



*Advancing
Hispanics/Chicanos
& Native Americans
in Science*

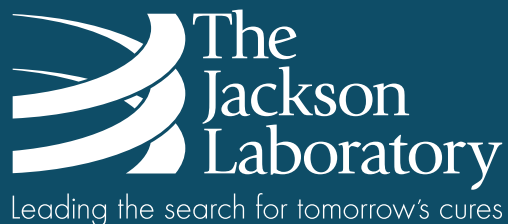
SACNAS NEWS

SUMMER/FALL 2010



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SACNAS News

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FEATURE ARTICLE

PATHWAYS TO SUCCESS IN SCIENCE 04
 An in-depth look at a new study on the shaping of a scientific identity among underrepresented minority and women science students.
Martin Chemers, PhD, Jamie Franco-Zamudio, PhD, and Sergio Queirolo, MS

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Letter from the President

By Jose D. Garcia, PhD



GREETINGS, SACNAS MEMBERS! This issue of the *SACNAS News* focuses on how individuals transform themselves into scientists. At the core of the SACNAS mission is transformation—transformation of society by encouraging Hispanics/Chicanos and Native Americans to achieve and succeed in careers in the science, technology, math, and engineering fields. Also at the heart of SACNAS' work is to

support our members, as they transform into scientists, to embrace scientific thinking while not forgetting their cultural and community roots.

SACNAS itself is also undergoing a transformation at the organizational level. This process can be challenging, and recently it has required us to question and understand what we have always done, with the intent of improving our processes. An important feature is our ongoing work to completely overhaul our information technology (IT) infrastructure. This enormous undertaking has required a deep comprehension of how our mission and goals relate to our web connectivity. What services do we already provide online? What services should we provide online? And how can we transform our services and connectivity to best serve our mission given our budget limitations? Lin Hundt, our director of cyber-infrastructure, and the SACNAS IT Committee have been working hard on optimizing the answers to these questions. They have obtained input from student members, professional members, and other SACNAS affiliates, as well as from expert consultants. Look for our new web presence and improved services early next year!

The SACNAS staff is also transforming to help us carry out our mission of change. Please welcome Dr. Matthew Martinez as director of Native American initiatives and Dr. Angelina Dayton as director of programs. Matthew brings a breadth of experience to SACNAS, including his immediate past work experience as director of Indian education at the New Mexico Higher Education Department. Angelina's recent employment as the director of the McNair Scholars Program at the University of California, Merced, also brings great value to the organization.

Examining our way of thinking is a prerequisite to change and improvement; this is as true for an organization as it is for an individual. One of our partnerships is assisting us with examining and understanding what works well in helping SACNAS students to achieve degrees and careers in science. Dr. Martin Chemers, a psychologist at the University of California, Santa Cruz, is partnering with SACNAS to do longitudinal studies on factors affecting our members' achievement of a science degree. The outcomes of this study will provide SACNAS with essential information about where the organization should strengthen or modify our focus, activities, and programs. (For more information about the Chemers partnership, read the feature article on page 4.)

SACNAS has a role in making America a better place. Our goal of advancing Hispanics/Chicanos and Native Americans in science is working to fill a gap in the number of Americans from these groups who become successful scientists. This requires that our student members work hard at transforming themselves into scientists, requires that our mentors seek to improve the ways in which they help students succeed, and it requires our staff and leadership to maximize what our organization does to assist those efforts. Each of us has an important role in the process.

Become part of this great movement at the SACNAS National Conference in Anaheim! See you soon!

A handwritten signature in black ink that reads "Jose D. Garcia".

Jose D. Garcia, PhD

BY MARTIN CHEMERS, PHD,
JAMIE FRANCO-ZAMUDIO, PHD,
AND SERGIO QUEIROLO, MS

PATHWAYS TO SUCCESS IN SCIENCE: CONFIDENCE, COPING, AND COMMITMENT

THE FEATURE ARTICLE in the summer/fall 2008 issue of SACNAS News reviewed educational and psychological findings on cultural differences in thinking processes. Researchers in this area conclude that people who grow up in different cultural or physical contexts often develop different ways of thinking. For example,

when asked to categorize three pictures (two of animals and one human), Native American children were much more likely to put the human in the same category as the animals than were the white children.

The implications of studies like this one suggest that not all members of our society bring the same cognitive habits and assumptions to the educational process. To serve such students well, we need to delve deeper into learning and achievement processes to make our educational institutions more responsive to all learners (i.e., “level the playing field”).

Many of the studies that try to understand more effective ways to teach science are prompted by the recognition that, as

a society, we are very dependent on science and technology and cannot afford shortages in these areas. However, many educators are more distressed by the low participation rate of minority students in careers in science and technology. In fact, improving the participation rate of minority group members holds great potential for strengthening our national capacity. In other words, in terms of fairness, equity, and even practicality, we are compelled to increase participation rates among underserved populations.

Our research group at the University of California, Santa Cruz, has approached the issue by studying the *psychological* factors that affect success in science, technology, engineering, and mathematics (STEM).

What students had to say in the many interviews that we conducted give a rich and poignant feeling for the meaning of science confidence and science identity.

Commitment, performance, and success in any endeavor are greatly influenced by perceptions, beliefs, and feelings that a person has about the area of study or performance. For example, few people with acrophobia (i.e., fear of heights) choose to be astronauts or high-steel workers. Supported by a grant from the National Institute of General Medical Sciences, we have been studying students enrolled in various science support programs around the country, such as Minority Access to Research Careers (MARC), Minority Biomedical Research Support (MBRS), Research Initiative Science Enhancement (RISE), and others. We employ a range of methodologies, including qualitative interviews and case studies, as well as cross-sectional and longitudinal quantitative surveys. (We have completed eight studies on our most recent grant.)



ABOVE
Dr. Martin Chemers (left) and Mr. Sergio Queirolo (right) are based at the University of California, Santa Cruz, just a few minutes from the SACNAS national office. The close proximity further facilitates the research collaboration.



As part of those investigations, in 2007 we asked SACNAS undergraduates, graduate students, and postdoctoral fellows to respond to a survey of their experiences and attitudes about STEM careers. Over 700 students and fellows responded and provided us with extremely useful data.

In every one of our studies, with all of our different methodologies, we found that the critical factors in student success were the development of confidence in the ability to do the work of scientists and the development of a sense of personal identity that was compatible with a career as a scientist. In our longitudinal studies, we found that students who showed the greatest increase in confidence and the greatest increase in the development of a “scientific” identity reported a stronger commitment to pursue the pathways to a scientific career, however challenging they might be.

What students had to say in the many interviews that we conducted give a rich and poignant feeling for the meaning of science confidence and science identity. In one study of graduate students conducted by Jamie Franco-Zamudio, observations helped us understand the centrality of our constructs. (See Figure 1)

Furthermore, comments from undergraduates express very similar ideas. (See Figure 2)

The findings from our research clearly suggest that science support programs and organizations must pay greater attention to

...continued on page 6

FIGURE 1

GRADUATE STUDENT OBSERVATIONS

About academic self-efficacy:

Since I started this program, my writing has really improved; my intellectual curiosity has sharpened.... I feel that the more I'm here, the more I'm learning and the more confident I am getting—in that this is where I should be.
Latino student

A lot of it is just previous personal experience. I've always been good at school, so I have confidence in myself that I can pull it off again.
White female student

I presented [at] our society's conference this summer. Yeah, but it was kind of like I did it. It's not like they told me, you should do this. I was like, well, I've seen people do this before, so I guess this is a good thing to do, so I'm gonna do it!
African American female student

About science confidence:

I'm confident with my experience and my research...at least now I know how to find information and how to design experiments and how to figure something out.
Asian male student

I feel I've made a lot of progress. I really do feel like at least somewhat of an expert in my field right now.... I feel like I have really learned a lot and I really can do a lot and I really can offer a lot to the [science] community.
White female student

I feel the most confident, I guess, when I have done something repeatedly and I feel comfortable enough to tell my PI that it's not working or it worked. I am able to actually describe to him my results that I have gotten; that is when I feel the most confident.
Native American female student

I feel [prepared] because I've done a lot of these assays and procedures before. I'm able to think about them and how they work or at least in some sense try and take them and branch out into an area that they haven't been used in before.
White female student

About scientific identity:

The fact that I am a woman and a Mexican American are pretty important. That I am a scientist and I am married is a big part of me and who I am...these are very important to me too.
Latina student

I am definitely a scientist. I have a lot of rants that I go on because I read a lot!
White male student

First and foremost, I would say that I identify as a scientist. Then I would say being mixed [ethnicity].
Latina student

As a woman of color in this discipline, I feel like that is something that could hinder me. I don't think that it is necessarily incompatible but it is definitely something that I think about, the types of barriers that I might encounter.
Latina student

About the Authors

Dr. Martin Chemers (professor emeritus and research professor, University of California, Santa Cruz) received his PhD in social and organizational psychology from the University of Illinois in 1968. His dissertation and early career research were on the ways in which national cultural differences affect leadership behavior and organizational processes. This research took him to Thailand, Malaysia, and Mexico. It also gave him an awareness that not everyone does everything in the same way, and that to be truly effective as a society, we need to recognize, respect, and make diversity a benefit to all. (Dr. Chemers reports that among the 12 PhD students he has trained, all but one were women or minority students, a record of which he is very proud.) He can be contacted at: mchemers@ucsc.edu

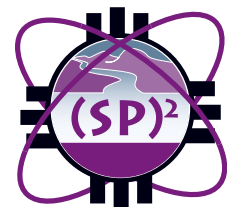
Dr. Jamie Franco-Zamudio (assistant professor, Spring Hill College) received her PhD in social psychology from the University of California, Santa Cruz, in 2009. Her dissertation and current research focuses on gaining a greater insight into the ways that social and personal identities affect academic persistence. More specifically, her research examines the intersections of role-based identities (e.g., scientist) and social identities (e.g., gender, ethnicity) on academic retention. Dr. Franco-Zamudio is currently analyzing personal narratives from undergraduate and graduate students across various fields of study, with the goal of identifying the positive influences across all fields (e.g., mentoring, programming) in order to advocate for programming that meets the needs of students from diverse backgrounds. She can be contacted at: jfrancozamudio@shc.edu

Born in Uruguay, **Sergio Queirolo** moved to California over two decades ago. In 1998, he received a MA in psychology from San Jose State University, where he wrote a thesis on study habits and learning styles of college students of different ethnic groups. In 2000, he received a MS in social psychology from the University of California, Santa Cruz, where he studied the intersections of mentoring, self-efficacy, and academic achievement of university students, focusing on underrepresented student groups within a social justice framework. He can be contacted at: sergioq@ucsc.edu

science confidence and science identity. In fact, when program PIs and staff hear about these results, they are very anxious to know specific things that they can do to improve their programs. Fortunately, SACNAS offered their help and advice in pursuing our findings in ways that could identify innovative and effective mechanisms of support.

The results of our first five-year project and the offered support of SACNAS members and staff did, indeed, encourage us to look deeper into the development of confidence and identity. In partnership with SACNAS, we submitted a new proposal to the National Institute of General Medical Sciences. This new grant, which we call the SACNAS Pathways to Science Project (SP)², is focused on a deeper understanding of causal influences in the development of confidence and identity. We are going to be looking very closely at the role of mentoring in the development of young scientists and at the kinds of situations that allow a student to get a better understanding of scientific careers. Of course, the SACNAS annual meeting is very much that kind of an opportunity.

Dr. Angelina Dayton, SACNAS' director of programs, has stated that "SACNAS is dedicated to utilizing the data collected by (SP)² to improve our programming, make informed



**SACNAS PATHWAYS TO
SCIENCE PROJECT**

strategic plans for the future, and continue to best support our membership. SACNAS embodies a unique and resourceful approach to incorporating scientific research into improved practice. This project will allow us to continue in these efforts.”

For the next five to ten years, the team of Santa Cruz faculty and students and SACNAS members and staff will be working closely together to address and illuminate important issues and critical processes for the success of underrepresented minority science and engineering students. We will be calling on SACNAS members at all levels (i.e., undergraduate and graduate students, postdoctoral fellows, and PhD academic and professional members) to participate in our work. Some will be asked to take a survey or give an interview. Others may be asked to help interpret and understand our results. We are looking forward to a very exciting scientific endeavor. ■



FIGURE 2

UNDERGRADUATE STUDENT OBSERVATIONS

About academic and science self-efficacy:

You know, I just compare [myself] to many other students in my class that are, you know, not in the same programs and I can see that I'm definitely a leg up in some respects. Enough to feel fortunate and I try not to take for granted what I've been able to do.

Latina student

My choices before I went to college were physics and chemistry. I was gifted in both in high school and so I was able to lean toward one or the other and I ended up choosing physics.

Latino student

The [MARC] program is really central to who I am because it's something I worked really hard to get. They take three people a year and I got to be one of those, and it's a really big accomplishment. And it's kind of, for my confidence and myself, it was a huge boost.

Filipino American female student

Yeah, I do feel prepared for this field, because, I mean, how many students get a chance to do research in a real lab and then how many students get the opportunity to go to a conference like this? Most of the people in my classes, they are like, 'Oh, that's cool, I wish I was a part of that' but they are not, you know?

Latina student

About scientific identity:

I'm still doing research, so science is a big thing in my life. I'm very interested in how science works and how I can use it to help other people.

Native American female student

Yeah, that's how I see myself. If you ask 'What would you do if you don't get to be a professor?', I would be like 'Ahhh, I don't know' because I have all my focus, all my youth, I have it there.

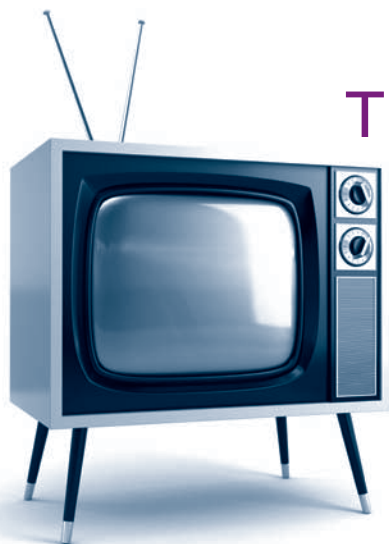
Latina student

Being a science student is important to me. And I love it. My brothers tease me about it all the time, 'You're such a nerd, you're such a square,' and you know what? Yes I am, and I'm proud of it.

Chicana student

Being curious about nature, the world, you know, just everything that, uhm, is nature, that's what's my passion. So definitely science is what I describe myself as.

Native American female student



THE PATH TO BECOMING A SCIENTIST: *How the Media Can Help*

By **Kristin Cantú**

TWENTY PERCENT OF THE CHILDREN in U.S. schools are Hispanic, and if you were to say the names Luis Leloir or Mario Molina to any number of them, how many would recognize those names? They're both Nobel Prize winners in chemistry, the former in 1970 and the latter in 1995.

But it's much more likely that Hispanic youth will respond when hearing the names Shakira and Big Papi. These celebrities are glorified by the media, and it's highly unlikely you won't come

across a young girl mirroring Shakira's world-famous dance moves or a young boy who longs to swing a bat like Big Papi.

But what about the Leloirs and the Molinas of the world? If they were embraced by the media in the same way pop stars and athletes are, would Hispanic American youth dream of being just like them, too?

Advertising Graduation from High School

Before society can begin to mold young Hispanic scientists, we first need to make sure they graduate from high school. In the U.S., 41 percent of Hispanics 20 years of

age and older don't have a high school diploma, compared to 14 percent of white adults and 23 percent of black adults, according to the Pew Hispanic Center. Of all the Hispanics without a diploma, only 10 percent have earned a G.E.D.

One effort to combat the under-education of Hispanic youth is the "Your Words Today" media campaign, a partnership between the Hispanic Scholarship Fund and the Ad Council. While the Pew Hispanic Center found that 90 percent of Hispanic parents say a college degree is essential to obtaining a successful career and living a comfortable life, another study from the Tomás Rivera Policy Institute discovered that more than 65 percent of them don't know how to guide their children on that educational path.

"Hispanic parents and their children see college as important but are at a disadvantage because many have not had the opportunity to attend college themselves," Ad Council CEO and president Peggy Conlon says. "By providing these parents with the necessary resources to better educate themselves on the college process, we can encourage all Hispanic parents to guide their children to a college degree."

Encouraging College...on TV

Another well-known media outlet taking on the challenge of motivating Hispanic American youth to get a college degree is Univision. In February of this year, the Spanish-language television giant launched a nationwide campaign, "The Moment Is Now," in order to encourage Hispanics to enroll in and complete college.

"Today, no issue is more important than education and improving academic achievement for our young people," Univision CEO and president Joe Uva says. With 95 percent of Hispanic homes in the U.S. watching this broadcast network, chances are pretty high their message will be heard.

Magazines and STEM Education

Latino Magazine also wants to contribute to the education of Hispanic youth, only their focus is much more specific. It wants them to embrace the academic and career fields of science, technology, engi-



ABOVE
Current efforts by the media may encourage young students like Oliver Crespo (pictured here) to pursue education and science.

neering, and math (STEM). During the magazine's Nuestro Futuro conference held in April, Latino leaders from across the country came together to figure out how more youth could be inspired to develop an interest in these fields and possibly build a life around them.

There is huge need for more professionals in the STEM fields. By 2014, the demand for people to fill these careers will have grown by 22 percent in 10 years, according to the U.S. Bureau of Labor Statistics. However, only 3.4 percent of Latinos held jobs in engineering and science in 2000, the U.S. Census Bureau says.

Judit Camacho, a Nuestro Futuro conference panelist and SACNAS executive director, believes that Latino and Native American perspectives on STEM are vital to finding solutions at the local and global levels. Developing future generations to have analytical and critical minds is key to our future of living in a sustainable economy and environment, believes Camacho.

Coming away from Nuestro Futuro, Camacho realized even more how important support from media outlets is when it comes to educating Hispanic youth and encouraging them to pursue STEM careers. Media can play a vital role in "paving the way for scientific work on a day-to-day basis," believes Camacho.

Camacho herself was actually inspired by an iconic piece of media to pursue her educational goals. When she was a junior in high school, Camacho made the decision to go out and watch the movie *Stand and Deliver* instead of finishing her homework. She was "truly inspired" by the film, and it motivated her to continue doing well in math. Camacho went on to receive her bachelor's in mathematics from the University of California, Santa Cruz, and later worked for the National Cancer Institute in between her two appointments at SACNAS.

Perhaps the Most Important Role of All

Despite the encouraging messages about the importance of education and STEM participation coming from Hispanic-focused media, sometimes it is a real-life role model who makes the biggest impact. In addition to parents playing a significant part in helping their children pursue an education, Camacho believes that "teachers play tremendous roles," maybe even "more so than parents most of the time" when it comes to instilling a sense of confidence and challenging a student to pursue an academic field.

That was the case for Oliver Crespo, a Mexican-born Stanford student pursuing his PhD in immunology. He says, "I had a really good biochemistry professor who

"Hispanic parents and their children see college as important but are at a disadvantage because many have not had the opportunity to attend college themselves."

**– Ad Council CEO and president
Peggy Conlon**

taught me all about how they discovered hemoglobins and I just thought that was really interesting." Another one of his teachers took notice of his curious, inquisitive nature and told Crespo he'd make a great researcher.

Growing up in Mexico City, Crespo didn't have a lot of media images telling him how much fun it would be to become a scientist. However, he does credit the children's television show *Beakman's World* for piquing his curiosity about science.

And who does Crespo cite as his scientific role model? None other than Mario Molina. ■

Kristin Cantú is a writer living in Cambridge, Massachusetts. She received a master's degree in journalism from Emerson College. She can be reached at kristincantu@gmail.com.



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DR. J. VICTOR GARCIA- MARTINEZ

Biochemist

By *Cassandra Brooks*

ABOVE

Dr. J. Victor Garcia-Martinez is also a member of the SACNAS Board of Directors.



Visit the SACNAS Biography Project online at www.sacnas.org/biography

I WAS BORN in a little town called Rio Verde in the state of San Luis Potosi in Mexico as the oldest of seven children. One of the challenges to living in a remote part of Mexico is that education is not as readily available as in other places and the quality of education is not as high. To excel academically, you have to work very hard and go beyond what is expected of you. I knew this all along because I had cousins, relatives, and friends who went to school in major cities around the country, and their educational opportunities far exceeded mine.

But ever since I was a child, I have been fascinated with chemistry. I was doing experiments by the time I was six years old. One of my favorite experiments to do with my childhood chemistry set was to crystallize copper

to catch up with my peers was to work twice as hard as everyone else. I had to forget about everything that wasn't academics and focus solely on my studies.

After college, I originally thought that I wanted to start a company with my father to recycle byproducts of corn, a major crop in the region where I grew up. Unfortunately, he died in an accident, which forced me to reassess my career goals. I decided to continue on with my schooling and enrolled in a PhD program in chemistry at Georgetown University in Washington, D.C. I felt that going to graduate school in the U.S. would be an excellent academic springboard to launch me anywhere else I wanted to go. I chose Georgetown in particular because the school offered me the best balance between a very rigorous education and a

We live in such an incredible time, when so many of the answers to our questions are literally at our fingertips.

sulfate. It was a blue crystal and I loved to see those blue crystals form. My uncle also really triggered my interest in science; he was a chemist and I saw him as an example of a person I could emulate.

When I left home and went to college, I studied chemistry at the Monterrey Institute of Technology in Monterrey, Mexico. It was the very best school in our country, and my uncle was a professor of chemistry there. My first year at the institute was a total struggle for me because their academic expectations were so much higher than I was accustomed to, and I hadn't yet developed the study skills to keep up. The only thing I could do

beautiful setting in the nation's capital.

The hardest thing for me in coming to the U.S. for graduate school was the language barrier. I was not able to understand all of the questions I was asked. I remember early on when I got an exam back, I was completely surprised that my answer was graded as incorrect. When I went to the professor and asked what part of my answer was incorrect, he said, "Everything you wrote is correct. Unfortunately, you didn't answer the question that I asked you!" It took about a year to learn enough English to excel in my classes. This experience felt similar to my college years, when my peers just

www.sacnas.org/biography

showed up for classes and took notes and that was it, and I had to work twice as hard to get to the same level as everybody else! But through these experiences, I learned that when you apply yourself and work toward your goal, you can overcome any obstacle.

Now as a professor of medicine at the University of North Carolina (UNC) at Chapel Hill, I lead a large group of researchers and train the next generation of biomedical scientists. In my lab, we are trying to develop ways to prevent the transmission of the AIDS virus among individuals in an effort to end the epidemic. I never imagined as a chemist that I would be doing biomedical research with such direct clinical implications, but the common denominator throughout my scientific career is that I've let science take me where I needed to go.

Being a full tenured professor at an institution as prestigious as UNC is a huge accomplishment for me, and every day that I come to work is a total pleasure. I work in the newest building at the UNC campus. It is absolutely beautiful and totally state-of-the-art. We have windows with a beautiful view of the woods and it's very relaxing and conducive to being both creative and highly innovative. This type of environment allows me and my colleagues to come up with novel solutions to problems and to tackle questions of fundamental importance in the field. My favorite aspect of my job is seeing young researchers develop and become seasoned independent investigators. Many of them become leaders in their field. Their transformation is just amazing to watch! My goal is to continue to set a good example for the next generation of scientists and to provide the people in my laboratory an outstanding environment to develop their talents.

Looking back, it seems incredible to be where I am now because neither of my parents had a degree nor even went to high school. Yet all my siblings and I ended up going to college, and many of us went on to pursue advanced degrees. After my father died, my mother was left alone with seven children. My dad had always conveyed the importance of education and the opportunities school could bring. But, it was up to me to set an example for the rest of the family by going to college. My father also had an incredible work ethic: when he died, he was working four jobs. But I had seen nothing yet! After my father died, my mother had to take care of us. That's when I realized how incredible and special she was. Raising seven kids and putting them through college and graduate school is really amazing. I've never met anyone as accomplished as her and she is the focus of all my admiration.

My advice to young people looking to be scientists today is to go beyond what is expected and deliver something that is better than

what everyone else is doing. The one thing that always motivated me was doing experiments—to ask questions and actually find answers. As long as you continue to cultivate your curiosity, you'll do great! And make sure to take advantage of all the resources available to you. Don't be shy.

We live in such an incredible time, when so many of the answers to our questions are literally at our fingertips. To be able to ask about any subject, any issue, anywhere in the world and to have an answer appear on your computer screen is truly amazing. Seeing how the world changes in front of you every day allows you to be in awe about all the potential discoveries in the world and will inspire you to make your own powerful and long-lasting contribution. ■

Cassandra Brooks (Abenaki) is a freelance science writer and a recent graduate of the Science Communication Program at the University of California, Santa Cruz.



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Moments of Understanding: Reflections on the Path to Becoming a Scientist

ABOVE
Saul Villeda, a graduate student at Stanford “reflects” on becoming a scientist.

TO EXPLORE THE THEME of “Transformation to a Scientific Attitude,” members of the SACNAS News Editorial Advisory Board asked their current and former students to write a vignette that focused on a “Eureka!” moment—a single incident in their scientific research or studies when they first “got it”—and how this moment either allowed them to define themselves as scientists or helped them see that they were on the road to becoming scientists.



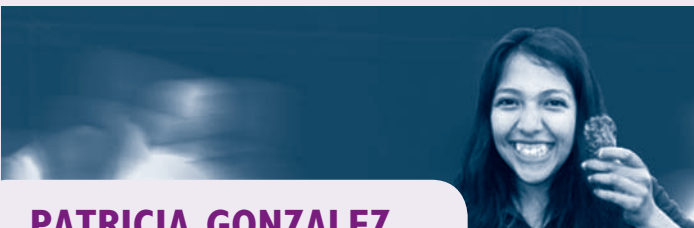
ORLANDO ANTELOPE

(Northern Arapaho)

I have always had a deep interest in science. Growing up, I thought it odd that I was interested in things such as chemistry and physics. A few years ago, my passion for science and the discovery of the world around us deepened even more. I was given a book by my father-in-law called *The Tao of Physics*, written by Fritjof Capra. This book offers comparisons between Eastern philosophy and Western science, describing the world through both lenses, which creates a unique vision of the universe around us. In reading this book, I discovered that a lot of my own previous ideas of reality—which I had thought to be odd or absurd—were now being explained to me in a scientific way that made complete sense. The comparisons between modern physics and the spiritual meditations on reality by Eastern sages allowed me to have a deeper understanding of how science comes to explain the natural phenomena expressed in every interaction with our natural environment.

As I understood the principles and learned of the numerous advances made quite recently in modern physics, I found myself wanting to be a part of these discoveries and advances. I felt a desire to teach everyone around me what I had learned, and how these concepts had opened my mind to an entirely new understanding of reality and perception. As I advance through my courses, I find myself thinking back to those moments when I first discovered my passion for science and I draw strength to push myself through my harder courses and challenge myself to fully understand each new concept.

Orlando Antelope is a student in health/medicine at Salt Lake Community College.



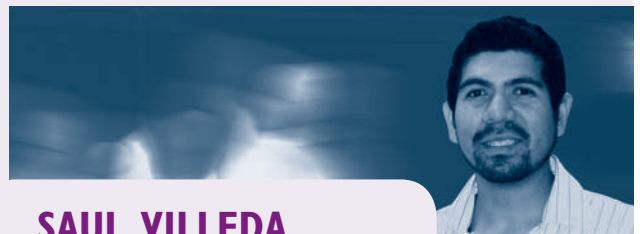
PATRICIA GONZALEZ

The Mojave Desert, California: It's hot, it's windy and if you forgot your sunscreen, it's pretty miserable. Which describes perfectly how I felt, slumped in the shade of the van my research group drove out to our field site. We had spent the hottest part of two days hauling buckets of sand across the desert to fill seed trays for our feeding experiment,

and the question I kept asking myself was "Who in their right mind would do this?"

Early the next morning, I shook a rodent out of a Sherman Trap we had set out the night before, and I found my answer. The rodent we had caught was a kangaroo rat, and as I held it firmly in my gloved hand, I peeked into its giant eyes. What I saw there was a calm curiosity, and a naked wildness that both terrified and fascinated me. I was stunned as I realized that everything I shared with this small mammal—the earth, the air, and the water we drank—was threatened by destructive human habits. But if I wanted to, I could make a difference by conserving it and other species. So what is a scientist? In my case, it's accepting that I can't save all the animals in the world, but I can try to understand how to increase the chances that some of them will survive. As a scientist, that's what I can do, and the real question now is "Who in their right mind wouldn't?"

Patricia Gonzalez is currently a Southern California Ecosystems Research Program scholar at California State University, Fullerton, and is investigating the physiological responses of oysters to thermal stress. She plans to pursue a master's degree in wildlife ecology and conservation after she earns her bachelor's degree in biological science in spring 2012.



SAUL VILLEDA

The scientific process is unique in its innate foundation in unadulterated curiosity. To be a scientist engulfed in this process is to have the ability to transcend borders—to be limited only by the scope of your mind. I entered the University of California, Los Angeles (UCLA), as the first person in my family to be born in the U.S., and the first to attend college. It was while navigating my way through an often overwhelming and intimidating sea of academic and economic challenges at UCLA that I discovered research, and more importantly, where I realized I was a scientist.

I still remember the immediate sense of abandoned excitement and sheer terror I felt when given my very own research project in the lab of Dr. Patricia Phelps. I was investigating spinal cord development using genetic

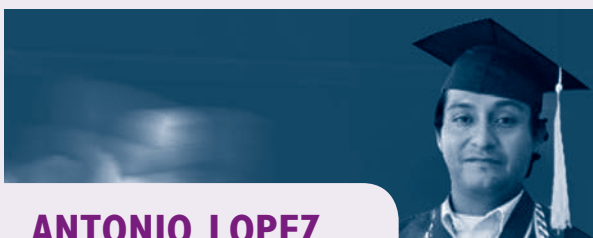
...continued on page 14

Moments of Understanding continued...

mouse models, when I became intimately acquainted with how much a mouse bite can hurt. As these bites became routine, I grew more aggravated, yet curious as to why only certain mice would bite me when I touched them. I kept track of my small aggressors and, to my surprise, realized it was exclusively the “knockout” mice. (Knockout mice are genetic models in which a gene has been literally “cut out.” Basically, it is a technique for testing how necessary a protein is in the body.)

A few months after this observation, I found myself frantically looking for a napkin at a coffee shop in Santa Monica to jot down an idea racing through my head that might justify the bites: “Spinal cord pain processing in knockouts?” Excited by this idea, I returned to the lab and identified developmental errors in the spinal cord of knockout mice in regions controlling pain processing. Eventually, I published this work as my first journal article, graduated from college, and will be graduating with a PhD from Stanford University in the fall. Through it all, I often stop to remind myself that it is from pure curiosity (and sometimes unexpected challenges, like being bitten all the time!) that the most surprising discoveries are made.

Saul Villeda is a first-generation Latino student with parents from Guatemala. He received his bachelor's from the University of California, Los Angeles. He is currently a graduate student in the neurosciences PhD program at Stanford University and will be defending in the fall.



ANTONIO LOPEZ

When I was invited to the National Research Experience for Undergraduates Program (NREUP) during the summer of 2007 at the University of Texas at Arlington to perform mathematical research, I was completely overwhelmed and unsure about whether I could even do research. My insecurity stemmed from past experience. As an English language learner, I had excelled in mathematics in middle and high school. Although I couldn't understand the lectures, I was able to read the language of math. When I entered college, I majored in math for the simple reason that it was

the subject I could do well in without much effort. After talking with friends and mentors, I learned that research was more than running simulations; it takes imagination, diligence, and patience, all the qualities I possess. So I agreed to participate in the program.

Thinking about that summer leaves me in astonishment. If every person in the world is allowed one moment of clarity, the summer of 2007 was my moment. This program lifted my myopia about mathematical research. I saw the benefits and the bountiful options I could possess if I were to continue to study mathematics. I enjoyed working on math research, especially when it made me feel as though I had the potential to solve the world's most dire problems. After finishing this program, I took math more seriously. I realized that research was something that would be very important for me throughout life, because it can positively impact others' ideas and lead to discovery and collaborations. Because of NREUP, I was able to see myself as another person, as a mathematician.

Antonio Lopez obtained his BS in mathematics in 2009 and is currently a graduate student at the University of Texas at Arlington working toward his PhD. He has been accepted into the GK-12 program, in which he will be working with high school students, inspiring them to study mathematics.



DR. MARINA RAMON

As far back as I can remember, I have always had questions about nature. Why do some birds only live in certain places or why can I find seashells in my backyard even though I don't live near the ocean? Although from a very early age I knew I wanted to study science, I had a very hard time identifying myself as a scientist. I had this stereotypically ingrained image of a scientist: single, male PhD who was socially awkward and worked in a laboratory. It has taken me a very LONG time to overcome this stereotype, even after the event that catapulted me to “scientist” status.

During my PhD studies, I attended a statistical workshop. After dinner I was talking with a very famous scientist whom I really admire. I had read all of his papers and was so excited to finally meet him. He asked me what I worked on and I told him marine fish, etc. ... and named a few of the species I had researched and their project descriptions. After I finished answering his question, he asked me about a specific project I had worked on during my master's thesis. He said,

"Have you published your work? I just read a study by 'Ramon et al' on this same topic." As he finished his sentence, he realized that I was the "Ramon et al" and went on to praise my study! This was the moment I finally felt like I might be a "real" scientist. I had published a paper that someone had read, and I was presenting at national meetings. But it wasn't until I received my PhD that, when asked what I did for a living, I could proudly respond "research scientist."

Dr. Marina Ramon is a postdoctoral fellow at the University of Southern California. Her primary interest is the molecular evolution, speciation, and local adaptation of marine fish.



DR. JULIUS YELLOWHAIR
(Navajo)

Growing up in one of the most isolated areas on the Navajo reservation in Arizona, I was never exposed to a whole lot of the outside world. But I always enjoyed math and science at the boarding school I attended. Fortunately, my two older brothers decided to pursue engineering after high school. When we were all at home together, I would look over the material that they brought back with them from college. When I was a kid, we did not have electricity at home, so at night I would look at a book on trigonometry with either a flashlight (if I had enough strong batteries) or a kerosene lamp. By the eighth grade, I had taught myself the basics of trigonometry and my curiosity about math and science grew.

In high school, I took my first physics course and saw the application of trigonometry to physical phenomena. I remember one exercise in which we estimated the height of school buildings using a person of known height standing next to the building, and then repeating the measurement using a protractor and roughly measuring the distance to the building. It was after this assignment that the application of math to physical events started to make sense, and my interest in engineering solidified. Today, as an optical engineer at Sandia National Laboratories, I am helping to develop technologies for renewable energy. It is my hope that the research I conduct will make it so children from my community in Arizona and other rural

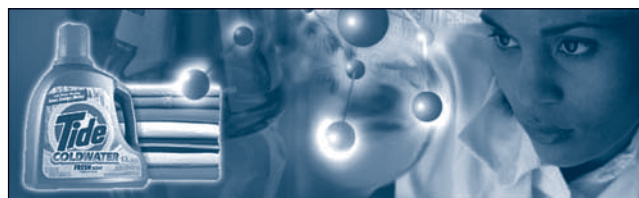
communities around the country will no longer need to read at night with flashlights or kerosene lamps.

Dr. Julius Yellowhair, PhD (Navajo), graduated with his PhD from the University of Arizona in 2007. He is currently an optical engineer at Sandia National Laboratories.

SPECIAL FEATURE ONLINE SUPPLEMENT!



We received more vignettes than we could print in this issue of the SACNAS News. To read about more moments that transformed SACNAS students into scientists, check out our special SACNAS News supplement online at www.sacnas.org/sacnewsResources.cfm



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Viewpoint features distinguished SACNAS mentors, honored annually at the national conference, who respond to questions from students regarding research, graduate school, internships, etc.



Featured Mentor: FRANK BAYLISS, PhD

Q: *When am I supposed to choose an advisor for graduate school? I know that some students meet faculty at conferences and choose them as advisors*

before they ever arrive at grad school. Other students automatically have an advisor because the professor provides financial support for them via grants. On the other hand, I've heard that lots of students arrive to graduate programs and are completely overwhelmed with all of the first-year challenges like courses and exams and may not even have the chance to connect with an advisor until their second year. I've also heard that some programs support students at the departmental level and the students don't even declare an advisor until they have completed coursework requirements.

Most PhD degree programs in the life sciences (biology and biochemistry) provide the opportunity and/or require entering students to rotate through three to four laboratories they have selected to determine which lab they will enter to conduct thesis research. Many of the degree programs are aggregated under an umbrella program with titles like "Biomedical Science" (BMS) or "Programs in Biological Sciences" (PIBS) while others are by specific disciplines, such as neuroscience, immunology, biochemistry, or molecular biology. The umbrella programs transcend departments and offer a wide range of opportunities usually not available, especially if the department is small. Applicants are usually invited to visit the campus and have the opportunity to meet with potential rotation advisors before accepting. Students in the life sciences are typically in a permanent research lab by the end of their first year.

The selection of advisors in the physical sciences tends to be more traditional and vary considerably by discipline and institution. Most students are not interviewed before being selected for admission and may be required to complete a master's degree en route to the PhD in fields such as engineering and computer science. It is also less likely students in the physical sciences will start laboratory research in the first or even the second year. Often, the student is sponsored for admission by a single faculty member interested in the applicant

and in many cases an applicant will not be admitted without a faculty sponsor's commitment.

Q: *How does all this factor in to how I choose a graduate school in the first place?*

Of course, you must do your homework. You can research your field of interest for the best institutions and programs and discuss them with your current department faculty to get an idea of what the best programs are to apply to. You can also meet faculty from these institutions at meetings such as the SACNAS National Conference and you can often arrange to visit the institutions and programs you are interested in attending.

Q: *What about funding for graduate school?*

All quality PhD institutions provide sufficient funding to cover living expenses. While it is not essential to know what the source is (department, college, university, state federal agency), it is very important to know what the amount and term of the funding will be. That is, you need to know for how long you have committed funding. If an institution offers you the first year of funding and then expects you to get an outside fellowship, think twice about going there. Often, you will be offered two years of department funding and then the remaining years will be covered by your research advisor on a research or training grant. Or you will optimally be told you will be funded for the entire period of your PhD, which is ideal. ■

Dr. Frank Bayliss received the 2009 SACNAS Distinguished Undergraduate Institution Mentor Award. He was also the recipient of the 2009 Presidential Award for Excellence in Science, Mathematics, and Engineering Mentoring (PAESMEM). He is a professor of biology at San Francisco State University. He can be reached at fbayl@sfsu.edu.



Read more Q&A with Dr. Bayliss online at www.sacnas.org/sacnewsResources.cfm or on our Facebook page: www.facebook.com/SACNAS

Perspectives is a forum for postdocs, junior faculty, and young professionals to share peer-to-peer insights and form community networks.

CORE COMPETENCIES FOR FUTURE RESEARCHERS: A COMPASS FOR NAVIGATING YOUR CAREER

BY EMIL CHUCK, PHD

I WAS REALLY NAÏVE when I was an early-phase graduate student. I believed that all the rewards for success were dictated by studying hard, doing well on my exams, and getting publishable data. I looked to the faculty who surrounded me as paragons of success who would write me wonderful letters of recommendation, and I presumed that being the best in my field meant knowing, thinking, and dreaming about my experiments and my data. I had no idea how limiting I let my training become as a result of these misconceptions.

Luckily, my research mentor and doctoral thesis committee made sure that I gave myself more than sufficient opportunities to be trained as the best scientist I could be. Even though I didn't have particularly outstanding grades, this group really forced me to think about all the professional skills that would allow me to survive the early phases of my science career. For example, when I gave presentations or worked in a team, my mentors encouraged me to think as an interdisciplinary scientist working with clinicians, engineers, and basic and applied scientists.

When I was given an opportunity to help articulate the competencies of future scientists with the National Postdoctoral Association, I frequently thought about the things I did to become an early career scientist

who could get competitive grants and awards and become a desired future colleague.

Now that I'm in administrative academia and have insights into other science or health

professional careers, I tell high school and undergraduate students beginning careers in research to take these competencies to heart, as it may dictate their future training and success. These six core areas or competencies (www.nationalpostdoc.org/competencies) define the characteristics of an ideally trained scientist. They are also a toolkit of resources that will aid trainees, supervisors, and institutions throughout one's career progression to pursue a wide range of scientific questions and transition among research areas as opportunities emerge.

1. Discipline-specific conceptual knowledge

It should be self-evident that a successful scientist needs to have a solid mastery of the foundational concepts of science and a familiarity with applications of the research being performed in other fields. With knowledge of the discipline, a scientist is able to identify gaps in knowledge, develop hypothesis-driven strategies, and evaluate any generated data. For me, my research forced me to learn molecular biology, electrophysiology, developmental biology, and clinical medicine, as evidenced by a 20-page thesis proposal (which eventually became a review article). Individuals who demonstrate the highest level of competence in this field should be aware of not just the technical details of experiments that support the field but should also envision and develop innovative future experiments to further explore the critical questions facing the discipline.

2. Research skill development

In the design of experiments that can test these hypotheses, the successful scientist should be familiar with the process of identifying and assessing primary sources whose results can be germane to the scientist's research. Such knowledge of past experiments can inform the scientist of innovative approaches to design new experiments and execute novel techniques in a safe and ethical manner. Moreover, just as the successful scientist relies on quality peer-reviewed research to govern the direction of research, the scientist is aware of the importance of proper documentation of experimental results and the rigor



of peer review when submitting research results for publication or grant review. Scientists who master research skills are renowned not just for technical skills but are also excellent critical thinkers who can analyze and evaluate literature and experiments that may be related to the scientist's original research interests.

3. Communication skills

Leading scientists demonstrate versatility in the way they communicate science to peers and to the public. More than just writing peer-reviewed articles, communication skills truly encompass multiple situations, among which are reporting results to one's colleagues, developing performance assessments and evaluations, delivering poster or plenary presentations, discussing one's research with the general public, and teaching techniques or giving lectures to trainees. Mastering communication skills involves not just the delivery of information but also critical listening skills to establish discussion settings that are inclusive and welcoming to all members of an audience.

4. Professionalism

By becoming a scientist, one recognizes that he/she enters a community of scholars through associations with one's laboratory group, one's institution, one's discipline, and one's affiliation with the general public. How others perceive you and your profession as a scientist often dictates how they value your research or your expertise, and any controversies that cast a negative light on your colleagues' professional decisions often paints your institution, your discipline, and even all of science negatively. Competency in professionalism focuses on how the individual identifies with each of these subcommunities, respects the individual contributions of other members of those communities, represents the communities to which he/she belongs, and appreciates the diversity of membership.

5. Leadership and management skills

By recognizing the value and diversity of one's peers and colleagues, a scientist can develop appropriate skills in management and leadership. To allow a research project to progress in a timely manner, one must be able to appropriately set a project schedule, manage finances, and utilize collaborators, thus effectively managing one's research, the data generated and the staff and colleagues needed to execute the experiments. One of the differences between manager and leader is the ability to develop a strategic vision that can be shared among and inspire one's peers in the aforesaid professional communities. While the most competent leaders may be identified by the rewarding of administrative titles, one need not have a title to be a leader. Rather, "the competency of a leader is often measured by the impact he/she makes within the community served."

RIGHT
Dr. Emil Chuck in 1997, his third year of graduate school.



6. Responsible conduct of research

In every profession, there are usually legal constraints that define the autonomy of a profession, and for this competency, professionals must acknowledge and operate within the explicit and often implicit expectations for the conduct of research. Most scientists tend to resist acknowledging or developing this competency until damage is done to the lab in a personal, physical, institutional, or disciplinary sense. The most competent researchers are not only aware of the legal ramifications of these restrictions, but also exhibit a deeper understanding of the ethics and philosophy behind them. Those who master this area are adept at discussing improvements or changes to these restrictions, and they assist in mediating conflicts that arise among colleagues.

In solicited comments to the developing strategic plan for the National Institute of General Medical Sciences, the National Postdoctoral Association urged: "Today and in the future, postdocs must prepare for more than one career path and develop a broad range of competencies to succeed.... A trainee's success may indeed depend upon their mastery of a broad range of skills and their flexibility regarding their career goals." More than just a map, the Core Competencies Toolkit should provide a career compass—a "Graduate/Postdoc Sherpa" [GPS]—to guide each scientist to his/her ultimate career destination. Even though I left the lab years ago and despite the detours I have had to take, these general principles allowed me to approach my personal destination toward becoming a better science professional. ■

A member of the SACNAS Postdoctoral Committee, Dr. Emil Chuck is a committee member for the National Postdoctoral Association Core Competencies Toolkit (professionalism author) and a health professions advisor and term assistant professor of biology at George Mason University. He can be reached at etchuck@yahoo.com.

The contributing editor for the Perspectives column is Dr. Ivonne Vidal Pizarro. She can be reached at ivonnevipi@alumni.upenn.edu.



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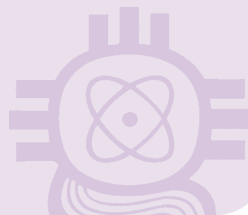
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Diverse and vibrant – a mosaic of individuals whose contributions reinforce and support each other, embracing differences, benefiting from active interdisciplinarity, transcending boundaries.

Check out our graduate program at www.phys.psu.edu and contact any of our faculty or our Associate Head, Richard Robinett, at rick@phys.psu.edu to discuss your graduate career goals. We are Penn State Physics and we are interested in your graduate student career.

PENN STATE

Penn State is committed to affirmative action, equal opportunity and the diversity of its workforce.



LEFT
Volunteers for the science academy that UCLA SACNAS chapter members organized for local Los Angeles high school students.

BELOW
Students at Texas Tech University gather for a round-table discussion at the SACNAS regional meeting in February 2010.

SACNAS Chapter at University of California, Los Angeles, Reaches Out to Local High School Students

In what is to be the first of many such outreach events, members of the UCLA SACNAS chapter joined forces with UCLA's Early Academic Outreach Program to co-host a science academy for over 200 high school students from throughout the Los Angeles Unified School District. Held in April 2010, the science academy exposed students to the option of science and research as a career—a choice they may not otherwise consider since many of them come from low-income areas with limited school resources.

The UCLA SACNAS chapter designed, coordinated, and led biology, neurobiology, engineering, and physiology modules. The high school students were given a theory, and then actively engaged in a “real life” activity. The chapter members (including undergraduates, graduates, postdocs, and staff) also introduced themselves, their research areas, and their life experiences.

Building partnerships allowed the UCLA SACNAS chapter to maximize our outreach efforts. UCLA faculty made donations and space available. The School of Medicine Postbaccalaureate Program at the University of California, San Diego, the Timao Foundation for Research and Development, and the Consortium of High Schools/Undergraduate and Medical Schools Outreach Program trained the volunteers and provided equipment. Some of the high school students have already written back to thank the chapter for the motivating and exciting science experience! ■

Angelica Riestra is a second-year graduate student in the Department of Microbiology, Immunology, and Molecular Genetics at the University of California, Los Angeles.



TWO SACNAS REGIONAL MEETINGS IN 2010

SACNAS thanks the SACNAS chapters at Texas Tech University (February) and Brandeis University (April) for organizing and hosting SACNAS regional meetings this year. In the second pilot year of the regional meetings program, both gatherings were one-day events that showcased student research presentations, dynamic keynote speakers, and opportunities for SACNAS students to network and learn from each other's activities.

The SACNAS Chapter Committee has been assessing successes the last two years and is excited to announce new guidelines and an ideal framework for SACNAS Regional Meetings. Please expect more information on how to apply and be selected to host in 2011 at this year's SACNAS National Conference. ■

Spotlight on a National Nuclear Security Administration (NNSA) Intern Ambassador

By Yemina Leszczuk



In 2008, SACNAS joined in consortium with the Society of Hispanic Engineers (SHPE) and the Society of Mexican American Engineers and Scientists (MAES) to further the involvement of Hispanics in science, technology, engineering, and mathematics (STEM) fields. Soon after, the consortium joined forces with the NNSA to create a unique internship program for underrepresented minority STEM students. Below, Yemina Leszczuk, NNSA internship ambassador, shares a little about her background and

reports on her experience with the prestigious NNSA program.

I was born in Buenos Aires, Argentina, where I grew up until my family moved to Michigan in the late 90s. I currently attend the University of Michigan, Ann Arbor, where I'm a fifth-year student in material science and engineering, with a minor in art history. At the university, I'm actively involved with SHPE and I work part-time at a chemical engineering lab. I'm graduating in December 2010 and I hope to continue my education by going to graduate school.

I was very excited to be accepted as an ambassador for the NNSA consortium internship program. As an ambassador to the program, I am excited to share my internship experience with other students. For example, I shared with my own SHPE chapter the benefits and opportunities a summer research program offers. In the future, I will be part of the SACNAS and SHPE national conferences, and will attend career fairs to promote the NNSA program.

My internship with NNSA was during the summer of 2009 at the Los Alamos National Laboratory in New Mexico. I worked in the materials science and technology division for structure/property relations. My project included growing single crystals of copper through a modified Bridgeman method. It was a great experience to work in a lab applying the principles we learned in my classes while obtaining firsthand experience in current research. It was also a great experience to get to spend a summer in Los Alamos. The scenery is beautiful and the state of New Mexico is full of history, so it's a perfect place for people who want to explore a unique part of our country.

I believe that a NNSA internship is an important way students can prepare for research in graduate school. The mentors who are involved in the program are experts in their fields and serve as excellent role models. Moreover, many of us work and study during the year to stay in school and research is not always an option. However, the NNSA consortium internship program allows students to gain research experience outside of the school year, while still earning money to finance their studies. Also important, the program creates a strong network of students during the summer, and the friendships made during the summer last a lifetime. ■

LEFT

Yemina participates in a SHPE e-board meeting.



Make sure you check out the NNSA internship on Twitter and Facebook to get updates on deadlines and requirements.



THE UNIVERSITY OF CHICAGO, Department of Chemistry – Assistant Professor

The Department of Chemistry of the University of Chicago invites applications from outstanding individuals for the position of Assistant Professor of Chemistry. This search is in the areas broadly defined as inorganic, organic, and physical chemistry. Applicants must apply online to the University of Chicago Academic Career website at <http://tinyurl.com/36pmntk>.

Applicants must upload a cover letter, a curriculum vitae with a list of publications, and a succinct outline of research plans. The cover letter should be addressed to the Inorganic Search Committee, Organic Search Committee, or Physical Search Committee, depending on the discipline of interest. The successful candidate must have a Ph.D. in Chemistry or related field. In addition, three reference letters will be required. Review of completed applications will begin **October 1, 2010**; to ensure full consideration, all material should be submitted by that date.



University of Chicago is AA/EOE employer.

SACNAS Chapter CHECKPOINT.

Preparing for the SACNAS National Conference: “Knowing it” and “showing it” are two different things!

By Tanya Beat

Throughout the year, I talk with professionals who represent faculty, administrators, program directors, and exhibitors about their experience at the SACNAS conference. The conversations follow a similar trend. They start with an enthusiastic explanation about why they love the SACNAS conference, how it impacts their work, and why they attend. As I inquire about how we can make the conference better, they consistently express that growing a student’s ability to prepare and present themselves is key. These professionals want our students to know why they are there, be able to express that to them succinctly, and to come prepared with materials that invite contact after the conference.

This “Chapter Checkpoint” provides information not just for chapter members, but for all students attending the conference. The more prepared you are to engage actively with others at the SACNAS conference, the better you will be at meeting exhibitors, new mentors, and peers who can contribute to your successful journey.

Set goals for the conference

Start with one simple idea: know your goal for attending the conference. Knowing why you are going to the SACNAS conference will provide you with the focus and confidence that is the foundation of

your presentation. Do you have more than one goal? Great! Now write them down. *I mean right now.* Go to your computer or grab a pad of paper and write three goals that you want to accomplish by attending the conference. Examples of goals: have five summer internships to apply for; meet two professionals in fields that interest me; go to the “How to Apply to Graduate School” session; meet recruiters from three graduate programs that I want to apply to.

Practice your one-minute introduction

Once you define your goals for the conference, meeting people will be easier. This builds up to the next idea: know your one-minute introduction (a.k.a. the elevator speech). Start with your name, where you go to school and why you’re at SACNAS. Practice this basic conversation with friends, family, and peers in your chapter or summer research program. The more you practice, the more comfortable you will feel in presenting yourself to others.

Business cards and curricula vitae

There will be 3,000–4,000 people at this year’s conference. How will they remember you after we all go our separate ways? The basic business card serves as the tool for post-conference follow-up with the faculty, directors, speakers, and other students you meet. Even better, bring your résumé or CV when you want to make a significant impact with recruiters. There are websites that offer free business cards for a minimal shipping fee.

These three basic suggestions are the building blocks in becoming the rock star that SACNAS knows you are. The key is to be prepared so that you can build your confidence and truly believe it. ■

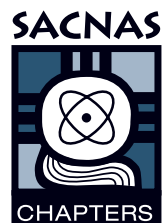
Tanya Beat is a program manager at SACNAS. She can be reached at tanya@sacnas.org.



ABOVE
A student at the 2009 SACNAS National Conference works it in the exhibit hall. Take note of his professional dress, enthusiasm, and confidence. (You just know that he has business cards and a résumé handy, too!)



For more information on how to prepare for the SACNAS conference, check out “Elements of Success: All You Ever Needed to Know to Get the Most Out of the 2010 SACNAS National Conference” online at www.sacnas.org





HELPFUL TIPS FOR CREATING BUSINESS CARDS AND RÉSUMÉS

Free Business Card Services

1. Vistaprint: www.vistaprint.com

250 cards for free with Vistaprint advertising on the back
Shipping and handling: \$5.67
(21 days to ship)

2. DCP Print: www.dcp-print.com

250 cards for free with DCP advertising on the back
Shipping and handling: \$4.99
(21 days to ship)

3. Bizcard.com: www.bizcard.com/product/free-business-cards

250 cards for free with no advertising on the back
Shipping and handling: \$8.88
(ground shipping)

Curriculum Vitae Information

1. University of North Florida Career Development Center

Curriculum Vitae and Related Resources

www.unf.edu/dept/cdc/publications/curriculum/welcome.htm

2. University Career Services at the University of Virginia

- Writing a Curriculum Vitae

www.career.virginia.edu/students/handouts/writing_cv.pdf

- Writing a Résumé

www.career.virginia.edu/students/handouts/writing_resumes.pdf



MESA AND SACNAS COLLABORATE ON 2010 LEADERSHIP RETREAT

For 40 years, Mathematics, Engineering, Science Achievement (MESA) has provided the tools and support to help educationally disadvantaged students at the K-12, community college, and four-year college levels become the scientists and engineers of the future.

California MESA serves as a model for other MESA programs in more than a dozen other states. The program has proven successful at advancing students through from bachelor's degrees to the workforce. MESA is nationally recognized for its innovation and strong education/industry partnerships.

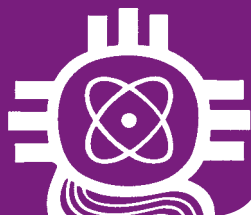
Many MESA students are also members of SACNAS and the two organizations have collaborated on numerous endeavors to support student achievement. SACNAS co-sponsored the 2010 MESA Student Leadership Retreat, which joined together 120 MESA community college students from 17 campuses to enhance their leadership skills. SACNAS hosted a networking dinner bringing scientists and graduate students to interact with MESA students. SACNAS also held two workshops and provided funding.

MESA students often attend the SACNAS National Conference and present their summer research projects each year. MESA students are also involved with SACNAS on campus and eight MESA community college campuses have official SACNAS Chapters. ■

Danielle McNamara is the communications coordinator for MESA.

ABOVE

MESA students chatted with SACNAS board member Dr. Lino Gonzalez at the MESA Student Leadership Retreat in April. The retreat, held in Santa Cruz, was co-sponsored by SACNAS. SACNAS scientists and graduate students held a networking dinner and workshops at the retreat.



Meet the New PhDs of SACNAS



➔ **Matthew Zack Anderson, PhD**

mzanders@unm.com

Ethnicity: Native American (Eastern Cherokee) and White

Degree Conferred: PhD in genetics

Institution: Stanford University

Dissertation Title: Genetics of Toxoplasma

Gondii Tachyzoite to Bradyzoite

Differentiation

Thesis Advisor: Dr. John C. Boothroyd

Research Interests: Infectious disease affecting underserved communities

Current Position: Postdoc at the University of Minnesota in the lab of Dr. Judith Berman

➔ **Wilfredo Ayala-Lopez, PhD**

wilfredo.ayala1@upr.edu

Ethnicity: Puerto Rican

Degree Conferred: PhD in chemistry with concentration in biochemistry and molecular biology

Institution: Purdue University

Dissertation Title: Folate-Receptor Mediated Targeting of Diagnostics and Therapeutics to Activated Macrophages in Inflammation

Thesis Advisor: Dr. Phillip S. Low

Research Interests: Nanoparticle research, drug targeting, inflammation, and cancer

Current Position: Assistant professor of biology, University of Puerto Rico in Humacao

How SACNAS Helped: "SACNAS helped me a lot in the final stages of my PhD process. I was not sure what I would do after I was done with my PhD work. During this time, I participated in the 2007 SACNAS National Conference and had the opportunity to talk to many scientists and peer graduate students about job opportunities. At the conference, I learned two things: that I was not alone with the struggles of graduate school and that many small colleges and universities actually offered teaching postdocs or teaching-focused positions. I came back from the conference that year with the resolution of finishing up as soon as possible and searching for a teaching position at a small liberal arts school. I did get a position at the

University of Puerto Rico in Humacao, and I am enjoying every minute of it. If it had not been for SACNAS, I might not have even considered such a career."

➔ **Odmara L. Barreto-Chang, PhD**

odmara@stanford.edu

Ethnicity: Puerto Rican

Degree Conferred: PhD in neurosciences

Institution: Stanford University School of Medicine

Dissertation Title: Regulation of Neuronal Survival and CREB-Dependent Transcription by CaV1.2 L-Type Calcium Channels

Thesis Advisor: Dr. Ricardo Dolmetsch

Research Interests: Neuroscience, developmental biology, medicine

➔ **Margaret Barnhill Bodemer, PhD**

bodemer@hawaii.edu

Ethnicity: Caucasian/White

Degree Conferred: PhD in cultural anthropology

Institution: University of Hawai'i at Manoa

Dissertation Title: Museums, Anthropology and the Work of Culture in Contemporary Vietnam

Thesis Advisor: Dr. Geoffrey White

Research Interests: Issues in contemporary society; the politics of culture, history, and anthropology

➔ **Monik Jimenez, ScD**

mjimenez11@rics.bwh.harvard.edu

Ethnicity: Latina

Degree Conferred: Doctor of Science (ScD) in epidemiology

Institution: Harvard School of Public Health, Department of Epidemiology

Dissertation Title: Disparities in Periodontitis and Tooth Loss: The Role of SES, Obesity and Diabetes

Thesis Advisor: Dr. Kaumudi J. Joshipura

Research Interests: Risk factors for stroke: adipocytokines, sex hormones; oral epidemiology

Current Position: Postdoctoral fellow at Brigham and Women's Hospital, Harvard Medical School

How SACNAS Helped: "I became involved with SACNAS during my master's program and served as president of the Harvard School of Public Health chapter. While I gained some obvious skills while a member of SACNAS, such as improving my presentation skills and networking, the greatest benefit was the sense of community the Harvard chapter provided. Formation of the Harvard chapter was an important support for me during my early graduate-school experience. Each of the events we conducted and attendance at the national conferences were not just educational and career advancing, but also emotionally supportive and invigorating."

While I gained some obvious skills while a member of SACNAS, such as improving my presentation skills and networking, the greatest benefit was the sense of community the Harvard chapter provided.

— Monik Jimenez, ScD

 **Monica Lares, PhD**

mmlares@coh.org

Ethnicity: Chicana

Degree Conferred: PhD in chemistry and biochemistry

Institution: University of California, Santa Cruz

Dissertation Title: Insights into a Novel RNA Gene: HAR1

Thesis Advisor: Dr. William G. Scott

Current Position: Postdoctoral fellow at City of Hope

How SACNAS Helped: “I began my involvement with SACNAS as an undergraduate. I was able to present my undergraduate research at a poster session at a SACNAS conference. Everyone made me feel very comfortable and gave me great feedback. As a graduate student, I gave an oral presentation and again I got great feedback and advice. Also, a recruiter came up to me after my talk and asked me to apply to his postdoctoral program. My experiences with SACNAS gave me confidence about going to other scientific meetings and presenting my research. Overall, SACNAS gave me a sense of community, connected me with helpful people, and gave me confidence in my presentation skills.”

 **Raquel M. Martinez, PhD**

raquel.martinez@dartmouth.com

Ethnicity: Mexican American

Degree Conferred: PhD in microbiology

Institution: Dartmouth Medical School

Dissertation Title: Identification of Novel Proteins in *Vibrio Cholerae* Motility

Thesis Advisor: Dr. Ronald K. Taylor

Research Interests: Clinical and public health microbiology

Current Position: Postdoctoral fellow

How SACNAS Helped: “I have been a member of SACNAS since I was an undergraduate. My first introduction to the annual conference was through my mentor, Dr. Maria Elena Zavala. It wasn't until my second conference that I was ready to think about graduate school. The exhibit hall was

At the conference, I learned two things: that I was not alone with the struggles of graduate school and that many small colleges and universities actually offered teaching postdocs or teaching-focused positions.

— Wilfredo Ayala-Lopez, PhD

a bit intimidating, but it was also the perfect place to gather information about schools and their programs. It was at the meeting that I met my future PhD advisor, Dr. Ronald Taylor. He was an exhibitor recruiting for Dartmouth's molecular and cellular biology program. Since then, I have also recruited for Dartmouth at SACNAS as a graduate student representative. SACNAS has been, and continues to be, a great resource for furthering my education.”

 **Francisco J. Pina, PhD**

fjpina@stanford.edu

Ethnicity: Mexican

Degree Conferred: PhD in biology

Institution: Stanford University

Dissertation Title: Hph1 and Hph2 Interact with the Sec63 ER-Translocation Complex and Are Required for Vph1 Protein Stability

Thesis Advisor: Dr. Martha Cyert

Research Interests: Plant genetics, evolution, and breeding of crops

Current Position: Looking for postdoctoral position starting in January 2011

 **Tepring Piquado, PhD**

piquadot@georgetown.edu

Ethnicity: Black

Degree Conferred: PhD in neuroscience

Institution: Brandeis University

Dissertation Title: Language and the Aging Brain

Thesis Advisor: Dr. Arthur Wingfield

Research Interests: Neurobiology of language

Current Position: Postdoctoral fellow at the University of California, Irvine

 **Gabriel A. Quinones, PhD**

quinones@stanford.edu

Ethnicity: Latino

Degree Conferred: PhD in cancer biology

Institution: Stanford University

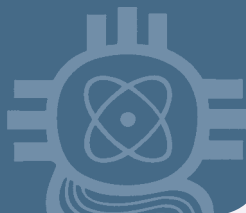
Dissertation Title: MIM Mediates Directional Sensing During Guided Cell Migration

Thesis Advisor: Dr. Anthony E. Oro

Research Interests: Cell migrations, large scale screening, relationship between extracellular signaling and components of the cytoskeleton

Current Position: Postdoc currently seeking employment

How SACNAS Helped: “SACNAS helped me early on in my undergraduate career by giving me the opportunity to present my research in a large setting and by networking with students and faculty from around the country. This translated to my graduate career in terms of networking and public speaking. One key aspect about SACNAS was the annual conference, and the opportunity to explain my research to students and professors from a wide array of scientific backgrounds. Speaking to people with not only different scientific backgrounds, but also different cultural backgrounds, has been a big help throughout my graduate career.”



■ **Dr. Frank Bayliss**, professor of biology and director of the Student Enrichment Opportunities office at San Francisco State University's College of Science and Engineering, was awarded the 2009 Presidential Award for Excellence in Science, Mathematics, and Engineering Mentoring.

■ **Dr. Erika Camacho**, an assistant professor of mathematical and natural sciences at Arizona State University and SACNAS Life Member, was featured on the January cover of *Diverse Issues in Higher Education*. Also in that issue, she was featured as one of the top emerging scholars in 2010.

■ **Gilberto Cardenas**, an undergraduate in mathematics at the University of California, Irvine, was an invited guest speaker for the Orange Coast College Honors Program Creating Scholars presentation. He spoke about his passion for the combination of photography and applied mathematics. In April 2010, one of Cardenas' research photographs was published on the cover of *The Journal of Experimental Biology*. Another of his photographs is scheduled to appear on the cover of *The Journal of Zoology*.

■ **Dr. Carlos Castillo-Chavez**, Regents Professor and Joaquin Bustoz Jr. Professor of Mathematical Biology at Arizona State University and SACNAS Life Member, was given the Award for Distinguished Public Service by the American Mathematical Society. Dr. Castillo-Chavez will also be writing a new column, "Expanding our Scope," in the news journal for the Society for Industrial and Applied Mathematics, *The SIAM News*. His first column was about the mentoring relationship between his mentee and colleague Dr. Erika Camacho and renowned high school teacher Jaime Escalante.

■ **Dr. Jorge Cham**, www.phdcomics.com, and Dr. Dwayne Godwin, Wake Forest University School of Medicine, won first place in the American Association for the Advancement of Science 2009 Visualization Challenge for their collaboration on neuroscience-themed comic strips that now appear regularly in *Scientific American Mind*.

■ **Tracie Delgado**, a fourth-year PhD candidate in the department of microbiology at the University of Washington, was first author on a paper entitled "Induction of the Warburg Effect by Kaposi's Sarcoma Herpesvirus Is Required for the Maintenance of Latently Infected Endothelial Cells," published in the *Proceedings of the National Academy of Science*.

■ **Dr. Russell J. Donnelly**, a professor of physics at the University of Oregon and a SACNAS IPY partner, was awarded an American Institute

of Physics Prize for his television series project "Absolute Zero and the Conquest of Cold."

■ **Lisandro Maya-Ramos**, who recently graduated with a BS in biology from the University of California, San Diego, was named a 2010 Gilliam Fellow with the Howard Hughes Medical Institute. The Gilliam Fellowship for Advanced Study offers full support for up to five years of study toward a PhD. Maya-Ramos will be attending the MD/PhD program at the University of California, San Francisco.

■ **Talea Mayo** and **Gina Pomann**, alumni of the 2007 Mathematical Summer Research Institute—Undergraduate Program, have received 2010 National Science Foundation graduate research fellowships.

■ **Nicholas Olivas** and **Lamar Blackwell**, both students at the University of California, Irvine, were winners of the 2010 student poster competition that took place at the American Association for the Advancement of Science meeting in February in San Diego.

■ **Dr. Ivelisse Rubio**, a professor in the computer science department at the University of Puerto Rico in Rio Piedras and SACNAS Life Member, was the 2010 recipient of the Dr. Etta Z. Falconer Award for Mentoring and Commitment to Diversity at the Infinite Possibilities Conference, which celebrates and promotes diversity in the mathematical sciences.

■ **Donaldo Salas**, an undergraduate biology student at the University of California, Santa Cruz, acted in a local production of *Tomás and Library Lady*, a play about the childhood of Tomás Rivera, the former chancellor of the University of California, Riverside. Salas played the part of Tomás Rivera's father.

■ **Diane Scaduto**, a third-year PhD student at Baylor College of Medicine and SACNAS Life Member, had her research on sequencing HIV variants featured on television during a one-hour special on *20/20* and *Oprah*. Her research, which was conducted during her first-year rotation project in Dr. Michael Metzger's lab, was also the basis for a *Law and Order SVU* episode.

■ **Luis O. Serrano Figueroa** recently received his MS degree in pharmacy/industrial pharmacy from the University of Puerto Rico Medical Sciences Campus. He is currently enrolled in the microbiology PhD program at Montana State University, Bozeman, with a molecular biosciences program fellowship. His research is about haloalkaliphilic bacteria physiology and siderophores.

■ **Norma Vasquez**, the founder of the SACNAS chapter at California State University, Monterey Bay, graduated with a BS in environmental science, technology, and policy. She was awarded a National Science Foundation graduate research fellowship, which will cover all of her expenses for the first three years of her PhD studies at Oregon State University.

■ **Griselda M. Velázquez** received her MA in mathematics education from the University of California, Santa Cruz. She will be continuing her studies in the same program to earn her PhD.

■ **Dr. David Vigerust** was appointed to the faculty at Vanderbilt University as a research assistant professor of pathology at the Vanderbilt University Medical Center.

■ **Dr. Lee D. Wilson**, an assistant professor of chemistry at the University of Saskatchewan, was recently awarded tenure.

■ **Dr. Maria Elena Zavala**, professor of biology at California State University, Northridge, and SACNAS Friend of the Society, was named a fellow of the American Association for the Advancement of Science (AAAS). Becoming an AAAS fellow is an honor bestowed upon members by their peers. Fellows are recognized for meritorious efforts to advance science or its applications. ■

IN MEMORIAM

Dr. Alonzo Atencio, a founding member of SACNAS and president of the board of directors from 1975 to 1977, passed away in January 2010. Dr. Atencio, a professor at the University of New Mexico School of Medicine, was known as the "Godfather of minority medical education." Though his research centered on heparin, his true passion was medical education, particularly for underrepresented minority students. It was Dr. Atencio who was responsible for gathering the original SACNAS community in 1972. Dr. Vernon Avila, another founding member of SACNAS and professor emeritus of biology at San Diego State University, said, "Dr. Atencio truly was one of the major reasons that SACNAS became a reality. He will be greatly missed."

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STUDENT

**GILBERTO CARDENAS**

Discipline: Mathematics with a concentration in applied and computational math

Ethnic Background: Mexican

Year in School: Fourth year undergraduate

Institution: University of California, Irvine

Research Abstract: Fish have a sensory organ in their bodies called the lateral line that is composed of tiny receptors known as neuromasts. Fish rely on the lateral line to detect the water around them, which aids in behaviors such as surface feeding, obstacle avoidance, detection of prey, schooling behavior, mate selection, and escape response to predators. Our lab studies the mechanics of the lateral line to get a better understanding of the physical properties that allow fish to detect signals around them and to make decisions based on their interpretations of those signals.

What direction would you like to go in your research?

My research with the lateral line system has given me an opportunity to apply what I've learned in the classroom to real-life situations that make contributions to science. Since I transferred to the University of California, Irvine, I've been working in a biomechanics lab with Dr. Matt McHenry and I've been given many opportunities to explore ideas and find possible solutions to various problems. My understanding of how various disciplines come together has increased, and as a result, I have been dedicating more time to doing experiments, reading literature, and gathering useful data. My goals are to be able to take my work to the next level and employ techniques that will further my understanding of the lateral line system, to collaborate with researchers within this field, and to prepare myself for the type of research that I will be doing in graduate school.

What valuable lessons have you learned from your mentors?

The thought of working in a laboratory outside my major was intimidating at first, but with the help of my mentor, I was able to learn the necessary procedures to be in a laboratory environment, and also learn the scientific process firsthand from someone who does it for a living. My experience has been great so far, and Dr. McHenry has given me indispensable guidance that has allowed me to grow not just as an individual but also as a student and a junior scientist. I've learned not to shy away from any problem,

and ask for help if anything is beyond my scope. Any idea that I have is given the same level of attention as every other idea from the graduate students, and this has encouraged me to become self-motivating in seeking out answers to my questions. There are many resources I can use, and the best thing I can do as an undergraduate student is take advantage of all of them to expand my knowledge and understanding of my research.

What are your career goals?

I have a great interest in photography and have taught myself the technical aspects of taking photos. I combine this passion with the research that I do by capturing images of the fish that I study, and I have had the privilege of having my work recognized not just for its scientific aspects, but also its artistic quality. This passion is also part of my work as a math major, because I am working on getting a concentration in computational math that focuses on computational photography. I am pursuing a graduate program that combines various disciplines to tackle problems through a different lens. When I began at UCI, I was unsure what I wanted to pursue after I graduated, but my experience working in a laboratory has been beyond my expectations. My goals now are focused and I am seeing graduate school and the possibility of working for a PhD as obtainable.

POSTDOC/YOUNG PROFESSIONAL

**HEIDI SCHUTZ, PHD**

Discipline: Evolutionary biology

Ethnic Background: Latina

Highest Degree Earned: PhD, 2008

Institution: University of California, Riverside

Position: Postdoctoral fellow

Research Abstract: My research interests examine the links among form, function, evolutionary selection, and life history. I explore how the responses to various functional pressures differ between males and females. The pelvis serves three critical functional roles in mammals: weight-bearing, giving birth, and locomotion. Since male mammals do not give birth, studying this complex bony element allows us to examine a selective pressure unique to females. These questions are evolutionarily relevant to all vertebrates and highlight an aspect of female biomechanical evolution and selection that, although well-studied in humans, has been relatively ignored in other vertebrate groups.

How did you know you wanted to get a PhD?

My mother loves to tell a story about me at five years old sitting in front of an ant trail for three hours just to figure out what they were doing and why. Apparently, I would not budge. For as long as I can remember, I have had a fascination with how animals function and somewhere along the line that became coupled with a desire to be a scientist. Then, in

college I had the opportunity to serve as an undergraduate teaching assistant and realized that along with doing science for a living, I also wanted to teach at the college level. The degree was clearly the way to get there.

Which of your non-research-related interests are you most proud of, and why?

Teaching and mentoring. There is an immense satisfaction to be had from knowing that you helped someone move forward in attaining his/her goals. Achievements are nothing if we can't use them to facilitate the success of others. In fact, I actually see teaching and mentoring as intertwined with my research activities in many ways. My teaching informs my research and vice versa.

What do you most enjoy about research and working in the lab?

Problem solving on the fly! No matter how well you plan, you always come across a snag (sometimes big, sometimes small) and being able to think on your feet to solve the problem and make research move forward is hugely satisfying.

PROFESSIONAL



LUIS ECHEGOYEN, PHD

Discipline: Chemistry

Ethnic Background: Hispanic (born in Cuba)

Highest Degree Earned: PhD

Institution: Clemson University, National Science Foundation

Research Abstract: Our work involves carbon-based compounds, especially “buckyballs,” carbon compounds that have spherical or approximately spherical shapes. The most famous buckyball is composed of 60 carbon atoms and is an identical nano-replica of a soccerball, containing 12 pentagons and 20 hexagons. These compounds are useful in solar cells and some derivatives are already present in commercial products. Our most recent interest is in buckyballs that contain other atoms trapped inside, making them analogues of nano-maracas, since the atoms inside are not really chemically bonded to the cages, just trapped there. These have interesting and unusual electronic and structural properties.

Why did you choose to pursue a career in chemistry?

From an early age, my curiosity and passion for science were very strong. I was awed by scientific knowledge and by the power it provides to explain the makings and workings of the physical world. When I was still in middle school, I remember when I found out why my mother's pressure cooker worked

so well and how the same principle explained why it takes so much longer to prepare a hard-boiled egg when on top of a high mountain. Chemistry in particular was attractive—not only because it allowed me to understand the properties of different compounds and their interactions with the environment and within living organisms, but most impressively, it allowed me to create compounds that did not exist in nature. Most sciences explain why nature works the way it does, but few offer the ability to create totally different forms of matter that cannot be found anywhere. The true beauty of chemistry is the ability to design compounds with very unique properties that can be useful in multiple applications, from curing diseases to trapping solar energy more efficiently than plants can.

What is the most valuable advice you have received from someone during your career?

One particularly important piece of advice was being told to have confidence in myself and in my abilities when I started my post-doctoral work at the University of Wisconsin. I went to Madison from the University of Puerto Rico (UPR) in Rio Piedras, where I obtained my PhD degree. Coming from UPR and going to a top-10 institution in the U.S. was a tremendous challenge for me. Although I had performed very well during my PhD in Puerto Rico, I had never had to compete at a top institution like the University of Wisconsin–Madison, so I was very tense. Having someone tell me to trust myself and my abilities gave me a tremendous lift and made me feel confident, thus helping me tremendously to succeed. One should always remember that a few words of advice at the right time and place can have a far-reaching and fantastic effect on people. One should always remember these important moments and try to help younger co-workers when the time is appropriate.

What are the skills and/or personal attributes that you find most vital to pursuing your line of research?

There are many attributes needed to succeed in any field and at any level, but I am convinced that responsibility and hard work are way at the top in importance. One must also have a passion for what one does in order to make it a true profession and not just a job. I always tell my students that they should select their professional field based on their true passions, to follow things that they are truly interested in doing, and not to worry too much about the potential monetary rewards. When I left my industrial position to go to an academic job, I took a salary cut of one-third because I wanted to pursue academic research. At that time, I was not completely sure that I had made the correct decision because I was very young and inexperienced. Retrospectively, I now know that not only was it the right move at the time, but what motivated me to do it then should motivate everyone as they make professional decisions throughout their lives and careers. ■

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For more information contact:

William H. Kinsey, Ph.D (wkinsey@kumc.edu)

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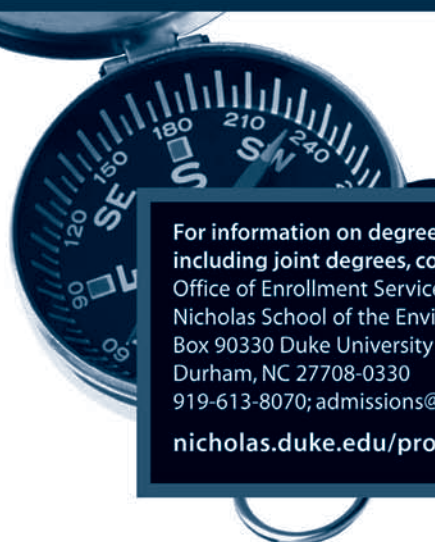
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SACNAS SCIENCE POLICY REPORT

By
**Robert
Barnhill, PhD**

The science policy program at SACNAS has made great strides in the winter and spring of 2010—including continued interaction with White House personnel; creation of a permanent home for SACNAS in Washington, D.C. at the American Chemical Society building; and responding, as an organization, to pressing public policies and research that impact the lives and experiences of Hispanics/Chicanos and Native Americans in science.

SACNAS D.C. PRESENCE

In the language of my preceding SACNAS News policy column, our recent Washington, D.C. activities are examples of SACNAS both as a “connector” and as a “maven” society.

SACNAS represented at White House activities: SACNAS president-elect Dr. Ernest Marquez, his wife Mrs. Toni Marquez, SACNAS board member Dr. Marigold Linton, and I attended the public portion of the visit by Mexico President Felipe Calderon to President Obama on May 19. Our goal to serve as a “social entrepreneur” organization is greatly enhanced by our relationship with the Office of the President. Therefore, invitations of this sort mark an important step in SACNAS policy activities.

Science policy fellow John Christensen attended a White House briefing on the Elementary and Secondary Education Act (ESEA) reauthorization, where he met with Juan Sepulveda, director of the White House Initiative on Educational Excellence for Hispanics.

SACNAS participation on national STEM issues: SACNAS is increasingly being seen as a significant STEM organization on a national scale and has been asked to participate in a number of recent activities. During this last season, I participated in meetings at the Council of Scientific Society Presidents, the American Association for the Advancement of Science, the American Chemical Society (ACS), the National Science Foundation

(NSF), the National Institutes of Health, the Hispanic Association of Colleges and Universities (HACU), and the U.S. Department of State (regarding the appointment of its next science advisor).

Dr. and Mrs. Marquez attended the NSF National Science Board dinner at the Department of State, where a variety of significant science awards were given. Dr. Marquez also attended the Fundación México-Estados Unidos para la Ciencia (FUMEC) Board of Directors meeting, where he connected with Congressman Mike Honda’s staff, and the 15th HACU Annual National Capitol Forum on Hispanic Higher Education. He was invited to help the U.S. Department of the Interior attract more urban Hispanics to the American Great Outdoors program. Finally, Dr. Marquez attended the Latino Magazine conference called Nuestro Futuro, which addressed underrepresentation of Latinos in STEM.

Moreover, John Christensen recently met with the National Park Service and its science advisor, Gary Machlis. In addition, there have been various SACNAS informational connections with relevant congressional staffs, such as with Congressman Grijalva’s office regarding the NSF’s proposal to bundle together several diversity programs.

SACNAS RESPONDS TO POLICIES AND RESEARCH

Arizona immigration law: Science thrives best in an open society without harassment. Many SACNAS members are familiar with the recently passed Arizona immigration law SB1070 and the ensuing SACNAS statement about its effect on the location of future SACNAS annual meetings. SACNAS’ goals of encouraging Hispanic/Chicano and Native American students and professionals in STEM fields means that a minimal requirement for meeting sites is that there not be the likelihood of undue harassment of our members. SACNAS chose to let the Arizona governor and other policy makers know about our decision to pursue other conference locations.

Response to Salzman research: Occasionally, reports or articles are written that claim there are too many scientists. This statement overlooks the fact that the majority of new American jobs over the last 50 years have been in high-tech fields. Moreover, most of these high-tech jobs are in small, not large, companies. In reflection of this economic reality, other industrialized nations have successfully imitated aspects of America’s higher educational system in STEM fields, leading us to ask, “What is still, in large part, uniquely American about

BELOW
SACNAS celebrates the opening of a new office in Washington D.C.

STEM education?" The answer is the intertwining of education and research in American universities, coupled with a remarkable national ability to turn discoveries into new high-tech products and services. The key word is "innovation." A major reason for the significant role that smaller companies play in embracing and promoting innovation is their agility and small size, which fosters a culture of empowerment and creativity for innovative scientists.

A recent report entitled "Steady as She Goes? Three Generations of Students Through the Science and Engineering Pipeline" by Hal Salzman (et al), a professor at Rutgers University, has recently brought these issues to the fore. The Salzman report (as it is commonly known) has received a fair amount of notoriety, mostly because it seems to have been misquoted or misinterpreted by some people to Congress.

The SACNAS science policy team, along with several SACNAS board members, felt it was important to respond to the discussions generated by the Salzman report. A very brief summary is the following: Some of the top-rated STEM BA graduates in this study have taken "non-STEM" jobs. The authors of the Salzman report recommend that companies and firms in STEM fields make their jobs more attractive so that these "best" graduates don't go into finance or other non-STEM fields.

As you see, it is a leap to go from this recommendation to saying that there are too many scientists. In fact, I would argue that the definition of a "STEM job" should be "a job for which STEM training is advantageous." This greatly broadens current definitions of economists, but seems to describe current reality. Thus, returning to "innovation," let us use this term to include new and ambitious career paths as well as more traditional meanings. These arguments take on an even greater sense of urgency in light of Congress' failure to pass HR5325, reauthorizing the America Competes Act (America Creating Opportunities to Meaningfully Promote Excellence in Technology, Education, and Science Act), by a two-thirds majority. Now more than ever, Congress needs to foster the expansion of science. SACNAS will continue its policy role by being an effective advocate for Hispanics, Chicanos, and Native Americans who are essential to this endeavor.

Dr. Robert Barnhill is SACNAS' vice president for science policy and strategic initiatives. His career in mathematics and computer science included creating the subject of computer-aided geometric design, as well as supervising and mentoring many students and faculty at all levels of higher education. He was vice president for research for a total of 15 years at Arizona State University, the University of Kansas, and the University of Texas system.



¹ These terms are a reference from Malcolm Gladwell's book *The Tipping Point*, which is about social movements. In his book Gladwell introduces such terms as connector, maven, and salesman societies. For more information about how SACNAS is employing these concepts, please read "SACNAS and Social Entrepreneurship" from the winter/spring 2010 issue of the *SACNAS News*, available at www.sacnas.org/pdfs/policy/SN_PolicyArticle_Spring10.pdf.

² Ibid.

³ For more information on the ESEA reauthorization, go to www.ed.gov/blog/topic/esea-reauthorization.

⁴ To read the full press release on the SACNAS response to SB1070, go to www.sacnas.org/pressRelease.cfm?contentitem_id=45.

⁵ May I strongly suggest that you read *The Innovator's Dilemma*, which discusses the topic of "disruptive technologies."

⁶ The full document based on input from Drs. Robert Barnhill, Lino Gonzalez, Greg Villareal, Ed Ramos, and Mr. John Christensen can be accessed at www.sacnas.org/policy.cfm.



Learn more about SACNAS' science policy work online at:
www.sacnas.org/policy.cfm

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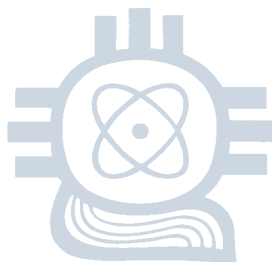
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Pictured from left to right: Jerry L. Bryant Jr., Ph.D., Keystone Symposia Diversity Advisory Committee member; Dana-Lynn T. Koomoa, Ph.D.; Laina King, Ph.D., Director, Diversity in Life Science Programs, Keystone Symposia; Jameel Dennis, Ph.D.; Dana C. Crawford, Ph.D.; Andrew D. Robertson, Ph.D., Chief Scientific Officer, Keystone Symposia; Fatima Rivas, Ph.D.; David R. Wilson, Ph.D.

Dana-Lynn T. Koomoa, Ph.D. is a postdoctoral fellow at the Cancer Research Center of Hawai'i currently investigating the malignant progression of neuroblastoma.

Jameel Dennis, Ph.D. is a postdoctoral fellow at Virginia Commonwealth University currently investigating oligodendrocyte morphogenesis during Central Nervous System development.

Dana C. Crawford, Ph.D. is an Assistant Professor at the Center for Human Genetics Research at Vanderbilt University, who identifies genetic variations associated with human complex diseases or traits.

Fatima Rivas, Ph.D. is a postdoctoral fellow at St. Jude Children's Research Hospital in Memphis studying the total synthesis of natural products and drug design.

David R. Wilson, Ph.D. is a senior research scientist at the Laboratory of Cellular and Molecular Biology, National Institutes of Health, investigating the biological functions of the SIRT6 enzyme.

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