Spring 2017

SCHOLARS' SCOPE

the annual publication of the Developing Scholars Program

Maria Fernanda De La Torre with her research mentor, Dr. William Hsu, pg. 8

A FUTURE OF DIVERSE EXCELLENCE

THE DSP DIFFERENCE

KANSAS STATE UNIVERSITY

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Developing Scholars Program

Kathlyn Gomendoza, Goldwater finalist, with research mentor, Dr. Lorena Passarelli

Welcome to the 17th Annual Developing Scholars Research Symposium

Developing Scholars proudly presents its seventeenth annual poster presentations. This year has been another banner year for the students in DSP: We have students publishing papers, presenting their research at national conferences, being chosen as global leaders and competing at the national level. In this magazine you will learn about students making a difference on multiple levels of involvement through their contributions to research, through leadership, and campus involvement. At this year's Symposium, you will see students whose aim is to make a difference in the welfare of people and the planet whether through cancer research, engineering new energy sources and medical breakthroughs or by educating children across the world.

Developing Scholars are inducted into an expectation of excellence. We call it the *axiom of achievement* and it applies not only to research but to academics, community engagement, and social justice as well. Our Scholars are being trained to be contributors in their fields while also becoming civic-minded professionals. Developing Scholars truly believe they can be change agents for a better world. Consider these interesting facts: 81% of DSP students graduate, most within five years or less, and many of those are in STEM (Science, Technology, Engineering, and Math) fields. Consider also that many are achieving excellence in their second language. Others are enhancing our lives by addressing cultural disparities and access for all. Almost half of our graduates (46%) are known to have continued on for post-baccalaureate degrees. This is a tribute to the land grant mission of accessible education and the great resource of intellectual capital that our diverse Scholars represent to the State of Kansas. It is also evidence in support of Governor Brownback's recent proclamation of Undergraduate Research Day (February 15) which stated that undergraduate research "…prepares students to critically engage in the complex issues of our state and a rapidly changing world and to seek solutions for the future, and…fostering active and collaborative learning early in a student's career can lead to the discovery of knew knowledge and applications that benefit the lives of many and has the capacity to strengthen the economic prosperity of our state."

Our diverse, under-represented, and first-generation students are poised to make that difference.

Anita Cortez

Anita Cortez, Director

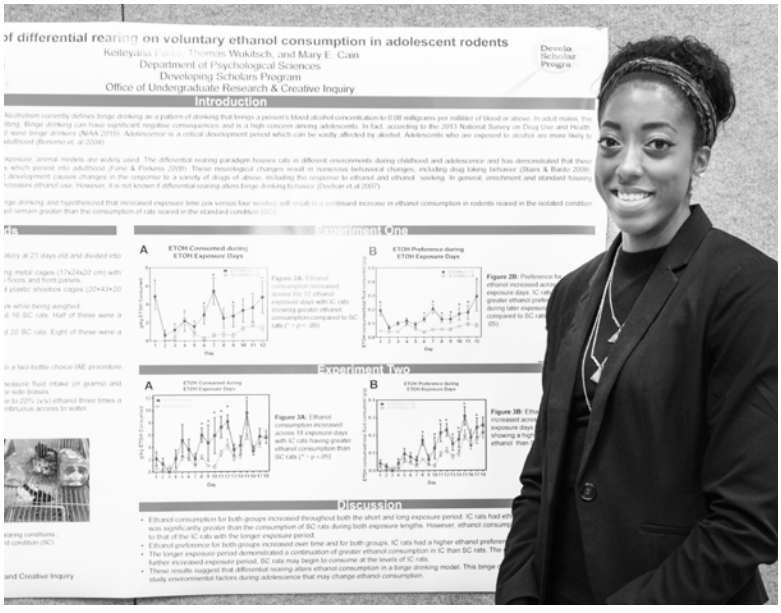
STUDENT SCHOLAR ATHLETE

When juggling all three, balance is "Key"

As an undergraduate researcher and a student athlete, **Keiteyana "Key" Parks** has had a unique undergraduate experience. Parks, a junior in psychology and sociology, is a member of the track and field team and a participant of the Developing Scholars Program.

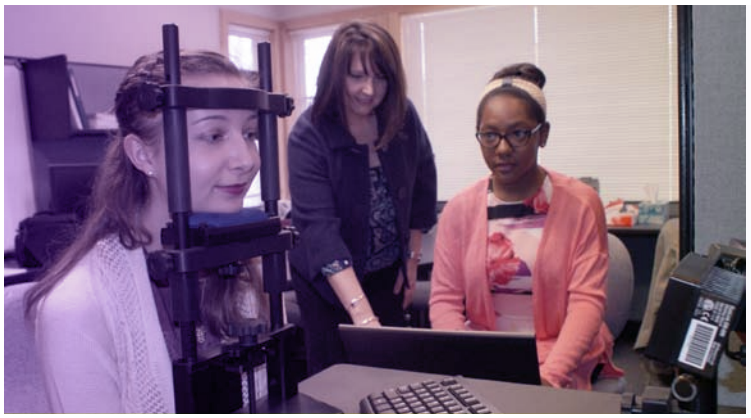
Parks began her undergraduate research journey in the lab of **Dr. Mary Cain**, professor in Psychological Sciences, working with rats to investigate the role of the amygdala and hippocampus in the acquisition of fear. They wanted to determine how different living environments affect learning in various ways, and how the rearing environment alters the neurological mechanisms for fear. Parks worked on this project for two years until transitioning to the lab of **Dr. Don Saucier**, Professor in Psychological Sciences.

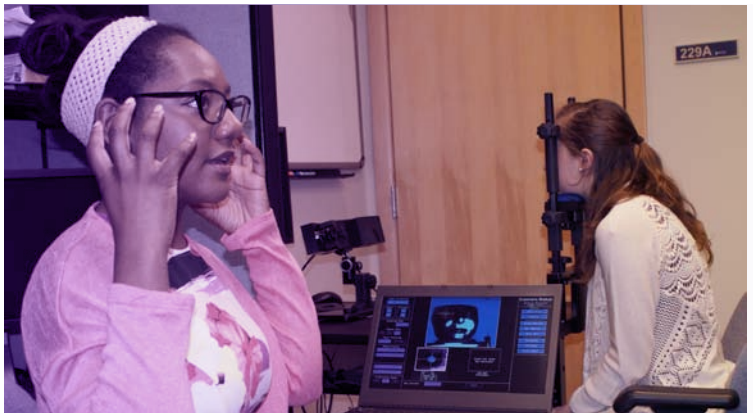
In Dr. Saucier's lab, Parks has switched her focus from animal model research to human-based research, from neuroscience to social psychology. Dr. Saucier challenged Parks to develop her own study. She rose to the occasion and has been working on her own project this year, *Playing It Safe: The Threat of Appearing Racist Affects Perceptions of Subversive Racial Humor.* Due to the effectiveness of humor as a tool to increase comfortability in discussing sensitive topics, Key wanted to better understand how people interpret subversive racial humor.



Through her study, she discovered that, "while subversive humor's intentions are prosocial, individuals may deem it disparaging in an effort not to appear prejudiced," and that the use of subversive humor could, "inadvertently encourage the prejudicial beliefs it intended to oppose."

While spending her time engaging in discovery through research, Parks has also balanced her role as a student athlete on the track and field team. At first, she was not sure she could handle both commitments. "I felt that if I was going to be an athlete, I wasn't going to be able to do anything else," she said. However, with work on time management and prioritization skills, Parks has excelled as a student, researcher, and athlete. She has even been able to draw connections between the two. "They are both difficult and challenging. In track, there are times when you compete and don't do well. In research, things aren't always going to work out. You have to keep working to get where you want to be. You have to go back and change something to get the result you want," she explained. Through her roles as a student athlete and student researcher, Parks has learned the importance of resilience, "just being able to embrace the challenge and keep pushing."





LANGUAGE IS EVERYWHERE

Studying speech and language is a passion of **Chelsea Turner**, sophomore in Communication Sciences and Disorders. For the past two years, Turner has been researching with **Dr. Kristin Pelczarski**, Assistant Professor in the School of Family Studies and Human Services.

This year, Turner has been working with a new piece of equipment called an eye tracker to study the connection between thought and eye sight. The eye tracker follows the participant's gaze and records it allowing the researchers to determine if the participant's eyes are more drawn to words that are semantically (e.g. dog and leash) or phonologically (e.g. dog and log) related. They hope to use their findings to better understand the psychology of language, and to explore different methods of how to get information to people with different learning disorders.

Turner's role in this project has been to develop all stimuli. When participants look at a screen, they will see four different pictures. At the same time, they will hear one word in their ear and the eye tracker will record the direction of their gaze in relation to the four different pictures on the screen. Turner developed all of the words and pictures to be used in the study.

When asked how this project relates to her future career plans, Turner said, "Language is everywhere." She explained that she knows she wants to help people in some way, and has considered studying representation and lack of representation in media. "Everyone is exposed to media. It affects and infects us more than we think it does." Through her research, Turner is learning how language impacts people differently and how people receive information in various ways, knowledge that will be beneficial to any career direction she chooses.

Last semester, Turner traveled to the Kansas Speech and Hearing Association Conference in Topeka, KS, to present her research on stuttering that she conducted her freshman year. She is also an Edgerley-Franklin Urban Leader and Community Assistant in West Hall; Co-President of Feminists Igniting Resistance and Empowerment (FIRE), and is involved with the Kansas State Theater Organization (KSTO). This summer, Turner will travel to Nyeri, Kenya, on an International Service Team through the School of Leadership Studies. She will work with the Children and Youth Empowerment Centre, an educational program for former street dwelling children and youth in Kenya.

BRIDGES TO THE FUTURE

Kansas State University receives new Bridges to the Future Grant

K-State has received a new Bridges to the Future grant funded by the National Institutes of Health. The purpose of Bridges is to increase the number of underrepresented students with degrees in the biomedical and behavioral sciences and to increase the number of Ph.D.s, M.D.s, and other professional doctorates in those areas, according to **Dr. Charlotte Shoup Olsen**, professor in Family Studies and Human Services and principal investigator of the grant.

The Bridges grant supports students by building relationships with them and their families while at the community colleges. The Developing Scholars Program supports Bridges students academically and personally by providing seminars, workshops, and research internships. To date, 104 students have transferred to Kansas State University through two previous Bridges to the Future grants. Past Bridges students have become engineers, chiropractors, dentists, medical doctors, optometrists, chemists, pharmacists, psychologists, social workers, veterinarians, and more.

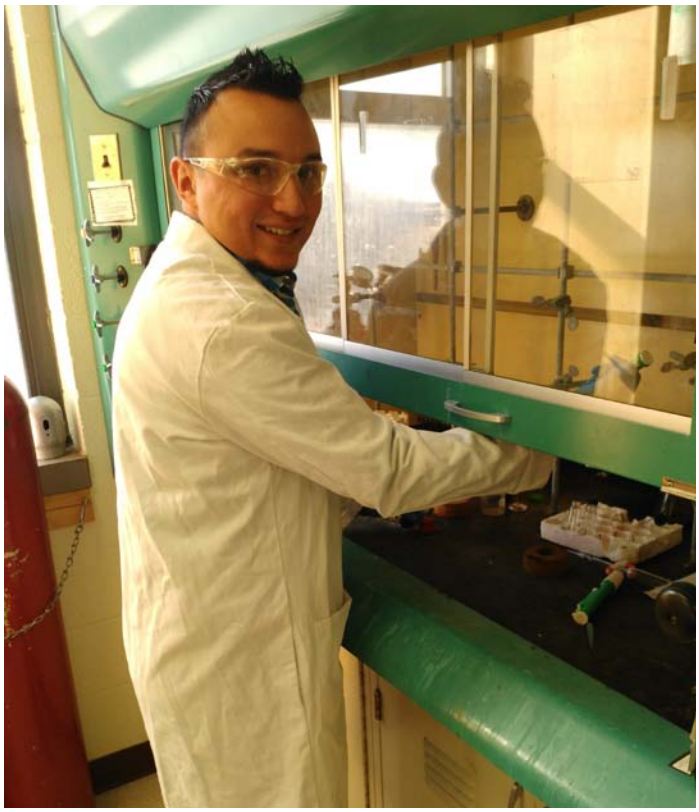
"Bridges is a life changer," Anita Cortez, DSP director said. "It is a mutually beneficial program in that we are offering a bridge from community college to K-State and K-State is also gaining bright, motivated students who are eager to learn and contribute to their communities."

"Bridges is a life changer...it is a mutually beneficial program in that we are offering a bridge from community college to K-State for underrepresented students and K-State is also gaining students who are eager to excel…"

Anita Cortez, Developing Scholars director

One such student is **Jose Covarrubias** who graduated at the top of his class in high school. His dream was to attend pharmacy school. While attending Seward County Community College, Covarrubias learned of the Bridges to the Future grant and was thrilled to be able to conduct research through the Developing Scholars Program. He says his sister, Obdulia, is his biggest inspiration. "She moved away from home, found her passion, carved her own way, and is now working toward her Ph.D. in Dr. Stefan Bossmann's chemistry lab," he said. **Dr. Stefan Bossmann** is Jose's research mentor as well. Covarrubias has had the opportunity to work on several research teams, including that of **Dr. Deryl Troyer** in Anatomy & Physiology, on topics such as a biodiesel initiative, new delivery methods to treat cancer, and ways to prevent the spread of bacterial infections.

Covarrubias has recently been accepted into graduate school. His ultimate career goal is to be the principal investigator of a laboratory either at a university, in industry, or at a hospital. He would love to work alongside his sister, Obdulia, to develop a new treatment method for cancer or various other



diseases. When asked about a piece of advice he would leave with future generations, his response was, "Don't be afraid to get out of your comfort zone and explore new pathways in order to find your true passion in life."

OLIVET MARTINEZ

Participates in Emerging Researchers National Conference

Olivet Martinez, a transfer student from Dodge City Community College, participated in the Research Immersion: Pathways to STEM (RiPS) Program offered by the Kansas Louis Stokes Alliance for Minority Participation (KS-LSAMP) last summer. This eight-week summer research program provides academic and professional preparation to students who come from underrepresented backgrounds in STEM fields and allowed Martinez to work closely with **Dr. Peying Fong**, in the Department of Anatomy & Physiology.

As a result of her summer research, Martinez was selected to participate in the Emerging Researchers National Conference in STEM. Through Developing Scholars, Martinez is currently working with **Dr. Sarah Rosenkranz** in Human Nutrition and plans to apply for medical school. KS-LSAMP sponsors Martinez's participation in the Developing Scholars Program.

BREAKING BARRIERS

a story of inspiration, grit, and rising in the field of Computational Neuroscience

Maria Fernanda De La Torre, senior in computer science and math, has always sought to rise to the highest possible level in her field. She knew she would go to college one day, but the journey to get there was not an easy one. De La Torre came to the United States when she was twelve years old, knowing very little English. She graduated Valedictorian from East High School in Kansas City, Missouri, while also obtaining her Associate's degree from Penn Valley Community College where she served as a student ambassador, Vice President of Phi Theta Kappa, and a Culture and Education Awareness Officer. After high school, she found her way to Kansas State University where she has relentlessly chased her dreams of rising in the field of Computational Neuroscience.

Inspiration for future careers comes from all sorts of places. For De La Torre, that inspiration came from her younger sister who showed symptoms of epilepsy at a young age. As the doctors ran test after test, De La Torre became intrigued with the human brain and developed an interest in helping people with similar conditions. Throughout her educational journey, De La Torre became increasingly interested in math, neuroscience, and artificial intelligence leading her to conduct research in those areas at K-State.

De La Torre began her undergraduate research career in the lab of **Dr. Lester Loschky**, professor of Psychological Sciences, where she studied the effects of visual blur on a search task. Together, they looked at how to measure the useful field of view for different people and how it is affected by cognitive load and distractions such as stress. This year, De La Torre is working with **Dr. William Hsu**, professor of Computer Science, on a machine learning project. Through coding and programming, she has been training a computer program to look at nighttime pictures of Allen, KS, and to detect when a light is on or off and what type of light it is.

"Machine learning has been my favorite part of research because it relates to what I already know and bridges that with what I want to do in the future working with cutting-edge technology," said De La Torre. She dreams about the potential impact the model could have in other areas of life asserting, "If I can train it do this, then I can train it to do a lot of other things too."

"Fernanda has helped to launch a K-State artificial neural networks and computational brain theory journal group. She has worked on a primary project to use the deep learning framework Caffe for detection of objects in aerial images (city flyovers), and is responsible for implementing new feature analyzers which she is writing about in her own paper, in preparation for a future peer-reviewed data mining conference or workshop."

-Dr. William Hsu

De La Torre has excelled as an undergraduate researcher evidenced by her numerous poster presentations and being selected as one of twelve students to participate in a highly competitive summer research program at the University of Missouri during summer 2016.

At the University of Missouri, De La Torre worked in the Bioinformatics and Computer Science Department where she studied gene candidates for autism. Using informatics tools to explore interactions between genes, she discovered pathways related to different addiction groups, such as cocaine, amphetamine and alcoholism, which were very uncommon. Her findings shifted the overall focus of the experiment leading her and her mentor to develop the hypothesis that Autism might behave in a way similar to addiction. Because of De La Torre's findings, they were able to make new hypotheses and take the project in a new direction that had not previously been explored. Their results have the potential to bring a new way of studying Autism and could potentially be the beginning of developing new treatments in the future.

Last semester, De La Torre's abstract for this research was accepted and she traveled to the Annual Biomedical Research Conference for Minority Students (ABRCMS), in Tampa, Florida to present. "It was really amazing to see all of the other students, all of the hard work they have put in, and how they have found ways to overcome obstacles," she said about the conference.

De La Torre has accomplished much in her young life, but her success story is just beginning. As a senior in computer science, she is focused on her future career goals. She aspires to obtain a Ph.D. in Computational Neuroscience and continue conducting research to discover how she can help people through computers and algorithms.

SERVICE AND AWARDS

Scholars recognized for distinguished excellence and achievement

UNIVERSITY AWARD
DISTINGUISHED UNDERGRADUATE IN RESEARCH

Navanté Peacock, DSP alumnus
Graduate in Psychology and Anthropology, Spring 2017

The award honors a student who has, "outstanding individual contributions in research for the purpose of the discovery and creation of new knowledge at K-State." Peacock's research mentor is **Dr. Don Saucier.** Peacock also received the Undergraduate Poster Award at the Society for Personality and Social Psychology national conference, and was invited to join Phi Beta Kappa national honor society. Peacock will begin a PhD program in Social Psychology at the University of Kansas in the fall.

COMMERCE BANK PRESIDENTIAL AWARD
FOR DISTINGUISHED SERVICE IN ENHANCING
MULTICULTURALISM AT KANSAS STATE UNIVERSITY

Yubisela Toledo, DSP alumna - student recipient
Senior in biology and research assistant in chemistry

Tess Hobson, DSP advisor - faculty/staff recipient
Advisor of DSP and Edgerly-Franklin Urban Leaders

We are proud that our students and staff exhibit multi-faceted accomplishments that contribute to the betterment of our communities.

SEVEN DEVELOPING SCHOLARS EARN CANCER RESEARCH AWARDS

Congratulations to the following Developing Scholars who have been awarded a 2017 Johnson Cancer Research Award. Each student receives $1000 to aid their own research as well as an additional $1000 to support their faculty mentor's lab. We are proud of their contributions to the advancement of cancer research and the mark they leave for those who follow in their footsteps.

ELSHADDAI ABAMEGAL | FRESHMAN
MECHANICAL & NUCLEAR ENGINEERING
Mentor: Amir Bahadori – Application of NASA Quality Factors to Estimate Secondary Cancer Risk to Patients Treated with Charged Particle Radiotherapy

YUBISELA TOLEDO | SENIOR IN BIOLOGY
Mentor: Stefan Bossmann – Synthesizing Dendrimers for the delivery of Prodrugs to Solid Tumors and Metastases

JOSE COVARRUBIAS | SENIOR IN BIOCHEMISTRY
Mentor: Stefan Bossmann – Mesoporous Silica Nanoparticles for Cell-Based Drug Delivery to Tumors and Metastases

RAQUEL ORTEGA | SENIOR IN CHEMISTRY
Mentor: Stefan Bossmann – Detection of Cytokines/Chemokines Signatures of Pancreatic Tumors Before and After Hyperthermia Treatment

KATHLYN GOMENDOZA | JUNIOR IN BIOLOGY
Mentor: Lorena Passarelli – Identifying peptides that form a complex with a viral sulfhydryl oxidase that oxidases SfP53, an insect oncogene suppressor homolog

ALEJANDRO GARCIA | SENIOR IN BIOCHEMISTRY
Mentor: Michael Kanost – Characterization of proteases that digest an extracellular matrix

JENNIFER DELZEIT | SENIOR IN STATISTICS
Mentor: Masaaki Tamura – Study of Euglena water extract-dependent functional differentiation of T lymphocytes

Carlos Aguirre receives Tau Beta Pi Underclassman of the Year Award

Carlos Aguirre, first-year Scholar in Computer Science, was awarded the Underclassman of the Year award from the Kansas Gamma chapter of Tau Beta Pi, a national engineering honor society. The award recognizes an outstanding underclassman for scholastic achievement and involvement. Aguirre's research mentor is **Dr. William Hsu.**

JORGE MENDOZA

Named University Distinguished Young Alumni

Jorge Eduardo Mendoza was selected as one of two University Distinguished Young Alumni for 2017 by the K-State Alumni Association Board. Awardees are alumni "under the age of 35 who are excelling in their professions and contributing to their communities," according to the award application. Mendoza is the second Developing Scholar alumni to win this award.

Mendoza came to K-State as a community college transfer student through the Bridges to the Future Program and joined the Developing Scholars Program for undergraduate research. While at K-State, Mendoza was active in research on the Konza Prairie studying the Migratory Upland Sandpiper and the Common Nighthawk with **Dr. Brett Sandercock**, Biology.

At the University of Wisconsin Mendoza's graduate research took him to rainforests of Costa Rica where he studied the niche ecology, reproduction and survival of the "tree-huggers," two- and three-toed sloths. He co-authored a study on sloths that caught the attention of the news media. He and his research team discovered the symbiotic relationship between sloths' defecation cycle, moths, and sloth nutrition. This research was published in The Economist, Time, The New York Times, Discovery, National Geographic Phenomena, Live Science, and National Geographic News.

Now at the Ohio State University, Mendoza manages the STEM Exploration and Engagement Scholars Program. Mendoza teaches a seminar of approximately 120 students designed to engage them in their field of study. He connects sophomores through juniors with STEM-related community outreach. He guides third-year students through their search for and application to professional and graduate schools. This brings Mendoza full circle with his Developing Scholars roots.

DSP ALUMNI | WHERE ARE THEY NOW?

Tara Hacker, M.P.H. (pictured bottom) (Kinesiology/Exercise Science, 2005)
Senior Program Manager at CommonHealth ACTION
Washington, D.C. area (past Peace Corps volunteer to Honduras)

Kristina Bigelow, M.S. (Biology, 2012)
Graduate student in Pharmacology and Molecular Sciences, Johns Hopkins University

Maria Magdalena Ortiz Smith, M.S. (Education, 2004)
Elementary Teacher, Dodge City

Tenisha Pettus, Ph.D. (Psychology, 2005)
Functional Family Therapist-Redirections at Institute for Child and Family Health, Inc., Miami area

Greg Corbin, J.D. (Political Science and Philosophy, 2008)
Attorney in Denver area

Deidra Allen Saina M.S.W. (pictured top) (Sociology, 2003)
First DSP Graduate, Domestic Abuse Victim Advocate Coordinator at USAF Family Advocacy Program, San Antonio area

Matthew Padilla, M.A. (Anthropology/Archeology, 2004)
Forest Archaeologist for Shasta-Trinity National Forest,
Heritage and Tribal Relations Program Manager, California

Rey Morales, M.D. (pictured middle) (Biology, 2006)
Surgeon, San Antonio

Robert Gomez, M.S. (Education, 2010)
Teach for America, now in Columbia University's Postbaccalaureate Premedical Program

2017 GRADUATES

ABIGAIL AGNEW
Marketing

KIERA BROWN
Psychology; Sociology

KELSEY CASTINADO
MS in Interior Architecture & Product Design

JOSE COVARRUBIAS
Biochemistry

JENNY DELZEIT
Statistics

DANIEL DISSMORE
History; Music

DENISSE DOMINGUEZ
Mathematics

MARK MATHIS
Civil Engineering

HECTOR MARTINEZ
MS in Architecture

STERLING MUSE
Marketing

RICARDO NAVA
Kinesiology/Pre-Physical Therapy

RAQUEL ORTEGA
Chemistry/Pre-Medicine

NAVANTÉ PEACOCK
Psychology; Anthropology

YESENIA PEREZ
Communication Sciences & Disorders

ZAIRA RUIZ
Humanities

DALIA SANCHEZ
Chemistry/Chemical Science

YUBISELA TOLEDO
Biology/Pre-Optometry

NATIRA STAATS
MS in Marriage/Family Therapy

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