

2017 WSU Undergraduate Research and Creative Projects Conference Awardees for Exceptional Presentations

Last name	First name	Presentation Format	Title	Faculty Mentor	Summary
Anderson	Ashleigh	Poster	Emergency Department Utilization and Birth Outcomes	Dawn Misra	Infant mortality rates in the city of Detroit are extremely high when compared with national rates. Knowing that low birthweight and preterm birth are main predictors of infant mortality rates, this study evaluated how they and along with other factors relate to Emergency Department utilization during prenatal care. This research was apart of an ongoing study being conducted through Henry Ford Health System under the guidance of Dr. Martina Caldwell and Dr. Dawn Misra. Through primary data collection, retrospective chart review, and preliminary data analysis, a few findings were deemed significant for future potential obstetrical and neonatal intervention.
Berjaoui	Abbass	Poster	Health Disparities among Middle Eastern Immigrants in the United States: Results from the 2006-2016 National Health Interview Survey	Wassim Tarraf	Most observational epidemiological studies examining health outcomes combine Arab Americans (AA), a minority group with distinct health risks, with Non-Hispanic Whites (NHW). The lack of separate classification can mask existing health disparities among Arab Americans and prevent evidence-based health interventions that could properly address the health and healthcare needs of the community. The National Health Interview Survey (NHIS) provides a region of birth question with a Middle Eastern classification. Using NHIS data from 2006-2016, I examined differences in health outcomes between middle eastern immigrants (including Arab Americans) and white immigrants from Europe.
Chahrour	Ibrahim	Poster	Phase Portraits and Stability Analysis of Nonlinear Differential Equations	Gang George Yin	Differential equations are equations that relate a function to its derivative(s). The vast majority of differential equations don't have simple solutions and are extremely sensitive to initial conditions. To study these equations, we plot the function's derivative versus the function itself. This provides a method of finding points from which either all trajectories are repelled, attracted, or trapped around their neighborhood. In this research we focus on physical systems such as the damped oscillators and study their equilibrium points.

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Johnson	Ashley	Poster	Integration of dental microwear texture analysis into studies of mandibular shape in three prehistoric populations in Peru	Julie Lesnik	Microwear signatures on the first and second molars can provide insight into the types of diets populations are consuming. These signatures in comparison to craniometric data can indicate a relationship between types of diets and jaw size among differing populations. My research is focused on three sites in Peru. The study compares Huaca Prieta, where agriculture is not fully developed (Preceramic Period, 3100-1880 BC) to Nasca (Early Intermediate Period (EIP), 1-800 AD), and Hualcayán (EIP, 1-600 AD), who's agriculture is fully developed, in order to test the hypothesis that Huaca Prieta's population will reflect a larger jaw size in relationship to their less agricultural diet.
Jose	Albert	Oral	Comparing Detroit Ambulance Response Times with Those of a Novel Unmanned Humanitarian Vehicle (Ambulance Drone) in Emergent Overdose Situations	Amar Basu	This research project aims to investigate the viability of using drones to get to the scene of an emergency opioid overdose faster than traditional first responders in order to deliver pre-hospital interventions, namely Naloxone (a medication that can be safely given, even by lay people, to reverse the effects of overdose within a matter of minutes), that can be rapidly administered by bystanders, thus decreasing the amount of time the patient goes without treatment and theoretically leading to better patient outcomes. In other words, this undertaking involves surveying the efficacy of a novel, "aerial telemedical" model by looking at its theoretical application in overdose situations.
Kahil	Ali	Poster	General Henri Mathias Berthelot: Savior of Romania and Founder of Greater Romania	Aeron Retish	General Henri Mathias Berthelot: Savior of Romania and Founder of Greater Romania is an inquiry into how the French military mission under the General Henri Mathias Berthelot impacted the Eastern Front as well as Romania's post-WWI politics. In 1918, Romania achieved its national ideal of uniting most Romanian speaking country under one flag. This achievement was a direct result of its involvement during the Great War and the French intervention.

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Karra	Ramasahitya	Poster	Fetal Brain Volume as a predictor of pre-term birth	Moriah Thomason	Recent research has indicated that brain size in premature infants is significantly smaller than in term-born infants. We were interested in examining this phenomenon in regards to fetal brain volumes of pre-term and term-born infants to see whether this finding was still robust. We utilized MRI to scan the fetal brain in utero, manually segmented the brain from surrounding maternal tissue, and calculated brain volume based on the mask size. We controlled for gender and also the gestational age at scan by matching every pre-term subject with a control term-born subject. Performing a statistical analysis revealed that there was no significant relationship between brain volume and gestational age at birth. We would need further investigation with more participants to reinforce this relationship on a larger scale.
Kutschman	Kenneth	Oral	Synthesis of Sulfur-Containing Cryptands via Thiol-Ene Photochemical Reactions	Matthew J Allen	Contrast agents in magnetic resonance imaging most commonly use the element gadolinium. Although useful for many purposes including anatomical imaging, new agents are needed for molecular imaging. Europium offers a potential alternative to gadolinium for imaging of oxygen content. Europium-based agents respond to oxygen by losing an electron and turning off contrast enhancement. My research aims to synthesize compounds called cryptands which bind to europium and to influence the response to oxygen. The cryptands that I am synthesizing are sulfur-based due to the ability of sulfur to stabilize europium. By using a photochemical reaction called the thiol-ene reaction, I aim to efficiently synthesize sulfur-based cryptands that can be used to stabilize europium-based agents.

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Luyet	Chloe	Poster	Predicting the Environmental Fate of Fluorinated Surfactants	Jeffrey Potoff	Fluorinated surfactants have many consumer applications, such as food packaging coatings, kitchenware coatings, and fabric protection. When oxidized in the environment, they can form perfluorocarboxylic acids, among the most common being perfluorooctanoic acid (PFOA). The strength of the C-F bond contributes to the incredible stability of fluorinated surfactants, making them extremely resistant to biodegradation. Insufficient information is known about the persistence and biological activity of these compounds in the environment. Using computer simulations to understand the physical properties of these molecules will promote the development of alternative surfactants that could serve the same industrial applications, with substantially lower potential for bioaccumulation.
Mutebi	Cedric	Poster	Would You Say "Yes" to an HIV Test?	Phillip Levy	With 1.2 million people in the United States living with HIV and 1 in 7 of them unaware of their status, HIV is a large public health problem. A strategy introduced by the Centers for Disease Control to tackle this epidemic is emergency department HIV screening aimed to diagnose HIV positive patients earlier. There are many approaches to this, but they all involve some form of consent. This study aims to discover whether men are more likely to refuse HIV testing in the emergency department and to determine whether the gender of the tester has an influence on consenting rates among patients. This research can help us to improve the ways we engage with our community to decrease the transmission and prevalence of HIV.
Nitta	Manon	Poster	Reconciling the Functional with the Aesthetic: the Body and the Machine	Lisabeth Hock	The boundaries between man and machine have merged due to a number of technological developments. The project "Reconciling the Functional with the Aesthetic" is an investigation into the relationship between beauty ideals and the functionality afforded to the users of artificial limbs. It is based on research of the development of prosthetics in the 20th Century and museum collections of prosthetics in Germany.

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Yee	Todd	Oral	New Bond Valence Parameters for Metal-Acetate Complexes	Federico Rabuffetti	The bond valence sum (BVS) method is a theoretical framework in coordination chemistry for calculating the oxidation (or valence) state of the atoms in a compound. The method utilizes an electrostatic model of bonding between cationic metals, and anionic ligands in order to determine the strengths of bonds between the two. Largely, BVS is used for validating solved structures obtained from crystallographic analytical techniques, but it can also be used to predict possible structures of unknown compounds. Analyzing solved structures of compounds created in our laboratory, with current literature parameters of BVS, shows that the reported values do not coincide with known oxidation states of the metal centers. By analyzing solved structures with the relevant metal centers and ligands, and applying various fitting techniques, new BVS parameters can be obtained.