saw1 and Rad10 recruitment to DSB sites is altered as a function of length of nonhomologous sequence flanking the DSB site.

Method — The PI will create a panel of yeast strains in which the DNA region surrounding an inducible DNA Double-strand Break site is varied so that the amount of DNA between the DNA cut site and the DNA repeats is altered. The strains will be investigated for the ability to observe Rad10-YFP protein being recruited to the DSB site. The experiments will also

determine whether yeast and human Rad52 are sufficiently similar that human Rad52 can recruit yeast Saw1-Rad1-Rad10 complexes during yeast DSB repair.

Publications — To view publications, visit: https://www.csun.edu/science-mathematics/chemistry-biochemistry/paula-fischhaber

Eric Kelson

Mentor Bio — **Ph.D.** 1993, California Institute of Technology. **B.S.** 1988, University of Utah

Research Question(s) or Hypothesis — The main goal of my research is the refinement of a ketone transfer hydrogenation pre-catalyst developed in my laboratory for eventual customization for pharmaceutically important reactions. This catalyst is unique in being a polypyridine supported ruthenium dimer in which metal centers electronically cooperate to bind organic substrates and transfer hydride as part of the overall catalytic process. Future work will explore new ligand designs within the existing framework to improve the activity and stability of catalytic intermediates as well as establish convenient means to customize catalysts for specific substrates.

Student Roles — Students will prepare organic ligands and ruthenium complexes, characterize them spectroscopically, and assess the resulting catalytic activity and selectivity. In doing this, they will collect and interpret nuclear magnetic resonance and multidimensional mass spectra as well as gas chromatographic data.

Expectations — By participating in this work, students will gain marketable synthetic and analytical skills and experience in organic and inorganic chemistry.

Publications — To view publications, visit my CSUN webpage.

Jheem Medh

Mentor Bio — My overall research interest is in the area of lipoprotein metabolism and atherosclerosis. It is well known that abnormal plasma low density lipoprotein (LDL) and high density lipoprotein (HDL) cholesterol levels result in cardiovascular disease. We are interested in the molecular and cellular mechanisms that translate an anomalous lipoprotein profile into atherosclerotic lesions. We are studying various components of the atherogenesis pathway including apolipoproteins, lipases and lipoprotein receptors. The current emphasis is on understanding cellular events that are unique to the vessel wall and may initiate lesion formation. **Ph.D.** 1990, University of Texas **M.S.** 1984, University of Bombay **B.S.** 1982, University of Bombay.

Background & Purpose — The general purpose of our research activities is to understand tissue-specific metabolic activity in pathophysiological conditions such as diabetes and atherosclerosis.

Research Question(s) or Hypothesis — There are two main research projects in our laboratory.

LPL and insulin sensitivity: This project is aimed at understanding the mechanisms and signaling pathways by which down-regulation of lipoprotein lipase (LPL), an enzyme participating in fat metabolism, leads to improved insulin sensitivity in muscle cells.

LPL and Cholesterol Efflux: A cholesterol transporter, ABCA1, reverses atherosclerosis by allowing the removal of cholesterol from cells lining the blood vessels (macrophages). This project aims to investigate how LPL inhibits the cholesterol efflux process.

Method — Different cultured cells (muscle, adipose, macrophages, hepatocytes) will be treated with various chemicals and reagents at variable doses and times and various cellular responses, such as insulin sensitivity and cholesterol accumulation will be measured. Quantitative data will be collected to represent glucose uptake, glycogen synthesis, cholesterol removal from cells. The data will be analyzed to compare differences in metabolism between normal and abnormal cells. Excel spread sheets will be used to generate bar graphs and plots to represent our data.

Student Roles — Students at all levels will design wet experiments with cultured cells, perform the experiment, collect and process data and prepare images and figures for presentation/publication.

Expectations — Students will learn experimental techniques, analytical skills, and the ability to communicate their research project and data. Students will be co-authors on publications describing their work.

Conferences Typically Attended — All students usually attend the CSU-wide Biotechnology symposium held in January each year.
Publications — To view publications, please visit my CSUN webpage.

Thomas Minehan

Mentor Bio — **Ph.D.** 1998, Harvard University **B.A.** 1992, Columbia University. My website.

Background & Purpose — The development of cell-permeable sequence selective DNA-binding molecules is a crucial goal in the context of current approaches to disease therapy. Since the vast majority of cellular regulatory proteins interact with DNA primarily or exclusively in the major groove, the preparation of major-groove binding ligands that can directly compete with these proteins for DNA binding sites is of paramount importance. However, no general paradigm currently exists for the design of sequence-specific major-groove binding small molecules.

Method — This research project involves the synthesis and DNA binding affinity/sequence selectivity evaluation of a series of aryl-C,O-glycosides, molecules hypothesized to interact with the major groove of DNA.

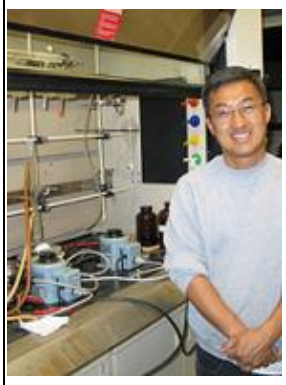
Student Roles — Students at the sophomore and junior levels will be introduced to the techniques of organic synthesis and then assigned specific chemical structure to prepare in the lab. Students at the senior level will also be involved in the analysis of the interaction of their synthetic compounds with DNA by spectroscopic (UV and fluorescence) techniques. Students may join this research project after having taking General Chemistry courses (Chem 101, 102 or equivalent).

Expectations — The synthetic and spectroscopic techniques used in this research can be learned in the lab in hands-on fashion.

Conferences Typically Attended — American Chemistry Society National Meetings, Southern California ACS Meetings, and National Sigma Xi Student Research Symposium.

Publications — To view publications, visit my CSUN webpage.

Taeboem Oh



Mentor Bio — Dr. Oh's research is the development of new methods and strategies for organic synthesis. These methods will be applied to undertake efficient syntheses of complex naturally occurring molecules, particularly those with biological activity and potential use in medicine or medical research. One of Dr. Oh's goals is to develop and apply the hetero Diels-Alder reaction to natural product synthesis. The targets of his current interests are indole alkaloids, starting with ergot alkaloids, and histrionicotoxins. Another project involves the development of chiral Lewis acids that can catalyze and induce asymmetry in organic transformations. The emphasis in on transformations that have been shown to be effective in the synthesis of complex natural products. **Ph.D.** 1985, University of Virginia **B.S.** 1980, Juniata College.

Research Projects — Benzimidazole derived compounds are an important class of biologically active small molecules. Their inhibition of a variety of enzymes have made them the focus of anticancer, antibacterial, anti-parasite, anti-fungal, anti-histamine, anti-malarial, analgesic, anti-viral (HIV), and as treatment and radiological probe for brain imagining particularly Alzheimer's among many other applications. One of the major problems of such an active drug is its tendency to have strong side effects; new variations of benzimidazole are constantly needed to develop better specificity and decreased side effect profiles. The biological activity arises from interactions with proteins or nucleic acids. Since DNA and proteins recognize chiral "mirror image" compounds, this can be used to either enhance or lower the biological effects. One potential way to increase the specificity of the biological effect is to modify the benzimidazole to incorporate a chiral center. We will explore incorporation of chiral axes to enhance the specificity of biological activity of these compounds.

Our second project involves benzimidazolium compounds in chemistry of ionic liquids. Imidazolium ionic liquids have been found to possess unique properties that have the potential to solve many other chemical and pharmacological problems. Deeper investigations of Imidazolium ionic liquids are needed to improve drug discovery, (especially in asymmetric

methods for synthesis of chiral drugs, catalysis, chiral additives for synthetic transformations), and to the field of biomolecule manipulation in ionic liquid systems. We will explore the synthesis of chiral atrope isomers based on imidazolium compounds capable of catalyzing various synthetic methods, investigate the mechanism that gives high stereoselectivites in ionic liquids at room temperature, and apply this method to asymmetric synthesis of biologically active compounds.

Method — The overall analytic process involves several areas. The first is isolation and purification of compounds that are synthesized. For purification, we use the methods of chromatography and recrystallization. For structural identification and dynamic investigations, we use spectroscopic techniques, especially nuclear magnetic resonance (NMR), infrared spectroscopy (IR), and polarimetry. For examining the interactions with substrate compounds, NMR and electron pair resonance (EPR) are important. The most important part of the analysis is the structure-activity studies, which utilizes computational modeling.

Student Roles — The students participate in research aspects relating to experimental design, scientific inquiry, synthesis, and data analysis. Students will analyze the experimental data by relating structural/electronic configurations to changes in catalytic activity.

Expectations — Students will develop a wide variety of skills in synthesis, methodology development, purification methods, use of sophisticated analytical instruments, designing-planning chemical research, laboratory safety, communication, and working in a team environment.

Conferences Typically Attended — We have a history of students attending national ACS, NOS, local ACS, SCCAP, and symposia on campus.

Publications — To view publications, please visit my CSUN webpage.

Jessica Vey

Mentor Bio — **Ph.D.,** Massachusetts Institute of Technology, Cambridge, MA. **B.S.** (Chemistry), Temple University, Philadelphia, PA.

Title of Research Project — Enabling rational design of the biodesulfurization process: biochemical characterization of dibenzothiophene monooxygenase

Background & Purpose — The Vey laboratory focuses on studying catalysis by selected flavin monooxygenases with the longer-term goal of rationally designing those monooxygenases to modify their substrate-binding properties. Our efforts will center on an ongoing research project in the lab that seeks to help develop bacterial biodesulfurization (BDS) as an industrially useful process for the desulfurization of crude oil. The long-term goal of this work is to produce an engineered BDS pathway capable of desulfurizing the majority of the refractory organosulfur compounds (ROCs) present in crude oil. Sulfur dioxide is an atmospheric pollutant generated by combustion of the sulfur that naturally occurs in coal and petroleum. Sulfur is currently removed from crude oil by hydrodesulfurization, a costly technique that requires harsh reaction conditions. Certain refractory organosulfur compounds (ROCs) cannot be effectively treated in this manner4. Researchers have identified several bacterial species that use a simple metabolic pathway to remove sulfur from specific ROCs5. This bacterial capability (biodesulfurization) could be exploited as an effective additional step to employ during the refinement process for generating low-sulfur fuels; however, several technical hurdles prevent industrial use of this environmentally friendly pathway. For example, the enzymes involved in biodesulfurization are too slow and too specific to effectively desulfurize the wide range of organosulfur compounds present in coal and oil. BDS will not be a viable industrial process until organisms are engineered to desulfurize a wide range of molecules6.

Research Question(s) or Hypothesis — To address this problem, we will examine the enzymes of the biodesulfurization pathway with the long-term goal of improving the enzymes' functional capabilities. We will first ensure that we have reliable methods to produce the four enzymes of the BDS pathway, and then we will establish methods to study the function of the enzymes using transient-state kinetics and surface plasmon resonance. With reliable methods in place, we will study how these enzymes work by strategically "breaking" them (using a process called site-directed mutagenesis)

and observing whether or not our attempt to break the enzymes has impacted their function. Our results will help guide rational design of the BDS enzymes to improve their enzymatic rates and substrate specificities.

Method — Recombinant DNA methods (PCR, subcloning, mutagenesis), recombinant protein expression and purification (E. coli culture, chromatographic purification methods), and a variety of biochemical characterization methods such as HPLC- or UV-Vis-based steady state enzyme activity assays, spectrophotometric titration, stopped flow spectrophotometry, protein crystallization and protein X-ray crystallography.

Student Roles — The specific methods each student uses depend on the specific project undertaken and the amount of progress made.

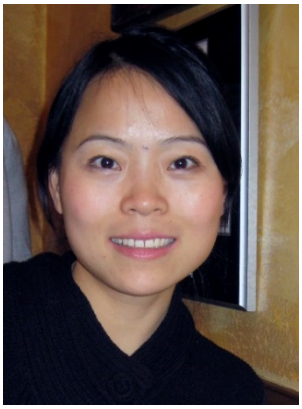
Expectations — Students must maintain a clean and safe lab, keep accurate notes of experiments, and analyze and present their results. They will learn essential biochemical techniques, and will develop critical thinking and communication skills.

Conferences Typically Attended — American Society for Biochemistry and Molecular Biology (ASBMB), California State University Program for Education and Research in Biotechnology (CSUPERB)

Publications — Visit my NCBI webpage.

Department of Mathematics

Jing Li



Mentor Bio — I am broadly interested in mathmatical modeling of biological phenomena using such mathematical techniques as differential equations (ODEs, PDEs, and DDEs). Recently I have also been applying techniques from game theory to problems from mathematical epidemiology. **Ph.D.** 2008, University of Western Ontario. **M.A.** 2003, Huazhong University of Science and Technology. **B.A.** 2000, Huazhong Normal University. Visit my website.

Background & Purpose — My research, in applied mathematics, is concerned with using mathematical techniques to describe, understand and predict the dynamics of biological systems in a variety of settings related to epidemiology, ecology and immunology, as well as in the study of economic and logistical issues involved in disease management. This research has both directly and indirectly evolved from my PhD work on modeling the dynamics of infectious diseases with latency in spatially heterogeneous environments. This work taught me the value of both theoretical and applied aspects of mathematics. I am fascinated by applied mathematics and the way in which it can be used to describe and guide interdisciplinary research. My current and anticipated future research is focused primarily on both theoretical analysis and applications to epidemiology, ecology, immunology, etc.

Research Question(s) or Hypothesis — My research questions concern the game theory of epidemic control and management.

Method — The mathematical techniques used in this work include both techniques from the theory of differential equations such as ordinary differential equations (ODEs), delay differential equations (DDEs), partial differential equations (PDEs) and impulsive differential equations (IDEs), as well as techniques from game theory and network/graph theory. The analytic process includes understanding the biological problem, building the model, analyzing the model, validating the model, using the model, and the repetition of the above mentioned steps.

Student Roles — Sophomore will be learning basic mathematical skills needed for the project, (e.g., Ordinary Differential Equations). Juniors will be learning bases of mathematical modeling (the bridge of mathematics and other disciplinary). Seniors will understand the background of the research project, build the model, and analyze the model.

Conferences Typically Attended —SIAM (Society for Industrial and Applied Mathematics) Annual Meeting, SIAM (Society for Industrial and Applied Mathematics) conference on Life Sciences, and The Annual Meeting for Society of Mathematical Biology.

Publications — To view publications, please visit my website.

Sattar Taheri

Antibiotic resistance is an ever-growing global health problem. Over the years, bacteria managed to develop strategies to resist antibiotics, urging us to search for alternative antibacterial options. Antimicrobial peptides (AMPs) are one of the candidates that hold promise for combatting the resistant bacteria. AMPs success in medicine, however, relies on new designs that are highly toxic for bacteria, yet, selective enough not to harm human cells. The difficulty is that we still lack a comprehensive understanding of their action mechanisms, which is needed to inspire new designs.

My laboratory is utilizing an state-of-the-art imaging platform, named "mother machine", to study effects of AMPs on bacteria. We perform video microscopy on individual live bacteria that are treated with AMPs. We then use our custom-designed image-analysis software to extract quantitive information on the life patterns of thousands of bacteria under AMPs treatment. Our data reveal the dynamics of cell death and possible development of resistance in bacteria. Information of these types are only accessible in high-throughput single-cell experiments.

The long-term goal of our laboratory is to leverage theoretical knowledge and modern experimental techniques to provide a framework to find ways to improve activity and selectivity of AMPs, such that they can be used to fight resistant bacteria. Previously, we developed theoretical models that provide experimentally-testable benchmarks on optimization of AMPs activity. For instance, AMPs activity is predicted to be a function of its electric charge, being maximum for charges around +4e.

In the lab, students learn how to set up single-cell experiments. The trainings cover four technical areas: (1) standard bacterial culture techniques, (2) fabrication and assembly of the mother machine, (3) time-lapse microscopy on live cells, and (4) analysis of the microscopy images.

The interdisciplinary nature of my research program invites students from various departments. This includes students from College of Science and Mathematics who are interested in quantitative approaches to fundamental questions in biology, and also students from College of Engineering who are interested in technologies used in cutting-edge scientific research. The technical aspects of the research projects cover tasks at various levels of difficulty. Students at different levels in their education (from freshman to graduate students) can have important contributions to our research projects.

We publish the results of our research in physics, biology and interdisciplinary journals. Students' contribution will be major parts of our publications. Students' will also present posters and give talks in scientific meetings and conferences, including the meetings of the American Physical Society, Biophysical Society, and American Society for Microbiology. **Visit our website** for information about our lab**.**

Anna Bezryadina

Mentor Bio — Dr. Anna Bezryadina is an Assistant Professor at Physics and Astronomy Department, California State University Northridge (CSUN). She has wide ranging experience in optics and photonics, her research interests include bio-photonics, nonlinear optics, optical trapping and manipulation for biological applications, and high-resolution microscopy. In 2005 she finished her B.S. degree in Physics and Applied Mathematics from San Francisco State University (SFSU), where she worked for several years on optical solitons, photonic lattices and vortices. Then she joined the University of California Santa Cruz (UCSC) to investigate the reliability and degradation mechanisms in different types of solar cells. After receiving her Ph.D. in 2012, she returned back to photonics and experimental optics with biological applications. She had her first postdoc at SFSU, where she developed new optical trapping and manipulation tools to study microorganisms' interactions, as well as demonstrating first-of-a-kind biological waveguides. And in 2015 she started her second postdoc at the University of California San Diego (UCSD), where she worked on video-speed super-resolution plasmonic structure illumination microscopy to study biological processes with resolution down to 50 nm. In 2018 she started her tenure-tracked faculty position at CSUN.

Dr. Bezyradina's lab is called the "Quantum & Nonlinear Biophotonics" lab.

Title of Research Project — "Development of Bio-photonics Microchips."

Background & Purpose — The central topic of the research is light interaction with microorganisms for engineering environmentally friendly bio-optical bio-compatible components for future quantum computers. The laboratory is utilizing an optical trapping and biological waveguide formation to transmit light through otherwise highly-scattering and/or non-transparent media. Microorganisms in biological waveguides get attracted toward the center of the beam (the highest intensity) due to the optical gradient force. Since living cells usually have a slightly higher index of refraction than the ambient media, the laser beam self-traps due to a self-lensing effect along the beam path, which allows the formation of a biological "fiber". By choosing unique biological properties of cells, the formed biological waveguide can be fixed and used as a structure for the first bio-optical circuits.

The main focus is finding a way to grow and fix biological waveguides and structures, which will help to develop a new generation of biological interconnects, bio-optical microchips and biodegradable nanotechnology. The long-term objective of this research is to develop biodegradable quantum photonics based technology to replace slow electronic based technology with 100 million times faster technology. Furthermore, bio-photonic microchips will create a platform to replace toxic to environment electronic devices with disposal environmentally friendly bio-devices.

Research Questions or Hypothesis

1) Establish optimal parameters of waveguide formation for different biological suspensions.
2) Develop protocol for fixing biological waveguides to allow long-term waveguide function.
3) Confine waveguides to substrates and other entities for future first network of bio-optical waveguides.
4) Generate first simple bio-optical circuits.

Method — This is experimental bio-photonics laboratory, so students will do primarily experimental work. To grow bacteria cultures and prepare biological samples, in the lab students will have an access to biological benches, a fumehood, an incubator, a microcentrifuge and other biological preparation equipment. To study waveguide formation, students will use multiple high-power CW lasers (green, blue, and, tunable NIR Ti-Sapphire laser), beam detectors/ cameras, a microscope system and other necessary optical equipment. By guiding different lasers with wavelength in visible and near-infrared range of a spectrum of light, students will be able to find optima conditions to form waveguides with minimum photodamage and maximum transmission of light. By holding bacteria in a waveguide under microscope, students will be able to observe how cells respond to environmental cues on individual and colony levels. By simple fabrication of a microfluidic chamber on top of a microscope slides and by delivering a laser beam from a side with a fiber, students will be able to assemble the first simple bio-optical circuits inside the microfluidic chamber.

Student Roles — Since basic research concepts are relatively easy to understand, students at different levels (from freshman to graduate students) and almost no background in physics or biology can participate and meaningfully

contribute to the research. After several months of primary trainings, students will be able to perform bio-photonic experiments by themselves. The training cover four technical areas: 1) laser alignment and laser safety; 2) standard bacteria cultures techniques and bio-sample preparation; 3) imaging under microscope with optical trapping; 4) data and image analysis. After finishing basic training, students will have a choice to do more biological studies (grow and preparation samples, use laser set-up for image bio-samples), laser studies (align and make new laser set-up, use laser set-up for image bio-samples), or both.

Expectations — In the beginning undergraduate students will usually work together with senior students from the group or with PI directly, where they can perform his/her independent part of sub-project and receive primary training in experimental optics and biosample preparation. Students are expected to spend at least couple hours twice a week on their projects. The group has weekly meetings, where students are encouraged to present their results every 2-3 weeks. Also PI meets with each student separately to give individual mentoring. In the first year, PI mentors closely new students and tries to provide step-by step instruction. As students get comfortable with what they are doing, PI encourages them to find solution themselves by providing sources. PI keeps open communication with students and always provide them a lots of encouragement and guiding with their projects and future career goals.

Conferences Typically Attended — The major conferences are SPIE: Optics + Photonics meeting in August, Conference on Lasers and Electro-Optics meeting in May-June, and Biophotonics Congress in April (once in two years) by Optics Society of America. Students are strongly encouraged to give oral presentation or poster at least once a year.

Publications — The full list of all publications can be found on website. http://www.csun.edu/~abezryadina/publications.html

A. Bezryadina, J. Zhao, Y. Xia, X. Zhang and Z. Liu, " High spatiotemporal resolution imaging with localized plasmonic structured illumination microscopy", *ACS Nano* 12(8), 8248 (2018).
A. Bezryadina, T. Hansson, R. Gautam, B. Wetzel, G. Siggins, A. Kalmbach, J. Lamstein, D. Gallardo, E. Carpenter, A. Ichimura, R. Morandotti, and Z. Chen, " Nonlinear self-action of light through biological suspensions", *Phys. Rev. Lett* 119, 058101 (2017).
A. Bezryadina, D. Preece, J. C. Chen, and Z. Chen, "Optical disassembly of cellular clusters by tunable "tug-of-war" tweezers", *Light: Science & Applications* 5, e16158 (2016).

Key Words — Biological microchip, waveguides, light-matter interaction, optical trapping, quantum computing, biological circuits, suspensions

College of Engineering & Computer Science

Department of Computer Science

Ani Nahapetian – NOT ACCEPTING NEW MENTEES

Mentor Bio — I grew up in the San Fernando Valley. As a researcher, I am inspired by reading the research of others, discussions with other researchers, and learning about new solutions and tools to known problems. I see a lot of myself in many of our students. I try to bring to the class and to the research lab experiences and opportunities that I have benefited from during my educational and research career. Ph.D. 2007, University of California Los Angeles M.S. 2004, University of California Los Angeles B.S. 2002, University of California Los Angeles.

Background & Purpose — With the exponential growth in mobile computing, mHealth, and now wearable computing, applications that promote healthy lifestyle choices and early monitoring of health issues can have a disproportionately large impact on individuals from underserved groups.

Research Question(s) or Hypothesis — This research effort looks at developing non-intrusive, engaging, and cost-effective systems to address health needs, with a specific focus on heart failure, diabetes, and chronic conditions affecting children.

Method — Develop mHealth (mobile health) systems.

Student Roles — CSUN students working on these projects will assemble end-to-end mHealth system, develop mobile apps to interface with users, and process aggregated data in the cloud. Students will target IEEE and/or ACM conferences in mobile computing, wireless health, and/or wearable computing.

Expectations — The research experience will enhance their programming and systems engineering skills. It will also expose them to the interdisciplinary nature of developing, testing, and validating wearable and mHealth systems, and processing time-series sensor data.

Katya Mkrtchyan

Mentor Bio – Katya Mkrtchyan is an assistant professor in Computer Science Department at California State University Northridge. She received her Ph.D. in 2016 from University of California, Riverside in Computer Science, M.S. in 2008 from Yerevan State University of Armenia in Informatics and Applied Mathematics, and B.S. in 2006 from Yerevan State University of Armenia in Mathematics. Her research is in computer vision and image processing with concentration on biomedical image analysis.

Title of Research Project – Automated Video-Analysis of Behavior Quantification on Human Odor by Mosquitoes

Background & Purpose - Mosquitoes and other blood-feeding insects are considered one of the most dangerous creatures on the planet because of their ability to spread deadly diseases. Biologists are trying to find solutions to prevent, control or treat these diseases. Mosquitoes host seeking behavior is important, as it is at the core of the processes involved in the contact between a fly and a human. In laboratory conditions, it is easy to have thousands of mosquitoes under different experimental conditions. One of these experiments aims to discover the reaction of mosquitoes around different odors, for which a special environment is created. These experiments were performed with mosquitoes held in cages with a glass top. A human arm was inserted in a glove containing a window covered with a double-layer of netting. Attraction towards the arm was measured using video recordings, which was done through the glass top. The count of the mosquitoes is used to describe the interest of the mosquitoes to each odor. The current manual analysis on these videos is not sufficient for quantitative analysis and available object counting approaches do not work well. The

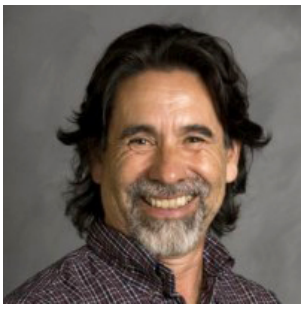
proposed research project is about creating an automated object counting method for counting mosquitoes captured in video. The results of this study would be of considerable biological importance.

Method – In this research we are creating automated video analysis software that can count mosquitoes from videos. The framework of the software is going to be comprised of several modules, which are; finding ROI (Region of Interest in each frame of the video), training and testing of a classifier to detect mosquitoes. The proposed framework will design mosquito feature to get the best classification results.

Student Roles – Students will get to work on a STEM research project, which blends biology, technology and mathematics. Students will target good conferences and journals in computer science and image processing.

Department of Electrical & Computer Engineering

Bruno Osorno



Mentor Bio —I have been running projects on this campus for many years, and I am getting into the fifth year of a mentoring program at the college of engineering and computer science. My industrial experience combined with my academic experience and my mentoring experience helps me recognize the value of the collaboration and its mentorship component. Research areas include Electrical Machines and Energy Conversion, Electric Power Systems, Power Electronics, Fault Analysis in Power Systems and Power Distribution Systems. **M.S.E.E** 1978, University of Colorado **B.S.E.E** 1970, Polytechnic Institute of Technology Mexico City.

Background & Purpose — The goal of the proposed research is to investigate how wearable electronics technology (apparel textile and devices) can improve the physical activity of people in different socioeconomic environments. Specifically, the technology exists to keep track of physical activity as well as sleeping patterns and energy generation.

Research Question(s) or Hypothesis — Since this is a broad topic, part of the research would be to identify the most promising emerging technology and apply it to our proposed research. After all this will be a $70 billion industry by 2020 (IDTechEX wearable-technology-2014-2024).

Method — The proposed research requires use of quantitative research methods. My background in engineering will allow me to deal with software and hardware as needed to carry on this research.

John Valdovinos

Mentor Bio — John Valdovinos is an assistant professor in Electrical and Computer Engineering (ECE) at California State University Northridge. He received his Ph.D. from the University of California Los Angeles in Biomedical Engineering in 2014. In addition, he worked as a postdoctoral fellow at the Yale School of Medicine under the American Heart Association Postdoctoral Fellowship in 2015. Professor Valdovinos has expertise is in the design of circulatory support medical devices for adult and pediatric heart failure patients. In his three years at CSUN, Professor Valdovinos has supervised a various senior design teams and served as a mentor for students participating in programs like BUILD PODER and AIMS2. Professor Valdovinos also serves as the faculty mentor for the CSUN Society of Hispanic Professional Engineers (SHPE) and as a board member of the Diversity Committee for the Biomedical Engineering Society. **Ph.D.** 2014, University of California Los Angeles **M.S.** 2010, University of California Los Angeles **B.S.** 2009, University of Southern California.

Background & Purpose — There have been great advancements in the design and implantability of medical devices that can monitor and assist patients with various cardiovascular diseases. While the miniaturization of electronics has enabled these medical technologies to become fully implantable, their lifespan is still limited by the batteries that power them. Often, batteries necessitate eventual re-operation to replace the unpowered devices. The focus of my research at California State University, Northridge is on the development of wireless powering technologies that can improve the

implantability of therapeutic cardiovascular devices. This entails utilizing traditional radio-frequency (RF) electrical systems (also known as transcutaneous energy transfer systems, TETs) as well as integrating the use of smart material like piezoelectric and magnetostrictive materials to miniaturize and power implantable medical devices.

Research Projects — My research will focus on two thrusts.

The first thrust focuses on powering traditionally low-power cardiovascular devices like pacemakers and other stimulators with magnetoelectric structures (essentially piezoelectric and magnetostrictive composites). This technology will allow for miniaturized receivers that can extract power from an outer transmitter to recharge or continuously power these small devices without sacrificing their small foot print. Magnetoelectric receivers can accomplish this because of their large energy density and excellent coupling between piezoelectric and magnetostrictive phases.

The second thrust will focus on improving the wireless technology for powering higher-power devices like blood pumps for patients with heart failure. The aim of this thrust is to improve current close range wireless powering systems to achieve higher efficiency and longer range for powering the device. This can have implications on the development of intravascular blood pumps that can eventually be continuously recharged or powered. This will be achieved by utilizing ferromagnetic materials like Metlgas to increase the efficiency and coupling between a receiving antenna and transmitting antenna.

Student Roles — Undergraduate students will play a key role in these projects. As sophomores, students will learn about real-world applications of classes they have taken like ECE 240 (Fundamentals of EE). During this time, students will get familiar with the research process, including literature reviews, keeping a laboratory notebook, contributing to group discussions/collaborations and using design software like Cadence and COMSOL Multiphysics. They will also gain some familiarity with the equipment that is used in the lab. I have access to the Printed Circuit Board Lab (JD 1564), which houses my 3D printer (for prototyping) and other equipment like pediatric blood pump, Metglas magnetic core ribbon, and electrical measuring equipment. During their Junior and Senior years, students will be involved in designing and prototyping devices and test rigs as well as planning and carrying out experiments.

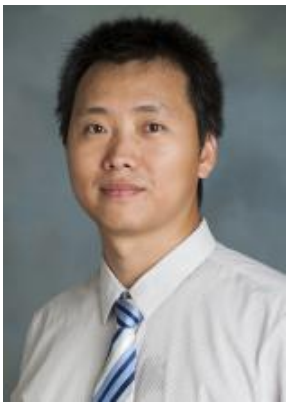
Expectations — The hope in the future is that these students will also experience the work it takes to design a medical device from start to in-vivo implantation in an animal (via our future collaborations with UCLA and Yale Schools of Medicine).

Conferences Typically Attended — Annual Biomedical Engineering Society Meeting (held in September/October every year), IEEE EMBS (Engineering in Medicine and Biology Society), and ASAIO (American Society of Artificial Internal Organs, held in June) Conferences.

Publications — Dr. Valdovinos's publications can be found on his CV.

Department of Manufacturing Systems Engineering and Management

Bingbing Li



Mentor Bio — Dr. Bingbing Li is an Assistant Professor in Manufacturing Systems Engineering, and Director of the Laboratory for Sustainable and Additive Manufacturing (LSAM). Ph.D. 2012, Texas Tech University M.A. 2008, Hefei University of Technology B.A. 2005, Hefei University of Technology. His research focus is in Additive Manufacturing, Smart Manufacturing, and Sustainable Design and Manufacturing.

http://www.ecs.csun.edu/~bingbing/

Title of Research Project — Additive Manufacturing for Health

Background & Purpose — The objective of biomedically relevant research in LSAM is to enable 3D printing of plastics, metals, functional biomaterials, cells and supporting components into complex medical implants and functional living tissues.

Research Question(s) or Hypothesis — 3D printing is being applied to regenerative medicine to address the need for implants, tissues and organs suitable for transplantation.

Method — Mixed method involving experiments, biofabrications, new materials and processes development. Different 3D printing technologies (including 3D Bioprinting, Selective Laser Sintering/Melting (SLS/SLM), Laser Cladding, Stereolithography (SLA), Fused Deposition Modeling (FDM), and Jetting) will be applied to fabricate the medical implant, tissues, and organs.

Student Roles — Students will be responsible for experiments setup, biomaterials fabrication, cell culture, ink solution preparation, data collection, preliminary data analysis and presentation.

Expectations — Students will gain a broad set of research-related skills, including experimental design, 3D printing processes, biomaterial science, environmental mentoring, equipment calibration, data analysis and public communication of findings.

Conferences Typically Attended — CSUPERB's Annual CSU Biotechnology Symposium; Annual UC Systemwide Bioengineering Symposium; Annual International Solid Freeform Fabrication Symposium; CIRP International Conference on Life Cycle Engineering; SME North American Manufacturing Research Conference (NAMRC) and ASME's Manufacturing Science and Engineering Conference (MSEC).

Publications — To View Dr. Li's publications, visit his website

Department of Mechanical Engineering

Shadhi Mahjoob

Mentor Bio – Dr. Shadi Mahjoob is an Assistant Professor at Mechanical Engineering Department, California State University, Northridge. Her field of expertise and interest is thermofluids sciences and has worked on a wide range of mechanical engineering projects, using Computational Fluid Dynamics (CFD), analytical and experimental techniques. She received her BSc and MSc degrees in Aerospace Engineering from Amirkabir University of Technology (Tehran Polytechnic) and her PhD degree from University of California, Riverside. She worked as a Postdoctorate Research Scientist, at Nano and Micro-Fluidics Institute (Center of Smart Interface) at TU Darmstadt, Germany. She then joined a company in North California as a Principal Scientist. She is currently an Assistance Prof. at CSUN. Her research expertise and interest include, but not limited to: thermal transport through biological media, cooling of biomedical devices, electronics cooling, heat transfer through porous media, multi phase flow, boiling and phase change, thermal transport in micro-channels and advanced heat exchangers, renewable energy, fan design and testing, rotor aerodynamics, wind and gas turbines, energy recovery systems, jet impingement mixing and film cooling.

Research Projects:

(1) Numerical Investigation of Transport through Biological Media
(2) Cooling of Biomedical Devices Employing Conductive Porous Substrates

Research Lab – Thermofluid Research and Design Lab

Background & Purpose – Bioheat transfer is the study of heat transfer through biological tissue. It is one of the important research topics to understand how heat penetrates through tissues and organs during medical thermal therapeutic applications. Knowing accurate temperature distribution within tissues and organ provides a great opportunity to avoid any damages to healthy tissues and to develop new medical devices or treatments to reduce the pain and side effects. One of the principal issues in medical thermal therapeutic applications, such as hyperthermia cancer treatment, is to properly predict temperature variation within biological tissues and body organs subjected to thermal treatment. Hyperthermia treatment is one of the four

main cancer therapy techniques following surgery, chemotherapy, and radiation techniques. In hyperthermia, the tumor cells will be overheated to a high value of around 40–45 °C to kill or damage the cancer cells. There are different techniques to provide heat in hyperthermia cancer treatment, including microwave ablation (MWA), radiofrequency ablation (RFA), ultrasound, hot water blankets, and thermal chambers. In this work, modeling of bioheat transport through the tissue/organ will be carried out during microwave and radiofrequency ablation process. The effects of several parameters such as applied hyperthermia heat flux intensity, volume fraction of the vascular space, blood and tissue matrix thermal conductivities, tissue matrix permeability and size, blood pressure and velocity and metabolic heat generation on blood and tissue phase temperatures and thermal transport during the treatment will be investigated. In addition, heat transfer in biomedical devices and in advanced heat management devices for cooling of biomedical devices will be investigated.

Research Questions or Hypothesis – A principal issue in medical thermal therapeutic applications, such as hyperthermia treatment, is modeling and understanding the heat transport and temperature variation within biological tissues and body organs. Biological media generally consist of cells, blood vessels, and interstitial space that categorize as vascular and extra- vascular regions. Biological structure can be modeled as a porous matrix, including cells and interstitial space, called tissue in which the blood flows through. Utilizing the porous media theory, non-thermal equilibrium between the blood and the tissue is addressed and the blood–tissue convective heat exchange is taken into account. In this work, numerical modeling will be performed utilizing CFD (computational fluid dynamic) commercial software. Both local thermal non-equilibrium and local thermal equilibrium models in porous media will be employed in the studies. Experimental and numerical studies are also performed to develop cooling techniques for biomedical devices.

Method – Commercial CFD software such as ANYSY FLUENT will be employed for numerical modeling and advanced techniques in porous media will be utilized. In addition, experimental and numerical studies are performed for development of cooling techniques for biomedical devices.

Student Roles – The sophomore, junior, and senior undergraduate students may assist the graduate students and the PI for developing the experimental set-up, performing experimental measurements, data collection, and post-processing of data while doing literature review, getting involve in numerical simulations and preparing the reports and papers.

Expectations – Enthusiastic students interested in thermofluids sciences, bioheat transfer and cooling of biomedical devices are encouraged to join the lab to perform hands on experimental or computational thermofluid projects. Undergraduate students can gain research experience and assist graduate students to perform research and have research publications or conference presentations. The students should follow all lab regulations and be responsible, on time, self motivated, honest, detail oriented, good listener and reader, and should collaborate properly with other students.

Conferences Typically Attended – Some of the related conferences the PI attends are CSUPerb conferences (CSU Annual Biotechnology Symposium), ASME conferences such as (Summer Heat Transfer conf.) and IEEE conferences (such as IEEE Itherm conf. and IEEE Sustch conf.).

Publications – Find all publications at her lab website.

Selected Peer Reviewed Journal Publications

- Zing, C., **Mahjoob, S**. and Vafai, K., "Analysis of porous filled heat exchangers for electronic cooling," International Journal of Heat and Mass Transfer, vol. 133, pp. 268-276, April 2019.

- Hardt, S., Herbert, S., Kunkelmann, C., **Mahjoob, S**., and Stephan, P. "Unidirectional bubble growth in microchannels with asymmetric surface features," International Journal of Heat and Mass Transfer, Vol.55, pp. 7056-7062, 2012.
- **Mahjoob, S.** and Vafai, K., "Analysis of Heat Transfer in Consecutive Variable Cross-Sectional Domains:Applications in Biological Media and Thermal Management," ASME Journal of Heat Transfer, Vol. 133, pp.011006-1 - 011006-9, 2011.
- **Mahjoob, S.** and Vafai, K., "Analysis of Bioheat Transport through a Dual Layer Biological Media,"ASME Journal of Heat Transfer, Vol. 132, pp.031101 - 031101-14, 2010.
- **Mahjoob, S.** and Vafai, K., "Analytical Characterization of Heat Transport through Biological MediaIncorporating Hyperthermia Treatment," International Journal of Heat and Mass Transfer, Vol.52, pp. 1608-1618, 2009.
- **Mahjoob, S**. andVafai, K., "Analytical Characterization and Production of an Isothermal Surface forBiological and Electronic Applications,"ASME Journal of Heat Transfer, Vol.131, pp. 052604-1 - 052604-12, 2009.
- **Mahjoob, S.** and Vafai, K., "A Synthesis of Fluid and Thermal Transport Models for Metal Foam HeatExchangers," International Journal of Heat and Mass Transfer, Vol.51, pp. 3701-3711, 2008.
- **Mahjoob, S.** and Vafai, K., "Rapid Microfluidic Thermal Cycler for Polymerase Chain Reaction NucleicAcid Amplification," International Journal of Heat and Mass Transfer, Vol.51, pp. 2109-2122, 2008.
- **Mahjoob, S.,** Taeibi_Rahni, M. "Parameters Affecting Turbulent Film Cooling- RANS Computational Simulation," AIAA Journal of Thermophysics and Heat Transfer, Vol.20, No.1, 2006.
- **Mahjoob, S.,** Mani, M., Taeibi_Rahni, M., "Aerodynamic Analysis of Circular and Non-Circular Bodies UsingComputational and Semi-Empirical Methods," AIAA Journal of Aircraft, Vol. 41, No. 2, March-April 2004.

Key Words – Bioheat Transfer, CFD, Computational Fluid Dynamics, Hyperthermia, microwave ablation (MWA), radiofrequency ablation (RFA), Cooling of Biomedical Devices

Vidya Nandikolla

Mentor Bio — **Ph.D.** 2005, Idaho State University **M.A.** 2001, Idaho State University **B.A.** 1998, Andhra University

Background & Purpose — Diabetic mellitus patients have problems with loss of sensation in their feet, insufficient blood flow to lower extremities and alterations in shape of their pressure patterns causing concentrated high pressure regions. These peaks due to dysfunctional feedback system from their mechanoreceptors may lead to complex problems such as amputation if they are not identified and treated in timely manner. Our main objective is to protect the foot by sensing these abnormal peaks and redistribute the pressure from excessive pressure regions.

Research Question(s) or Hypothesis — The foot anatomy and its mechanical loading effects the loading pattern which is very critical to determine the pressure distribution. The research is to create a study of anatomy, and connect the analysis to the foot pressure distribution. The main goal is: *Measurement of the plantar pressure and shear forces actively using foot insert and examine the interrelationship of these forces.*

Method — In this research we are developing a design prototype for an adaptable shoe insert useful for diabetic foot care and comparing to the existent diabetic foot wears. The proposed design will consider human anatomy and anthropometry of the foot to properly sense the sensory regions during standing and walking. The developed design will be evaluated to the existent diabetic foot care available to validate and for market analysis.

Student Roles — This research will include the pros and cons of the existent technology. It is indeed an STEM multi-disciplinary research opportunity, which gives our undergraduate students a good knowledge and experience of how to integrate the science (biology, physics), technology, engineering and mathematics fundamentals into a biomechanical footwear design for diabetic foot care. The students who are in junior level with understanding of system design and

modeling will get a hands-on experience developing and simulating a real world biomedical problem. This will not only help them understand how to relate the mechanical design concepts into biomedical modeling but also use modern computing tools such as Solid works and Matlab to simulate and show the pressure pattern.

Expectations — The students will get an opportunity to present in such organizations giving them a great opportunity to connect with the scientific network. The results will also be published in poster to share the research with the CSUN community. The primary deliverable will be a comprehensive report that provides the detailed design, modeling, and simulation results.

Conferences Typically Attended — The research results will be disseminated to promote the findings to peer reviewed conference proceedings and journals in American Society of Mechanical Engineers (ASME) and Institute of Electrical and Electronics Engineers (IEEE) societies.

Publications — To view her publications, visit her mechanical engineering page.

Key Words List
Some mentors have provided key words. Please find their profiles above.

Edith Chen – Asian Americans, health disparities, immigrant health paradox, social determinants of health, immigrant and minority health, race, gender and class.

Rika Meyer – Chronic pain, Trauma, Stress, PTSD, Children, Adolescents

Danielle Jarvis – jumping, athletes, dance, injuries, fatigue, ASD, biomechanics

Thomas Chan – #augmentedreality #community-basedinterventions #immersivetechnology #mixedreality #magicleap #spatialcomputing #psychologicalengagement #flowtheory #positivepsychology #biotech #mentalhealth #cognitivehealth #preventionintervention

Stefanie Drew – electroencephalogram (EEG), neuroimaging, virtual reality, VR

Holli Tonyan – child care, family child care, sociocultural theory, ecocultural theory.

Lisa Banner — Diabetes, Obesity, Prediabetes, Immunology, Neuroscience, Cytokines, Brain, Mice

Casey terHorst – rapid evolution, ecology, species interactions, bacteria, pitcher plants, carnivorous plants, protozoa

Aziz Boulesbaa – Photothermal Therapy, Nanomaterials, Lasers, Spectroscopy

Anna Bezryadina — Biological microchip, waveguides, light-matter interaction, optical trapping, quantum computing, biological circuits, suspensions

Shadhi Mahjoob – Bioheat Transfer, CFD, Computational Fluid Dynamics, Hyperthermia, microwave ablation (MWA), radiofrequency ablation (RFA), Cooling of Biomedical Devices

For More Information:

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