

Silicon Valley Chemist

Santa Clara Valley Section

American Chemical Society

Volume 33 No. 2

FEBRUARY 2011 NEWSLETTER TOPICS

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Chair's Message

As I write this, we've just experienced a New Year celebration and jumped into the International Year of Chemistry! I hope you enjoyed a relaxing end to your 2010 with some extra time to spend with your friends and loved ones. If you celebrate the winter season with gift-giving traditions, I hope you received fun goodies that were made possible by the transforming power of chemistry. At my house, Santa visited and brought one especially nifty toy laden with cool chemistry—"Princess Bath Beauty Belle". This Disney Princess has a lovely little orange swim suit and pink-streaked hair, but once dipped into the bath by my 4-year old, her bathing suit and hair instantly turn bright yellow. At age 4, my daughter can't appreciate the interesting thermochromic properties of Belle's bathing suit, but I'm looking



continued on page 2

March Dinner Meeting

Making Chemical Testing Relevant to Breast Cancer

Dr. Megan R. Schwarzman

Abstract

Although breast cancer is one of the leading causes of cancer and death in women, even the small numbers of chemicals that undergo safety testing are not routinely evaluated for their impacts on mammary (breast) tissue. Likewise, there is no well-established set of tests for screening chemicals for their ability to raise the risk of breast cancer.

In 2010, Dr. Schwarzman served as Principal Investigator of a project to tackle this issue. The Breast Cancer and Chemicals Policy project, supported by a grant from the California Breast Cancer Research Program, convened a panel of 20 scientists and policy experts to review the biological mechanisms associated with breast cancer and propose a strategy for screening and identifying chemicals that could increase the risk of the disease. The panel followed a unique "disease endpoint" model, working backwards from a disease to identify the changes caused by chemicals that could serve as early indicators of toxicity. While this approach was recommended by the National Academy of Sciences in their report "Toxicity Testing in the 21st Century", this is the first time it has been implemented for any disease, including breast cancer.

The Breast Cancer and Chemicals Policy project model is intended to dovetail with the State of California's Green Chemistry Initiative, as well as ongoing efforts by federal scientific agencies working to create new and more effective comprehensive chemical testing approaches to better protect human health.

Biography

Dr. Megan R. Schwarzman's work focuses on endocrine disrupting substances, repro-



ductive environmental health, U.S. and European chemicals policy, and the implications for human health and the environment of the production, use and disposal of chemicals and products. She is a research scientist at the Center for Occupational and Environmental Health (COEH), in UC Berkeley's School of Public

Health, and Associate Director of Health and Environment for the interdisciplinary

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March Dinner Meeting Joint Meeting with Palo Alto AWIS

Date: Wednesday, March 23, 2011

Time: 7:00 Networking Dinner
7:30-7:45 Announcements
7:45-9:00 Presentation

Location: Xerox PARC
3333 Coyote Hill Road
Palo Alto, CA 94304

Speaker: Dr. Megan Schwarzman
UC Berkeley, School of Public Health
Making Chemical Testing
Relevant to Breast Cancer

Cost: \$10.00 Light dinner buffet

Reservations: www.scvacs.org
Sally Peters 650-812-4994

Reservations MUST be made by Sunday, March 20th, stating your name, address, company affiliation, and number of people in party. Watch the web site for more information. If you are unable to honor your reservation and do not cancel by Tuesday, March 22nd, you will be invoiced following the dinner meeting.

Breast Cancer, continued from front page

Berkeley Center for Green Chemistry. She earned her medical degree from the University of Massachusetts, completed her specialty training in Family Medicine at the University of California, San Francisco, and earned a master's of public health from the University of California, Berkeley. Dr. Schwarzman also practices medicine part time at San Francisco General Hospital.

Chair's Message, continued from front page

forward to the day when I can share the chemistry behind this 'trick' with her. What nifty chemistry gifts or gadgets have you received recently? Tell us about it on the Santa Clara Valley ACS Facebook page! Click on "Like" the Santa Clara Valley ACS page in order to automatically receive real-time updates to the page.

Are you tired of calling months in advance for the best Valentine's Day dinner reservations and then paying double for half the service? Do we ever have the solution for you during the month of love! Check out our February 17th dinner meeting, where Susan Kuchinskas, author of *The Chemistry of Connection* will enlighten us with her research on oxytocin and the biochemistry of love. Any research topic that can actually make me blush while describing is sure to be intriguing! Bring your special someone, or come just to hone your dating skills using a new tool—your knowledge of chemistry. We'll meet at Shiva's Restaurant in Mountain View, so bring your saffron-receptor taste buds for a special Indian food treat.

Did you know that it's possible to etch the entire Periodic Table of the Elements on a human hair? I did not—until one of my Ex Comm colleagues (thanks, George!) sent me the fascinating YouTube video of this laser-etching procedure explored by Dr. Martyn Poliakoff at University of Nottingham. It is posted on the Santa Clara Valley ACS Facebook page for you to enjoy too! I would love to hear about the surprising chemistry projects you've heard about—email me at akennedycali2007@yahoo.com and I'll post your links and comments.

Finally, have you made your housing reservations for the ACS National Meeting in Anaheim in March? Housing is open and I'm thrilled to report I scored the Disneyland Hotel and I can't wait to see some great talks and meet Princess Belle in person!

Reminder

February Dinner Meeting Sex, Love and Oxytocin

Reminder

Susan Kuchinskas

Abstract

We tend to think of our emotions as coming from our minds. In fact, what we call emotion can be seen as the expression of a bodily state. As chemicals like cortisol or adrenaline prep our bodies for fight or flight, they tweak our minds into the state we call fear.

The sunnier emotions are also the result of chemicals flooding our bodies and brains. The emotions of positive interaction with others -- trust, friendship, connection and every kind of love -- are all based on oxytocin, the neurochemical of bonding. This includes sexuality. While lust is driven in both men and women by testosterone, when we're touched, and especially when we orgasm, our brains release oxytocin. You could say that sexuality, love and intimacy -- when you read them as neurochemical states -- are all one thing. And they're all the result of oxytocin.

If the need to propagate our species has driven human evolution, it's not surprising that sex would be one of the most fun things to do. What is surprising is that the sheer joy of sex is so closely tied to our most transcendent emotions.

In this lecture with Susan Kuchinskas, author of the new book, *The Chemistry of Connection*, we'll explore the effects of oxytocin as a hormone coursing through the bloodstream and as a neurochemical, exciting the emotional pathways of the brain. We'll review research in biology, neuroscience and psychology to examine the connection among the myriad kinds of love we're capable of and ponder what it means for each of us that sex and love are so intertwined.

Biography

Journalist Susan Kuchinskas, M.A., is the author of *The Chemistry of Connection: How the Oxytocin Response Can Help You Find Trust, Love and Intimacy*. She writes about science, technology and culture for a variety of publications, and is a frequent guest on talk radio, where she discusses how neuroscience can improve our relationships. She is in



training to become a certified Slow Sex Coach.

She has a B.A. from Rutgers, and an M.A. in creative writing from San Francisco State University. Her websites are www.kuchinskas.com, www.chemistryofconnection.com and www.hugthemonkey.com, which covers oxytocin news, research and cultural sightings.

[hugthemonkey.com](http://www.hugthemonkey.com), which covers oxytocin news, research and cultural sightings.

February Dinner Meeting

Date: Thursday, February 17, 2011

Time: 6:00 Social Hour
7:00 Dinner
8:00 Presentation

Location: Shiva's Indian Restaurant
800 California St, Suite 100
Mountain View, CA 94041

Speaker: Susan Kuchinskas
Science writer
"Sex, Love and Oxytocin"

Cost: \$27.00
Indian Buffet that includes both vegetarian and chicken dishes.

Reservations: www.scvacs.org
Sally Peters 650-812-4994

Reservations MUST be made by February 14th stating your name, address, company affiliation, number of people in party. Watch the web site for more information. If you are unable to honor your reservation and do not cancel by Monday, February 15th, you will be invoiced following the dinner meeting.

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Welcome to the Santa Clara Valley Section of ACS

Each month the section receives a spreadsheet from national ACS with the names of members new to our section. The members are either new to ACS, have transferred in from other areas, or are the newest members -- the students. To welcome you to the section and get to know you, the Executive Committee offers new members a free dinner!! To encourage you to attend a monthly section dinner meeting, we would like you to be our guest. When you register, make certain to mention that you are a new member and you and a spouse (or friend) will

be our guests. The dinner meetings are often the 3rd Thursday of the month at a local spot, somewhat convenient to the entire section. If you are unable to attend in the evening, perhaps you would join us for an outreach event, like judging a science fair, participating in the chemistry olympiad, or a national chemistry week event in October. Then, there is our annual wine tasting and awards picnic in July. The local section is a volunteer organization. Please attend an event, volunteer to help, and get to know your local fellow chemists. Welcome!!

New Members List for December

Dr. Deepshikha Angrish	Jasna Hodzic	Mr. Servando G. Panee
Diego Avelloned	Mr. Brian Jeffrey Hom	Mr. Phat-Dat Phan
Mr. Jordan J. Baker	Victoria Johnson	Mrs. Ashley Piekarski
Terri Bella	Mrs. Aleida Jones	Mr. Taha Rezai
Mr. Anthony J. Bortolazzo	Harpreet Juneja	Dr. Hector Manuel Rodriguez
Ms. Jenelle K. Bray	Dr. Alexander A. Khorlin	Dr. Patrick J. Rudewicz
Mr. Arick Brown	Mr. Jacob Latone	Ms. Katrina T. Sarkissian
Ms. Thao P. Bui	Mr. Bao Le	Vong Sok
Mr. Phillip J. Calabretta	Dr. Jacques Leibovitz	Dr. William B. Stockton
Mr. George Chan	Mr. Neel A. Leslie	Mr. Daniel L. Sun
Dr. Daniel J. Coady	Zhengzheng Li	Mr. Ravisubhash Tangirala
Ms. Emily Ann M. Crocker	Mr. Steve Liu	Celia M. Tarcha
Mr. Andy Dang	Ms. Melissa C. Lombardo	Mr. Tan Q. Tran
Mr. Scott Dashner	Ms. Pamela M. Lundin	Ms. Tiffany T. Truong
Ms. Jenny Y. Doan	Mr. Nicholas A. Moore	Ms. Kristina M. Tuminaro
Ms. Denise R. Eubanks	Miss Megan Morisada	Hailiang Wang
Ms. Kimberly Ann Eugenio	Ms. Elena Naderzad	Dr. Lloyd S. White
Ms. Tanya Ghaemmaghami	Dr. Hou T Ng	Dr. Gregory Lewis Whiting
Ms. Zhuojun Guo	James T. Nguyen	Ms. Heather J. Wright
Mr. Daniel R. Haber	Joy Obiri	Dr. Haiming Zhang
Ms. Amrita B. Hazra	Mr. Jonathan D. Oribello	

Volunteer with Kids and Chemistry

Kids & Chemistry is a community-based program that brings together scientists and children to do hands-on science activities. Volunteers include ACS members, ACS Student Chapters, and corporate groups.

Volunteer efforts can be implemented as a full program administered by an ACS local section or by an individual as a one-time classroom visit. The program can also be incorporated into an existing corporate outreach/education program, or serve as the focal point for a larger mentoring program.

How it Works:

1. Contact a school - Establish a rela-

tionship with a local school.

2. Choose an activity - Purchase our new Kids & Chemistry Kits from the ACS Store, or use ACS-approved lessons submitted from other members.
3. Present your lesson - Use classroom management techniques to maximize the impact of your lesson.

Tell us about it - After you're done, drop us a line. We'd love to hear about your efforts and help in any way possible.

Please visit the ACS website to be able to access the links above at:

www.ACS.org > Education > Community Outreach > Volunteer with kids and chemistry

Black History Month

February is Black History Month and it would be nice to remember some of the important African American scientists, engineers, and inventors that have made important contributions to the science of chemistry. This isn't meant to be a comprehensive list, but should be taken as a starter to get your interest piqued.

Patricia Bath - (USA) In 1988, Patricia Bath invented the Cataract Laser Probe, a device that painlessly removes cataracts. Prior to this invention, cataracts were surgically removed. Patricia Bath founded the American Institute for the Prevention of Blindness.

George Washington Carver - (USA, ca. 1864-1943) George Washington Carver was an agricultural chemist who discovered industrial uses for crop plants such as sweet potatoes, peanuts and soybeans. He developed methods for improving soil. Carver recognized that legumes return nitrates to the soil. His work led to crop rotation. Carver was born a slave in Missouri. He struggled to gain an education, eventually graduating from what was to become Iowa State University. He joined the faculty of the Tuskegee Institute in Alabama in 1896. Tuskegee is where he performed his most of his famous experiments.

Marie Daly - (USA, 1921-2003) In 1947, Marie Daly became the first African American woman to earn a Ph.D. in chemistry. The majority of her career was spent as a college professor. In addition to her research, she developed programs to attract and aid minority students in medical and graduate school.

Mae Jemison - (USA, born 1956) Mae Jemison is a retired medical doctor and American astronaut. In 1992, she became the first black woman in space. She holds a degree in chemical engineering from Stanford and a degree in medicine from Cornell. She remains very active in science and technology.

Percy Julian - (USA, 1899-1975) Percy Julian developed the anti-glaucoma drug physostigmine. Dr. Julian was born in Montgomery, Alabama, but educational opportunities for African Americans were limited in the South at that time, so he received his undergraduate degree from DePauw University in Greencastle, Indiana. His research was conducted at DePauw University.

Samuel Massie Jr. - (USA, died May
continued on next page

Black History Month, continued from previous page 9, 2005) In 1966, Massie became the first black professor at the U.S. Naval Academy, making him the first black to teach full-time at any US military academy. Massie received a master's degree in chemistry from Fisk University and a doctorate in organic chemistry from Iowa State University. Massie was a professor of chemistry at the Naval Academy, became the chairman of the department of chemistry and co-founded the Black Studies Program.

Garrett Morgan - (USA) Garrett Morgan is responsible for several inventions. He was born in Paris, Kentucky, in 1877. His first invention was a hair straightening solution. October 13, 1914 he patented a breathing device which was the first gas mask. The patent described a hood attached to a long tube that had an opening for air and a second tube with a valve that allowed air to be exhaled. On November 20, 1923, Morgan patented the first traffic signal in the U.S. He later patented the traffic signal in England and Canada.

Norbert Rillieux - (USA, 1806-1894) Norbert Rillieux invented a revolutionary new process for refining sugar. Rillieux's most famous invention was a multiple effect evaporator, which harnessed steam energy from boiling sugarcane juice, greatly reducing refining costs. One of Rillieux's patents was initially declined because it was believed he was a slave and therefore not a US citizen (Rillieux was free).

Committee Chair Needed

For over 10 years, I have chaired the Santa Clara Valley (SCV) Section's committee on local and international science fairs.

This year (the International Year of Chemistry, 2011) will be my last year as chair of this committee. We need a new chemist within our Section to step up now to become the co-chair, learn the process, and next year (2012) chair our Science Fair Committee.

It has been my pleasure to serve and be a part of this local ACS activity.

For more information, please contact: peters4pa@sbcglobal.net

Albert Ghiorso, Nuclear Researcher

BERKELEY, CA—Albert Ghiorso, lifelong nuclear researcher at the Lawrence Berkeley Laboratory, the co-discoverer of twelve chemical elements (more than anyone else in history) and a prolific inventor of nuclear technology, died December 26, 2010, at the age of 95.

With a round dozen elements to his credit, more even than his great friend, mentor, and colleague, Glenn Seaborg, Albert Ghiorso holds the world record for the discovery of transuranium elements -- and possibly for elements of any kind. It's an astonishing achievement for someone who found his true calling almost by accident.

Al Ghiorso was born in Vallejo, California, and grew up in Alameda. His father had come to the U.S. with his family from Genoa, Italy, at the age of two, growing up to become a ranch hand, riveter, welder, and general jack-of-all-trades -- and, not coincidentally, a strong union supporter and political radical, who urged his son to become an "honest" lawyer. But the younger Ghiorso had too much fun fixing and building gadgets, so with the help of a scholarship -- to cover the \$26 annual fee -- he got a degree in electronic engineering from UC Berkeley in 1937.

It was the depths of the Great Depression and the only work Ghiorso could find was doing odd jobs for short-wave radio and electronics enthusiasts. In 1941 he was hired to install an intercom system to connect the secretarial desks at UC Berkeley's Radiation Laboratory. He did a good job, so he was asked to wire some Geiger counters.

"I was not told that it would be necessary to build hundreds of these devices for Professor Glenn T. Seaborg's group," Ghiorso later recalled. By way of consolation, when the U.S. entered World War II not long afterward, he married one of the Rad Lab secretaries whose desk he had wired, Donald Cooksey's assistant, Wilma Belt.

When Seaborg went to Chicago to organize the Manhattan Project's Metallurgical Laboratory he asked Ghiorso to join him there, instead of enlisting in the Navy. Ghiorso barely knew Seaborg, but he agreed on condition that he wouldn't have to build any more Geiger counters.

Seaborg kept his word. In the spare moments left over after he'd spent the day maintaining the existing Met Lab equipment, Ghiorso began inventing new instruments for detecting nuclear radiations, the

first step in his long, element-finding career.

For reasons having to do with available energies and experimental methods, most of these elements were discovered in pairs. Ghiorso's first trophies, while still at Chicago's Met Lab, were elements 95 and 96 (americium and curium) in 1944-45. These were followed, back at the Rad Lab in Berkeley in 1949, by the discovery of elements 97 and 98 (berkelium and californium). In late 1952, elements 99 and 100 (einsteinium and fermium) were found in debris brought back from the first H-bomb test in the Pacific.

Element 101 (mendelevium) was a loner, the first element to be identified from individual atoms -- a mere 17 atoms, created in the 60-inch cyclotron. Many discoveries since have been based on even fewer atoms.

Competition and controversy have been part of the element quest from the beginning, and Al Ghiorso has never ducked a vigorous discussion about who discovered what when. He was a leader in the fight to have element 106 named seaborgium after Glenn Seaborg, but when the International Union of Pure and Applied Chemistry finally conceded and allowed an element to be named after a living person, they compromised by giving element 105, claimed by both Berkeley Lab and Dubna, the name dubnium. Today, most of the rest of the world calls it that, but the name hahnium is still heard in Berkeley.

Many of the machines and detectors used in the search for heavy elements, including some of the most important accelerators built at Berkeley Lab over a period of three decades, were invented or influenced in their design by Al Ghiorso, including the HILAC, SuperHILAC, and BevalAC. Ghiorso's finest invention, the Omnitron, was never realized, however. "Unfortunately, the accelerator was never built because it came into competition with the terrible holocaust war in Vietnam, where the U.S. was spending the equivalent of three Omnitrons per day to devastate the country!"

Ghiorso's life was never limited to heavy elements and heavier machinery. He credits his wife, Wilma, with sparking his interest in music, art, and opera. They began collecting paintings in 1951 and before long Ghiorso was picking up his own camel's hair brush. Many of his powerful semi-abstract paintings are to be seen on the walls of UC Berkeley Buildings.

SPLASH is Coming to Stanford

April 16-17, 2011

In 1957, MIT students first started running short educational programs for high school students to explore fun and interesting topics on the MIT campus. It is called Splash! And it is the program that brings high and middle school students from everywhere to Stanford's cam-

pus for a two-day learning extravaganza. Classes are taught by Stanford undergraduates, graduate students, and other community members.

See www.stanfordesp.org for more information or contact Howard Peters at peters4pa@sbcglobal.net.

Happy Valentine's Day

Make Your Own Sculpture Dough

from Celebrating Chemistry



Sculptures can be made from many different kinds of substances or combinations of substances. One of these materials is clay. Clay can be made to have different qualities by changing the ingredients. It can be harder or softer and can have different colors. This is a recipe for one type of material that can be molded easily that is similar to the clay artists use for their work.

Materials

Flour
Salt
Cornstarch
Vegetable oil
Food coloring
Water
2 plastic cups
Spoon
Measuring spoons
Plastic bag (for storage)



Where's the Chemistry?

When materials are mixed together, the combination that is produced sometimes acts differently than the individual ingredients do. Even though the identities of the ingredients used to make the sculpture dough have not changed, the mixture of the materials behaves in a new way.



Procedure

1. Place 4 teaspoons of water in a small cup. Add 4 drops of food coloring and 2 teaspoons of salt and mix well with the spoon until as much salt dissolves as possible.
2. Place 4 tablespoons of flour in a different small plastic cup. Add 1 teaspoon cornstarch and 2 teaspoons of vegetable oil.
3. Add the colored salt water from Step 1 to the materials in the cup from Step 2 and mix well with the spoon.
4. Take the material out of the cup and knead it back and forth between your hands until it is smooth and pliable. (It may be a little oily, but this will keep it moist when stored in a plastic bag.)
5. Shape and sculpt the clay.
6. Clean up the work area and thoroughly wash your hands.



SAFETY: Be sure to follow Milli's Safety Tips and do this activity only with adult supervision! Do not drink any of the liquids used in this activity. Eye protection must be worn by everyone performing this activity.

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FUTURE MEETINGS

- Feb 17** Susan Kuchinskas
Science Journalist
Shiva's Indian Restaurant
800 California Street
Mountain View, CA
- Mar 13-17** 2011 AIChE Spring Meeting
Chicago, IL
www.aiche.org/Conferences/SpringMeeting/index.aspx
- Mar 16** Dr. Merry Sherman
CEO Mountain View Pharmaceuticals
BioScience Forum
www.biosf.org/programs.htm
- Mar 23** Dr. Megan Schwarzman
Joint meeting with AWIS
Palo Alto Research Center
Palo Alto, CA
- Mar 27-31** National Meeting and Exposition
Anaheim, CA
- Apr 4-5** 16th Annual John Stauffer Lectures
Dr. John Bercaw, N. Carolina State U.
www.stanford.edu/dept/chemistry/events/conf/jstauffer/index.html
- Apr 28** Dr. Charles Bamforth
UC Davis Professor
BEER