2005 ACS NATIONAL AWARD WINNERS

Recipients are honored for contributions of major significance to chemistry

Following is the third set of vignettes of recipients of awards administered by the American Chemical Society for 2005. C&EN will publish the vignettes of the remaining recipients in successive January and February issues. An article on George A. Olah, 2005 Priestley Medalist, is scheduled to appear in the March 14 issue of C&EN along with his award address.

Most of the award recipients will be honored at an awards ceremony, which will be held on Tuesday, March 15, in conjunction with the 229th ACS national meeting in San Diego. However, the Arthur C. Cope Scholar awardees will be honored at the 230th ACS national meeting in Washington, D.C., Aug. 28–Sept. 1.

ACS Award in Inorganic Chemistry

Sponsored by Aldrich Chemical Co.

Long considered the forgotten elements of the periodic table and sometimes thought of merely as atomic number placeholders, the lanthanides owe much to **William J. Evans** for their increasing popularity. With a spokesman like Evans in their corner, these metals are easily changing their status from disregarded to indispensable.

Though Evans, 57, now is a strong proponent of lanthanide chemistry, his path into this area was not so straightforward. In fact, it was his interest in rowing that steered him to inorganic chemistry in the first place. While at the University of Wisconsin, Evans decided to work with chemistry professor Donald F. Gaines doing pentaborane research because of the flexibility it offered to Evans' training on the crew team. However, since he enjoyed doing research so much, "I found I was spending about 24 hours per week in the Gaines lab, far more than the 10 required, because I just loved the research so much. And I still lettered in crew my senior year."

The research experience in Gaines's lab pushed Evans into the "boron pipeline," which led him to the University of California, Los Angeles, to obtain his Ph.D. with M. Frederick Hawthorne working with metallocarboranes. Evans then went to Cornell University to serve as a postdoc with the late Earl L. Muetterties. Evans is currently professor of chemistry at the University of California, Irvine.

When Evans began his own independent research, he opted for the synthetic realm. "I looked around the periodic table for some area that would benefit from a focused effort on synthesis," Evans says. "It seemed that group 3 and the lanthanide metals were ready to be explored." Though many scientists might shy away from such unexplored research areas, Evans was emboldened by such a challenge and thoroughly embraced these heavyweight transition metals.

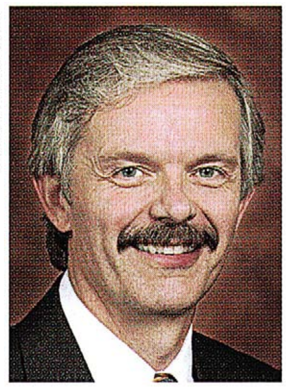


PHOTO BY HUGH NAYEB

Evans

One colleague notes that Evans' work has "provided the foundation for much of current f-element chemistry" and praises his "independence of thought and originality." Indeed, Evans' research interests entail advancing the fundamental aspects of lanthanide, actinide, and early transition-metal chemistry. Advances in his lab have been discovered in fields as diverse as reduction chemistry, dinitrogen chemistry, polymerization chemistry, and nonclassical carbonium ion chemistry, to name a few. These metals and their unique properties have seen use in energy-efficient lighting devices, catalytic converters in automobiles, and catalytic formation of biodegradable polymers and synthetic rubber.

Evans has recently used lanthanide metals to bring reductive chemistry to complexes of redox inactive metals, which involved the synthesis of the first metal (M) complexes containing three pentamethylcyclopentadienyl ligands. For decades, these $(C_5Me_5)_3M$ complexes were thought to be too sterically crowded to exist. The mechanisms and implications of this "sterically induced reduction" are now being studied.

Evans has also probed the lanthanides' unique potential in catalytic polymerization chemistry. These metals are among the best catalysts for the formation of biodegradable polymers from lactones and synthetic rubber from isoprene. His group is studying these catalyses since they offer great opportunities to identify new aspects of fundamental organometallic chemistry.

To explore these wide-ranging topics, Evans' group uses a diverse panoply of characterization techniques, all of which must be accomplished with rigorous exclusion of air and water because the complexes are extremely air sensitive. Indeed, the experimental difficulties in handling complexes of these large electropositive metals were additional hurdles that Evans and his group had to overcome to pursue this area of chemistry.

Evans has more than 250 research publications, articles, and patents to his credit. Among Evans' many honors are the 2004 Special Creativity Extension Award by the National Science Foundation and the 2002 Outstanding Contributions to Undergraduate Education Award by UC Irvine Physical Sciences. Evans has been a Camille & Henry Dreyfus Teacher-Scholar, an Alfred P. Sloan Research Fellow, and the chairman of the Gordon Research Conference in Inorganic Chemistry.

The award address will be presented before the Division of Inorganic Chemistry.—STEPHEN TRZASKA

Charles Lathrop Parsons Award

For **Marye Anne Fox,** chancellor of the University of California, San Diego, leadership and public service go hand-in-hand, and those qualities have been hallmarks of her professional career. Fox is the kind of person whose ability to direct and serve was recognized early: She held her first leadership role as president of her third-grade class.

Fox, 57, grew up in the post-*Sputnik* era when young people were strongly urged to study science. Although young women were not widely steered to science in those days, Fox went to a high school where boys and girls received their academic instruction in single-sex classes. After she finished secondary school, she matriculated at the then all-female Notre Dame College outside Cleveland. That it was unusual for women to study in the sciences, she says, "never occurred to me."

Fox selected chemistry as her academic focus for a variety of reasons. Chemistry was highly regarded in the 1960s, she points out. "It was something that was changing the world in a positive way," she tells C&EN. Plus, she found it appealing that chemistry fell between the heavily quantitative fields of mathematics and physics and, at the time, the qualitative field of biology.


Fox

"Chemistry, of course, is the most fascinating science," Fox says with a hint of delight in her voice.

After earning her B.S. in chemistry in 1969, Fox completed a doctorate in physical organic chemistry at Dartmouth College in 1974. She completed a two-year postdoc at the University of Maryland, then joined the faculty at the University of Texas, Austin.

After 18 years of working her way up the professorship ladder leading to her appointment to the Waggoner Regents chair, Fox was named vice president for research at UT Austin in 1994. In 1998, she became chancellor of North Carolina State University. She moved to the top job at UC San Diego in August 2004.

Fox credits Norman Hackerman, emeritus professor of chemistry at UT Austin and a retired president of Rice University, with encouraging her toward public service. Hackerman asked her to become involved in national science policy discussions, which in turn led to a presidential appointment to the National Science Foundation's National Science Board, where she served from 1991 to 1996.

She has also served as a member of the National Academies' Committee on Science, Engineering & Public Policy, chair of the National Research Council's Government-University-Industry Research Roundtable, and on the President's Council of Advisors on Science & Technology. She has spoken and written widely on science policy. Her service work has extended beyond federal science issues—the wide swath of advisory board positions she has held include organizations such as Girl Scouts, an educational group countering gun violence, and women in science and technology.

Fox believes it is important for her to give back to the community by improving the quality of science education and establishing ways to encourage members of underrepresented groups to consider careers in science or engineering. And now she's blended her service activities with her career.

Fox says she finds it "rich and stimulating" to lead a university, interacting with all sorts of people, raising funds, and maintaining standards of excellence for students. "Public service becomes what you're doing," Fox says.

The award address will be presented on Sunday, March 13, 1 PM, at the San Diego Marriott, Marina D.—CHERYL HOGUE

ACS Award for Volunteer Service to the American Chemical Society

Sponsored by the ACS General Endowment Fund

Since joining ACS in 1969, **Janan M. Hayes** has constantly led ACS activities at the local and national level. A fellow chemist and ACS volunteer observed that she could not remember the first time she met Hayes because "she has always been there, that is, she has always been part of and involved in activities for ACS before I was even born!"

Hayes has played key roles in organizing regional and national meetings for the past two decades. A longtime ACS volunteer comments that Hayes is always concerned with making sure the meetings meet the needs of the average ACS member. "To my knowledge," he says, "she has never refused to serve on the organizing committee."

She served for more than 12 years on the Program Planning & Coordination Committee, a group that organizes ACS meetings. She took on the enormous task of chairing the Western Regional Meeting not just last year but also in 1984.

GARDNER STUDIO PHOTO

Hayes

"All of these volunteer activities have been at the core of my teaching career and of my personal satisfaction in the profession," Hayes says to explain her generosity toward the society. "When I first became a councilor, the late Sister Agnes Ann Green mentored me and opened many opportunities for me, so I am trying to do the same for younger chemists."

Hayes joined the society's Sacramento Section in 1971, a section she has since chaired twice. In 1976, she joined the Coordinating Committee of California Sections, where she has at various times since then served as chair, treasurer, and secretary.

A turning point for Hayes occurred in 1974 when she was elected to the ACS Council and started to involve herself in a broader range of ACS activities. She became the liaison to the committee that developed ACS's position on the naming of transfermium elements. She has been reelected 10 times to the council since 1974, eventually being elected to the Council Policy Committee, the executive committee of the ACS Council.

Hayes is also acclaimed for being codirector of Project Inclusion for more than 10 years. Supported by the National Science Foundation and the Chemical Heritage Foundation, Project Inclusion aims to encourage women and underrepresented groups to study chemistry by drawing attention to these minority groups' contributions.

Hayes earned her B.S. and M.S. in science education and speech from Oregon State University in 1965. On graduation, she taught high school in Fortuna, Calif., before resuming her studies at Brigham Young University, where she was awarded her Ph.D. in inorganic-analytical chemistry in 1971. She then taught chemistry at the college level in Sacramento until 1981.

From 1981 to 1989, she was dean of science, mathematics, agriculture, and related technologies at Cosumnes River College in Sacramento. She moved to Merced College in 1989 as dean and eventually vice president of instruction. In 1993, she joined the faculty of Merced as professor of chemistry and physical science. She still teaches there part time, although she formally retired last September.

"I now have the time to do all of the other things I had wanted to do, such as writing materials on multicultural topics for future middle school teachers," she says.

The award address will be presented during the ChemLuminary event at the ACS fall national meeting in Washington, D.C.—JEAN-FRANÇOIS TREMBLAY

Glenn T. Seaborg Award for Nuclear Chemistry

Sponsored by the ACS Division of Nuclear Chemistry & Technology

Luciano G. Moretto started out his intellectual life both inquisitive and adventurous. If his research and reputation as a professor of chemistry at the University of California, Berkeley, and faculty senior scientist at Lawrence Berkeley National Laboratory serve as a guide, he never lost a step since his days as a precocious child.

One colleague calls him "perhaps the most distinguished active scientist working in the area of complex nuclear reactions." Another colleague adds, "His contributions to nuclear level densities, fission formalism, complex fragment emission, deeply inelastic reactions between heavy nuclei, multifragmentation reactions, and scaling theory," along with his "advanced arguments for the nuclear liquid-gas phase transition, have made him one—if not 'the'—world expert in statistical theory as applied to complex nuclear reactions."

COURTESY OF LUCIANO G. MORETTO

Moretto

As a schoolboy, Moretto's tedious Greek and Latin grammar classes weren't enough to keep his curiosity satisfied. He supplemented his studies with physics and chemistry books from a small local library. He says his experiments left him with the "yellow stains of nitric acid and the black stains of silver nitrate." One night he synthesized nitroglycerin. Prompted by the "sweet and burning" taste a book told him nitroglycerin should have, he tasted the concoction. The strong vascular dilator left him with the worst headache of his life.

Later on, Moretto says he earned the best score in all of Italy on that country's notoriously challenging "esame di maturità classica," an exam taken at the end of high school. That performance secured him a scholarship to continue his studies. After receiving his Ph.D. in chemistry from the University of Pavia, Moretto set to work studying the yields of fission fragments.

He then received a fellowship to work at Lawrence Berkeley National Laboratory on slow neutron, fast neutron, and electron-induced fission yields. He stayed in Berkeley for three years before returning to Italy temporarily to teach.

In 1971, Moretto returned to Berkeley permanently and focused on the study of nuclear reactions. He spent the 1970s inducing fission with high-energy particles to determine, he says, how the shell structure "slowly fades away" with increasing energy. This work led to influential papers on nuclear level densities with John R. Huizenga.

In the late 1970s and the 1980s, Moretto's group studied deep-inelastic collisions between heavy nuclei. The group studied how energy and angular momentum relax from translational to internal motion.

More recently, Moretto's group was able

to interpret multifragmentation in terms of a liquid-vapor phase diagram. "It turns out that nuclear matter does behave very much like a van der Waals fluid," he says. He says this work "closed the circle" on his career in chemistry because of his familiarity with phase diagrams as a young university student working endlessly in a lab. "All of a sudden, we took the world of nuclear physics into a more mundane and human frame of understanding," he says.

Also closing the circle is Moretto's hobby: using those grammar lessons to read classical Greek and Latin literature, which he enjoys every night.

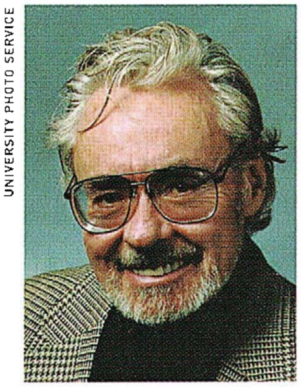
The award will be presented before the Division of Nuclear Chemistry & Technology. —ALEXANDER TULLO

ACS Award for Creative Research & Applications of Iodine Chemistry

Sponsored by SQM S.A.

Robert M. Moriarty's academic work in iodine chemistry has been published in dozens of articles and has earned him the acclaim of his colleagues. It's his industrial work in process chemistry, however, that has earned him enough money to race Formula Mazdas and M3 BMWs throughout the Midwest.

Moriarty, 71, got hooked on chemistry as a youth in 1940s New York City with the help of a Gilbert chemistry set and the enticing reagents he could easily purchase from local chemical distributors. He attended Fordham University, receiving a B.S. in chemistry in 1955. Soon after, he joined Merck & Co. in the Rahway, N.J., research group of Lewis H. Sarett, who had been the first chemist to synthesize cortisone.


UNIVERSITY PHOTO SERVICE

Moriarty

After a short stint, Moriarty left Merck for graduate work in Everett S. Wallis' labs at Princeton University. He earned his Ph.D. from Princeton in 1959 and conducted postdoctoral research with both Rolf Huisgen at the University of Munich and Elias J. Corey at Harvard University. Moriarty credits Corey for providing a research foundation. "I worked on five or six projects for E. J., each of which I failed at, but each of which formed the basis for my subsequent research," he says.

Following his postgraduate work, Moriarty taught at the Catholic University of America, Washington, D.C., for six years, then joined the faculty of the University of Illinois, Chicago (UIC), in 1968. Moriarty says he got interested in iodine chemistry in 1981 while trying to find a reagent that would donate an oxygen atom in much the same way that oxygenase enzymes do. His experiments with iodosobenzene didn't work in this role, but they gave rise to subsequent, fruitful research into hypervalent iodine.

According to Donald J. Wink, head of the chemistry department at UIC, Moriarty's work with hypervalent iodine has "had a major impact on methodology in organic synthesis." In addition, Wink says, Moriarty's efforts have provided chemists with oxidants that have clear environmental advantages over heavy metals such as lead, thallium, mercury, and chromium.

Although Moriarty is recognized for the 300 academic papers he has published—more than 90 of which are on iodine chemistry—he is equally proud of his lesser known work in the business world.

At around the same time that he was first delving into iodine, Moriarty started a completely unrelated company, SynQuest, dedicated to the synthesis of early-stage drug candidates. One customer was United Therapeutics, which was developing treprostinil, a prostacyclin analog, as a treatment for pulmonary hypertension.

Working with United Therapeutics, Moriarty created a successful synthesis of the drug and produced it at a commercial scale. In 1999, Moriarty sold his company to the drugmaker, turning enough of a profit, he says, "to pursue my rather expensive interest in racing automobiles," which he considers a natural extension of his academic professorial life. The drug, tradenamed Remodulin, was approved by the Food & Drug Administration in 2002.

If running a company and teaching at UIC were not enough to keep him busy, in 1997 Moriarty started a second company, OncQuest, to pursue his longtime interest in vitamin D chemistry. The company's main focus is his discovery of 1-α-hydroxy vitamin D-5, which is being developed as a chemopreventive treatment for breast cancer.

Moriarty has slowed down some on the academic front, becoming a professor emeritus in 2002. However, he still maintains a research group at UIC of six postdocs and four graduate students who are focused on glycolipids and antihepatitis B compounds. And things are heating up on the business front: His vitamin D compound just received a patent and is about to go into clinical trials.

The award address will be presented before the Division of Organic Chemistry.—MICHAEL MCCOY

Ernest Guenther Award in the Chemistry of Natural Products

Sponsored by Givaudan

The nomination citation is succinct: "for his extraordinary contributions to natural products chemistry, biology, and medicine." Those contributions have underpinned the awarding of the Guenther Award to **Satoshi Ōmura,** 69, president of Kitasato Institute in Tokyo.

Ōmura received his B.S. degree in 1958 from Yamanashi University, in Yamanashi prefecture, west of Tokyo. He earned an M.S. in 1963 from Tokyo University of Science, and followed that by earning a Ph.D. in pharmaceutical sciences in 1968 from the University of Tokyo, and another in chemistry two years later from Tokyo University of Science.

His first position was as a research associate at Yamanashi University, from 1963 to 1965. In 1965 he began his career-long association with Kitasato Institute, as a researcher; over the years he was named to various posts, culminating in his appointment in 1990 to his current position as director and president. He has held many senior teaching posts, and is currently a professor in the Kitasato Institute for Life Sciences, and in Kitasato University Graduate School of Infection Control Science.

COURTESY OF SATOSHI ?MURA

Ōmura

Under his direction, Kitasato Institute has achieved worldwide recognition as one of the premier centers for the discovery and structural elucidation of natural products. Ōmura's teams have identified more than 150 distinct types and more than 330 individual compounds. His contributions span the areas of microbiology, biosynthesis, biological investigation, and chemical synthesis, according to a colleague, helping "define natural-products chemistry, biology, and medicine over the last few decades."

Among Ōmura's discoveries is avermectin, for which his group eventually deciphered the entire genome of the producing organism (*Streptomyces avermectinius*) and identified the 17 genes crucial for production of the compound.

The dihydro-derivative of avermectin, ivermectin, has been used extensively for human and animal health, and for agricultural purposes around the world. It is a broad-spectrum antiparasitic product and is the world's leading anthelmintic agent, used to cure onchocerciasis (river blindness). Millions of people have been saved from misery, disfigurement, and blindness by this drug, and millions more are expected to benefit from it as its uses expand into new domains such as the treatment of lymphatic filariasis and strongyloidiasis.

Other compounds identified by Ōmura are clinical agents or biological tools: the antibiotics leucomycin A3, the erythromycin derivatives motilides, and rokitamycin, as well as the animal health antimicrobials nanaomycin A and tilmicosin. Still other compounds feature as widely used enzyme inhibitors, such as staurosporine, cerulenin, lactacystin, and atpenin, facilitating biological investigations around the world.

Ōmura has been broadly recognized in the natural-products field, as indicated by his numerous awards and honors. Among these are the Nakanishi Prize, jointly awarded by ACS and the Japan Chemical Society, and the Japan Academy Prize. He is a member of the Japan Academy, and is a foreign associate of the U.S. National Academy of Sciences and the Institut de France, Academie des Sciences.

Besides his own body of work, Ōmura has continued to enrich the tradition of Japanese natural-product discovery by training many talented young scientists in his institute, and by publishing widely. Since 1973, he has been a member of the editorial board of the *Journal of Antibiotics,* becoming editor-in-chief in 2004.

The award address will be presented before the Division of Organic Chemistry.—PATRICIA SHORT

ACS Award for Creative Advances in Environmental Science & Technology

Sponsored by Air Products & Chemicals, in memory of Joseph J. Breen

In 1974, F. Sherwood Rowland and Mario J. Molina wrote a paper in *Nature* in which they proposed that man-made chlorofluorocarbons (CFCs) were reaching the stratosphere and catalytically destroying the ozone layer. It wasn't until 1985 that the springtime Antarctic ozone hole was discovered. By 1985, **Akkihebbal R. Ravishankara** had a string of research findings on the chemistry of the stratospheric ozone layer. The passage of the Montreal protocol, and its amendments, encouraged him to find ozone-friendly substitutes for CFCs.

Ravishankara, 56, began his studies in India and in 1968 received a B.S. in chemistry and physics from the University of

Mysore. He went on to earn an M.S. in physical chemistry from the same institution. He moved to the U.S. to study for a Ph.D. in physical chemistry at the University of Florida, under the direction of R. J. Hanrahan. Ravishankara was studying molecular reactions when he heard a seminar about the chemistry of the ozone layer, which he described as "cool." He decided to pursue the subject in postdoctoral research at the University of Maryland lab of Doug Davis.

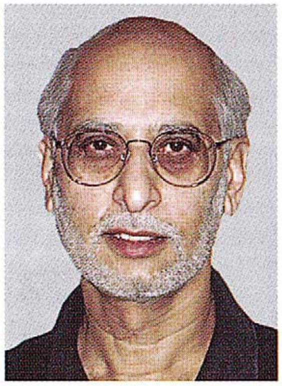


PHOTO BY DEBRA DAILEY-FISHER/NOAA AERONOMY LAB

Ravishankara

From 1976 to 1985, Ravishankara researched the rates of reactions of molecules in the atmosphere at Georgia Institute of Technology and headed the Molecular Sciences Branch, Engineering Experiment Station, from 1979 until 1985. From 1985 until the present, he has been at the National Oceanic & Atmospheric Administration (NOAA) where he is currently a senior scientist and chief of the Atmospheric Chemical Kinetics Program. Keeping an eye on the global atmosphere is a big job, but Ravishankara also finds time to be professor adjoint at the University of Colorado.

In the early 1970s, atmospheric scientists were interested in whether gases from supersonic transport, the space shuttle, and other anthropogenic pollutants (especially chlorine) might cause chemical reactions that would destroy stratospheric ozone. A parallel discovery by James E. Lovelock that the amount of CFCs in the atmosphere was close to the total amount that had ever been produced touched off concern about the thinning of the ozone layer. The ozone layer protects living organisms from ultraviolet radiation, especially UV-B rays.

In inheriting this quest, Ravishankara became a world leader in the application of laboratory chemical kinetics to understand the gas phase and surface chemistry that controls atmospheric ozone and other gases relevant to climate change and global atmospheric pollution. His study—with Georgia Institute of Technology professor Paul Wine—of the rate of the hydroxyl radical reaction with nitric acid found that it had a higher reaction rate coefficient and that it was negatively dependent on temperature.

This finding caused a reassessment of predictions for the impacts of supersonic transports on stratospheric ozone. His laboratory methods and studies of critical reactions such as between HCl and HOCl became a major factor in understanding the Antarctic ozone hole. Such reactions can take place on solid surfaces, occurring, in the case of HCl and $ClONO_2$, within clouds in the polar stratosphere. According to James T. Hynes, professor of chemistry and biochemistry at the University of Colorado, Boulder, Ravishankara "has played a defining role in identifying and quantifying the key surface processes responsible for stratospheric ozone depletion."

An ongoing challenge in protecting the ozone layer lies in finding substitutes for CFCs. Ravishankara has quantified the relative impacts on the ozone layer of more than a dozen potential substitutes for CFCs and halons. His research helped clear the way for the use of non-ozone-depleting HFC-134a. Ravishankara says testing new substances is a "continuous process—you assume a chemical to be guilty unless proven innocent."

Long-lived compounds in the atmosphere may also play a role in climate forcing. Ravishankara has studied how molecules break down even in very slow reactions such as for methane and perfluorocarbons. He, with Susan Solomon and other NOAA colleagues, found that gases such as CF_4 and C_2F_6 have lifetimes of many thousands of years and are infrared absorbers with potential to permanently impact climate. Similarly, Ravishankara's research into the oxidation rates and mechanisms of gas-phase sulfur compounds—COS, CS_2, and dimethyl sulfide—assisted in understanding stratospheric and tropospheric aerosols.

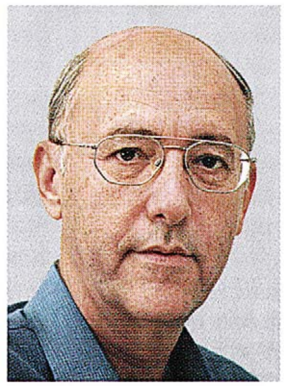
Ravishankara was the 2003 Centenary Lecturer of the Royal Society of Chemistry. He is a fellow of the American Association for the Advancement of Science and American Geophysical Union and is a member of the U.S. National Academy of Sciences. In 1998, he received the Polanyi Medal from the Royal Society of Britain. He was recognized with the Stratospheric Ozone Protection Award from the U.S. Environmental Protection Agency (1996) and the Silver Medal from the U.S. Department of Commerce (1995).

The award address will be presented before the Division of Environmental Chemistry.—MELODY VOITH

ACS Award for Creative Work in Fluorine Chemistry

Sponsored by Honeywell

Elemental fluorine has never been a popular reagent in organic chemistry because of the widespread perception that it is difficult and dangerous to work with and that it destroys organic compounds on contact. Hence, among organic chemists, elemental fluorine has had few champions. But one of the best has been **Shlomo Rozen,** professor and Josef Kryss Chair in Organic Chemistry at Tel Aviv University, in Israel.



Rozen

Rozen, 62, has been "a tireless advocate" of using F_2 and compounds derived from it as reagents in organic chemistry, according to Andrew E. Feiring, a colleague at DuPont. "He dispelled the myth that elemental fluorine is an uncontrollable strong oxidizer," says George A. Olah of the University of Southern California (USC). Rozen showed that "it is possible to perform some very selective reactions with elemental fluorine or reagents derived from it," Feiring adds.

One of Rozen's major accomplishments was introducing new acyl and alkyl hypofluorites (OF reagents) and demonstrating their utility in organic transformations. Acetyl hypofluorite, for instance, has "turned out to be one of the most powerful electrophilic fluorinating agents in organic chemistry, and today there are hundreds of publications" associated with it, notes USC's Surya G. K. Prakash. The hypofluorite reagents have been widely used to incorporate radioactive fluorine-18 into tracers for positron emission tomography.

In a similar vein, by bubbling diluted F_2 through aqueous acetonitrile, Rozen's group produced $HOF \cdot CH_3CN$, which he once noted is "probably the best oxygen-transfer agent chemistry has to offer." It can oxygenate a wide variety of substrates, including acetylenes, azides, and sulfides. Indeed, this reagent enabled Rozen and a coworker to oxygenate both nitrogen atoms in 1,10-phenanthroline, ending a 50-year quest for the N,N′-dioxide.

Rozen also demonstrated that bromine trifluoride (BrF_3) is a useful fluorinating agent, although he didn't invent the reagent. Chemists had shied away from using BrF_3 because it can react violently with water and oxygen-containing organic solvents. Rozen and his coworkers developed successful procedures to use this reagent to add fluorine to a variety of organic substrates to make α,α-difluoro esters, α-trifluoromethyl esters, difluoroacrylates, and other compounds. BrF_3 also was shown to effect a novel C–C–N to

C–N–C rearrangement, leading to a new family of compounds.

Rozen received his Ph.D. in chemistry from Hebrew University in Jerusalem in 1973. He has been at Tel Aviv University since 1976 and served as chairman of the School of Chemistry from 1997 to 2001.

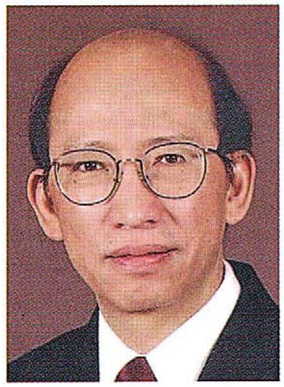
In the 1980s and 1990s, he visited DuPont's Experimental Station in Wilmington, Del., nine times, working there for extended periods as long as 16 months. "The times that he spent here were extremely productive because Shlomo is an excellent collaborator," DuPont's Feiring tells C&EN. "He would set up his fluorine line [special apparatus for handling elemental fluorine], and no sooner than he did that he'd have half a dozen people knocking at his door wanting to try things that they would not have been able to do otherwise because we weren't set up" to do that kind of chemistry. Feiring's DuPont colleague Bruce E. Smart agrees, adding, "It was a very fruitful 15-year collaboration with Shlomo."

Rozen received the award at the 17th Winter Fluorine Conference, Jan. 9–14, in St. Petersburg, Fla.—RON DAGANI

Ralph F. Hirschmann Award in Peptide Chemistry

Sponsored by Merck Research Laboratories

James Tam is a medicinal chemist who has dedicated his career to peptide chemistry and biology in a biomedical context. His motivation has been to take the principles of physical organic chemistry and apply them to find novel types of syntheses and molecular design for peptides and proteins. One reason to synthesize peptides is to gear antibody production in a tailored direction for use as therapeutics as well as diagnostics.


NTU PHOTOGRAPHY SERVICES

Tam

In his work on vaccine design, Tam developed a versatile design platform known as multiple antigen peptides (MAP), which are chemically defined to eliminate the production ambiguity of conventional designs. They induce a very specific immune response provoking production of specific antibodies. The MAP technique involves multimerizing differing synthetic peptide antigens and fastening immunomodulating molecules. In particular, Tam mastered how to create structurally defined dendrimer subunits with an architecture of a controlled number of branches. This structure permits controlled structure-activity relationship studies, eliminates the use of extraneous adjuvants, and is applicable for oral or nasal delivery to elicit mucosal immune responses.

In Tam's view, chemistry is key to the design of MAPs. In fine-tuning this technique, for example, Tam looked at how MAPs might be modified to optimize targeting and delivery. He found that lipidation, the attachment of lipophilic anchors to the dendrimers, showed distinct advantages in obtaining a cellular response and thus in its use in synthetic vaccines. This advance in peptide chemistry greatly aids in vaccine design, and MAP has become a commonly used technique around the world. For example, this technique was applied to malaria, hepatitis, HIV, and foot and mouth disease.

Tam also expanded upon the solid-phase peptide-synthesis method developed by R. Bruce Merrifield in the sixties in which the growing peptide chain is anchored to a polymer. Realizing that dendrimers, branched peptides, and proteins with unusual architectures were difficult to synthesize by conventional methods, Tam sought a way to evolve this solid-phase synthesis in order to couple unprotected peptide segments in an aqueous environment that is conceptually similar to abiotic synthesis. The method he found falls in the class of chemoselective chemical ligation, which entails the assembly of peptides or biopolymers through a high degree of selectivity. This approach avoids the requirements to protect the reactive groups and coupling reagents. Drawing on the work of Daniel Kemp, Tam and others, notably Steve Kent and his coworkers, developed a repertoire of ligation methods for the synthesis of complex peptides, proteins, and dendrimers, using synthetic or DNA recombinant building blocks. Such methods remove the size limitation of conventional peptide synthesis methods.

Born in Hong Kong, Tam received his B.S. and Ph.D. degrees in medicinal chemistry at the University of Wisconsin, Madison. After a postdoctoral scholarship at Rockefeller University, he became an associate professor there in 1982. He joined Vanderbilt University as a full professor in the department of microbiology and immunology in 1992. In 2001, he established the School of Biological Sciences and the Biosciences Research Centre at Nanyang Technological University in Singapore while continuing his research activity and appointment at Vanderbilt University. This year, he will join Scripps Research Institute-Florida to head the HIV therapeutics and vaccine program.

The award presentation will be presented before the Division of Organic Chemistry.—VIVIEN MARX

Strube Wins International Palladium Award

JÜRGEN F. STRUBE, CHAIRMAN OF THE supervisory board of BASF AG, will receive the International Palladium Award on May 26 in New York City. The award has been given out 21 times since 1958 by the Société de Chimie Industrielle to recognize distinguished contributions to the chemical industry and that enhance the aims and objectives of the society.

Strube, a native of Bochum, Germany, is being honored both for his success at BASF and his role as a statesman and promoter for the chemical industry. He has more than 35 years of experience in the industry, starting at BASF in 1969 as a member of the finance department and subsequently serving as a member of the logistics department, head of the Brazil division, and head of U.S. operations. He served as chairman of the board of executive directors of BASF AG from 1990 until May of 2003. In addition to his current role at BASF, he also serves as president of the Union of Industrial & Employers' Confederations of Europe and chairman of the supervisory board of Fuchs Petrolub AG, Mannheim, Germany.

Strube has been a member of the board of the German Chemical Industry Association, serving as president from 1996 to 1997. He was also a founding member of the German Employment Initiative as well as deputy chairman and board member of the German Science Foundation. He received a doctorate in law in 1967 after studying in Germany and Switzerland.

Coppola Named State Professor Of The Year

UNIVERSITY OF MICHIGAN, ANN ARbor, chemistry professor Brian P. Coppola was named the 2004 Professor of the Year in Michigan by the Council for Advancement & Support of Education and the Carnegie Foundation for the Advancement of Teaching. The award recognizes outstanding teaching, commitment to undergraduate students, and influence on teaching.

Coppola has previously won the university's College of Literature, Science & the Arts Dean's Excellence in Teaching Award from 1991 to 1997 and the Golden Apple Award for teaching in 1994. He earned a Ph.D. in 1984 at the University of Wisconsin and joined the Michigan faculty in 1986. ■