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THE MAGAZINE FOR ACS STUDENT MEMBERS
February/March 2016

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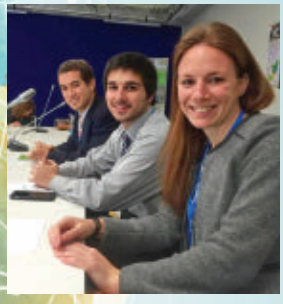

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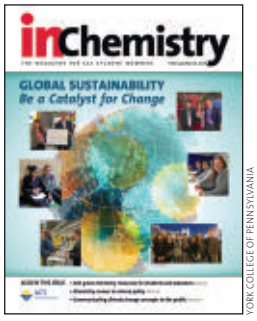
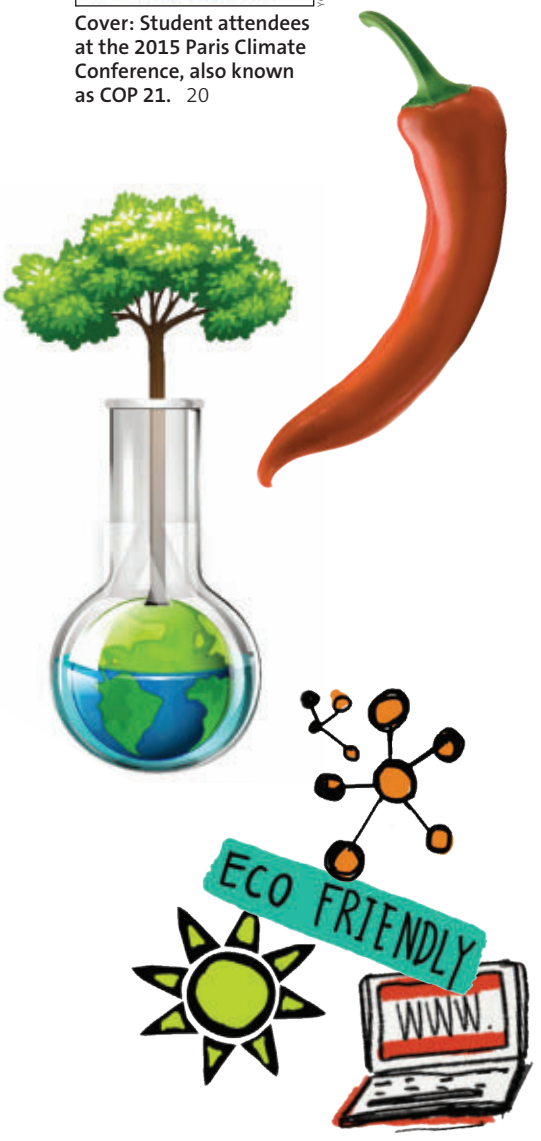


YORK COLLEGE OF PENNSYLVANIA

Cover: Student attendees at the 2015 Paris Climate Conference, also known as COP 21. 20



CONTENTS

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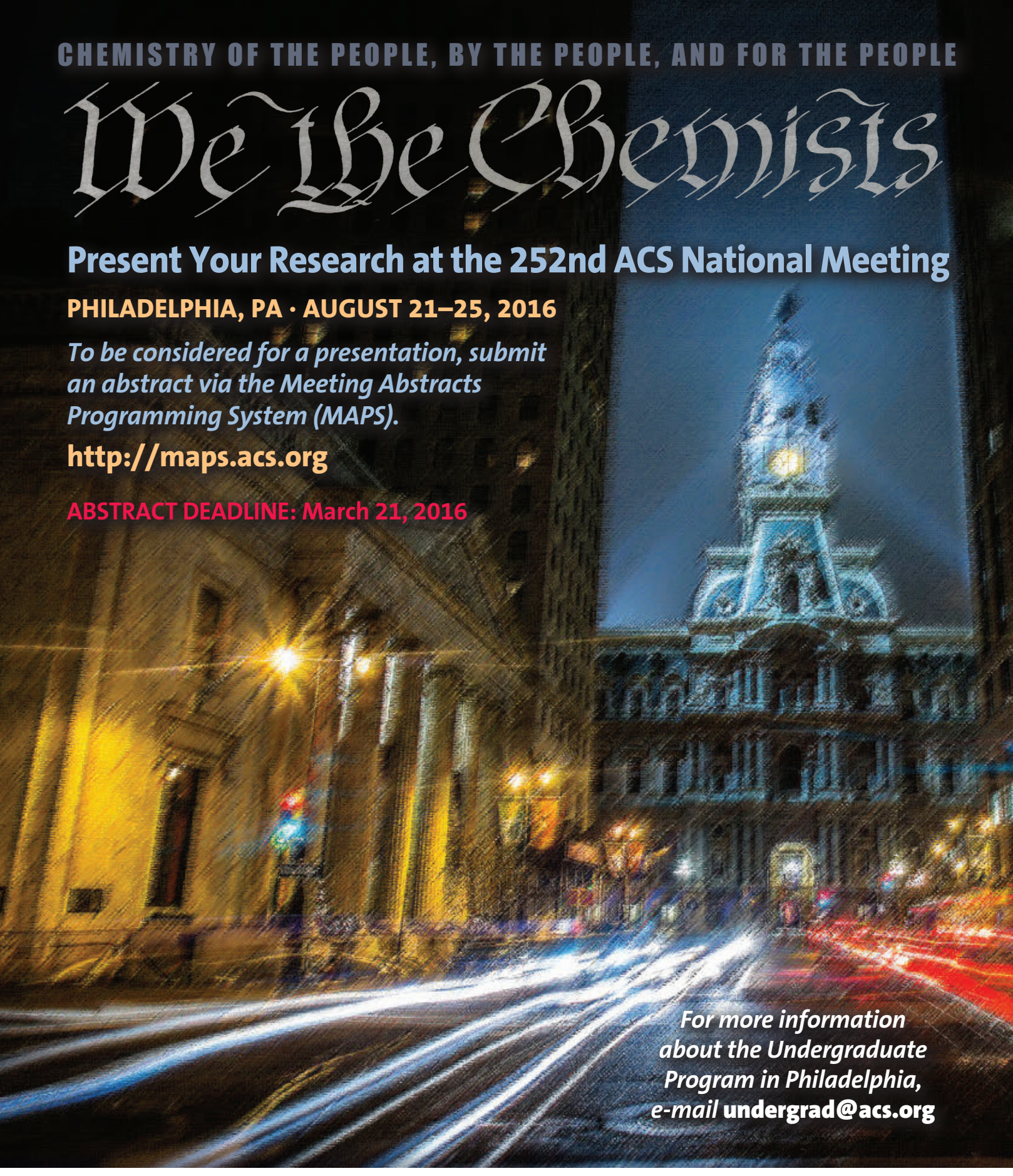

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EDITORIAL:
Persist — and Be Ready!

BY DONNA J. NELSON

When students ask me for suggestions about how to get started on their careers, I reply with three pieces of advice.

ONE

"Aim high." If you shoot for the moon, you might at least hit Mount Everest.

TWO

"Be persistent. When people tell you something can't be done, don't always believe them." You know your own capabilities better than anybody else, and if you think you can do something, go ahead and give it a shot. I would have never done anything if I had believed the people who told me, "That can't be done; don't even try." On the other hand, it's good to at least listen to the naysayers, because their input can help you prepare better.

THREE

"Be ready for opportunities; they may not come around a second time. And sometimes you have to create your own opportunities." That's how I developed a relationship with *Breaking Bad,* the AMC TV series about a dying chemistry teacher who begins synthesizing meth to support his family.

I had read an article in *Chemical & Engineering News* about the show's creator and executive producer, Vince Gilligan. He mentioned he didn't have a budget for a paid chemistry advisor, but he said he would welcome constructive remarks from a chemically inclined audience. I looked at that and thought, "What an opportunity; our scientific discipline has been looking for a long time for a way to connect with Hollywood." I had the reporter contact Vince and tell him that I volunteered. And within about a week, one of his people contacted me, and I became the show's advisor. I asked Vince

ADOBE STOCK

later, "That article went out to about 160,000 chemists — how many volunteers did you get?" And he said I was the only one. So you have to be ready to see opportunities and seize them.

When students complain that they fear public speaking or that they aren't good at it, I suggest that they practice speaking in public as often as they can. When I first started speaking in public, I was so nervous I could barely speak. My voice would quaver. Sometimes I felt my throat tightening, so I would speak to someone or hum quietly as I walked to the microphone in order to loosen my vocal cords. And I got better with experience.

Occasionally I'm asked to name the best advice I ever received as a student or postdoc. One great bit of advice was to work for the best people I could find, and to take graduate school and postdoc opportunities very seriously. Another was to not spend too long getting either degree — to go in, give myself a time limit, and try to get out on time. Yet another was to keep socializing in check. It's sometimes hard to tear oneself away from interesting conversations in the lab and get back to work. But if you're not careful, you could chat all day, and accomplish nothing toward your degree.

The common thread in all this advice is that you should think carefully about your career decisions, as those decisions will impact the rest of your life. iC

Donna J. Nelson, *a chemistry professor at the University of Oklahoma, is president of ACS. She is a fellow of ACS and the American Association for the Advancement of Science, and her other honors include a Guggenheim Fellowship, a Fulbright Scholarship, and a Woman of Courage Award from the National Organization for Women.*

Related links:

Donna J. Nelson:
http://en.wikipedia.org/wiki/Donna_Nelson

Article in *Chemical & Engineering News*:
http://cen.acs.org/articles/86/i9/Breaking-Bad.html

Breaking Bad: **www.amc.com/shows/breaking-bad**

ATOMIC NEWS

COMPILED BY JESSICA ROBERTS

Source: ACS Office of Public Affairs Weekly PressPac, www.acs.org/content/acs/en/pressroom.html

Chipping away at the **secrets of ice formation**

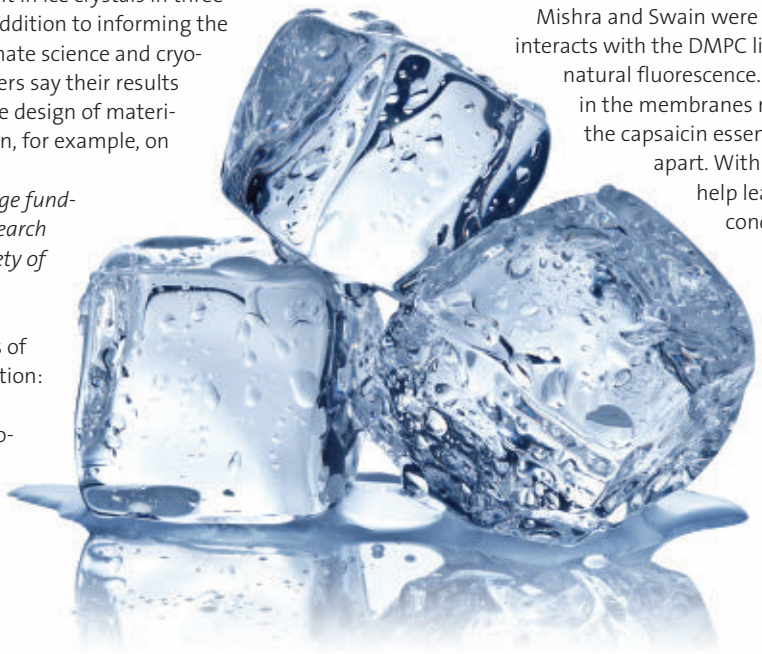
Making ice to chill our drinks is easy enough, but surprisingly, the details of that seemingly simple process are still not well understood. Now researchers report in the *Journal of the American Chemical Society* that they have unlocked some of ice's mysteries while debunking a major assumption about the process. The findings could help us better understand how water freezes, which has significant implications for climate science, air travel, and cryopreservation.

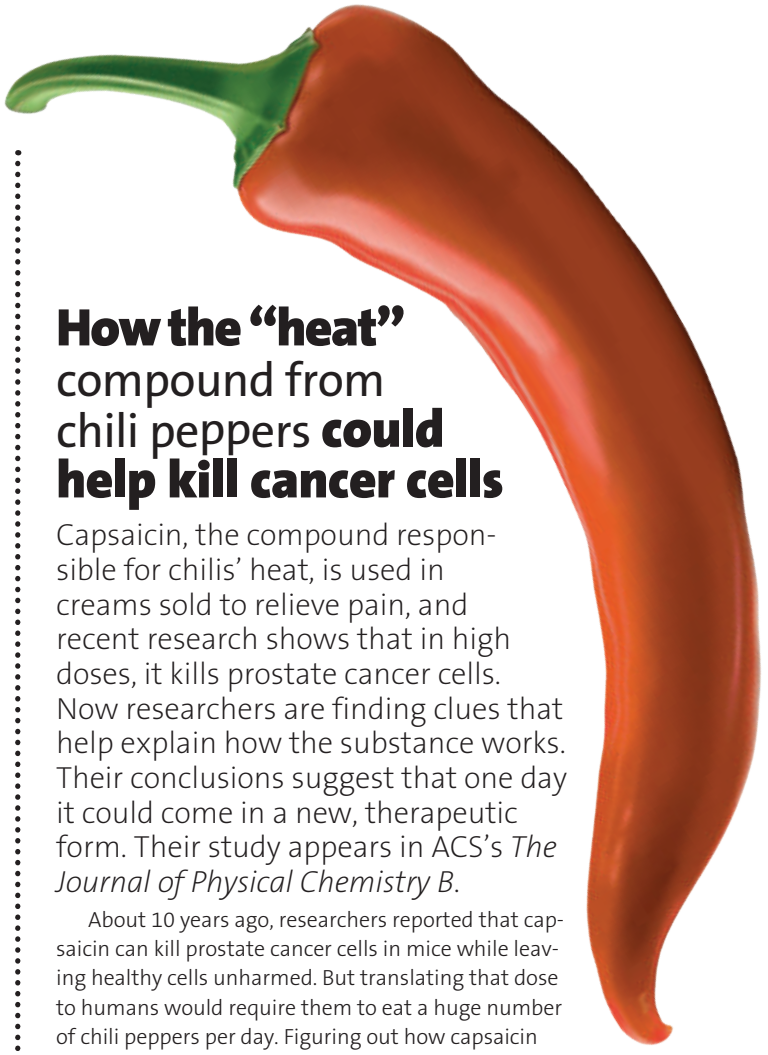
When it comes to water for drinking and cooking, cleaner is better. But when it comes to cloud formation and rain and snow, impurities are a big help. Tiny particles such as dust, soot, pollen, and even bacteria give water a seed to crystallize around. Without them, water can remain liquid even at temperatures below its freezing point. So what kinds of particles work best to promote ice nucleation? Angelos Michaelides and colleagues searched for an answer.

Using computer models of simple crystalline particle surfaces, the researchers pinpointed how their structures and their interactions with water on a molecular level impact ice crystallization. A commonly held assumption was that if a particle's surface structure is similar to that of ice, it acts as a template for water molecules and encourages ice to form. But the team found that a surface that acts as a template for one ice face will not necessarily act as a template for another. And two identical surfaces can result in ice crystals in three different orientations. In addition to informing the more obvious fields of climate science and cryopreservation, the researchers say their results could help guide the future design of materials to prevent ice formation, for example, on airplane wings.

The authors acknowledge funding from the European Research Council and the Royal Society of Chemistry (UK).

Read more about the research: "The Many Faces of Heterogeneous Ice Nucleation: Interplay Between Surface Morphology and Hydrophobicity," *Journal of the American Chemical Society*, 2015, 137 (42), pp 13658–13669.





How the "heat" compound from chili peppers **could help kill cancer cells**

Capsaicin, the compound responsible for chilis' heat, is used in creams sold to relieve pain, and recent research shows that in high doses, it kills prostate cancer cells. Now researchers are finding clues that help explain how the substance works. Their conclusions suggest that one day it could come in a new, therapeutic form. Their study appears in ACS's *The Journal of Physical Chemistry B*.

About 10 years ago, researchers reported that capsaicin can kill prostate cancer cells in mice while leaving healthy cells unharmed. But translating that dose to humans would require them to eat a huge number of chili peppers per day. Figuring out how capsaicin works could help researchers transform it into an effective drug in the form of an injection or pill. Investigators have figured out that the molecule binds to a cell's surface and affects the membrane, which surrounds and protects the cell. That finding prompted Ashok Kumar Mishra and Jitendriya Swain to try to gain a deeper understanding of capsaicin's effects so it might be harnessed in the future for new medicines.

Mishra and Swain were able to detect how the compound interacts with the DMPC lipid bilayer membrane by monitoring its natural fluorescence. The study showed that capsaicin lodges in the membranes near the surface. Add enough of it, and the capsaicin essentially causes the membranes to come apart. With additional research, this insight could help lead to novel tools against cancer or other conditions.

The authors acknowledge funding from the Government of India's Department of Science and Technology.

Read more about the research: "Location, Partitioning Behavior, and Interaction of Capsaicin with Lipid Bilayer Membrane: Study Using Its Intrinsic Fluorescence," *The Journal of Physical Chemistry B*, 2015, 119 (36), pp 12086–12093.

IMAGES USED IN ATOMIC NEWS ARE FROM ADOBE STOCK

Portable device can quickly test for sickness-causing toxins in shellfish

Mussels, oysters, scallops, and clams might be ingredients for fine cuisine, but they can also be a recipe for diarrhetic shellfish poisoning (DSP). That's a gastrointestinal illness people can get if those tasty morsels contain marine toxins. Now, researchers are reporting in ACS's *Journal of Agricultural and Food Chemistry* the development of a portable, inexpensive device that can quickly and easily screen freshly caught shellfish for these substances.

DSP is caused by eating shellfish that have accumulated okadaic acid (OA) or related marine toxins. Algal blooms — commonly referred to as "red tides" — can produce these substances, which shellfish can accumulate through filter feeding. Because cooking the shellfish does not destroy the toxins, several regulations are in place to prevent the sale and consumption of tainted shellfish. To comply with these regulations, the current practice is to send samples to labs that use expensive, slow, and technically intense tests. Waqass Jawaid and colleagues set out to develop an inexpensive, easy-to-use, and portable device that could quickly test shellfish on boats and other remote locations but could also maintain the rigorous testing standards of off-site labs. The researchers adapted a test called a lateral flow immunoassay (LFIA), which is like a home pregnancy test strip. This LFIA combines simple test procedures with an antibody previously shown to specifically bind to three OA toxins. The small, portable device can accurately screen for the presence of these substances in less than 20 minutes on a boat, before they go further into the supply chain. If the test is positive, then the shellfish would not be sold. If the LFIA readout is negative, then an additional, easy-to-use test could be conducted dockside for "total toxins", which would include detection of a fourth type of OA.

The authors acknowledge funding from Innovate UK, Scottish Enterprise, and Neogen Europe Limited.

Read more about the research: "Development and Validation of a Lateral Flow Immunoassay for the Rapid Screening of Okadaic Acid and All *Dinophysis* Toxins from Shellfish Extracts," *Journal of Agricultural and Food Chemistry*, 2015, 63 (38), pp 8574–8583.

1.5 °F Rise in the global average temperature over the past century. It is currently projected that the average temperature will rise 0.5–8.6 °F over the next 100 years.

10,000 *Rate of occurrence per cell per day of oxidative DNA damage in humans. The 2015 Nobel Prize in Chemistry recognized three scientists who mapped DNA repair systems at a molecular level.*

1.9×10^{19} Half-life in years of bismuth-209 undergoing alpha decay, which is longer than the estimated age of our universe.

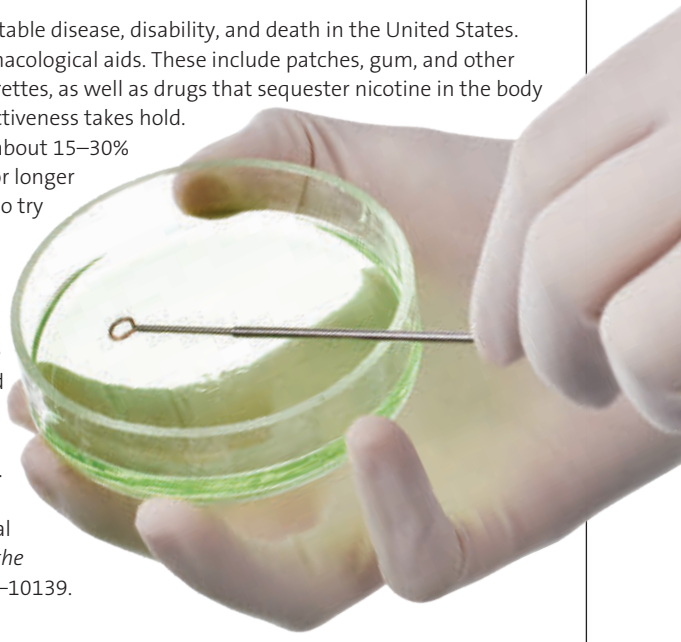
17 Amount in centimeters (equal to 6.7 in) the global sea level rose in the past 100 years.

Nicotine-eating bacteria could one day help smokers kick the habit

Most people who smoke cigarettes know it's bad for their health, but quitting is notoriously difficult. To make it easier, researchers are turning to bacteria that thrive on nicotine, the addictive component in tobacco. In the *Journal of the American Chemical Society*, they report successful tests on a bacterial enzyme that breaks down nicotine and could potentially dull its effects in humans.

Tobacco use remains the leading cause of preventable disease, disability, and death in the United States. Smokers who want to quit can turn to various pharmacological aids. These include patches, gum, and other nicotine-releasing products designed to replace cigarettes, as well as drugs that sequester nicotine in the body to prevent it from reaching the brain, where its addictiveness takes hold. But the success rates of these options are low. Only about 15–30% of smokers who try them are able to stop smoking for longer than one year. Kim D. Janda and colleagues wanted to try a new angle.

Janda and his research team used an enzyme called NicA2 that comes from *Pseudomonas putida*, a kind of bacteria already known to degrade tobacco waste. In lab tests, NicA2 broke down all the nicotine in blood samples within 30 minutes. It also remained stable for more than three weeks in a buffer solution and at least three days in serum, and mice given the enzyme showed no observable side effects.



Read more about the research: "A New Strategy for Smoking Cessation: Characterization of a Bacterial Enzyme for the Degradation of Nicotine," *Journal of the American Chemical Society*, 2015, 137 (32), pp 10136–10139.

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UNDERGRADUATE PROGRAM

Sunday, March 13

Hospitality Center
8:00 AM – 5:00 PM
San Diego Ballroom B

Undergraduate Research Oral Session
8:30 AM – 5:00 PM
Manchester Grand Hyatt San Diego, Promenade A

The Two-Year College Guidelines: What's New?
8:30 AM – 12:00 NOON
Manchester Grand Hyatt, Promenade B

Making the Most of Your First National Meeting
9:00 – 9:45 AM
San Diego Ballroom B

Graduate School Reality Check, Part I: Getting In
10:00 – 11:15 AM
San Diego Ballroom A
Cosponsored by the ACS Younger Chemists Committee

Chem Demo Exchange
11:00 AM – 12:30 PM
San Diego Convention Center, Sails Pavilion

Graduate School Reality Check, Part II: You're In – Now What?
11:15 AM – 12:30 PM
San Diego Ballroom A
Cosponsored by the ACS Younger Chemists Committee

Symposium: Trends in Computational Chemistry
1:00 – 2:30 PM
San Diego Ballroom C
Cosponsored by the ACS Computers in Chemistry Division

Networking Social with Graduate School Recruiters
1:00 – 5:00 PM
San Diego Ballroom B

Workshop: Effective Chemistry Demos for Community Outreach
2:45 – 4:00 PM
San Diego Convention Center, Sails Pavilion

Workshop: Improving Scientific Communications
3:00 – 4:15 PM
San Diego Ballroom A

All events are sponsored or cosponsored by the Society Committee on Education Undergraduate Programs Advisory Board

CHAIR: Michael R. Adams, *Xavier University of Louisiana, New Orleans.*
PROGRAM CHAIR: Steven Emory, *Western Washington University, Bellingham.*

UNDERGRADUATE PROGRAM

Workshop: Networking 101
4:15 – 5:45 PM
San Diego Ballroom A
Cosponsored by the ACS Division of Professional Relations and Younger Chemists Committee

Student Chapter Awards Ceremony
7:00 – 8:30 PM
San Diego Convention Center, Ballroom 20A – C

Undergraduate Social
8:30 – 11:00 PM
San Diego Convention Center, Ballroom 20D
Hosted by California State University-Fresno

Monday, March 14

Hospitality Center
8:00 AM – 5:00 PM
San Diego Ballroom B

Realities of the Chemical Industry: Career Paths and Opportunities
8:30 AM – 5:00 PM
Coronado Room
Cosponsored by the ACS Industrial & Engineering Chemistry Division

Undergraduate Research Oral Session
8:30 AM – 5:00 PM
Manchester Grand Hyatt San Diego, Promenade A

Symposium: Advances in Chemical Imaging: Ultra-Resolution to Single Molecules
9:00 – 10:30 AM
San Diego Convention Center, Room 33B
Cosponsored by the ACS Divisions of Analytical Chemistry and Physical Chemistry

Symposium: Frontiers in Inorganic Chemistry
9:30 – 11:30 AM
San Diego Convention Center, Room 33C
Cosponsored by the ACS Division of Inorganic Chemistry

Chemists Celebrate Earth Day Outreach Ideas
9:45 – 11:00 AM
San Diego Convention Center, Room 30C/D
Sponsored by the ACS Committee on Community Activities

Chemistry Ambassadors Game & Café
10:30 – 11:30 AM
Carlsbad Room

Undergraduate Research Poster Session
12:00 NOON – 2:00 PM
San Diego Convention Center, Hall D
Cosponsored by the ACS Divisions of Agricultural and Food Chemistry, Analytical, Environmental, Inorganic, Medicinal, Physical, and Polymer Chemistry, Biological Chemistry, and Geochemistry

Eminent Scientist Lecture
Featuring Richard N. Zare, Stanford University,
"My Life with Lasers"
2:30 – 3:30 PM
San Diego Ballroom A
Cosponsored by the ACS Divisions of Analytical Chemistry and Physical Chemistry

Student Speed Networking with Chemistry Professionals
3:45 – 5:15 PM
San Diego Ballroom B

Kavli Lecture
5:30 – 6:30 PM
San Diego Convention Center, Ballroom 20A – C

Sci-Mix/Successful Student Chapter Posters
8:00 – 10:00 PM
San Diego Convention Center, Hall D/E

Tuesday, March 15

Realities of the Chemical Industry: Career Paths and Opportunities
8:30 AM – 5:00 PM
Coronado Room
Cosponsored by the ACS Industrial & Engineering Chemistry Division

Workshop: ChemIDP: A New Career Planning Tool
10:00 AM – 12 NOON
San Diego Convention Center, Ballroom 20A

Chemistry and the Environment Film Series: *Waste Land*
12:00 NOON – 2:00 PM
San Diego Convention Center, Room 8
Cosponsored by the Committee on Environmental Improvement

ATTENTION: Graduate School Recruiters!

Network with highly qualified undergraduate students who are interested in learning more about your graduate school programs. Register to participate in the graduate school recruiting events. To register, go to www.acs.org/GradSchoolRecruiters.
For more information contact undergrad@acs.org.

Green Chemistry Resources for Students and Educators

BY ASHLEY BAKER

The ACS Green Chemistry Institute® (ACS GCI) is dedicated to helping individuals reimagine chemistry and engineering for a sustainable future. Innovation in these disciplines holds the key to solving many environmental and human health issues facing our world today. As students, you are in a position to become part of the sustainability solution; as educators, you are empowered to catalyze change in the minds of young chemists. The ACS GCI offers a wide range of materials for both students and educators interested in learning about and applying green chemistry.

Getting involved — resources, awards, and more

You might be asking, "As a student, how can I make green chemistry a part of my education?" There are many ways to get involved in green chemistry. Take a moment to explore the student resources and activities section of the ACS GCI website.

There are many resources available for students and educators, such as workshops, awards, webinars/videos, and textbooks. You'll also find information about the upcoming annual student workshop, which will coincide with the Green Chemistry and Engineering Conference being held in Portland, OR, on June 14–16, 2016. Attending the conference will give you the opportunity to sit in on technical presentations, meet students and leaders in the green chemistry field, and present a poster. To register, go to **www.gcande.org**.

Undergraduate and graduate students alike have told the ACS GCI how learning about green chemistry, attending our conference, or winning green chemistry travel awards have altered the focus of their research and career paths.

Webinars, videos, and online teaching resources are also available on the website for a broad range of interests, whether you've never heard of green chemistry or you're just looking to include it in a new class.

Using the Education Roadmap, the ACS GCI is working in collaboration with the green chemistry community to shape a future for chemistry education that is safer and more sustainable. As the project progresses, there will be additional teaching resources available, as well as opportunities to get involved. (**www.acs.org/content/acs/en/greenchemistry/students-educators/education-roadmap.html**)

ACS Green Chemistry Student Chapters

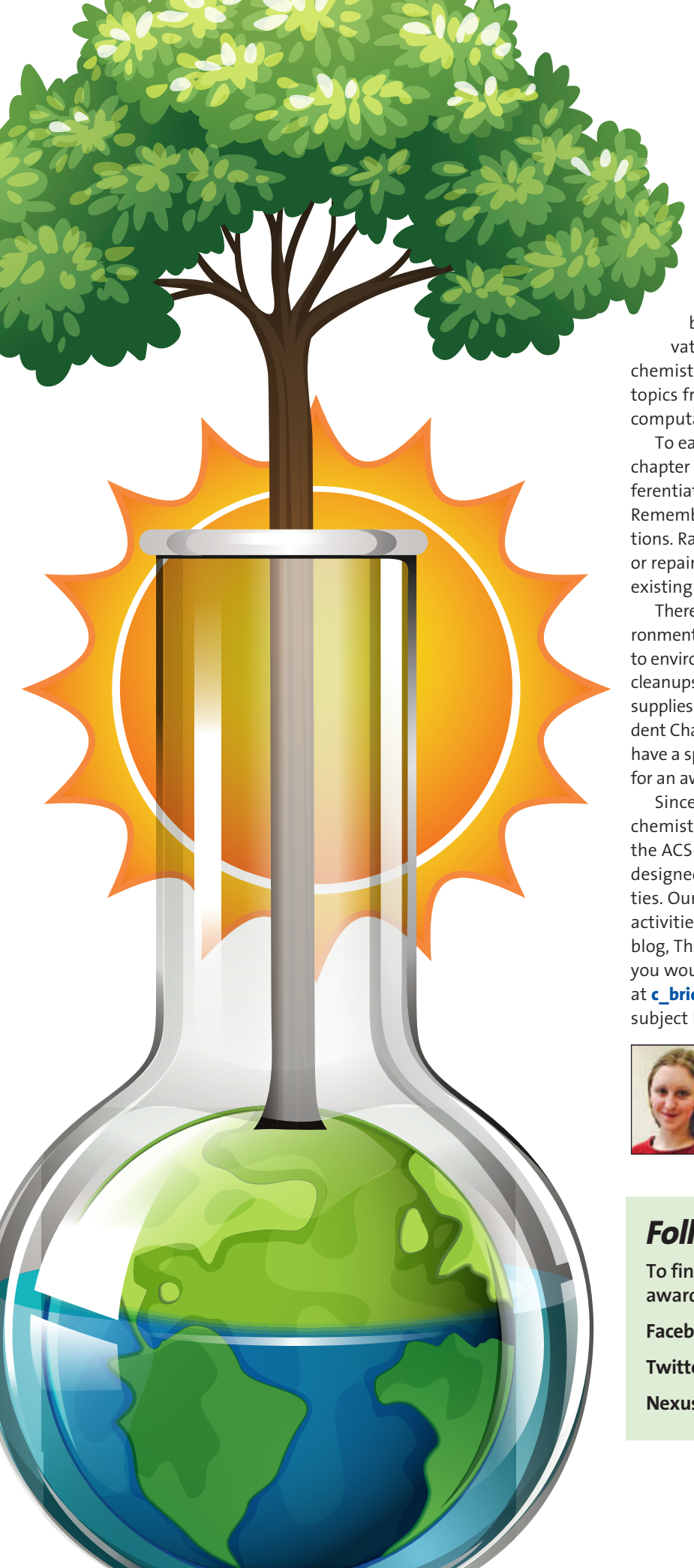
If your college or university has an ACS student chapter, a great way to get your campus involved in green chemistry is to join the chapter and incorporate sustainable and green chemistry into its activities. If your chapter completes three eligible activities, it can apply for a Green Chemistry Student Chapter Award. Winners of this award are recognized at ACS national meetings.

Last year, 43 ACS student chapters earned Green Chemistry Student Chapter Awards, and the number of applica-

Green Chemistry & Engineering 101

Chemistry has advanced society in too many ways to count — from increased crop production to better medications. But in the midst of so many successes, it has been easy to turn a blind eye toward the damage being done to our planet and to humans. The field of green chemistry, which began 25 years ago, is still young. The term "green chemistry" simply refers to a different approach to doing chemistry and chemical engineering, in which chemical processes and commercial products are designed in a way that, at the very least, limits the damage by not creating toxic chemicals and waste.

Green chemistry is notably about more than concerns over toxicity or unintended environmental impacts; it's a field rooted in innovation. It asks the question: how can we use chemistry and chemical engineering to improve current systems, reduce waste, improve whole life cycles, and ultimately build a more sustainable society? iC



tions continues to increase each year. Popular green chemistry activities include performing chemistry demonstrations, creating posters, hosting workshops, organizing field trips, inviting speakers, and having scavenger hunts. For example, chapters have visited LEED-certified buildings and discussed how green chemistry innovations have enabled new building materials. Green chemistry lectures hosted by student chapters have covered topics from carbon capture and storage to biocatalysis and computational toxicology.

To earn a Green Chemistry Student Chapter Award, your chapter must demonstrate that members know what differentiates green chemistry from other areas of science. Remember that green chemists "look upstream" for solutions. Rather than attempting to evaluate negative impacts or repair damage after the fact, they look for alternatives to existing designs and innovate to enable sustainability.

There is a fine, but important, distinction between environmental chemistry and green chemistry. Activities relating to environmental chemistry — such as park, road, and stream cleanups, recycling drives, or even using biodegradable party supplies — won't qualify a chapter for a Green Chemistry Student Chapter Award. Likewise, Earth Day celebrations must have a specified green chemistry component in order to qualify for an award.

Since the most challenging part of developing green chemistry activities can be knowing where to begin, the ACS GCI website hosts a number of how-to videos designed to walk you through planning a range of activities. Our website also includes how-to guides on popular activities and case studies from successful chapters in our blog, The Nexus, which is located on the ACS Network. If you would like to contribute, contact us about your idea at **c_briddell@acs.org** with "Nexus article idea" as the subject line! iC

Ashley Baker *is a research assistant at the ACS Green Chemistry Institute.*

Following the ACS GCI Is Easy

To find the latest green chemistry news, research, events, awards, and more, check out these ACS GCI resources:

Facebook: ACS Green Chemistry Institute

Twitter: @ACSGCI

Nexus Blog: **www.acs.org/gci**

Making the Most of Mentors

BY LISA M. BALBES

Having LeVerne Fernandez and David Maryniak as mentors had a tremendous effect on my academic success and confidence ... Without them, I would not have been as successful as I was, becoming the first person in my family to graduate from college.

GRAFFIE EDLER,
ASSOCIATE OF APPLIED SCIENCE 2015,
AUGUSTA TECHNICAL COLLEGE (GA)

"Mentor" is a popular buzzword these days (right up there with "selfie", "Big Data", and "mindfulness"). Perhaps you have been assigned a mentor as part of a scholarship, internship, or class. Perhaps you have been urged to find a mentor for professional development.

But why are mentors such hot commodities? What is a mentor, how do you find one, and what do you do with one once you've found him or her? Read on to learn how to make mentoring relationships work for you.

What is a mentor, really?

A true mentor is someone who is a combination of an advisor, role model, and counselor. A mentor is not someone who should tell you what to do, but rather is someone who listens, shares his or her wisdom, and asks questions that help you figure out what path is best for you. A good mentor is invaluable in helping you advance your academic and professional career.

A mentoring relationship generally develops over time, and involves help, advice, information, encouragement, honesty, support, and motivation (and sometimes even tough love). Unlike advising, mentoring is more about personal growth than solving immediate problems. The mentee often leads the relationship, rather than the mentor. While a mentorship may resemble a friendship, both parties maintain a professional distance.

Mentors provide both guidance and accountability — helping you figure out what to do, and how and when to do it. By setting personal deadlines and communicating them to your mentor, you will be more likely to meet them. Your mentor may be able to point you to resources, such as scholarships and internships. He or she can be helpful when you need to choose a research project or decide which professional conferences to attend, whether to pursue graduate school or a job, which technical and interpersonal career skills you should acquire, and how you can gain relevant experience.

What qualities should you look for in a mentor? You want someone who has enough professional and life experience to be able to help you, and who is also willing and able to provide candid feedback about your performance. It must be someone whom you respect and trust. Most importantly, a mentor must be someone who is a good listener, willing to be a sounding board, and ready to spend the time needed to mentor you.

How do I find a mentor?

To find a mentor, start going to places where professional chemists are, and talk to them. Faculty can be a good place to start. "Stop by during office hours and ask questions about homework problems," suggests Pamela Clevenger, an instructor at Itawamba Community College (Fulton, MS).

"A prime time for talking to chemistry faculty is before, during, or after laboratory sessions, when the atmosphere is more relaxed and individualized," advises Joan Sabourin, professor

ISTOCK

emeritus at Delta College (MI). "Start working in a lab doing scientific research as soon as possible, either through a formal program at your school or by asking instructors if they have space in their laboratory. Then, take advantage of these opportunities. Talk to other participants (volunteers, attendees, labmates) about your career goals, and ways to accomplish those goals."

Mentors can be found in other ways as well. "Ask your professors about past students who are now employed in chemistry-related careers that are of interest to you, and how to contact them. Co-op or intern positions with local employers will put you in touch with more experienced professionals, who may become mentors. The career office at your institution may also have a list of alumni who are willing to talk to students about their careers," says Sabourin. "Or volunteer to help with activities related to National Chemistry Week or Earth Day, usually organized by ACS local sections or student chapters. Attend meetings on technical topics related to your interests. Don't hesitate to ask your instructors where to find these opportunities."

If you talk to enough people, you will find someone with whom you really connect and who inspires and challenges you. When you do, you can choose to nurture and build that relationship. "Amina El-Ashmawy [a chemistry professor at Collin College, in McKinney, TX] is one of those rare people with whom I felt a complete sense of mutual understanding very early on — it's like her mind works the way my mind works," says Amy L. Glazier, a student at Collin College. "She's been there every time I needed moral support or professional advice. It makes such a huge difference to have someone who thinks of science with the same sense of wonder. She's the person I can depend on for support, encouragement, and answers about how to navigate life as a young professional in science."

You may find it useful to have multiple mentors with diverse talents, ages, personalities, and backgrounds to help with different aspects of your career. Each relationship will be unique and add a different piece to the puzzle that will eventually reveal your career path. Mentors can provide information about things you have not yet experienced, or maybe have not even considered. They can help you set goals and timelines, and adjust your expectations to reasonable levels. You should seek out mentors who will help you become the best professional you can be — and not try to turn you into a clone of themselves.

I've found a mentor; now what?

Once you've identified a potential mentor, ask him or her if you can meet for 15–30 minutes — either in person or on the phone — to get advice on a particular issue you are currently wrestling with. Set a specific time and place to meet, and then prepare your story and questions in advance. Ask open-ended, opinion questions, rather than questions that can be answered with simple "yes" or "no" answers. A good mentor will listen carefully, reflect back what you said, ask probing questions, and point out resources and ways to address your issue. Be mindful of the mentor's time, and limit your conversation to the promised 15–30 minutes.

After each interaction with your mentor, make sure to thank them for their time, then reflect and act on their advice. Within a few weeks, follow up to let them know what action you took, and why, and how it worked out. Often this will lead to another set of questions. A good mentor will continue to identify options, possibilities, and factors to consider… but will *not* tell you what to do.

It is up to you to synthesize all the information provided by your mentor(s) and apply it to your specific situation. Is their

advice relevant today, or are they telling you how things worked 20 years ago? Will what worked for them work for you, or do you need to modify their advice to fit your personality? If you are from a different culture, are they advising you about how to succeed in your culture, or theirs?

To sustain a mentoring relationship, both sides must get some benefit. You are getting advice, information, and insights. Your mentor is gaining the satisfaction of helping someone else, and also being challenged to think about themselves and their career in new ways. However, it is very important that you respect their time, and be aware of competing issues. Always make sure they have time to talk, and don't waste their time asking questions that you could easily get answered another way. You are looking for their opinions, not facts. You may need to ask for starting points, or the right terms on which to search, but people will be much more likely to help you if you have shown some initiative.

Just like Odysseus, who set off on his decade-long travels having left his house in the care of the very first Mentor (from whose name the term is derived), you should develop your own group of trusted mentors to help with the care and development of your professional life. It just may be the best thing you do to advance your professional future.

"Over the years, my mentors offered me advice on a wide range of topics that were significant not only to the success of my career as a student scholar but also to me as a person and a young lady," says Jessica M. Simpson, a graduate student at Louisiana State University. "That is partially the reason why I was very successful. Getting advice on things from different perspectives was truly helpful, and having a supportive network away from home was the best thing that happened to me in undergrad." iC

Becoming a Mentor

If someone asks whether you're interested in acting as their mentor, consider accepting. Mentoring others is not only a way of paying back for what you have received, but it also gives you the opportunity to think about why you do what you do. Perhaps you see something in a potential mentee that reminds you of yourself, or perhaps you like to see others succeed. It takes extra work to be a mentor, but it provides rewards in the form of fresh thinking and the opportunity to share knowledge and experience with a younger chemist. And it just may lead to some insights about yourself. iC

Lisa M. Balbes, *Ph.D., is a freelance technical writer and editor at Balbes Consultants LLC. She is also the author of* Nontraditional Careers for Chemists: New Formulas for Chemistry Careers *(Oxford University Press).*

Summer Research Experiences

How to Use the Scientific Method to Choose Your Path After Graduation

BY SHANNEN CRAVENS

Your undergraduate years will fly by — and before you know it, you'll be facing the decision to either enter the workforce or seek a graduate degree. The decision can be daunting, especially since there is no right or wrong answer.

Your post-graduation plan is a personal choice, based on your interests, desired career, and perceived strengths — but there is always an element of uncertainty. Does undergraduate success mean you're prepared to excel in an industry position, graduate school, or professional school? How can you be confident that you will flourish in the environment you choose to enter next?

This is where your training as a scientist can help you: apply the scientific method to hypothesize, experiment, and conclude! The impending end of your undergraduate career means you need to develop a hypothesis about your next step, which can be as simple as saying, "I am ready to go into industry/graduate/medical school." How do you decide if your hypothesis is correct before you start the application process? You need to conduct an experiment! That experiment is called "gathering experience".

Experience outside of the classroom is an essential component of your résumé, regardless of your post-graduation plans. Internships are a great way to collect data on what it's like to work as a professional scientist or in graduate-level education before committing to that career path. Completing a research internship will give you insight into what it's like to pursue graduate-level studies in chemistry. It's also a fantastic way to build your laboratory skills for an industrial position and could be a unique experience to showcase on your professional school application.

You might be questioning how you'll ever find the time to squeeze in more work between classes, clubs, and all of the other hallmarks of a stressful and jam-packed undergraduate education. I have two words for you: summer vacation. You should view the weeks of free time given to you at the end of the academic year as opportunities to begin preparing yourself for the next step. While that might sound tiring, it's worth the effort. Some of the most valuable opportunities for career experimentation are available during the summer months.

On-campus research: gain experience locally

Experimenting with a research career might be easier than you realize. Many institutions provide a stipend for students performing summer research with faculty members on campus; residential campuses often provide housing as well. At these colleges and universities, summer research is a common way to gain research experience as an undergraduate.

What's the best way to find research opportunities on campus? Talk to your professors. Most faculty members have websites that describe their research, and virtually all professors will be happy to discuss their projects with you. Once you've found professors whose research interests you, set up appointments to discuss potential research opportunities. They might be able to provide you with a research opportunity, or they might know of other professors who are in the market for a research assistant with your interests and skills.

Procedures vary by institution, but expect to submit some type of grant proposal to your chemistry department. Expect, too, to wait a few months to find out if you are funded for the summer. Your professor can give you an idea of how long to wait and how likely it is that you'll get funded.

Assuming you are funded, you can expect to spend 8–12 weeks engaged in research. If you are at a primarily undergraduate institution (PUI) or two-year college, you can expect to work closely with your professor and other undergraduate students. If you are at a research university (or a two-year college that partners with a research university for research), you may still see your professor, but you will work more closely with graduate students, postdocs, and other undergraduate students.

Most professors will accept undergraduates into research programs after their second year, but some will accept promising students after their first year of chemistry. Summer research is a great way to confirm — or disprove — your hypothesis of a career at your type of academic institution. Obtaining actual research experience can help you make an informed decision about whether to apply to graduate school.

Off-campus research: learning in a different environment

After searching around campus, you might find that there aren't opportunities for you to do the kind of research that interests you.

Or a summer of on-campus research may have left you thinking you'd like to continue doing research, but in a different setting. That doesn't mean you're stuck! Instead, try working in labs outside of your home institution. A number of institutions offer opportunities for undergraduates who are from other institutions to conduct research.

The most well-known of these opportunities are the Research Experiences for Undergraduates (REUs) funded by the National Science Foundation (NSF). These are competitive, 10-week paid internship programs hosted at various universities across the country. The fact that these research internships involve a nationwide competition means they are imbued with a certain amount of prestige, which will stand out on all of your employment or graduate and professional school applications.

The REU application process is institution-specific and usually consists of letters of recommendation and other supporting documents such as your résumé, transcripts, and personal statement. Typically, the applications are due in February or March for research opportunities that begin in May or June of the same year.

Even if you attend an institution where on-campus research opportunities abound, you may want to consider an REU or other off-campus opportunity. It's a good way to broaden your professional network and experience conducting research at different types of institutions. If you do research at a school you are considering for grad school, it is also a chance to network and obtain a letter of recommendation from a faculty member at that institution. If you attend a two-year college or PUI, a summer at a research university is a fantastic way to test-drive being a graduate student. Finally, if you've never moved out of your home state, it's a chance to push yourself out of your comfort zone before you consider applying to out-of-state grad schools.

Undergraduate research and medical school

If you are hypothesizing that you want a career in medicine, a medical school REU provides you with great networking opportunities and allows you to make an informed decision about including research in your career. Moreover, admission to medical school is very competitive, so gaining medical research experience will help your application rise above the competition. It also provides you with exposure to current research being done to evolve the field of medicine. Remember also that your choice to go to medical school does not mean you cannot do research, or vice versa; more than 100 U.S. medical schools have M.D./Ph.D. programs, so there are opportunities for flexibility.

Outside of academia: industrial and government research

If pursuing a career in industry or government is an intriguing hypothesis for you, you are not alone. According to the 2014 ACS Salary and Employment Survey, 60% of ACS members are employed in industry or government. While the vast majority of academic careers center around research, industry and government careers have a broader range of options, such as technician, analyst, manager, and, yes, researcher. Experimenting with these options means pursuing a summer internship.

Where to Find Research Opportunity and Internship Programs for Undergraduates

- **www.acs.org/GetExperience** — ACS's "Get Experience" database of internships, REUs, co-ops, and more
- **www.nsf.gov/crssprgm/reu/reu_search.jsp** — National Science Foundation
- **www.acs.org/DGRweb** — ACS's Directory of Graduate Research (look under "REU Experiences")
- **www.pathwaystoscience.org** — Institute for Broadening Participation's Pathways to Science website
- **www.aamc.org/members/great/61052/great_summerlinks.html** — American Association of Medical Colleges' REU program
- **www.training.nih.gov/programs/sip** — National Institutes of Health (NIH) biomedical undergrad research program
- **www.looksharp.com/s/chemistry-internships** — InternMatch database of chemistry internships

Internships offer a number of advantages. First, they give you valuable experience in professional environments. Not only will this experience stand out on your future résumé, but it will also give you insight into industry and government, which are very different work environments from academia. Second, they enable you to explore careers that do not require an advanced degree. Third, there are opportunities to network with professional chemists, technicians, analysts, and so forth, and learn more about potential careers. An internship can help you decide (a) whether you want a career in industry or government, and (b) what type of degree you need (e.g., A.A.S., B.S., M.P.S., M.B.A.). If your professor has industry connections (particularly common in chemistry-based technology programs), you can ask him or her for internship contacts; your career center is another likely internship resource.

On-campus research, off-campus research, and internships are all great experiments for testing your hypotheses regarding your preferred career path. Remember that experiences can vary greatly from one institution to the next. As with most research, the more experiments you can conduct, the sounder your conclusions will be. iC

Shannen Cravens *received her B.A. in chemistry from the University of San Diego and is on track to complete her Ph.D. in molecular biophysics at the Johns Hopkins University School of Medicine in summer 2016. She can be reached at scraven2@jhmi.edu.*

Science Policy

Shaping the Big Picture

BY ACS STAFF

Careers in science policy are based on communicating science to policy-makers, and communicating policy to scientists. For example, many elected officials are not experts in science, so they hire expert advisors to provide balanced scientific information about all sides of the issues, in order to make informed decisions. Many government agencies use analysts to turn policy into rules and regulations, which then must be communicated and applied to all interested parties.

Careers in science policy exist not only in the federal government (mostly in the legislative and executive branches, but some in the judicial as well) but also in state governments, professional organizations, scientific societies, non-governmental organizations, lobbying groups, and even independent think tanks.

Depending on the type of position, analysts may specialize in a specific area, such as energy or biotechnology. Alternatively, they may be generalists, responsible for knowing a little about all aspects of all types of science. For example, a state government position might focus on the types of technologies that are prevalent in that state, while a nonprofit agency employee could specialize in the technologies that are relevant to their organization's particular mission.

Increasingly, universities have staff who serve as liaisons between the university and government funding agencies, potentially involving some lobbying activities. They may work in a university development office, conveying information about potential funding opportunities to university employees. Or they may work in a government liaison office, sharing results of university research with state officials. Another position in academia involves managing institutional review boards, ensuring that research is conducted ethically and following all appropriate guidelines.

Job titles vary widely in this field. The most common are Science Policy Advisor, Public Policy Specialist, Analyst, Coordinator, Officer, Director, and others.

Career path

There are many people competing in this field, so you may have to take a lower-level position or unpaid internship just to get started. It is possible to do a science policy fellowship for a year or two and then return to scientific research with a more thorough understanding of how decisions are made. If you decide to stay in the science policy field, higher-level positions usually involve dealing with larger and more complex issues and supervisory responsibilities.

Future employment trends

Employment opportunities for science policy specialists are growing, due to increased interest and public input on science-related policy issues, but are growing more slowly than average. In addition, there is strong competition for available positions.

Is this career a good fit for you?

Much policy work is conducted at a very fast pace — a hearing may be called and testimony required in a matter of days, or a new regulation passed with a short time frame before implementation. Scientists are trained to conduct thorough research and evaluate all options before forming an opinion, so reacting quickly can sometimes be a challenge. You must have confidence in your scientific knowledge and be able to communicate it credibly to both scientists and government officials.

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ADOBE STOCK

Typical Job Duties for Public Policy Professionals

- Collect and compile background information on particular issues, and write summary documents that explain all sides of the issues.
- Advocate for increased funding for particular programs.
- Write talking points on particular hot topics on short deadlines.
- Organize conferences or panel discussions where scientific experts present the latest results in a particular field.
- Inform scientists about the impacts of new or changed legislation on their research.
- Assess the uses, benefits, and economic impacts of certain classes of chemicals by collecting and analyzing data on application methods, effectiveness, and quantities used.
- Interpret laws, regulations, agency policies, and directives to identify how these regulations may impact potential developments.
- Review documents to ensure that proper technical and professional procedures were followed and that all recommendations are in line with applicable statutory, regulatory, and policy guidance requirements.

Technical Skills Required

- Excellent communication skills, both written and oral, especially under time pressure. You must be able to convey complex scientific topics, making them understandable to a general audience without oversimplifying.
- Interpersonal skills to build relationships with key people and diplomacy to work with people with whom you disagree.
- Negotiating skills and the confidence to be able to debate on topics in professional settings.
- Ability to see the big picture and analytical skills to critically evaluate all sides of an issue (scientific, political, economic, etc.).
- Interest in a wide variety of scientific issues.
- Ability to conduct thorough research quickly and to work independently.

Quick Facts

OPPORTUNITIES

- Rising awareness of public policy issues is increasing the number of opportunities, but competition for available positions is fierce and may require starting at a junior level.

REQUIRED EDUCATION

- An undergraduate degree in a science or public policy or an advanced degree in science policy. The preferred route is usually a science degree backed with professional experience, followed by academic policy training (usually a master's degree).

SALARIES

- Median annual wage for science policy professionals was $102,000 (May 2012, Occupational Outlook Handbook).

Chemists in the Real World: Jalonne White-Newsome

DIRECTOR OF FEDERAL POLICY, WEST HARLEM ENVIRONMENTAL ACTION, INC.

B.S., CHEMICAL ENGINEERING, WITH CONCENTRATIONS IN JOURNALISM AND ENVIRONMENTAL STUDIES, NORTHWESTERN UNIVERSITY, EVANSTON, IL

M.S., ENVIRONMENTAL ENGINEERING, SOUTHERN METHODIST UNIVERSITY, DALLAS, TX

PH.D., ENVIRONMENTAL HEALTH SCIENCES, UNIVERSITY OF MICHIGAN, ANN ARBOR

West Harlem Environmental Action, Inc. (WE ACT for Environmental Justice) is a 27-year-old community-based organization based in Northern Manhattan (NY). When WE ACT obtained funding three years ago to open a branch office in Washington, DC, they hired Jalonne White-Newsome as director of federal policy. This office is a two-person operation, which includes White-Newsome and her recently hired assistant (and often, several interns as well).

WE ACT works to help low-income groups and people of color participate effectively in environmental policy-making processes. The group organizes and mobilizes citizens to campaign for policies that support healthy communities — a movement often referred to as "environmental justice".

Q: What is your major responsibility in your current position?

White-Newsome: To ensure that federal environmental policies — in Congress as well as the Administration — are protective of low-income people and communities of color. I help elevate the perspective of people who are often left out of the policy-making process.

Q: How did you find your first chemistry-related job after you graduated from college?

White-Newsome: After I received my bachelor's degree, I decided against going immediately to graduate school because I wanted to work. At a National Society of Black Engineers Annual Conference in Anaheim, CA, I attended a career fair, which led to a job as a project engineer at U.S. Gypsum (USG). At first, I intended to work at USG for 30 years and then retire, but after a few years, my interest in all things environmental drove me to return to graduate school. USG needed someone with environmental expertise, so they agreed to pay for some of my expenses.

Q: Describe the career path that led you from chemical engineering to your current position.

White-Newsome: Company layoffs at USG put me back into the job market after I earned my master's degree, but I immediately landed another job in nearby Fort Worth as a process engineer, where I was responsible for supervising several production lines and chemical processes in a production plant. This job gave me experience in managing people and working as a union steward. Eventually, I moved to Maryland to work with the state's Department of the Environment, where my job entailed encouraging various state agencies to use alternative-fuel vehicles. Traveling to the state capital, I learned to lobby the legislature and advocate for policies. I also learned how the state agencies worked and how to influence their decisions.

I married and returned to my hometown of Detroit, MI, to work as an environmental manager at a startup company that made car engines. After I became interested in working in public and environmental health, I completed the Ph.D. program in Environmental Health Sciences at the University of Michigan's School of Public Health. I accepted a postdoc position at the Union of Concerned Scientists, which brought me to Washington, DC, to work on documenting the effects of climate change on health. After my postdoc, I began my current position at WE ACT.

Q: Please describe your typical day on the job.

White-Newsome: Every day is different. Some days, I will be responding to our funders, or something will happen on Capitol Hill, and we need to respond quickly. Other times, one of our community groups might need a short briefing paper on a particular issue.

Q: Typically, how many days each month do you spend away from your workplace on travel?

White-Newsome: I spend 6–10 days a month on travel. People invite me to speak at conferences and coalition gatherings. I meet all kinds of people from different backgrounds. I help coordinate sessions at EPA conferences. When I can, I take time to tour communities and neighborhoods wherever I am, to see the challenges they are facing.

4 SURPRISING FACTS ABOUT CLIMATE CHANGE

METHANE MATTERS

Methane, the main compound in natural gas, is a huge contributor to global warming. Although it makes up only 9% of the human-made greenhouse gases, it can do a lot more damage. In the first 20 years after it is released in the atmosphere, methane traps 86 times more heat than carbon dioxide.

GOODBYE GOLDEN TOAD

Increasing temperatures change weather and vegetation patterns. This forces animal species to migrate to cooler areas in order to survive. Rapidly changing climates, however, can exceed species' ability to migrate or adapt and lead to their extinction. The very first extinction from climate change happened in 1999—never again will you see a Golden Toad on this planet.

HOT AND HEAVY BREATHING

In extreme heat, pollen and other allergen levels are increased. These allergens can trigger asthma attacks, which affect around 300 million people worldwide. As earth's temperature increases each year, so will this breathing burden.

OCEANS OF ACID

Oceans act like a giant sponge, absorbing 27% of CO_2 in the atmosphere. CO_2 mixes with seawater creating carbonic acid, which is steadily increasing the acidity of oceans. This threatens marine life and the well being of humans who depend on food from the sea.

ACS Chemistry for Life®

www.nature.org/ourinitiatives/urgentissues/global-warming-climate-change/threats-impacts/human-health.xml
http://cen.acs.org/articles/92/i27/Methanes-Role-Climate-Change.html?h=-1898752047
http://cen.acs.org/articles/92/i29/Research-Opportunities-Arise-Oceans-Sour.html?h=-2132983578
www.nature.org/ourinitiatives/urgentissues/global-warming-climate-change/threats-impacts/wildlife-at-risk.xml
http://www.who.int/features/factfiles/climate_change/facts/en

Climate Change Communication: Bridging Science and Society

BY DARYL RAMAI

What if your chapter was given the opportunity to present a documentary or give a speech to an audience on climate change — how amazing would that be? Or, what if you had the chance to speak about climate change and other media-covered science topics with peers, community members, or family? Such situations might be a little nerve-wracking, but they could still be life-changing opportunities.

But how would you go about preparing? What strategies would you use to articulate your ideas? How would you deal with someone who challenged the reality of climate change?

In recent years, climate change has become the epicenter of much political and bioethical debate. The scientific community continues to urge leaders to draft policies aimed at guiding a more sustainable approach to addressing climate change. Yet, however robust these efforts may be, there are still individuals who are not aware of the reality of climate change and its present-day effects. Let's explore a few ways to ensure that you can be more effective in communicating the impact of global climate change.

Communication strategies

The science behind climate is vast, and quite technical. However, as communicators, it is your duty to convert such technical material into simplified and relatable language. For instance, except for fellow scientists, hardly anyone will sit through a detailed discussion of complicated physical chemistry equations involving CO_2. Thus, it is important to simplify your presentation — while keeping it interesting enough to capture the audience's attention. Make your message interesting by using analogies, real-life examples, and basic statistics. Loretta J. Mickley, senior research fellow at Harvard University, says, "Students can use simple metaphors to describe the science of climate to others. For example, they can refer to the greenhouse gas CO_2 as a 'heavy blanket' that cannot be peeled off easily." Now that's catchy!

A great content summary on climate change can be accessed using the ACS Climate Science Toolkit (**www.acs.org/climatescience**). The Union of Concerned Scientists and the American Association for the advancement of Science also have excellent materials available on their sites. But as good as these resources are, many people really aren't interested in listening to general facts on climate change. Instead, people are more interested in hearing how climate change will affect *them*. Mention a rise in CO_2 and global temperatures, and the response might be mediocre at best, but mention a rise in temperature that could affect agriculture, including the cost and availability of food, the frequency of extreme weather, and coastal flooding, and suddenly you've got their attention!

Thus, in communicating climate change, it is important to show that climate change is a present reality — and not merely something that might occur in the distant future. Focusing on the present helps to emphasize the urgency of climate change — and of policies that will slow its progression.

Another strategy you can use is to ask the audience what climate change effects they are aware of at present. Ask leading questions to get them to provide examples that are easily relatable. These might include the distinction between weather and climate; the increase in greenhouse gases in the atmosphere, especially CO_2, that are due to human activities; the rapidly

The United Nations Framework Convention on Climate Change (UNFCCC)

The 22nd session of the Conference of the Parties (COP 22) to the UNFCCC

TAKE ACTION ON CLIMATE CHANGE — REPRESENT ACS AT COP 22 IN MOROCCO!

As an ACS student member, you can represent ACS at the 22nd session of the Conference of the Parties (COP) to the United Nations Framework Convention on Climate Change (UNFCCC) November 7–18, 2016, in Morocco. The ACS student-led climate literacy project uses the annual COP as an international platform and leverages your social networking skills as a tool—Twitter, Facebook, Students on Climate Change blog, Instagram, YouTube, BuzzFeed, and more—to engage peers and the general public in climate change literacy and education.

For more information, go to: **http://faculty.ycp.edu/~gfoy/COP22App.htm**. Or visit the Students on Climate Change booth at the graduate school recruiting event at the ACS spring meeting in San Diego on Sunday, March 13, from 1:00 – 5:00 PM in the Marriott Marquis San Diego Marina, Ballroom B, or attend the symposium "Perspectives on Climate Change Literacy and Education; Local to International" on Sunday, March 13, 1:30–5:20 PM, in the Manchester Grand Hyatt San Diego, Promenade B. iC

increasing (at least, on a geological timescale) *average* global temperatures caused by these gases; the consequent melting of ice all over the planet (glaciers, Arctic sea ice, and ice sheets on Greenland and Antarctica); and oceans becoming more acidic as extra CO_2 dissolves, endangering sea life.

Follow up the discussion by asking whether all these changes have any common variables. Discuss how all these effects stem from a common cause — mainly, increasing levels of CO_2 caused by the burning of fossil fuels for energy production and transportation. Finally, and most importantly, ask for some ideas on what people can do to help reduce the production of CO_2 and other greenhouse gases — solutions such as an overall reduction in energy usage, recycling, and the use of alternative energy sources, such as solar energy.

It is important to note that these strategies are aimed at getting your audience involved and letting their ideas guide the direction of the discussion. This makes the discussion more personal and interesting to the audience — and not simply what you, the communicators, think is interesting. Senior ACS scientist Jerry Bell notes that "ideally, the communicators will be aware of their audiences' ideologies *before* beginning the discussion and will take them into account. Even better, if communicators share those ideologies, there will be a more trusting and productive relationship from the start."

What to emphasize

In the past, a common strategy was to scare people by talking about the impending doom that would befall them if something were not done to stop climate change. To some extent, this approach is still included in one form or another in the speeches of many advocates, some more openly than others. However, a more effective means would be to focus on the *benefits* of having a heathier climate, with less emphasis on doom. For example, you could emphasize the benefits to farmers, such as creating jobs and avoiding the costs of runaway climate change. This strategy is more productive and shows that by adopting green solutions, we can not only help our planet but also have a positive impact on our economy.

Bell adds, "Students are in a position to play the 'future card', since the majority of their lives lie in the future. If present lev-

els of greenhouse gas emissions continue or are only modestly reduced, the changes already seen will be multiplied. The planet will be a much less hospitable place for the next generation. Is this the legacy the audience wants to leave its descendants?" This question is powerful and can lead people to question their actions in an ethical and emotionally provoking manner. However, Bell adds, "this kind of messaging has to be used with care and with consideration of how an audience will respond." It can also be used to transition the conversation into asking the audience what personal actions they might adopt as part of a green initiative. This is a time to offer suggestions, such as driving less, changing home thermostats, making less carbon-generating food choices, and reducing waste in water.

Addressing skepticism

There are some people who are skeptical that climate change is real or that it poses a threat. When speaking to those who do not agree with the ideology of climate change, it is important to first understand their perspectives and how they arrived at their opinions. Encourage them to speak about their doubts, and listen and respond in a non-judgmental, neutral manner. We all have had doubts about something at one time or another — so take their skepticism seriously and respond with adequate facts from reliable and reputable sources. Mickley says, "Some people have a hard time accepting that the climate is changing and that human activity accounts for most of that change. Students in the sciences can begin to address this skepticism by arming themselves with details of the changes already observed in regional or global climate." Facts are important, but as stated earlier, using examples illustrating the effects that are currently occurring will help to show that climate change is not simply an abstract theory.

To this end, always remember that while you are trying to communicate the fact that humans are the primary contributors to climate change — and the supposition that they can change its current trajectory — you must continue to respect other people's beliefs, even if they are inaccurate. Over time, they may come to a more realistic assessment of the world we are creating. One place to get background information for responses to many of the climate change "myths" that confuse people is at **www.skepticalscience.com**.

Getting involved

The most important messages here are that individual actions are important, and we are all responsible. It is too easy to say and think that the problem of climate change is so huge that one's own efforts are worthless. This is far from the truth. Although one person's action has only a tiny effect, the sum of a group, state, or country's effort will have an exponentially greater effect. Of course, if there is no action at all, there is zero effect.

To create an even bigger impact, communicators must advocate voting. If the audience feels that climate change is a problem that requires society's attention and action, then encourage voting for local, state, and nationally elected officials who share this belief and are willing to work toward finding *greener* solutions. Mickley notes that "one of the most important things a concerned citizen can do is vote! In my view, having government programs that will promote a shift toward greener technology is key to dealing with climate change."

Additional websites for authoritative educational resources (videos, animations, lab exercises) regarding climate change can be found at: **www.camelclimatechange.org** and **http://cleanet.org/index.html**. iC

Daryl Ramai *is a writer and author living in New York City.*

SPOTLIGHT

Tuskegee University

Tuskegee, AL

COMPILED BY ROBIN LINDSEY

Chapter president: Taryn N. Dooms **Chapter members:** 14 **ACS student members:** 10
Institution description: Small, private, rural, minority-serving, 4-year

Q: **How do you ensure a smooth officer transition from year to year?**

A: To ensure that new officers are prepared for their duties and the members are adjusted to new leadership, we practice a members-at-large program. These individuals shadow current officers and help them with the tasks that come with running the chapter (organizing community service events, hosting fundraisers, hosting meetings with faculty, etc.). By doing so, our future officers are better prepared for their positions.

Q: **Do you have any unique positions?**

A: Our organization's senator attends university student senate meetings in order to be well informed on the university's policies and procedures regarding hosting campus events. The senator is also responsible for sharing that information during chapter meetings.

Q: **How did you celebrate National Chemistry Week?**

A: Last year for NCW, we hosted an illustrated poem contest for the grade-school children in our area to coincide with the theme "Chemistry Colors Our World." We also performed a "Colors of Chemistry" workshop at a local school to motivate students about science. In addition, we hosted a "Pie-a-Professor" fundraiser on the campus quad, where students paid a fee to throw a colorful pie at their "favorite" chemistry professor.

Q: **In what ways does your chapter give back to the community?**

A: Every year for Halloween, our chapter hosts the "Mad Scientist" program at one of our local schools. In this program, we perform interactive and stimulating science demonstrations for third- and fourth-grade students to foster an early interest in chemistry.

Q: **Is your chapter active in recruiting prospective students to your university?**

A: Our department usually hosts a mixer at the beginning of the semester in order to introduce any new faculty, inform first-year students about our chapter, and talk about any new research performed. The chapter president also gives a presentation about our chapter during this mixer.

Q: **What types of activities do you sponsor?**

A: Our ACS chapter is really into educational initiatives. Since our university is located in a predominantly African-American rural community, we plan events where we can interact with grade-school children and motivate them to pursue careers in science.

Q: **What careers-related events does your chapter host or participate in?**

A: Our chapter usually has many former students and members who have graduated come back and give presentations on graduate school experiences, admissions, research, and even unique career opportunities. Many of our former members are pursuing medical degrees and doctoral degrees, as well as careers at major companies.

PHOTO COURTESY OF TUSKEGEE UNIVERSITY

The Tuskegee University chapter centers its volunteer efforts on outreach activities with grade-school children to encourage them to become more interested in science and ultimately pursue careers in science.

Faculty advisor: Michael Curry, 14 years

Q: **How did you become a faculty advisor?**

Curry: I became a faculty advisor so that I could impress upon students the importance of sharing with the local and global community how science impacts their lives on a daily basis.

Q: **What challenges have you faced in your position?**

Curry: The most challenging part of my position has been the transitioning and training of new student officers to take charge of their organization. The organization is only as successful as each year's student leadership.

Q: **What advice can you offer those new to the advisor position?**

Curry: After being a mentor of student organizations for 14 years, I have learned that the successes of the organization will depend directly on the leadership team selected to govern. Thus, as a mentor it is your duty to inspire and guide the leadership team in a manner that allows them to unite and stand as one entity.

2016 ACS National & Regional Meetings

251st ACS National Meeting • MARCH 13–17 • SAN DIEGO, CA
Central Regional Meeting • MAY 18–21 • COVINGTON, KY
Middle Atlantic Regional Meeting • JUNE 9–12 • RIVERDALE, NY
Northwest Regional Meeting • JUNE 26–29 • ANCHORAGE, AK
Northeast Regional Meeting • OCTOBER 5–8 • BINGHAMTON, NY
Southeastern Regional Meeting • OCTOBER 23–26 • COLUMBIA, SC
Southwest Regional Meeting • NOVEMBER 10–13 • GALVESTON, TX

OTHER MEETINGS OF INTEREST

CO_2 Summit II: Technologies and Opportunities
April 10–14 • Santa Ana Pueblo, NM
www.engconf.org/conferences

Advancing Chicanos/Hispanics & Native Americans in Science (SACNAS) National Conference
October 13–15 • Long Beach, CA
www.sacnas.org

National Organization for the Professional Advancement of Black Chemists and Chemical Engineers (NOBCChE)
November 8–11 • Raleigh, NC
www.nobcche.org

Annual Biomedical Research Conference for Minority Students (ABRCMS)
November 9–12 • Tampa, FL
www.abrcms.org/index.html

American Indian Science and Engineering Society (AISES) National Conference
November 10–12 • Minneapolis, MN
www.aises.org

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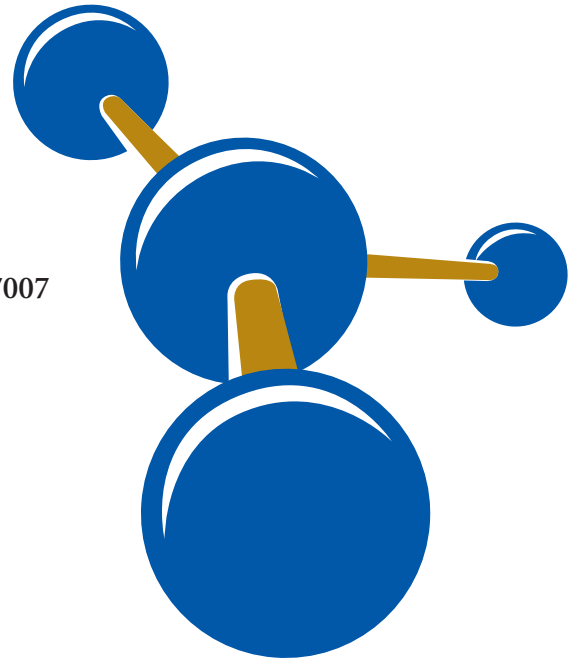

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1155 Sixteenth Street, NW
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