

**Saint Mary's College of California**  
**Faculty Research Grants, Cohort 2**

*For Projects Taking Place in 2016-17*

*Approved December 2015*

**ABSTRACTS**

**David Chambers**

Assistant Professor, Biology

“Tread That Water Line: Understanding Potential Dynamics Between Amphibian Phenotype Plasticity and Disease Susceptibility”

Amphibian populations worldwide are disappearing at alarming rates. Because of their importance to ecosystem long-term sustainability, understanding the dynamics behind amphibian declines is absolutely critical. Research in my laboratory, fueled by undergraduate participation, has always focused on these conservation issues. The purpose of this proposed project is to examine amphibian phenotypic plasticity and subsequent disease susceptibility consequences of such a remarkable physiological phenomenon. Phenotypic plasticity, generally speaking, is a physiological tool that enables larval amphibians (mostly frogs and toads) to radically accelerate development leading towards metamorphosis. The fuel behind such an energetically expensive acceleration (in some instances, phenotypic plasticity can cut developmental time in half) is hormonally based - specifically, corticosterone. Corticosterone is a glucocorticoid, meaning it is a steroid hormone with a purpose of mobilizing stored glucose for fuel. However, one horrific drawback to chronically elevated corticosterone is immune system suppression. With the direct assistance of undergraduate students, this project will attempt to understand the dynamics between phenotypic plasticity and two common amphibian diseases directly linked to population declines - parasitic trematode infection (*Echinostoma* or *Ribeiroia*) and fungal infection (*Batrachochytrium dendrobatidis*). Our highly interdisciplinary and integrative approach will allow us to experimentally tease out any relationships to phenotypic plasticity and increased disease susceptibility. Ideally, our work will be extrapolated up to the conservation issues facing amphibian populations. Because I'm a new faculty member at Saint Mary's, nothing thrills me more than getting an early opportunity to get students involved in transformative (both for the discipline and for their personal enrichment) research.

**Chi-An Emhoff**

Assistant Professor, Kinesiology

“Effect of peppermint oil supplementation on ventilation, metabolic health, and exercise performance”

Peppermint oil (*mentha piperita*) has been shown to have cooling effects in animals and humans, as well as beneficial influences on pulmonary function tests possibly due to bronchodilatory mechanisms. In a recent experiment conducted in our Human Performance Lab, undergraduate student David Salas and I found that a single supplementation of one milliliter of peppermint oil raised the ventilatory threshold in endurance-trained and moderately active men. These findings were significant, because the ventilatory threshold is widely known to have high correlation with an athlete's fastest tolerable speed during an endurance event. If peppermint oil supplementation can elevate an individual's ventilatory threshold, then perhaps it may also directly contribute to faster race times. In this grant application, I propose a research program that creates opportunities for students to investigate whether peppermint oil supplementation may acutely contribute to improved endurance performance in both men and women, and to elucidate the possible mechanisms behind our observations.

**Peter Freund**

Professor, Art and Art History

“Iran/USA”

IRAN|USA (2012-15) is a program of three multiple-projection works of video art created by Peter Freund. The work focuses on historical overlaps between Iran and the United States addressed from the vantage point of political fantasy and explored through experimental artistic form. The 2016 Faculty Research Grant will support the production of an exhibition catalogue that will bridge Freund's recent solo exhibition of IRAN|USA at the Sazmanab Center for Contemporary Art in Tehran, Iran (August 2015) and his forthcoming presentation of the program at the SMC Museum of Art (February-April 2017). The catalogue publication will include visual extracts from the installations, photo-documentation of the Iran exhibition as well as interviews, essays, an extended transcription of the Skype dialogue conducted between the artist and the Sazmanab audience, and additional commentaries that contextualize the work. The catalogue will be made available at the SMC Museum exhibition and associated events.

### **Dana Herrera**

Associate Professor, Anthropology

"#OFW: Technology, Identity, and the Filipino Diaspora"

"#OFW: Technology, Identity, and the Filipino Diaspora" uses insights from anthropological and economic theory to analyze how overseas Filipino workers (OFW) challenge dominant discourses about their everyday lives through the use of new technologies. The Philippine government offers specific narratives of the OFW as modern day national heroes who embody the ideal citizen; the state is particular adept at deliberately manipulating media propaganda such as television and print advertisements. Filipino workers are indoctrinated to conflate good citizenship and nationalism with working abroad and maintaining economic, social, familial, and political connections to the country. The powerful discourse of the OFW as "heroes" and "citizens" reveals a government ideology that equates their ability to work and remit funds with a patriotism and national identity. This project places at the center of its inquiry the words and photos of overseas Filipino workers and explores how the emergence of Instagram and Bitcoin technologies interplay with these government discourses.

### **Rebecca Jabbour**

Associate Professor, Biology

"Geographic Variation in Eastern Lowland Gorilla (*Gorilla beringei graueri*) Skeletons and Its Relationship to Ecology and Evolutionary History"

Variation among gorillas from different regions of Africa has received increased attention over recent decades from primatologists, conservationists, and paleontologists. Studies of geographic variation in DNA, skulls, and teeth have led to suggestions of new species and subspecies, but differences in the limb bone skeletons have received less attention. Because variation in limb bones could reflect behavioral differences such as frequencies of tree-climbing or quadrupedal walking, limb bones could be informative regarding variation in ecology and evolutionary adaptations. This project will focus on variation among populations of eastern lowland gorilla (*Gorilla beringei graueri*), a subspecies that actually occupies a patchwork of highland and lowland habitats. Highland habitats are more sparsely forested, probably leading to differences between highland and lowland populations in how much they climb trees or travel terrestrially. These contrasts may have been greater during dry periods of the Pleistocene. Variation among populations in limb bone features could tell us about gorilla evolutionary history in eastern Africa and about how the skeleton reflects ape ecology. This work will build on my previous research showing intriguing patterns of geographic variation within this subspecies, based on a small sample. Museum collections in Belgium and Austria include specimens that will significantly expand my sample size and allow me (with SMC students) to better address questions about *G. b. graueri* variation and evolution. Funding is requested for travel to three museums in Europe during my proposed Spring 2017 sabbatical and summer salary while I analyze data and write an article based on results.

**Emily Klein**

Associate Professor, English

“Performing the Family Dream House: Space, Ritual, and Images of Home & Performance in a Militarized Culture”

The Saint Mary’s College Faculty Research Grant supports my work on two scholarly anthologies during the summer and fall of 2016. The first project, *Performing the Family Dream House: Space, Ritual, and Images of Home*, is part of a collaborative endeavor with theatre scholars Jennifer-Scott Mobley (East Carolina University) and Jill Stevenson (Marymount Manhattan College). Our co-edited anthology explores performances in, of, and around the home from a variety of disciplinary perspectives, spanning cultural contexts, historical periods, and subjects of study. In addition to my role as co-editor, I am also the author of one of our 17 chapters, “Intimate Cartography/Won't You Be My Neighbor?: Pittsburgh’s Squonk Opera and San Francisco’s Antenna Theatre perform the dynamic hometown.”

My work on a second project, *Performance in a Militarized Culture*, edited by Professors Sara Brady and Lindsay Mantoan is part of a collection with its initial proposal currently under consideration by Routledge. The volume’s editors have invited me to contribute a chapter, tentatively titled “The Kids Are Not Alright: Adaptation and apathy in militarized post-political dystopias.” After presenting my preliminary research for this project at the Association for Theatre in Higher Education conference this past summer, I will be spending 2016 expanding and revising a full chapter draft for submission.

The Faculty Research Grant will support my research, writing, editorial work, manuscript proofing, indexing, and permissions acquisition on both of these projects. It also covers the costs of research travel to Pittsburgh, PA to do archival work and performance reception study.

**Mark Lingwood**

Assistant Professor, Chemistry

“Construction of a dynamic nuclear polarization instrument for characterizing & improving immobilized radicals”

Magnetic resonance imaging (MRI) is a ubiquitous method for medical imaging. While MRI techniques are very versatile, they can suffer from low sensitivity and lack of inherent contrast between the object of interest and the background signal. Previously, I used a technique called dynamic nuclear polarization (DNP) to increase the amount of signal and contrast available from MRI. DNP utilizes the interaction between the hydrogen nuclei in water and an immobilized free radical to enhance the magnetic resonance signal of water, which is then injected into the sample/subject of interest in the MRI. This method provides unique image contrast without the use of external contrast agents.

Recently I have begun to develop DNP-MRI at ultra-low magnetic field strengths in collaboration with Prof. Matthew Rosen at the Martinos Center for Biomedical Imaging. In this work, I have continued to develop the chemistry required to optimally attach the free radicals to the immobilizing beads. The DNP behavior of immobilized radicals is markedly different at ultra-low fields, and further work must be done to characterize these radicals and rationally design improved immobilized radicals.

I propose to construct a small DNP system at Saint Mary’s that can fully characterize immobilized radicals and aid in the design of improved species. I will use the newly-improved immobilized radicals to conduct DNP-MRI experiments in collaboration with Prof. Rosen.

This work will aid DNP research and further demonstrate the information available from DNP-MRI and ultra-low field MRI, potentially leading to MRI with increased clinical utility and reduced cost.

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**Rebecca Proehl**

Professor, Educational Leadership

**Co-researchers: Rebecca Anguiano, Desiree Braganza, and Suzy Thomas**

“DeMarillac Academy: Educating Children of Promise”

During the 2014-15 academic year, a team of KSOE faculty researchers conducted a study at De Marillac Academy (DMA), a Lasallian middle school in the Tenderloin District in San Francisco, CA to identify the non-cognitive skills and attributes the graduates developed, enabling them to succeed in high school and beyond at a greater rate than their peers in public schools. During this research, it became evident that this small San Miguel school with its shared mission and extraordinary commitment to its students is a special place, worthy of additional study. To this end, this grant, if approved, would help support additional research, leading to a book publication and other possible avenues for publication.

We propose a joint project between four KSOE faculty members and De Marillac's current President and Vice President for Mission Effectiveness, who enthusiastically support this study. The research (and book) itself will have four components; we will:

- Thoroughly familiarize ourselves with the San Miguel education model, including a trip to Providence, RI, the home of the first San Miguel school;
- Interview key organizational leaders and review documents to chronicle the organizational development and change process employed at the school in the past three years;
- Summarize the findings from the initial study on non-cognitive skills, which included interviews with DMA leaders, staff, teachers, parents, and graduates; and
- Conduct interviews with DMA parents and children to tell the narrative stories of the individuals whose lives have been touched and transformed by their educational experience.

**María Luisa Ruiz**

Associate Professor, Spanish

“Hits & Misses: Gender, Beauty Queens & Violence in Narratives of Narcotráfico”

Much has been written—both in the popular press and in scholarly literature—on the Mexican drug trade. For example, sociological studies discuss the affects of violence on the relationship between the state and

society (Dammert 2012), histories trace the development of drug trafficking in Mexico (and the role of the U.S in that process) (Buollosa and Wallace 2015) and criminologists trace the power of transnational cartels around the world (Bunker and Sullivan (2014). Less consideration has been given to the ways in which the drug trade and 'narcoviolence' have influenced and shaped, over the past decade, popular culture in Mexico and more recently, in the U.S. Even less attention has been paid to representation of women in those narratives. Indeed, very little scholarly work in either Spanish or English that analyzes, from cultural studies and feminist studies lenses, the ways in which Mexican women in the world of the Mexican drug trade are represented. This seems a bit odd considering that it seems as though narratives about Mexico, the drug trade and violence are as ubiquitous in the U.S. as are mariachis and misunderstood celebrations like *Cinco de Mayo*. For example, movies like Oliver Stone's *Savages*, the recent *Sicario*, and television shows like Netflix's recent *Narco* shape U.S. audience perceptions about Mexico. Similarly, the numerous number of Spanish language television programs, movies and novels about the drug trade shape narratives about the drug trade for Spanish-speaking communities. These modes of cultural production, have become, what Mexican author Jorge Volpi identifies as "the new paradigm" of Latin American literature and culture in which "now there are drug dealers and corrupt police where before realism prevailed, a new hyperrealism has emerged, fascinated with portraying the uses and customs of these new anti-heroes" (Volpi in Polit Dueñas 3). The notorious antiheroes serve to put a 'narcomacho' cultural persona front and center of popular culture. The recently escaped El Chapo Guzmán is just one example of the masculine narratives of narcotraffic that often portray male narcos as modern day Robin Hoods.

Can there be a space for women in these stories? Because narcoculture is associated with stereotypical male swagger and violence, women's active participation *seem* rare and, stories about them often highlight their femininity. Best-selling novels, like Jorge Franco's *Rosario Tijeras* and Arturo Pérez Reverte's massive hit *La riena del sur* and films like Gerardo Naranjo's *Miss Bala* portray female characters as 'black widows', 'dolls' and 'bosses'. My project, then, breaks new ground among those who write and research this topic in English because I focus on Spanish language news stories, films, crónicas and novels published in the last 15 years that narrate and represent Mexican women in the world of the Mexican drug trade. Moreover, with this project I will join a select group of scholars who are examining the representation of Mexican women from a feminist cultural studies perspective. I also believe that my position as a bicultural, transborder, and bilingual Latina academic in the United States gives me a unique perspective on this topic; my analysis is informed by both my training in U.S. academe and the ways in which my extended family has been touched by some of the very real issues addressed in the films and literature I will be researching.

### **Michael Viola**

Assistant Professor, Justice, Community and Leadership

"Filipino/a Critical Theory: Filipino/a American Oral Histories and the Farm Workers Movement in California"

Commemorating the 50-year anniversary of the United Farm Workers of America (UFW) 1965 Grape Strike in California, my research project entitled, Filipino/a Critical Theory: Filipino American Oral Histories and the Farm Workers Movement in California places Filipino/a American labor activism at the center of analysis. The project analyzes the strengths and weaknesses of a farm workers movement from the standpoint of Filipino immigrants as well as analyzes the implications for contemporary social justice movements. Furthermore, my project forwards a culturally relevant and praxis-promoting theory – what I call Filipino/a Critical (FilCrit) Theory - positioned to theorize and challenge the social injustices or racism and labor exploitation that continue to impede the life chances of Filipino/as in the United States and throughout a global diaspora.