

# BUILD PODER

Promoting Opportunities for Diversity in Education and Research

## 2018 COMMUNITY COLLEGE PIPELINE PARTNER MASTER MENTOR LIST

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### Bryant Horowitz, Professor of Psychology \*New Mentor\*

**Mentor Bio** — As a Behavioral Neuroscience PhD, my research has focused on both human and animal research on multiple behavioral disorders. In the past, my research has focused on cognitive testing of Alzheimer's and Dementia patients, giving them cognitive tasks to assess their cognitive abilities, but the research also centered around the caregivers that take care of them. I have also looked at treatments for preventing the progression of Alzheimer's and related dementia using natural supplements, such as DHA in fish oil, and curcumin, the yellowish ingredient in turmeric, used in curry, as well as the benefits of aerobic exercise. My research has also extended to Schizophrenia, where my experience dealt mostly with some of the symptoms of Schizophrenia, concentrating specifically on the cognitive deficits using animal models (mice). I also have experience testing patients with head trauma and assessments with patients with Multiple Sclerosis.

**Title of Research Project** — TBD

**Background & Purpose** — In this area, the main focus of the research is to help to identify, prevent, or find treatment for behavioral disorders of a psychological nature.

**Research Question(s) or Hypothesis** — Are there factors or things that can be done to prevent disorders from progressing? The working hypothesis is that exercise, physical and mental, as well as supplements can potentially serve a neuroprotective purpose and prevent onset or progression of dementia.

**Method** — In this context, we can offer exercise programs and do assessments for people at risk.

**Student Roles** — Within psychology, my areas of interest in research have expanded recently, and I can tailor opportunities to fit the needs of potential students. I have taken a big interest in the psychology of political affiliation and psychology, looking at differences socially and cognitively when voting a certain way or different belief systems involved. I am very interested in the stigma society gives to people based on issues such as immigration, gun control, helping or withdrawing help for certain groups, and whether the information is processed automatically, and if this would change at all if we somehow made people more aware of these biases and automatic processes. In this area, we can answer questions that address whether there is a difference in how people vote and their stance on certain issues, especially with regards to minorities and ethical issues, and if the process is an automatic, unconscious issue. The main hypothesis in this area is that people that identify as conservative choose to vote more out of fear-based decision making and cognitive processing, whereas liberals vote more out of information-based decision making. Previous research falls in line with this hypothesis, and imaging studies show more amygdala activation with "conservatives" and more prefrontal cortex activation in "liberals".

**Expectations** — Potential students would get in with me on the ground floor and come up with their own interpretations of the research questions in order to tailor their focus. They would help define the variables we will study and manipulate how we study them. The student will get a taste for the scientific method, including collecting and interpreting their own data, and an inside look at the statistical analyses used in research and how to interpret what the results mean and how they can explain them.

**Conferences typically attended** — The typical conference for this area is the Western Psychological Association conference (WPA), but I would also like to strive to go to the American Psychological Association conference (APA), and any others that would suit the needs of the students.

**Publications** — Doctoral Dissertation: Horowitz, B (2012). "Investigating the Role for Dysbindin in Hippocampal-Dependent Learning and Memory: Glutamatergic Mechanisms"

Glen, W. Bailey, Horowitz, B, et al. "Dysbindin-1 Loss Compromises NMDAR-Dependent Synaptic Plasticity and Contextual Fear Conditioning". *Hippocampus* 24.2 (2014). 204-213.

"No Health Without Mental Health". National Publication distributed by The Chicago School of Professional Psychology in Spring of 2016.

## **Humberto Gallegos, Professor of Engineering and Technologies**

**Mentor Bio** — Humberto Gallegos is a STEM Mentor at ELAC.

**Title of Research Project** — *STEM Research Project in Bio-Medical Engineering*. Investigating the Placement of Bio-Engineering Design Methods along Flood Control Channels to Mitigate for Deterrent Levels of Water Quality near the mouth of these channels from Storm Drain Runoff.

**Background & Purpose** — The purpose of our project is to investigate the placement of several bio-engineering designs along flood control channels to mitigate for deterrent levels of water quality near the mouth of these channels from storm drain runoff.

**Research Question(s) or Hypothesis** — We seek to answer the following scientific question: Would softening man-made channels such as the Los Angeles River (LAR) with bio-engineering design methods optimize water quality near the wave mix region, a region close to the mouth of these channels? Given the success rates of bioengineering design methods to enhance water quality variables, we estimate LAR's runoff, in terms of water quality, can be enhanced while infusing biological processes in the design schemes of flood control channels.

**Method** — The method of analysis will involve the usage of a one-dimensional (1D) water surface and water quality modeling program titled HEC-RAS. HEC-RAS stands for the Hydrologic Engineering Center River Analysis System (HEC-RAS) program. The program was developed by an organization within the Institute for Water Resources for the U.S. Army Corps of Engineers (USACE). In terms of analytical processes used for this project, HEC-RAS was programmed to use numerical methods based on steady and unsteady state analysis for hydraulic modeling purposes. In order to run the water quality model, a working HEC-RAS unsteady or steady flow model must already be in place. The water quality model uses an explicit 1D advection-dispersion equation which can simulate fate and transport of water temperature, arbitrary conservative and non-conservative constituents, dissolved nitrogen, phosphorous, and oxygen.

**Student Roles** — The following line items illustrate several roles students will be assigned during their tenure on this project: (1) Literature Research, (2) Attend Lecture Based Meetings, (3) Training for Basic Computer Modeling Skills, (4) Field Site Visits, (5) Potential River Surveys, (6) Water Quality Sampling & Testing, (7) Modeling, Analysis and Critical Thinking, and, (8) Technical Presentations.

**Expectations** — Our research program has one main prerequisite, to have fun, and, to ask many questions. The program also requires students to visit several sites along LAR. The students will be exposed to advanced methods used in water resources simulations using standard software applied in public and private industry to design flood control channels.

**Institutions & Conferences Typically Attended** — University of California, Irvine (UCI), Hydrodynamic Modeling Group. Harvey Mudd College, Southern California Conference for Undergraduate Research. Los Angeles County Department of Public Works, Geographic Information Systems (GIS) Day. Metropolitan Los Angeles Branch, American Society of Civil Engineers (ASCE). ELAC: Engineering Club, East Los Angeles College (ELAC). ELAC's Undergraduate Research Conference.

## Eileen Ie, Professor of Sociology

**Mentor Bio** — Congratulations on your acceptance to BUILD PODER! My background is in Sociology and Educational Psychology. Specifically, my emphasis is in the Social Psychology of Gender and Sexuality. I earned a bachelor's and master's degree in Sociology (minor in Human Sexuality) from CSUN and a doctoral degree in Education from USC. I have been a researcher since 2005 and joined the ELAC family in 2009. Currently I am interested in learning the sexual attitudes and behaviors of ELAC students. As a sociologist, the world is my lab. It's my hope to work, learn, and grow together!

**Purpose** — To explore the sexual knowledge and behaviors of community college students. Most American college student health behavior research focuses on university students (Pokhrel, Little, Herzog, 2014) and 2-year or community college students have been less studied. According to the Center for Disease Control (2013), American youth bear a disproportionate share of sexually transmitted infections. While 15 to 24 year olds make up 27% of the sexually active population, they account for half of new STIs in the U.S. each year.

**Research question** — What is the sexual knowledge and behaviors of ELAC students?

**Method** — Survey questionnaires, in-depth interviews, and content analysis of student journals. Qualitative analysis and basic quantitative analysis.

**Student roles** — Student will assist with sampling, data collection, coding, and analysis.

**Expectations** — Students can expect me to be responsive and genuinely care about their academic and personal growth. What I expect from students is also what students can expect from me: to be open to learning content and process and to be respectful of timelines, to be communicative, and to be kind. My goal is to demystify the research process and to expose students to the messiness of research in real life. Students will gain knowledge through experiential learning. You have a lot to bring to this relationship and I will be learning from you just as you will be learning from me.

**Conferences** — California Sociological Association annual conference, ELAC Mujeres Xingona's Conference, ELAC Global Awareness Conference.

**Publications** — "Mass Media 'Fast' for a Fast Media." 2005. Teaching about the Mass Media in the Classroom. Heather Laube and Sara Sobieraj (eds.). New York: American Sociological Association. (with David Boyns).

## Dezzie Prewitt, Social Sciences

**Mentor Bio** — This researcher taught biomedical statistics for the nursing program at National University from 2012-2015. This researcher also collected nationwide data as an Economist with the Bureau of Labor Statistics from 2000-2004

**Background & Purpose** — The purpose of this biomedical research is to investigate variation in life expectancy among the 196 countries that reported data to the United Nations World Health Organization (WHO). The United Nations WHO has published reports on the global tobacco epidemic and AIDS prevention in selected regions (United Nations, 2015; WHO, 2015). This study will also look for significant differences in life expectancy among the 196 countries that reported data on tobacco usage and the prevalence of HIV and AIDS in selected regions.

### Research Question(s) or Hypothesis

1. What is the distribution of life expectancy at birth for males among the 196 countries that reported data to the WHO?

2. What is the distribution of life expectancy at birth for females among the 196 countries that reported data to the WHO?
3. Is there a significant difference between standard age male and female smokers of tobacco among the 196 countries that reported data to the WHO?
4. Is there a significant difference between male and female youth that use tobacco products among the 196 countries that reported data to the WHO?
5. Is there a correlation between adult life expectancy and the number of deaths due to HIV/AIDS among the 196 countries that reported data to the WHO?
6. Is there a correlation between adult life expectancy and the prevalence of HIV among adults ages 15-49 from the 196 countries that reported data to the WHO?

**Method** — This researcher will conduct a correlation study that relies on quantitative methods to answer the six research questions above. The quantitative data from the 196 countries that reported to the United Nations WHO will be collected electronically from the Global Health Observatory (GHO) Data Repository (WHO, n.d.). Data analysis will be conducted using biomedical statistics and explanations will be applied to the economics of developing countries (McConnell, Brue, and Flynn, 2015).

### Student Roles

	Sophomore	Junior	Senior
Design of Research Questions	Number 1 & 2 Frequency Distribution	Number 3 & 4 Significant Difference	Number 5 & 6 Correlation vs. Causation
Number of Variables	One	Two	Three or More
Description of Statistical Analysis	Analysis of appropriate data	Hypothesis Testing	Hypothesis Testing

**Conferences Typically Attended** — CCC Online Education Initiative Professional Development Conference -Ronald E. McNair Scholars Program National Research Conference.

### Kashif Powell, Professor of Communication Studies

**Mentor Bio** — Dr. Kashif Powell is an artist, researcher, gardener, and activist. Emerging from his diverse interests, his work uses a wide range of methods to explore the relationship between health, race, and social mobility.

**Background & Purpose** — In the field of health, the understanding of race as genetic variance has pushed for a greater understanding of how health disparities fall along racial divides. My proposed research project aims to extend current research by considering how health disparities on the basis of race affect more than just an individual’s physical health. I posit that racial health disparities not only play a vital role in health indicators such as life expectancy, but also greatly affect social conditions such as educational attainment. Put simply, if African American students are healthy, they are more likely to succeed.

**Research Question(s) or Hypothesis** — “How do the health disparities of the African American community impact educational attainment?”—with “health disparities” being defined as “preventable differences in the burden of

disease, injury, violence, or opportunities to achieve optimal health that are experienced by socially disadvantaged populations.”[\[1\]](#)

**Method** — The methodology for this study is two-folded: First, researchers will engage quantitative methods of communication research, including surveys, personal interviews, and statistical analysis. Second, researcher will also engage qualitative methods of inquiry, namely ethnographic methods of data collections, i.e. collecting personal stories, video documentation, photography, and sound recording. To frame this study I utilize a method of Critical Ethnography, which uses participant-observation fieldwork to engage sites of cultural production. Critical Ethnography is an appropriate method because it structures our role as a participant-observers, and offers guidance for understanding the political impact of our study.

**Student Roles** — Students will be actively involved in the data collection phase of the research; they will learn both quantitative and qualitative methods of inquiry. Additionally, students will work on turning the results of the study into a conference hosted on the campus of East Los Angeles College. The conference will explore the themes of health, community, and social action.

**Expectations** — This project is intended to be interdisciplinary in nature. Though is it directly related to the hard sciences, the methods and discussions will be influenced by the social sciences, i.e. Political Science, Sociology, and Communication Studies.

**Conferences Typically Attended** — The Black and Brown Unity Conference, hosted by the Speech Lab at ELAC.

### **Luis Soto-Ortiz, Professor of Mathematics**

**Mentor Bio** — I was born in Mexico and I came to the U.S. with my family when I was 10 years old. I graduated from CSULA with a bachelor's in Mathematics, from Caltech with an M.S. in Applied and Computational Mathematics, and obtained my Ph.D. in Biomedical Engineering from UCI. I have been working at ELAC since Fall 2015 and have conducted biomedical research since 2012. I am an applied mathematician interested in biomedical applications of math and computer science. I currently conduct research in the following two areas:

- 1) Deterministic and stochastic modeling of cancer growth and cancer treatments.
- 2) Cancer epidemiology at the population level: cancer incidence, recurrence and morbidity and how they vary by race and geographical region.

**Title of Research Project** — Assessing the Relative Risk of a Second Primary Cancer among Colon and Breast Cancer Survivors using SEER Data

**Background & Purpose** — It has been observed that the incidence of second primary cancers among cancer survivors is significantly higher than expected. The purpose of this project is to quantify the heterogeneity of risk of developing a second primary cancer in the same organ as that of the first cancer diagnosis, between women who were diagnosed with a first primary colon cancer and those who were diagnosed with a first primary breast cancer. We also want to investigate why does a difference in risk exists, if any.

**Research Question(s) or Hypothesis** — If there is a difference in the risk of developing a second primary colon cancer compared to the risk of developing a second primary breast cancer, does this difference vary by race and by geographical region? Why would it be more likely to develop a second primary colon cancer than a second primary breast cancer, or vice versa? What risk factors make cancer recurrence in the same organ more likely? This research project will shed light on whether or not an individual who is diagnosed with cancer may be born susceptible to developing multiple primary cancers (supporting the internal risk factors hypothesis), or the susceptibility to multiple primary cancers may be due mainly to socio-economical factors such as environmental conditions and lifestyle (supporting the external risk factors hypothesis).

**Method** — My lab will adopt an approach that merges theory with empirical evidence to assess how the risk of developing a second primary cancer of the same type varies between women diagnosed with a first primary colon cancer and women diagnosed with a first primary breast cancer. The case files from the Surveillance, Epidemiology, and End Results (SEER) Program will be parsed by writing a custom program using the Perl programming language to compile the age-specific incidence of first and second colon and breast cancers in women living in the United States. We plan to investigate how the risk of a second primary colon and breast cancer in women varies by race and geographical region.

**Student Roles** — My research assistants will help to extract and organize cancer incidence data using the Programming language Perl. They will conduct literature review to become familiar with the theoretical and empirical aspects of cancer epidemiology at the population level. They will keep a detailed account of what they discover and will learn to present their findings in writing and orally through a written report and a poster presentation.

**Expectations** — I expect student assistants to be enthusiastic about conducting research in general. I expect them to be inquisitive and interested in applying mathematics, computer science and biology to discover trends in cancer epidemiology.

**Conferences Typically Attended** — SACNAS

#### **Publications**

<http://article.sapub.org/10.5923.j.ijtt.20180701.01.html>

<https://www.sciencedirect.com/science/article/pii/S002251931600059X>

<http://www.m-hikari.com/asb/asb2015/asb1-4-2015/sotoASB1-4-2015.pdf>

## **Los Angeles Pierce College**

### **Jennifer Moses, Associate Professor of Psychology & Statistics**

**Mentor Bio** — Hello! As a community college Professor, I have a passion for mentoring new scholars. Over the last 15 years, I have mentored 70+ undergraduates, helping them go on to graduate education. I have a PhD in experimental social and quantitative psychology from the University of Minnesota. I have a wide variety of research interests, all involving the intersection of individual differences and social behavior. I currently have two active lines of research and present/publish regularly in these areas.

**Research Projects (2)** — “Individual Differences and Political Behavior” and “Volunteerism in Online Settings”

#### **(1) “Individual Differences and Political Behavior”**

**Background & Purpose** — This project explores individual differences, such as age, ethnicity, gender, and personality, relate to political behavior. There has been a recent rise in negative partisanship, polarization, hostility, and violence in the political domain. The current research explores how individuals differences might be important predictors of antisocial or maladaptive political behavior, to better inform efforts to curb these trends.

**Research Question(s) or Hypothesis** — Exploring predictors of antisocial or manipulative political attitudes and behavior, to better inform efforts to curb these trends.

#### **(2) “Volunteerism in Online Settings”**

**Background & Purpose** — This project looks at volunteerism in online settings. There is a sharp increase in recent years in individuals and organizations moving helping activities to online (over the internet), as opposed to traditional face-to-face settings. This presents barriers to involvement for those who may be motivated to help others because of

strong social motivations. Online settings may not satisfy the social motives of would-be volunteers who desire authentic interpersonal interaction.

**Research Question(s) or Hypothesis** — Findings ways of increasing online helping behaviors.

**Methods (both projects)** — In the past, research in these domain has employed large-scale online survey methodology using extant volunteer-related websites (e.g., Cyclopath), as well as targeted online experiments to test specific causal theories (e.g., Mturk). Analytic processes used in the past on similar projects have included multivariate ANOVA, multiple regression, and structural equation modeling. The specific analyses that will be used in the future will be dependent on the specifics of the data collected.

**Student Roles** — Students will be involved in designing specific studies to address the broad research goals outlined above. Furthermore, they would be involved in all aspects data collection and analysis. They will learn the "nuts and bolts" of research including but not limited to literature reviews, experimental design, IRB protocols, data analysis, poster/paper preparation, and research presentations.

**Conferences Typically Attended** — I have attended the yearly conferences for the Society for Social and Personal Psychology (SPSP), The American Psychological Association (APA), the Western Psychological Association (WPA), and The Society for the Study of Social Issues (SPSSI) the International Society for Political Psychology (ISPP).

### **Publications**

- Filson Moses, J., Dwyer, P.C., Fuglestad, P., Kim, J., Maki, A., Snyder, M., & Terveen, L., (2017). Encouraging Online Engagement: The Role of Interdependent Self-Construal and Social Motives in Fostering Online Participation. *Personality and Individual Differences*.
- Weaver J., Filson Moses, J., Snyder, M. (2016). Self-fulfilling prophesies in ability settings. *Journal of Social Psychology*, 156, 179-89.
- Filson Moses, J., & Gonzales, M.H. (2015). Strong candidate, nurturant candidate: Moral language in presidential television advertisements. *Political Psychology*, 36, 379–397
- Fuglestad, P., Kim, J., Filson Moses, J., Dwyer, P., Mannino, C., Terveen, L., & Snyder, M. (2012). What Makes Users Rate (Share, Tag, Edit...)? Predicting participation in online communities. *Proceedings of the Association for Computing Machinery Conference on Computer Supported Cooperative Work (CSCW 2012)*, 969-978.
- Patock-Peckham, J.A., King, K.M., Morgan-Lopez, A.A., Ulloa, E.C., & Filson Moses, J. (2011). The gender specific mediational links between parenting styles, parental monitoring, impulsiveness, drinking control, and alcohol-related problems. *Journal of Studies on Alcohol and Drugs*, 72, 246-257.
- Filson, J., Runfola, C., Ulloa, E.C., & Hokada, A. (2010). Intimate partner violence, powerlessness, and depression: A mediational analysis. *Journal of Interpersonal Violence*, 34-46.
- Prislun, R. & Filson, J. (2009). Seeking conversion versus advocating tolerance in pursuit of social change. *Journal of Personality and Social Psychology*, 97, 121-141.
- Ulloa, E.C., Jaycox, L., Marshall, G., Collins, R., & Filson, J. (2005) Gender, acculturation, and attitudes about dating violence among Latino youth: A brief report. *Latino Psychological Association of New Jersey Bulletin*, 4-7.

### **Savanah St. Clair, Professor of Agriculture (Plant Science) \*New Mentor\***

**Background & Purpose** — The purpose of this research is to identify and isolate antibiotic resistant and plant growth promoting bacterial accessions from the Pierce College Farm. Further, we will be working with plant essential oils to investigate antimicrobial activity of the plant extracts, particularly on antibiotic resistant accessions. Finally, we intend to identify and quantify unknowns produced by the isolated plant-growth promoting bacteria which may be responsible for their beneficial effects. A large scale production protocol will be the goal if we find species of interest.

**Research Question(s) or Hypothesis** — We hypothesize that antibiotic resistant bacteria are present on the Pierce College farm due to livestock rearing. We further hypothesize that these bacteria can be controlled by plant extracts

form species such as eucalyptus, thyme, lavender, and mint, which are suspected to have terpenoid compounds with antibacterial properties. We also expect to find plant-growth promoting bacteria in the rhizosphere of plants on the farm and at the Botanic Garden and Pierce College Arboretum. Is it possible to farm the herbaceous plant callus to produce large amounts of the biomedically active compounds? Is it possible to produce large amounts of the beneficial bacteria to inoculate crops for a better yield? Is it possible to produce the plant promoting bacterial compounds directly under cultivation?

**Method** — Bacterial culture, plant micropropagation, gardening and plant production, isolation of antibiotic resistant and plant growth promoting bacterial colonies, micropipetting, gel electrophoresis, soil and plant DNA extraction, Polymerase chain reaction, DNA sequencing, spectrophotometry, IR, and NMR, biopharming to produce plant compounds of interest from non-differentiated cells (callus culture). Statistical analysis of results including analysis of variance, graphing in Excel, visualizing DNA bands on agarose gel, comparing gel fragments to known constructs, visualizing IR and NMR peaks.

**Student Roles** — *Sophomores*: glassware technician, autoclaving, preparing the workspace, dilutions, mixing solutions, pouring gels, pouring media, running gels, tissue culture, extracting DNA, making measurements, soil sampling, gardening, helping with the experimental design, essential oil extraction, excel data analysis. *Juniors & Seniors*: pouring gels, running gels, preparing culture media, setting up PCR reactions, designing primers, soil sampling, gardening, helping with experimental design, essential oil extraction and distillation, data analysis in SAS or R, IR spectroscopy, and NMR.

**Conferences Typically Attended** — Society for In Vitro Biology, Plant and Animal Genome Conference

## Shannon DeVaney, Professor of Biology, Chair of Life Sciences

**Mentor Bio** — As a biologist, I am particularly drawn to the weird stuff. In particular, I study deep-sea fishes: the kinds that do strange things like light up (or bioluminesce), swallow meals bigger than themselves, or live as parasites on the body of their mate. My research has taken me all over the world, from research ships in the middle of the far northern Atlantic (complete with icebergs), to laboratories in Tokyo, to the Natural History Museum here in Los Angeles. I current serve as the Chairperson for the Life Sciences Department, on the Pierce College Professional Ethics Committee, on the District Life Sciences Committee, and on the District Gold Creek Field Station Committee. Most of all, I love sharing my enthusiasm for the weird and wonderful world of biology with the awesome students at Pierce College. **Ph.D.** Ecology and Evolutionary Biology, University of Kansas, 2008 **B.S.** Zoology, University of Washington, 2002.

**Title of Research Project** —

**Background & Purpose** — As an evolutionary biologist and ecologist, I offer students the opportunity to study how human health is affected by interactions with other species.

**Research Question(s) or Hypothesis** —The primary research area available to students is the use of ecological niche modeling to predict distributions of invasive species and/or disease vectors, allowing us to know what regions are most at risk while prevention is still an option.

**Method** — Niche modeling algorithms such as the Genetic Algorithm for Rule Set Production (GARP) and Maximum Entropy Modeling (MAXENT) will be used in conjunction with open source GIS software to build models of a species' abiotic niche based on known occurrence data. These models can then be projected onto a new range to determine areas suitable for the species of interest.

**Expectations** — There may be possibilities in the future to perform specimen-based research on the effects of pollutants on food dishes

**Conferences Typically Attended** — Southwestern Association of Naturalists and the Society for Integrative and Comparative Biology.

### **Publications**

DeVaney, S.C. 2016. Species distribution modeling of deep pelagic eels. *Integrative and Comparative Biology* 56(4):524-530.

Kenchington, T.J., R. Benjamin, M. Best, A. Cogswell, A. Cook, S. DeVaney, C. Lirette, B. MacDonald, K. MacIssac, P. Mallam, T. McIntyre, A. McMillan, H. Moors-Murphy, G. Morton, L. Paon, S. Roach, E. Shea, D. Themelis, and E.L.R. Kenchington. 2014. Field Methods of the 2008, 2009 and 2010 Surveys of Meso- and Bathypelagic Micronekton in the Gully. Canadian Technical Report of Fisheries and Aquatic Sciences 3076:73pp.

Kenaley, C.P., S.C. DeVaney, and T.T. Fjeran. 2014. The complex evolutionary history of seeing red: Molecular phylogeny and the evolution of an adaptive visual system in deep-sea dragonfishes (Stomiiformes: Stomiidae). *Evolution* 68(4):996-1013.

DeVaney, S.C., K.E. Hartel, and D.E. Themelis. 2009. The first records of *Neocyema* (Teleostei: Saccopharyngiformes) in the Western North Atlantic with comments on its relationship to *Leptocephalus holti* Schmidt 1909. *Northeastern Naturalist* 16(3):409-414.

DeVaney, S.C., K.M. McNyset, J.B. Williams, A.T. Peterson, and E.O. Wiley. 2009. A tale of four carp: Invasion potential and ecological niche modeling. *PLoS ONE* 4(5):e5451.

## Los Angeles Valley College

### **Chander Arora, Professor of Biology**

**Background & Purpose** — Obesity is frequently cited as one of America's more pressing public health problems. It poses the underlying threat to multiple and complex diseases. Although its incidence appears to be steady, a substantial proportion of adult Americans remain obese. According to estimates from National Health and Nutrition Examination, several studies have linked obesity to an increased risk of chronic disease poor health-related quality of life, and functional disability. In fact, the public health impact of obesity has been shown to exceed that of two other behavioral problems, smoking and heavy alcohol use. Understanding obesity could be instrumental in understanding the common mechanisms of diseases. The project can be ramified into multiple directions. Behavioral modifications of significant risk factors could be recommended in presentations and publications. The purpose of this research is to explore gender-specific disparities in obesity of US born and foreign born youth. Funding to be explored from American Heart Association, government and private agencies.

**Research Question(s) or Hypothesis** — Identifying factors of obesity that are specific to gender and region.

**Method** — Questionnaires would be developed to collect data by personal interviews with equal number of young male and female subjects. Surveillance of behavioral risk factors in men and women of different races in college student population would be conducted using these questionnaires. Obesity is operationalized as having a body mass index (BMI) equal to or greater than the 95th percentile among individuals younger than age 18 years or a BMI of 30 or greater for individuals age 18 years or older. Examination of racial/ethnic disparities in obesity among U.S. - and foreign-born Whites, Blacks and Hispanics would reveal complex variations by sex and educational level. Comprehension of these relationships is vital for designing future obesity research and intervention strategies. The data would be analyzed for correlation of different risk factors and calculating odds ratios.

**Student Roles** — There is a wide spectrum of roles that students at each level can play. Review of literature and developing the questionnaires, could be developed by sophomores, interview questions and timing, data collection data entry and preservation could be done by juniors, data analysis, testing different models for males and females and

presentation can be done by seniors. The roles could easily be exchanged between students based on their interest and capabilities.

**Conferences Typically Attended** — CSUPERB, Society of Reproductive Investigators (SRI), American Heart Association.

**Erika Brockmann, Professor of Biology**

**Pamela Byrd-Williams, Professor of Biology**

**Mentor Bio** — Professors Byrd-Williams and Brockmann are full time faculty within the Biology Department at Los Angeles Valley College. Both have worked in basic science research in cell, molecular and microbiology laboratories. They will be teaming up in a facility at LA Valley College that has the equipment necessary for tissue culture and microscopy techniques required for both projects.

**Background & Purpose** — We are interested in the antioxidant, anti-inflammatory and antimutagenic properties of *Salvia hispanica* seeds, commonly known as Chia seeds, on various types of mammalian cells. Recently, from various media sources, Chia seeds have been touted as the new “superfood”. It is high in omega-3 and omega-6 fatty acids, phenols and other antioxidants that are known to be anti-inflammatory but scientific research is still required to elucidate the mechanisms which confer health benefits at the cellular level. We propose two potential projects that will allow us to determine if the direct treatment of mammalian cells with Chia seed extract effect the activity of either Natural Killer (NK) Cells or macrophages. These are both cells of the immune system that are known to respond to tumor formations or presence of cancer cells. Both cells also produce cytokines which are important in cell signaling responding to events that include tumor formation, the inflammation and the anti-inflammatory responses. This research will apply to broad fields such as cancer, inflammatory diseases such as rheumatoid arthritis, Crohn’s disease & celiac disease with regards to nutrition as a supplement to other therapeutic or curative treatments.

**Research Question(s) or Hypothesis**

Project 1: Determine the effect of chia seed extract on the activity of activated mouse natural killer (NK) cells.

Does Chia seed extract effect their proliferation? Does it affect their production of cytokines Tumor Necrosis Factor alpha (TNF-a) or Interleukin-10 (IL-10)?

Project 2: Determine the effect of Chia seed extract on mouse macrophage production of IL-1 levels.

**Student Roles**

- Maintaining a detailed and accurate laboratory notebook
- Serial dilutions in dose dependency experiments
- Seed extraction & purification methods
- Tissue culture methods and techniques
- Aseptic techniques
- Media preparation
- Gel electrophoresis & Western blot techniques
- Microscopy (phase contrast, DIC, immunofluorescence)
- Review scientific literature
- Meet with mentors to discuss data interpretation and progress

**Expectations** — Students at any level can participate.

**Conferences Typically Attended** — Conferences may include American Society of Nutrition, American Cancer Society and SACNAS.

## Ruby Christian Brougham, Professor Psychology

**Background & Purpose** — My research focuses on the relationship between language acquisition and the socio-emotional development of children between the ages of birth – 3.5 years.

**Research Question(s) or Hypothesis** — The main goals of the project are to use Critical Race Theory to identify elements of society, race, and culture that influence the understanding and expression of emotion in children ages birth-3.5 years. In particular, the use of positive and negative emotions expressed in language, the value placed on the displayed emotion by the parent or another child and the amount of cooperative behavior displayed by the child will be studied.

**Student Roles** — Students will be involved in all aspects of the research project and will be mentored as developing scholars. Students will work as part of a research team and will learn about research design, data collection, data analysis, and dissemination of research results through participation at a regional or national research conference along with manuscript preparation. Students will also have opportunities to work on innovative projects at the Family Resource Center and in some cases students will collect empirical data that subsequently informs a workshop.

**Expectations** — Involvement in research enhances the students' ability to understand the merits of theoretical models, empirical data collection, logic-based arguments and aids in their integration and synthesis of new learning with existing information learned in the classroom, resulting in a richer and deeper understanding of psychology. Involvement in research also broadens the students' professional options and helps them to prepare for graduate school and professional work. I plan to apply for an NIH pilot project grant.

## Veronica Getskow, Professor of Child Development

**Mentor Bio** — With a passion for teaching adults about young children, Veronica Getskow (Ph.D.) has served as a preschool and kindergarten teacher as well as a college instructor for more than twenty years. Her educational background includes an MA from CSUN in Psychological Foundations, Early Childhood Specialization. Veronica has taught for the Los Angeles Community College District since 1998, working at both Valley and Pierce Colleges. She enjoys teaching all of the child development courses and delights in meeting new students each semester. Her two books, *Kids with Special Needs* and *Incredible, Edible Geography* were written with both parents and teachers in mind. The mother of five unique children (one a special needs student), Veronica has learned and will share lessons the textbooks have left out.

**Background & Purpose** — This research project is an outgrowth of The Children's Project, a non-profit organization whose goal is to raise awareness of emotional health strategies for parents and children. Dr. Gerald Newmark's book, *How to Raise Emotionally Healthy Children* (2008) is a basic read for parents and educators. Through the lens of Critical Race Theory, this project will identify factors that influence teacher and parent thinking on emotional health for their children and the resources or tools they use to create an emotionally healthy environment.

**Research Question(s) or Hypothesis** — What resources exist to assist parents and early childhood educators to raise emotionally healthy children and create an emotionally healthy learning environment for young children?

**Student Roles** — Students choosing to participate in this project will survey student parents and prospective teachers at the Los Angeles Valley College Child Development Department and Child Development Center to collect ideas and strategies currently in use. In addition, student research responsibilities will include a review of the literature, conducting interviews, data collection/analysis and creating a database of picture books and classroom tools that foster emotional health.

**Expectations** — Writing up the findings to submit to various early childhood publications such as *Child Care Information Exchange* is also an option.

**Conferences Typically Attended** — Student researchers will attend and present at local conferences such as: STEM and CAEYC conferences sharing the findings.

### **Debbly Pourroy, Professor of Child Development**

**Mentor Bio** — With a passion for teaching, Debra Pourroy (M.A.) has spent the last 30+ years administering and teaching in the field of early childhood education. Debra's resume includes a Master's degree in Education for Young Children, with an emphasis in Early Childhood Education. Additionally, her Bachelor's degree and undergraduate studies were also in Child Development. Debra is an avid supporter of the National Association for the Education of Young Children and has been both an active member and workshop presenter for this organization on the local and state levels throughout her career. Debra's focus has been on the development, implementation and integration of a quality pre-school experience for children of all socio-economic and culturally diverse backgrounds. For many years, she was the director of a state funded child care center that served homeless and low income families. Prior to that, she taught in infant-toddler centers and preschools. One of Debra's many talents is "story telling" and many students still remember her via her stories. On a personal level, she loves to travel and recently spent time in Italy studying the strategies of the Reggio Emilia Schools. For the last 10 years, Debra has taught adults, and high school students in child care occupations. She is very excited by the prospect of inspiring adults to be their "best" for young children. As Debra says, "Working with young children is one of the most important jobs on the planet!"

**Background & Purpose** — My research interest focuses on the work life balance of effective child care providers. Training of competent child care workers is a career path that community colleges serve with practicum capstone classes. A LA Up sponsored program, Partnerships Education Articulation and Coordination through Higher Education, (PEACH) has identified that the missing instructional training component is the work – life balance component of individual child care workers. The missing training component is the goal of this study. The instructional component will be made available.

**Research Question(s) or Hypothesis** — Using the lens of Critical Race Theory, this project will explore the factors of work life balance surveying current and past students who have completed CD 22, and 23 coursework.

**Student Roles** — Students selecting to participate in this research will survey current and former practicum students with the goal of collecting ideas and strategies that are being used to create the balance between work and personal life. In addition, student researchers will review the literature, conduct interviews with trainers, and data collection/analysis

**Conferences Typically Attended** — Student researchers will participate in a CAEYC conference workshop or presentation to the LA PEACH organization on the findings of the project.

## **Pasadena City College**

**Jared Ashcroft, Chemistry**

**Brandon Rodriguez, NASA JPL**

**Mentor Bio** — Jared Ashcroft received a doctorate from Rice University in chemistry designing drug platforms using immuno-conjugates of carbon-based nanostructure. Currently I teach chemistry at Pasadena City College. My research group is designing and studying the affects of using Problem-based Learning in conjunction with a remotely accessible Scanning Electron Microscope in K-12 education. Specifically, we want to see if using this pedagogy can increase the interest in STEM for K-12 students, with an emphasis on underrepresented populations.

**Title of Research Project** — Education Equity: Using Problem-Based Learning in Tandem with a Remotely Accessible Scanning Electron Microscope to Close the Achievement Gap in the Science Classroom.

**Background & Purpose** — The development of a series of Problem-based Learning labs/activities that can be used in K-12 and undergraduate science courses. We want to bring active-learning and advanced technologies to the STEM classroom to promote student interest and success.

**Research Question(s) or Hypothesis** — Does active-learning used in tandem with remotely accessible instruments increase interest and success in the STEM classroom?

**Method** — We have developed summative assessments that are aimed at determining how much science content students have retained from their lab experience. We also have students do a formative assessment where they must draw what they have learned from using the Scanning Electron Microscope. Surveys are also done that measure how much student interest in the labs and passion for science increased using the Problem-based Learning pedagogy.

**Student Roles** — Students design the labs and assessments, attend and run the outreach sessions at the K-12 schools as well as perform data analysis from our surveys and assessments. Lastly, students are responsible for helping with writing the publications from our work.

**Expectations** — We expect our students to have a strong work ethic and to be an active contributor to the experience. Students must voice their thoughts and concerns for any experiment we perform. They must be vocal and contribute thoughtful discussion about the research. They must always be on time and be respectful for all that work with them on the project. My goal is to teach students to think and communicate effectively. I (Jared) especially expect my students to perform well in their classes and out importantly to have fun.

**Conferences Typically Attended** — High Technology Conference, Micro-Nanotechnology Conference, American Chemical Society Conference, Materials Research Society Conference, Computer-Using Educator Conference, HTTC Honors Conference.

#### **Publications**

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2. Jared Ashcroft, Jillian Blatti, Veronica Jaramillo and David Douglass; It DOES RAIN in Southern California. NANOWIRE Rain's Quarterly Newsletter, Fall 2016.
3. Jared Ashcroft and William Miller; Remotely Accessible Experiments for Use in K-12 Education. NANOWIRE Rain's Quarterly Newsletter, Winter 2017.
4. Jared Ashcroft and Brandon Rodriguez; Using RAIN in Conjunction with Problem-Based Learning to Promote Student Success. NANOWIRE Rain's Quarterly Newsletter, Fall 2017.
5. Jared M. Ashcroft, Atilla Ozgur Cakmak, Esteban Bautista, Vanessa Wolf, Jillian Blatti, Dwaine Davis, M. Josefina-Jimenez, Raymond Tsui, Richard Hill, James S. Smith, Kristine J. Schroeder, Robert K. Ehrmann; It's RAINing: Remotely Accessible Instruments in Nanotechnology to Promote Student Success. Current Issues in Emerging eLearning. Accepted August 2017.
6. Vanessa Wolf, Esteban Bautista, Svetlana Timberlake, James Shiffley, James Smith, M. Josefina Arellano-Jimenez, Jared Ashcroft, Brandon Rodriguez; Bridging the Gap Between 'Rocks for Jocks' and the Mars Sample Return Program: Using NASA Resources and Remote Access to Promote Geology. Science Scope. Accepted September 2017.
7. Brandon Rodriguez, Veronica Jaramillo, Vanessa Wolf, Esteban Bautista, Jennifer Portillo, Alexandra Brouke, Ashley Min, Andrea Melendez, Joseph Amann, Abdon Pena-Francesch, Jared M. Ashcroft; Contextualizing Technology in the Classroom Via Remote Access: Using Space Exploration Themes and Scanning Electron Microscopy as Tools to Promote Engagement in Multidisciplinary Geology/Chemistry Experiments. Journal of Technology and Science Education. 8, 1, 86-95, 2018.
8. Jared M. Ashcroft, Ashley Min, Isabel Bojanini, Melanie Hacopian, Kristine Schroeder, Atilla O. Cakmak, Brandon Rodriguez; Cultivating Mars: A Problem-Based Learning Lab Designing an Oxygen-Rich Environment on the Red Planet. Journal of Laboratory Chemical Education. 6, 1, 4-11, 2018.

9. Ashley Min, Jared Ashcroft, Joel Monroy, Vanessa Wolf, Christina Lee, Josée Horton, Robert Ehrmann, Brandon Rodriguez. Making it RAIN: Using Remotely Accessible Instruments in Nanotechnology to Enhance High School Science Courses. Science Scope. Submitted March 2018.
10. Jared Ashcroft, Brandon Rodriguez, Joel Monroy, Randy Flores; Geology Mineral Lab. <https://nanohub.org/resources/27659>. December 2017.
11. Jared Ashcroft, Brandon Rodriguez, Isabel Bojanini, Ashley Min, Melanie Hacopian; Determination of Percent Oxygen in Air. <https://nanohub.org/resources/27665>. December 2017.

### **Veronica Jaramillo, Professor of Chemistry**

**Mentor Bio** — Ph.D. (Chemistry), University of Arizona.

**Background & Purpose** — Water quality is a big concern for a healthy life. It is proposed that we study tap water quality related to where students reside. Although this information is posted by water companies, most students are not aware of these reports. Most of our students either live at home with their parents or are renters, so they generally are exposed directly to the water quality reports.

**Research Question(s) or Hypothesis** — It is proposed that students will be more engaged in the issue by hands on testing of their own tap water.

**Method** — After characterizing different tap water samples, we will map out the quality of the different tap waters versus location and have a greater discussion of the causes and implications. Water quality testing will include testing for nitrates, nitrites as well heavy metals. Normal water characteristics will also be explored such as pH, conductivity, hardness and dissolved oxygen. After water has been analyzed, water purifications techniques will be explored through the collaborative research project described eCure proposal.

**Student Roles** — Students will explore different water purification techniques, but focus on nanoparticle purification. This experience will enlighten students to cost and effectiveness of water purification. Pasadena City College students will be involved in water collection as well as water analysis. They will be trained in making standard solutions, performing spectroscopic studies and volumetric analysis.

**Expectations** — Students will begin their research during their General Chemistry course and be expected to continue with the research project for at least one year and submit applications to the national Conference for Undergraduate Research (NCUR) and the national American Chemical Society (ACS) meetings.

**Conferences Typically Attended** — Conference for Undergraduate Research (NCUR) and the national American Chemical Society (ACS) meetings.

### **Juan Leon, Professor of Mathematics & Computer Science**

**Mentor Bio** — My main interests lie in physics based simulations, scientific computing, and computer graphics and animation.

**Background & Purpose** — My research opportunity involves the Oculus Rift Virtual Reality system to model molecular models and reactions. The purpose of this opportunity is to develop educational tools to help understand molecular reactions in 3D space. Many chemical and biological systems studied are complex and having technology that allows for observation of these systems in 3D space would help students visualize chemistry and biology in a way they have never been able to. For example, complex biomolecules, such as proteins, which fold in a highly organized way, could be seen whole in a 3d space as opposed to on screen or in a book.

**Research Question(s) or Hypothesis** — We will be trying to answer some questions such as what sort of physics based models can be used to model and display chemical reactions in a 3D space. We will look at both a molecular mechanics model as well as a quantum chemical model. We would like to look at mathematically describing the collisions and subsequent reactions. One of our main research questions is “How can existing molecular databases be incorporated in the VR environment to create a physics based molecular graphics model?”

**Method** — A group consisting of students and faculty from Pasadena City College and CSUN within the Chemistry and Computer Science Department will work together in building a framework for using VR simulations in a Science classroom. Initially, two CSUN and two PCC students will work on the molecular rift computer program with the aim of having the first molecule in a virtual reality by July 1, 2018. They will then work over the summer to have to molecules collide by November 1, 2017 and finally by July 1, 2018 have a successful reaction taking place.

**Student Roles** — At the sophomore level students will be working to place virtual models into the virtual world. At the junior level, students will program the molecules to collide with each other to simulate a possible reaction. At the senior level, virtual molecules will be designed to properly orient themselves in order to show successful chemical reactions. Senior students might also try to incorporate a simple quantum chemical model. In the case of all level of students, they will have the opportunity and expectation to program in the Unity environment, which uses the C# programming language.

**Expectations** — Students should have some experience with at least any one of the C++, Java, or Python programming languages.

**Conferences Typically Attended** — I typically attend the SIGGRAPH computer graphics conference.

## **Michael Vendrasco, Professor of Geology \*New Mentor\***

**Mentor Bio** — Dr. Vendrasco’s research interest keywords include pollution, water quality, oceanography, beach, public health.

**Background & Purpose** — Beaches accumulate pollutants in water and sediment. These pollutants pose health risks to beachgoers, who are especially plentiful in Los Angeles and Orange counties. It is important to determine the geographic and temporal patterns of pollutant concentrations in these regions, in order to: better estimate the range of probabilities of health impacts at different beaches; better predict when certain beaches will contain higher concentrations of pollutants; and ultimately determine the causes of high accumulations of pollutants at specific beaches.

### **Research Question(s) or Hypothesis**

- (1) How and why do densities of **microplastics** vary in the sands of beaches in Los Angeles and Orange Counties? How do densities vary through time at specific beaches? Which environmental toxins become attached to these microplastics?
- (2) How do concentrations of dissolved **heavy metals** vary in **waters** off beaches of Los Angeles and Orange counties? How do these change through time? What factors contribute to these patterns?
- (3) How do concentrations of **heavy metals** in the **sediment** vary among beaches of Los Angeles and Orange counties? How do these change through time? What factors contribute to these patterns?

### **Method**

#### (1) Beach microplastics

Sediments will be collected at beaches in Los Angeles and Orange Counties. A sediment corer will be used for an analysis of changing concentrations of microplastics over time. Beach sediment samples will be examined and characterized via microscopes. The density of microplastics and other anthropogenic debris will be measured and

recorded for each sediment layer at each locality. Potentially toxic coatings around the microplastics will be observed at a very-fine scale via Scanning Electron Microscopy with elemental analysis and Atomic Force Microscopy, and attached molecules will be identified via Mass Spectrometry.

### (2) Beach water quality

Water samples will be collected systematically at beaches in Los Angeles and Orange Counties. These samples will be analyzed by Inductively Coupled Plasma Mass Spectrometry in order to record concentrations of dissolved metals Cadmium, Chromium, Copper, Manganese, Nickel, Lead, and Zinc.

### (3) Metals in nearshore sediments

Sediments in shallow subtidal nearshore regions will be collected using a sediment corer. The sediments will be digested using Aqua Regia in a High Pressure Microwave System. Concentrations of the metals Cadmium, Chromium, Copper, Manganese, Nickel, Lead, and Zinc will be measured using Inductively Coupled Plasma Mass Spectrometry.

**Analytic processes:** Scanning Electron Microscopy with elemental analysis, Atomic Force Microscopy, High Pressure Microwave Digestion System, Inductively Coupled Plasma Mass Spectrometry

**Student Roles** — At higher levels, students may participate in the entire research process, including: working to design a specific project within the research framework; doing background literature research; collecting and analyzing data; and contributing text and/or diagrams to a manuscript for publication.

**Expectations** — Students may develop their own research projects within the research framework presented here. The aim is for students to experience all steps of the research process.

**Conferences Typically Attended** — Geological Society of America (GSA) Annual Meeting, Society for Sedimentary Geology (SEPM)/AAPG Annual Meeting.

## **Miriam Hartman, Professor of Natural Sciences \*New Mentor\***

**Background & Purpose** — A pressing health concern in urban environments is the level of air pollution to which city-dwellers are exposed. Los Angeles has long been the poster child for air pollution; while the worst days of smog seem to be in the past, [levels of pollution are far from ideal and appear again to be rising](#). In addition, there is evidence that poor air quality has the greatest impact on sensitive populations, such as children and the elderly, yet many locations where these individuals spend time (schools, apartments for seniors) [are built in areas with major pollution problems](#). In addition, correlations between air pollution and low socio-economic status have been determined in several urban environments ([citation1](#), [citation 2](#)). [Recently, Google Street View cars](#) were equipped with pollution-detecting equipment, and surveyed areas in both Oakland and Los Angeles, CA. This data is at higher resolution than any previous dataset of its size, and allows for study of correlations between pollution levels and geographic or demographic attributes, such as residential housing density, income level, and the ethnic makeup of a particular area.

**Research Question(s) or Hypothesis** — As noted above, studies have already shown that there is a correlation between pollution levels and poor neighborhoods. This dataset would allow such a study within the urban area of Los Angeles. Research questions would include: are there correlations between pollution and the location of schools where a large percentage of children receive a free or subsidized lunch? Of housing developments currently being built or planned, what fraction are in high-pollution zones? How far from major thoroughfares do high levels of pollution travel, and do these disproportionately affect low-income neighborhoods?

**Method** — The method would vary slightly depending on the research question being addressed, but all would utilize the Google data. In addition, demographic data, locations of schools, etc. will be determined using either datasets from data.gov or google.com. Students will extract data and place in a tabular/matrix format for ease of analysis. Initial analysis will be done graphically, plotting variables that are expected to show some correlation. Final statistical analysis will be determined using open-source software such as Python (NumPy).

**Student Roles** — Students would learn to manipulate the plethora of open-source data that are currently available, using software and tools that are applicable to a wide variety of topics and disciplines. Students will have hands-on experience at every step in the process, from distilling and formatting data to performing the mathematical and statistical analysis. Students will be encouraged to present their findings at conferences. Southern California Conferences for Undergraduate Research (SCCUR), local presentations at PCC.