2014 Harry and Carol Mosher Award
Understanding Asymmetric Phase Transfer Catalysis Through Chemoinformatics

Professor Scott E. Denmark

Abstract:
Although asymmetric phase transfer catalysis has been known and practiced for over 25 years, the fundamental issues of what constitutes reactive and selective phase transfer catalysts are still unknown. This lecture will describe a multifaceted program designed to learn the “rules” that govern rate and enantioselectivity for simple phase transfer catalyzed alkylation reactions. The approach involves the creation of different chiral scaffolds for quaternary ammonium salts that are embellished with a variety of different functional substituents in a convergent region of space using parallel synthesis methods to generate large libraries of ammonium ions. The chiral ammonium salts are evaluated for their catalytic potential by standard kinetic and analytical methods. A Quantitative Structure-Selectivity Profile is developed to explain the roles of the different substituents so that the most important controlling features can be systematically identified and their properties incorporated in designs for more reactive and selective catalysts.

Biography:
Scott E. Denmark was born in New York on 17 June 1953. He obtained an S. B. degree from M.I.T. in 1975 and his graduate studies were carried out at the ETH-Zürich under the direction of Professor Albert Eschenmoser, culminating in a D. Sc. Tech degree in 1980. That same year he began his career as assistant professor at the University of Illinois. He was promoted to associate professor in 1985.

Chair’s Message
Ashley Piekarski

Happy New Year!
I am Ashley Piekarski, the new Chair of the Santa Clara Valley ACS Section. I am very excited to lead the section this year! We have some great seminars and events lined up this year. The seminars are open to everyone so please feel free to invite your family, friends, or colleagues. We do not have an event in January; however, we will have two events in February. On February 5th, Dr. Scott Denmark from University of Illinois at Urbana-Champaign will be giving the Mosher Award presentation. Reservations should be made by January 27th if you plan to attend the dinner. On February 19th, the Teacher Scholar Award will be presented at Mission College. More details to come about this exciting event in the February newsletter!

I would like to tell you all a little about myself. I graduated from M.I.T. in 1975 and my graduate studies were carried out at the ETH-Zürich under the direction of Professor Albert Eschenmoser, culminating in a D. Sc. Tech degree in 1980. That same year I began my career as assistant professor at the University of Illinois.

February Dinner Meeting
The Harry and Carol Mosher Award

Date: Thursday, February 5
Time: 6:00 Social Hour
7:00 Dinner
8:00 Presentation
Speaker: Dr. Scott Denmark
University of Illinois at Urbana-Champaign
Understanding Asymmetric Phase Transfer Catalysis Through Chemoinformatics
Location: Biltmore Hotel & Suites
2151 Laurelwood Blvd.
Santa Clara, CA
Cost: $26.00. Grilled Salmon or Vegetarian Crepes
Reservations: www.scvacs.org
Sally Peters 650-854-4614

Reservations should be made by Monday, February 2nd stating your name, address, company/school affiliation, number of people in party. Watch the web site for more information. If you are unable to honor your reservation please cancel by Tuesday, February 3rd.
Professor Denmark is primarily interested in the invention of new synthetic reactions and elucidating the origins of stereocontrol in novel, asymmetric reactions. The current emphasis in his laboratories focuses on the relationship between structure, reactivity and stereoselectivity in a variety of organometallic processes. He has pioneered the concept of chiral Lewis base activation of Lewis acids for catalysis in main group synthetic organic chemistry. His group has also developed palladium-catalyzed cross-couplings with organofunctional silicon compounds. In addition, his research program encompasses the development and application of tandem heterodiene cycloadditions for the synthesis of complex natural (alkaloids) and unnatural (fenestranes, phase transfer catalysts) nitrogen containing compounds. In recent years, his group has investigated the use of chemoinformatics to identify and optimize catalysts for a variety of organic and organometallic reactions.

Professor Denmark has won a number of honors for both research and teaching. These include: A. P. Sloan Foundation Fellowship, NSF Presidential Young Investigator Award, Stuart Pharmaceuticals Award, A. C. Cope Scholar Award (ACS), Alexander Von Humboldt Senior Scientist Award, Pedler Lecture and Medal (RSC), the ACS Award for Creative Work in Synthetic Organic Chemistry, the Yamada-Koga Prize, the Prelog Medal (ETH-Zürich), the H. C. Brown Award for Creative Research in Synthetic Methods (ACS), Robert Robinson Lecture and Medal (RSC), the ISHC Senior Award in Heterocyclic Chemistry, Paul Karrer Lectureship (Uni Zürich), the Frederic Stanley Kipping Award for Research in Silicon Chemistry (ACS), and the Harry and Carol Mosher Award (Santa Clara Section, ACS). He is a Fellow of the Royal Society of Chemistry and the American Chemical Society. He has received numerous honorary lectureships and visiting professorships and has served on many editorial advisory boards. He edited Volume 85 of Organic Syntheses, has served on many editorial advisory boards. He was Editor of Volumes 22-25 of Topics in Organic Reactions, Inc. and was Editor of Organic Letters (1999-2004). In 2005, he was Editor of Volume 22 of Topics in Organic Reactions, Inc. He is a Fellow of the Royal Society of Chemistry (ACS), and the American Chemical Society. He has received numerous honorary awards for both research and teaching. These include: A. P. Sloan Foundation Fellowship, NSF Presidential Young Investigator Award, Stuart Pharmaceuticals Award, A. C. Cope Scholar Award (ACS), Alexander Von Humboldt Senior Scientist Award, Pedler Lecture and Medal (RSC), the ACS Award for Creative Work in Synthetic Organic Chemistry, the Yamada-Koga Prize, the Prelog Medal (ETH-Zürich), the H. C. Brown Award for Creative Research in Synthetic Methods (ACS), Robert Robinson Lecture and Medal (RSC), the ISHC Senior Award in Heterocyclic Chemistry, Paul Karrer Lectureship (Uni Zürich), the Frederic Stanley Kipping Award for Research in Silicon Chemistry (ACS), and the Harry and Carol Mosher Award (Santa Clara Section, ACS). He is a Fellow of the Royal Society of Chemistry and the American Chemical Society. He has received numerous honorary lectureships and visiting professorships and has served on many editorial advisory boards. He edited Volume 85 of Organic Syntheses, was Editor of Volumes 22-25 of Topics in Stereochemistry and was a founding Associate Editor of Organic Letters (1999-2004). In 2008 he became Editor in Chief and President of Organic Reactions, Inc.

Local Science Fairs in 2015
by Susan Oldham-Fritts

Haven't decided on a New Year's resolution yet? How about encouraging middle and high school students' participation into the world of STEM (science, technology, engineering, and mathematics)? The cost is minimal—a day of your time judging at your local science fair. The following area science fairs need category awards judges (especially in the areas of botany, biology, biochemistry, chemistry, microbiology, and the behavioral/social sciences). In addition, we need interested section members for our SCV-ACS sponsored special award judging team at the Santa Clara County ISEF (International Science and Engineering Fair) qualifier, the Synopsys Championship (please contact me at sofritts@garlic.com) for inclusion in the latter).

So, no matter which fair includes your home town, please volunteer now!

**Sciencepalooza**
Santa Clara County Fair Grounds, San Jose
February 7
[www.outreach-foundation.org/judges.html](http://www.outreach-foundation.org/judges.html)

**San Mateo County Science, Math and Technology Fair**
Hiller Aviation Museum
March 3
[http://www.stemfair.net](http://www.stemfair.net)

**Santa Cruz Science Fair**
Santa Cruz County Fairgrounds, Santa Cruz
March 7
[http://www.science.santacruz.k12.ca.us](http://www.science.santacruz.k12.ca.us)

**Synopsys Championship**
San Jose Convention Center, San Jose
March 11
[www.outreach-foundation.org/judges.html](http://www.outreach-foundation.org/judges.html)

**Monterey County Science and Engineering Fair**
California State University, Monterey Bay – University Center, Bldg 29
March 14
[www.montereycountysciencefair.com](http://www.montereycountysciencefair.com)

**San Francisco Bay Area Science Fair**
San Francisco County Fair Building - Golden Gate Park
March 25

*Many students at this East Side Union School District fair are first time science fair participants.*
EPA Monitoring Contamination in Sunnyvale

by Kevin Greenman

The semiconductor industry has created a profound and lasting impact on the region we now call the Silicon Valley. The once sleepy farming region has evolved into the global center of technology. We have witnessed world-changing technologies that would be impossible to imagine a century ago. Yet, this transformation has not been without costs. Among those costs, environmental contamination resulting from the improper storage and disposal of chemicals is a legacy we continue to deal with.

In 2014, the San Francisco Bay Regional Water Quality Control Board transferred lead agency responsibilities to the EPA for three sites in Sunnyvale, collectively known as the Triple Site. This site encompasses: three contaminated groundwater sites at the Advanced Micro Devices location at 901 and 902 Thompson Place, the Philips (formerly Signetics) site at 811 E. Arques Avenue and 444 N. Wolfe Road, and the TRW Microwave Superfund Site at 825 Stewart Drive. Collectively these sites have created a groundwater plume composed of volatile organic compounds (VOCs) which extend north, past Highway 101. The immediate concern of drinking water contamination is avoided by the nature of the water supply: drinking water in this area comes from the Hetch Hetchy Reservoir in the Sierra Nevada Mountains, and is tested regularly to ensure that it meets state and federal drinking water standards. The potential for this plume to continue migrating northward and contaminate the San Francisco Bay is being addressed by the ongoing remediation efforts. However, concerns about vapor intrusion – or vapors from groundwater contamination that may have migrated into the indoor air – have prompted additional action by the EPA.

The EPA is requesting permission from certain residents in the Duane and San Miguel neighborhood to collect indoor air samples. The EPA must get permission from homeowners and renters to perform the free indoor air sampling as part of a study that will look at the potential for vapor intrusion. Indoor sampling has been conducted annually at the Montessori school buildings on Duane Avenue in the area. Indoor air sampling results from those buildings continue to fall within EPA’s health protective range for children. However, the EPA’s approach to monitoring vapor intrusion has evolved to incorporate newer more advanced science and sampling strategies. The EPA is asking to place a sampling device in homes and buildings for a 24-hour to two-week period. If the detected levels of contaminants exceed EPA’s health-based screening levels, the EPA will present options to each resident as how to proceed. For more information about the indoor air sampling project, contact Melanie Morash at (415) 972-3050 or morash.melanie@epa.gov or visit http://epa.gov/region9/triplesite

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 -- 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 seminar 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 seminar 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 for December

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<tr>
<th>Dr. Christian Adams</th>
<th>Travis Horst</th>
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Chemistry Quiz

Four individuals have won or shared Nobel Prizes twice. Marie Curie and Linus Pauling each won Nobel Prizes in two different fields. Who was the only person to win the Nobel Prize in Chemistry twice? Who was the only person to win the Nobel Prize in Physics twice?

Last Month’s Question:
Approximately how many proteins are encoded in the human proteome?

Answer:
Currently, the human proteome map contains evidence for translation of over 17,000 human genes with 30,057 proteins identified so far. www.humanproteomemap.org
FUTURE MEETINGS

Jan 17  Low Tide Walk
      Marine Science Institute
      Redwood City, CA
      www.sfbaymsi.org/Events.html

Feb 1  Groundhog Day
      Free Admission to the Exploratorium
      www.exploratorium.edu

Feb 5  Mosher Awardee: Dr. Scott E. Denmark
      Understanding Asymmetric Phase Transfer Catalysis Through
      Chemoinformatics
      Biltmore Hotel & Suites
      Santa Clara, CA

Feb 19 Community College Teacher Scholar Award Presentation
      Dr. Leandra Martin, Vice President of Instruction
      Mission College campus

Feb 21 Stanford Women in STEM Symposium
      Huang Engineering Center
      Stanford University
      http://events.stanford.edu/events/474/47491

SANTA CLARA VALLEY SECTION

2015 Section Officers
Chair     Ashley Piekarski  408-855-5269  ashley@scvacs.org
Chair Elect Jane Frommer  408-927-2224  frommer@scvacs.org
Past Chair Ean Warren  650-329-4554  ewarren@scvacs.org
Secretary Karl Marhenke  831-688-4959  karlmar@armory.com
Treasurer Ihab Darwish  650-594-1654  darwish@yahoo.com

Councilors
2013-2015 George Lechner  408-226-7262  glechner@aol.com
2013-2015 Herb Silber  408-924-4954  hsilber@science.sjsu.edu
2014-2016 Linda Brunauer  408-554-6947  lbrunauer@scu.edu
2014-2016 Sally Peters  650-812-4994  sallybrownpeters@gmail.com
2014-2016 Peter Rusch  650-961-8120  pfrusch@aol.com
2015-2017 Abby Kennedy  209-640-2005  akennedycali2007@yahoo.com
2015-2017 Ean Warren  650-329-4554  ewarren@scvacs.org

Alternate Councilors
2013-2015 Stephanie Bachmann  408-429-9681  s_gehling@hotmail.com
2013-2015 Lois Durham  650-322-3507  lduham3998@sbcglobal.net
2013-2015 Natalie McClure  650-906-7831  nmclure@drugregulatoryaffairs.com
2014-2016 Mark Kent  408-736-0989  marklent@yahoo.com
2015-2016 Howard Peters  650-854-4614  peters4pa@sbcglobal.net
2015-2017 David Parker  408-615-4961  drdparker@comcast.net
2015-2017 Ashley Piekarski  408-855-5269  ashley@scvacs.org

Newsletter
Editor   Kevin Greenman  650-210-2900  kevin.greenman@gmail.com
Assoc. Editor Partha P. Bera  partha.pb@gmail.com

ChemPloyment Abstracts
Director: Liang Cao  liang.cao@aol.com