

CSUN BUILD PODER

PIPELINE PARTNER MENTORS

East Los Angeles College

Armando Rivera-Figueroa, STEM/MESA, Chemistry

Janice Velazquez, Family and Consumer Science

The purpose of the research will be to investigate correlations, if any, with atmospheric pollutants, health disparities and social justice. The research project will be carried by according to the following steps:

1. Identify appropriate atmospheric pollution related data utilizing the AQMD database. Specifically, we will be looking at atmospheric pollutants in areas adjacent to the college's community of East Los Angeles: particulate matter (PM_{2.5}), nitrogen oxides (NO_x) and ozone (O₃). Close continuous monitoring stations will be identified using the AQMD map. Attention will be placed in stations located in the cities of Los Angeles, Pasadena, Pico Rivera and Azusa.
2. Analyze data appropriately to relate it to meteorological parameters (precipitation, temperature, relative humidity and wind direction and velocity), in order to link measurements of the above-mentioned atmospheric pollutants to precursors and deposition zones, if any. Mathematical modeling and excel will be used in this section. Analyzing for trends, correlations among pollutants and meteorological variables the following site will be used: <http://www.aqmd.gov/home/library/air-quality-datastudies/meteorological-data>.
3. Once precursors and deposition zones are identified and understood, these will be studied in relationship with health disparities studies. Specifically, correlations (if any) between atmospheric pollutants and data on pulmonary (e.g. asthma) and heart conditions will be studied. The health disparities issues found (if any) between the ratio of health issues and ethnicities living in the area and adjacent areas of East Los Angeles will be evaluated in order to correlate the issues with social justice issues. To identify health disparities issue we will try to use a combination of census data and data provided by the National Health and Nutrition Examination Survey (NHANES). NHANES is a program of studies designed to assess the health and nutritional status of adults and children in the United States. Specifically, this investigation will collect data from Hospitals, Schools, community centers, grocery stores, restaurants, farmers' markets, and food banks to become aware of factors that could lead to the identification of health disparities. SPSS will group factors into variables allowing us to identify significant correlations. The data will be analyzed using factor analysis. The correlations among the factors will be identified by a correlation analysis. All statistical data analyses will use Statistical Package for the Social Sciences (SPSS), Version 14.0 for Microsoft Windows. The investigators hope that combining information from different scientific perspectives will, perhaps, allow the identification of the new correlations that have not been explored yet. A second phase of bullets
4. Will be to include the use of the program EpiInfo from the Center of Disease Control (CDC) for analyses and GIS data to see the distribution of health disparities in the communities. From the CDC website: Epi Info™ is flexible, scalable, and free while enabling data collection, advanced statistical analyses, and geographic information system (GIS) mapping capability.
5. After atmospheric studies are done and health disparities-social justice better understood in this community we will move to perform studies on the deposition of atmospheric pollutants. In a future study, dry or wet deposition of the pollutants will be study through water and soil quality analysis, using techniques such as ion and gas chromatography (IC/GC), high performance liquid chromatography (HPLC) and mass spectrometry (MS), among others. (Over here is not only wet/dry deposition but also dispersion)

(e): Role of students: The big advantage of this research is that students at all levels can be engaged in research questions 1 – 4; for research question 5 we will focus on students above sophomore level (students with general chemistry completed).(f): Typical conferences students will attend are: 1.American Chemical Society (ACS) National meeting, 2. Health Disparities Conference, 3.Minority Health & Health Disparities Conference, 4. Air & Waste Management Association

Humberto Gallegos, Engineering and Technologies

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

(a) Purpose/Content

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.

(b) Research questions or hypotheses

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.

(c) 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).

(d) Analytic process

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.

(e) Roles students can play at sophomore, junior, and senior levels

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.

(f) Conferences typically attended

Research Institutions:

- University of California, Irvine (UCI), Hydrodynamic Modeling Group
- Harvey Mudd College, Southern California Conference for Undergraduate Research

Conferences:

- Los Angeles County Department of Public Works, Geographic Information Systems (GIS) Day

Professional Organizations:

-Metropolitan Los Angeles Branch, American Society of Civil Engineers (ASCE)

Community Colleges:

-Engineering Club, East Los Angeles College (ELAC)

-ELAC's Undergraduate Research Conference

(g) Other information pertinent to students selecting your research experience.

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.

(h) A few key words for your research that can be used for students to find research aligned with their interests.

-Bio-engineering design methods

-Dry weather runoff

-Heal the Bay's 2014-2015 Annual Beach Report Card

-Storm drain runoff

-Poorest dry weather water quality in California

-High risk of adverse health effects such as contracting gastrointestinal illnesses

-Flood control channels

Eileen Ie, Social Sciences

Research Description:

a. Purpose: To explore the ways in which socioeconomic factors, such as family income and parental education, may have an effect on university choice among transferring community college students.

b. Research question/hypotheses: To what extent does socioeconomic status affects the type of universities transferring community college students apply to?

c. Method: In depth interviews and survey questionnaires

d. Analytic process: Qualitative analysis and basic quantitative analysis

e. Student roles: Student will design survey instrument, pilot the questionnaire, collect preliminary data, and transcribe interviews.

f. Conferences: Preliminary data will be presented at the California Sociological Association annual conference

Dezzie Prewitt, Social Sciences

(a) Purpose/context

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.

(b) Research Questions

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?

(c) Method

This researcher will conduct a correlation study that relies on quantitative methods to answer the six research questions above.

(d) Analytic Process

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).

(e) Roles students can play at the following levels:

	Sophomore	Junior	Senior
Design of Research Questions	<u>Number 1 and 2</u> Frequency Distribution	<u>Number 3 and 4</u> Significant Difference	<u>Number 5 and 6</u> Correlation versus Causation
Number of Variables	One	Two	Three or more
Description of Statistical Analysis display using plot, Magnitude	Analysis of appropriate data	Hypothesis testing, Scatter	Hypothesis testing with ANOVA,
	Correlation matrix, mode, median, and type of Multiple mean, Histogram, relationship regression on the Pie charts, and Pearson's (r) dependent Bar charts based correlation, and variable life on regional areas Linear regression expectancy		

(f) Conferences Typically Attended

-CCC Online Education Initiative Professional Development Conference -Ronald E. McNair Scholars Program National Research Conference

(g) Other Information Pertinent to Students

-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

Luis Soto-Ortiz, Mathematics

The outcomes of clinical trials involving cancer treatments suggest that a promising approach to treat cancer is through a combination therapy. The purpose of the project is to use mathematical modeling based on ODEs to simulate cancer treatments to identify the monotherapies that have the greatest potential to synergize when given in combination, leading to an enhanced anti-tumor therapeutic effect. An open question in oncology is to what extent immunosuppression, tumor angiogenesis, the size of the tumor at the start of treatment, and the presence of resistant tumor cells determine whether a treatment will fail to eliminate a tumor. Mathematical modeling can help to predict the types of treatment, dose and frequency that can maximize the potential of eliminating a tumor, while also minimizing the required number of injections and side effects.

The hypothesis that will be tested is whether treatments that disrupt distinct signaling pathways can eliminate a tumor in a shorter amount of time compared to a monotherapy. Testing this hypothesis is not a trivial matter, since there are a large number of treatments that are currently under investigation. The proposed mathematical model will simulate treatments that involve monoclonal antibodies, tyrosine kinase receptor inhibitors, adoptive cell transfer as well as chemotherapy drugs. To test the aforementioned hypothesis, the model will include ODEs that simulate the concentrations of anti-tumor immune cells (CD8+ cytotoxic T lymphocytes, natural killer cells, CD4+ Th1 helper T cells, and M1 macrophages), pro-tumor cells (regulatory T cells, CD4+ Th2 helper T cells, and M2 macrophages), as well as various cytokines. Initially, the model will consider deterministic, mean-field assumptions. Over time, the model will be expanded to consider spatial and stochastic effects, making its predictions more accurate and reliable.

The analytic process will involve the derivation of each model equation based on the biological aspects of tumor and immune system interactions. By varying the treatment dose and frequency, an optimal dose and frequency that maximizes the potential for tumor elimination, and that minimizes the total number of required injections, will be identified.

Students at the sophomore level can contribute by undertaking a thorough literature review to identify the most promising treatments. These students will contribute by looking up the safe dose and frequency for each distinct monotherapy, as well as the documented side effects. Students at the junior level can help with the expansion and coding of the model, especially if they already possess basic programming skills. Students at the senior level, especially mathematics majors, will undertake a stability analysis of the model and will generate phase portraits that illustrate the stability of the system under distinct treatment regimes.

The results of this research collaboration will be presented at a national conference such as SACNAS, BMES or AACR. I have already published preliminary results in the Journal of Theoretical Biology in April 2016 and have presented a poster on age-specific cancer incidence at the annual meeting of the American Association for Cancer Research.

Keywords: mathematical modeling; tumor growth; immunosuppression; angiogenesis; immune system;

Kashif Powell, Communication, Studies

Purpose/Context

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)

"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.

Analytic Process

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.

Roles Students Can Play

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 paper to be presented at an appropriate national conference.

Conferences Typically Attended

National Communication Association Annual Conference

National Council for Black Studies

Other Information Pertinent to Students

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.

Los Angeles Mission College

Par Mohammadian, Biology and Physiology

Dress, gender, age, and ethnic background of professors and students' perceptions majoring in STEM and Allied Health.

Many factors, such as teaching style and class size, influence student evaluation, performance, and learning. The impact of dress, gender, and ethnic background of professors on students' perceptions have not been very well examined in higher education, especially in STEM and Allied Health majors. However, It is known that dress code may affect customer relations and/or employee morale. A study has shown that students majoring in business rate professors' trustworthiness and expertise differently based on their style of dress, gender, and forms of address (Sebastian and Bristow, 2008). Another study identified that students, mostly enrolled in psychology courses, rate male professors as more effective while the quiz grades were higher in older female professors (Joye and Wilson, 2015). The impact of professional attire was also considered as important in both business and non-business students (Carr et. al, 2010).

The purpose of this study is to examine the perceptions (knowledge, likeability, trustworthiness) of students majoring in STEM and Allied health fields in relation to faculty style of dress, gender, age, and ethnic background. Surveys will be prepared and distributed to the STEM and Allied health students. The CSUN IRB approved surveys will include pictures of faculty with different dress styles, gender, age, and ethnic background. This study will also consider student participants with various dress style, gender, age, and ethnic background. Statistical analysis will include ANOVA (dress style x knowledge, likeability, trustworthiness), (gender x knowledge, likeability, trustworthiness), (age x knowledge, likeability, trustworthiness), and (ethnic background x knowledge, likeability, trustworthiness).

Keywords: Student perception, age, gender, ethnic background, dress style, STEM, Allied Health.

References:

Carr, D., Davies, T., and Lavin, A. (2010) The impact of instructor attire on college student satisfaction. *College Students Journal*, 44, 1, 101-111.

Joye, S.W. and Wilson, J.H. (2015) Professor Age and Gender Affect Student Perceptions and Grades, *Journal of the Scholarship of Teaching and Learning*, Vol. 15, No. 4, August, 2015, pp.126-138.

Sebastian, R.J. and Bristow, D. (2008). Formal or Informal? The impact of Dress and Forms of Address on Business Students' Perceptions of Professors. *Journal of Education for Business*, 83(4), 196-201.

Student's Role:

PODER students will assist in collecting related literature, designing the surveys, preparing the IRB application, recruiting student participants, distributing/collecting surveys to/from the students, preparing the data for statistical analysis, and writing an abstract for publication.

Conferences typically attended:

CALIFORNIA SCIENCE EDUCATION CONFERENCE

http://www.cascience.org/csta/conf_home.asp

COMMUNITY COLLEGE CONFERENCES:

<http://www.cca4me.org/Conferences.asp>

AMERICAN PHYSIOLOGICAL SOCIETY:

[American Physiological Society Conferences](#)

Margarethe Cooper, Life Sciences

Purpose/Context: Identification and characterization of the sporulation mechanisms of *Sporosarcina ureae*, as a model for understanding sporulation in major spore-forming disease-causing bacteria (pathogens) such as *Clostridium difficile*, *Clostridium perfringens*, and *Bacillus anthracis*. *Sporosarcina ureae* is a non-disease-causing (non-pathogenic) aerobic, Gram-positive, spore-forming bacterium commonly isolated from the soil in association with human and dog activity. Spore-forming pathogenic bacteria such as *Clostridium difficile* are extremely environmentally hardy and very difficult to eliminate in hospitals and other health care settings, and thus result in numerous healthcare-associated infections. Additionally, major spore-forming pathogens like *Clostridium difficile*, *Clostridium perfringens*, and *Bacillus anthracis* cause potentially deadly disease in humans and animals; therefore, they are difficult and dangerous to work with in the laboratory. However, we still need to understand the sporulation mechanisms of these pathogens to create treatment and prevention methods, therefore using *Sporosarcina* as a laboratory model we can gain a better understanding about these organisms without needing to work directly with them in the laboratory.

Research Question: What genes does *Sporosarcina ureae* utilize to sporulate, and how do they relate to genes and known sporulation genes in major spore-forming pathogens? a. Methods.

After identification of a potential sporulation gene in *Sporosarcina*, students will knockout the gene using a variety of molecular biology techniques, and confirm the inactivation of the gene by polymerase chain reaction (PCR). Students will then induce the mutant and wild-type strains to sporulate, and the number of spores will be quantified. b. Analysis.

Students will perform bioinformatics analysis on the *Sporosarcina* genomes to determine potential sporulation genes, and determine how closely they are related to other spore-forming pathogens' genes. Students will learn to confirm site-specific mutagenesis using CR, and how to microscopically and quantitatively determine if there is a variation in sporulation ability between the mutant and wild-type strains of *Sporosarcina*, confirming the role of the targeted gene in sporulation.

Student roles:

Sophomores: Will begin performing basic laboratory and microbiological techniques and learn to make different types of microbiological media. Students will perform several molecular biology techniques including but not limited to PCR and site-specific mutagenesis, and several different microbiological assays to examine the targeted genes role in sporulation. Students will also perform bioinformatic analysis of gene sequences, and determine how closely related genes across different genera.

Conferences:

The conferences that Dr. Cooper attends including an in-state conference: American Society for Microbiology (ASM) Southern California Branch; Annual Meeting and national conferences: ASM General Meeting, Anaerobe Society of the Americas Annual Meeting.

Other Information:

My husband is an Assistant Professor of Biology at CSUN, who conducts research on the epidemiology, pathogenesis, and genomics of foodborne pathogens, and is also a faculty mentor for the NIH BUILD PODER program. Therefore, students will have the opportunity to conduct research in a CSUN laboratory prior to transferring, and will have the option to transfer directly into a BUILD PODER laboratory that they have become familiar with prior to attending CSUN.

Shannon DeVaney, Life Science

As an evolutionary biologist and ecologist, I offer students the opportunity to study how human health is affected by interactions with other species. 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. 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. There may be possibilities in the future to perform specimenbased research on the effects of pollutants on food dishes. Possible conferences include the Southwestern Association of Naturalists and the Society for Integrative and Comparative Biology.

Jennifer Moses, Psychology

PROJECT ONE

- a) The first 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, those who have strong social motivations. Online settings may not satisfy the social motives of would-be volunteers. b) The specific questions that students might ask around this topic are broad; however, the guiding questions should involve findings ways of increasing online helping behaviors.
- c) In the past, research in this 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).
- d) 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.

PROJECT TWO

The second project looks the problem of intimate partner violence. Those who are victims of violence often suffer psychological effects far beyond any physical damage. Exploring how and why victims develop ongoing problems is an important societal concern.

- b) The specific questions that students might ask around this topic are broad; however, the guiding questions should involve determining how violence leads to increased risk for psychological disorders.
- c) In the past, research in this domain has employed medium-scale face-to-face survey methodology, as well as targeted focus groups.
- d) Analytic processes used in the past on similar projects have included multivariate ANOVA, multiple regression, structural equation modeling, as well as the Actor-Partner Interaction Model approach to dyadic research. The specific analyses that will be used in the future will be dependent on the specifics of the data collected.
- e) In that I am at a Community College, any mentees would be sophomores. They would 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.
- f) 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 International Society for Political Psychology (ISPP).

Los Angeles Valley College

Chander Arora, Biology

Purpose: To explore gender-specific disparities in obesity of US born and foreign born youth.

Research Question: Identifying factors of obesity that are gender and region specific

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.

Analytic process: 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.

Roles students can play: 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: CSUPERB, Society of Reproductive Investigators (SRI), American Heart Association.

Other Information: 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.

Funding: To be explored from American Heart Association, government and private agencies.

Erika Brockman, Biology; Pamela Byrd-Williams, Biology

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.

Potential projects include:

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.

Skills students will acquire include:

- 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)

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. As part of the analytic process, students will be required to review scientific literature as it relates to the projects and meet with mentors to discuss data interpretation and progress of the project. Students at any level can participate.

Conferences may include American Society of Nutrition, American Cancer Society and SACNAS.

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. We 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.

Ruby Christian-Brougham, Psychology

My research focuses on the relationship between language acquisition and the socio-emotional development of children between the ages of birth – 3.5 years. 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. 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. 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. If I am an NIH BUILD PODER mentor, I plan to apply for an NIH pilot project grant.

Gary Huff, Family Resource Center

My research focuses on the connection between the quality and quantity of language exposure between fathers or other male primary caregivers, and very young children. Through the lens of Critical Race Theory, this project will identify elements of society, culture and race that influence early language exposure and acquisitions techniques that occur between father and child. Students participating in this project will have access to the LAVD Family Resource Center's infant and toddler lab. In this environment, caregivers and their children ages birth-2.5 years attend weekly play sessions. Working as part of a research team, students' responsibilities will include review of the literature, observation, conducting interviews, data collection/analysis, and presenting at conferences. Findings will assist in assessing various strategies to be used in the implementation of an emergent literacy program for fathers.

Marni Roosevelt, Family Resource Center

My research focuses on the family needs of community college student-parents with young children (birth-8 years). From my work in the Los Angeles Valley College Family Resource Center with community college student-parents, I know that they have challenges beyond those of the typical college student that greatly influences their relationship with their children. Using Critical Race Theory as a lens, students will research student-parent's family challenges, attachment and attunement issues, and existing model programs with support strategies for this group. In addition, they will analyze and determine which strategies can be implemented by the LAVC Family Resource Center. Data will be collected and evaluated to determine the outcomes and success.

Veronica Getskow, Child Development

Research Focus: Emotional Health of Young Children

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?

This research question 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.

Student Research Participation: 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.

Conference and Publication Opportunities: Student researchers will attend and present at local conferences such as: STEM and CAEYC conferences sharing the findings. Writing up the findings to submit to various early childhood publications such as Child Care Information Exchange is also an option. Elmida:

Debby Pourroy, Child Development

Research Focus: 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. My research interest focuses on the work life balance of effective child care providers.

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 Participation: 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.

Conference Attendance: Student researchers will participate in a CAEYC conference workshop or presentation to the LA PEACH organization on the findings of the project.

Study Outcomes: The missing training component is the goal of this study. The instructional component will be made available.

Pasadena City College

Dr. Jared Ashcroft, Chemistry, Bio and Nanotechnology, Early Career Undergraduate Research Experience (eCURE)

The Early Career Undergraduate Research Experience (eCURE) is a program at Pasadena City College (PCC) designed to give underrepresented students an undergraduate research experience in the natural or physical sciences. Through this program, we have developed collaborative and interdisciplinary research projects to provide underrepresented students with research experience at the onset of their scientific careers to better inform their decision to pursue a career in science. This unique experience inspires enthusiasm for scientific research by introducing students to cutting edge projects with a broader impact in terms of energy, the environment and emerging scientific technologies in drug diagnostics and therapeutics. Current eCURE research projects utilize synthetic and characterization bio/nanotechnology techniques.

It is proposed that we will study the synthesis and characterization of nanomaterials made from graphene oxide and inorganic nanoparticles, such as silver and gold nanoparticles. These materials have been shown to be used in biomedical, solar and water purification applications. We will develop novel graphene oxide conjugates to inorganic nanoparticles and study their cellular uptake, as well as their use in diagnostic imaging. We will also study graphene oxide's use as a water purification material and its use in solar energy. The nanoparticle conjugates will be developed through covalent linkage using the organic cross linkers EDC and NHS.

Silver nanoparticle graphene oxide conjugates have been used in protein detection and as a DNA nanocomposite film. Non-conjugated silver and gold nanoparticles have also been used as biosensors. The new graphene oxide-gold nanoparticle conjugates will be studied for their biosensing capabilities. Initial work will be to develop a water solubilized conjugate that is stable at various temperatures and pH.

A second application, water purification using graphene oxide based materials will also be studied. Currently, carbon nanotubes have been shown to improve water purification techniques. Recent computer simulations have shown graphene oxide to have a high potential for water purification as well covalently linking graphene oxide to one another, thus making a graphene oxide framework. We will covalently link the graphene oxide particles to one another and study their water purification properties.

Lastly, the photocatalytic capabilities of the graphene oxide conjugates will be studied using the Solar Energy Activity Laboratory kit from the California Institute of technology. The novel nanomaterials will be studied in conjunction with metal oxides and compare the photocatalytic ability of the graphene oxide materials and metal oxides.

Pasadena City College students will assist in all synthesis, characterization and analysis aspects of these projects. They will be trained in the use of Scanning Electron, Atomic Force Microscopy and Ultraviolet Spectroscopy, as well as be trained in organic synthetic and purification techniques. They will begin their research during their General Chemistry course and be expected to continue with the research project for one year and submit applications to Poster on the Hill and the national Conference for Undergraduate Research (NCUR).

Grants Currently Applying for: NSF for developing the Center for Nanoscale Catalysis with UC Riverside.

Veronica Jaramillo, Chemistry Early Career Undergraduate Research Experience (eCURE)-Water Project

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. It is proposed that students will be more engaged in the issue by hands on testing of their own tap water. 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. 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. They 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.