

BIOGRAPHIES

VIRGINIA CORNISH, PHD

Helena Rubinstein Professor
Department of Chemistry
Columbia University, New York, NY

Virginia W. Cornish graduated *summa cum laude* from Columbia University with a B.A. in Biochemistry in 1991, where she did undergraduate research with Professor Ronald Breslow. She earned her Ph.D. in Chemistry with Professor Peter Schultz at the University of California at Berkeley and then was a Postdoctoral Fellow in the Biology Department at M.I.T. under the guidance of Professor Robert Sauer. Virginia joined the faculty of the Chemistry Department at Columbia in 1999, where she carries out research at the interface of chemistry and biology, and was promoted to Associate Professor with tenure in 2004, Professor in 2007, and the Helena Rubinstein Chair in 2011. Her laboratory brings together modern methods in synthetic chemistry and DNA technology to expand the synthetic capabilities of living cells. Her research has resulted in over 60 research publications and patents and currently is supported by grants from the NIH, NSF, and private foundations. Virginia has been recognized for her research by awards including an NSF Career Award (2000), a Sloan Foundation Fellowship (2003), the Protein Society Irving Sigal Young Investigator Award (2009), and the American Chemical Society Pfizer Award in Enzyme Chemistry (2009).

PAUL J. HERGENROTHER, PHD

Kenneth Rinehart Jr. Endowed Chair in Natural Products Chemistry
Professor
Department of Chemistry
Affiliate, Department of Biochemistry
University of Illinois at Urbana-Champaign, Urbana, IL

Paul J. Hergenrother was born in 1972 and raised in Akron, Ohio. He attended the University of Notre Dame, where he received his B.S. in Chemistry in 1994. From there, Paul moved to the University of Texas at Austin, to conduct graduate research under the direction of Professor Stephen F. Martin. While in the Martin laboratory, Paul elucidated the catalytic mechanism of phospholipase C and completed the total synthesis of erythromycin B. He graduated with his PhD in Chemistry in 1999, and moved on as an American Cancer Society postdoctoral fellow to Harvard University, where he worked in the laboratory of Professor Stuart L. Schreiber in the Department of Chemistry and Chemical Biology. While at Harvard, Paul was involved in the development of small molecule microarrays as a platform for high throughput compound screening. He established his own laboratory in the Department of Chemistry (and as an affiliate in the Department of Biochemistry) at the University of Illinois at Urbana-Champaign in 2001. He was promoted to Associate Professor with tenure in 2006, and to full Professor in 2010. Professor Hergenrother has been the recipient of an NSF-CAREER Award, a Research Corporation Research Innovation Award, a Beckman Young Investigator Award, an Alfred P. Sloan Foundation Fellowship, the GlaxoSmithKline Chemistry Scholar Award, an American Cancer Society Research Scholar award, the ACS David Robertson Award for Excellence in Medicinal Chemistry, the Camille Dreyfus Teacher-Scholar Award, the ACS Eli Lilly Award in Biological Chemistry, and he was named by *Technology Review* magazine as one of the top innovators under the age of 35. Professor Hergenrother serves on the editorial board/editorial advisory board for multiple journals, including *Current Opinion in Chemical Biology*, *Journal of Medicinal Chemistry*, *Organic Reactions*, and *ChemBioChem*. The Hergenrother laboratory seeks to use small molecules to identify and validate novel targets for the treatment of intractable diseases, including cancer, degenerative disorders, and multi-drug resistant bacteria.

STEPHEN KRON, MD, PHD

Professor
Department of Molecular Genetics and Cell Biology
The University of Chicago, Chicago, IL

Stephen Kron was born in Philadelphia in 1961 and developed an early interest in biology. He attended the University of Pennsylvania, earning an honors degree in Biochemistry in 1982 and a Masters in Bioengineering in 1983. He then studied at Stanford University, where he was an MSTP and received MD and PhD degrees in 1990. His graduate work with Jim Spudich developed tools to probe the mechanics of muscle with single molecules. He also collaborated with Steve Chu to manipulate DNA by optical tweezers. Dr. Kron was granted a Helen Hay Whitney Fellowship to support post-doctoral training with Gerry Fink at the Whitehead Institute at MIT where he studied cell division and morphogenesis in brewers yeast.

In 1996, Dr. Kron came to the University of Chicago as an Assistant Professor of Molecular Genetics and Cell Biology and built a lab studying cell signaling and control of cell division, with an increasing focus on the response to DNA damage. As a young faculty member, he received a Beckman Foundation Young Investigator Award, an NSF CAREER award, and the Leukemia & Lymphoma Society Scholar Award. Dr. Kron was awarded tenure in 2003, named a Stohlman Scholar by the Leukemia & Lymphoma Society in 2007 and promoted to Professor in 2009.

At the University of Chicago, Dr. Kron has taught undergraduate, graduate and medical students, receiving the Provost's Teaching Award in 2008. He has directed fellowship programs for graduate and undergraduate students, served on committees overseeing admissions and teaching among others and now leads the Biology honors program. He directs the University of Chicago proteomics core facility. Dr. Kron is an active grant reviewer for foundations, and federal and international funding agencies. He has published ninety research papers and reviews and has over twenty patents approved or pending. Among his commercialized inventions is a core technology for genome-scale DNA sequencing. He serves as a consultant to biotech and has founded two early-stage start-ups.

Dr. Kron leads a highly interactive and interdisciplinary laboratory of a dozen researchers applying computation, drug discovery, systems biology, imaging and other approaches to examine responses to DNA damage and other stresses in cancer cells and tumors. His current collaborators include chemists, engineers, computer scientists, molecular biologists, imaging scientists and radiation oncologists at the University of Chicago, Northwestern, UIC and other institutions. Recent work with long-time collaborator Ralph Weichselbaum on therapy-induced senescence in cancer is poised to be translated to clinical trials. His work is generously funded by grants from foundations, the NIH, NSF, and the Department of Defense.

STUART L. SCHREIBER, PHD

Director of Chemical Biology at and a Founding Member of the Broad Institute of Harvard and MIT
Investigator, Howard Hughes Medical Institute
Morris Loeb Professor of Chemistry and Chemical Biology
Harvard University, Cambridge, MA

Stuart L. Schreiber, Ph.D. is the Director of the Center for the Science of Therapeutics at and a Founding Member of the Broad Institute of Harvard and MIT, where he is a Howard Hughes Medical Institute Investigator. He is also the Morris Loeb Professor of Chemistry and Chemical Biology at Harvard University, and a member of the National Academy of Sciences.

Dr. Schreiber is known for having developed systematic ways to explore biology, especially disease biology, using small molecules and for his role in the development of the field of chemical biology. He discovered principles that underlie information transfer and storage in cells, specifically discoveries relating to signaling by the phosphatase calcineurin and kinase mTOR (demonstrating for the first time that drugs can result from the targeting of protein kinases and protein phosphatases), gene regulation by chromatin-modifying histone deacetylases, small-molecule dimerizers that activate cellular processes by enforced proximity, and small-

molecule probes of challenging targets and processes (e.g., transcription factors, oncogenes, protein/protein interactions, transdifferentiation) that relate to human disease. His work has contributed to diversity-oriented synthesis (DOS) and discovery-based small-molecule screening in an open data-sharing environment. His research has been reported in over 500 publications (H index = 124).

Four new anti-cancer drugs that target proteins discovered in the Schreiber laboratory have been approved by the U.S. FDA: temsirolimus (Wyeth) and everolimus (Novartis), which target mTOR (discovered using rapamycin in 1994), for renal cancer, and vorinostat (Merck) and romidepsin (Celgene), which target HDACs (discovered using trapoxin in 1996), for cutaneous T-cell lymphoma. A small-molecule dimerizer drug (AP1903) reversed the effects of graft-versus-host disease in acute leukemia patients receiving hematopoietic stem cells engineered to express caspase-9 fused to a drug-responsive, FKBP12-based dimerization domain (NEJM, 2011). Proteins first shown by Schreiber to be targeted by a small molecule have been validated therapeutically by the FDA-approval process: tacrolimus (calcineurin/immunosuppression/1994; Schreiber's study of FK506) and bortezomib (proteasome/multiple myeloma/2003; Schreiber's study of lactacystin). Schreiber extended chemical biology principles to medicine by participating in the founding of four biotech companies, each of which has devised novel therapeutic agents that are being tested in human clinical trials or used as FDA-approved drugs: Vertex Pharmaceuticals (founded 1989: fosamprenavir/Lexiva; telaprevir/Incivek; ivacaftor/Kalydeco), ARIAD Pharmaceuticals (founded 1991: ponatinib/Iclusig; AP26113), ARIAD Gene Therapeutics (founded 1994: ridaforolimus; AP1903), and Infinity Pharmaceuticals (founded 2001: retaspimycin; IPI-145). More recently, he has co-founded two currently private companies that pursue a chemical biology-based approach to drug discovery: Forma Therapeutics and H3 Biomedicines.

KEVAN M. SHOKAT, PHD

Professor and Chair
Investigator, Howard Hughes Medical Institute
Department Cellular and Molecular Pharmacology, University of California San Francisco
Department of Chemistry, University of California Berkeley, CA

Professor Shokat is a pioneer in the development of chemical methods for investigating cellular signal transduction pathways — with a particular focus on protein kinases and lipid kinases. Dr. Shokat uses a combination of chemical synthesis and protein engineering to create uniquely traceable and regulatable kinases, allowing the function of over 100 different kinases to be uncovered across all disease areas including oncology, metabolism, and infectious disease.

Kevan is currently an Investigator of the Howard Hughes Medical Institute and Chair of the Department of Cellular and Molecular Pharmacology at the University of California at San Francisco. He is also Professor in the Department of Chemistry at the University of California at Berkeley. After receiving his Ph.D. in Organic Chemistry at UC Berkeley with Professor Peter Schultz, and post-doctoral work in immunology at Stanford University with Professor Chris Goodnow, Kevan began his independent research career at Princeton University. He has received numerous awards including being named a Fellow of several prestigious research foundations such as the Pew Foundation, Searle Foundation, Sloan Foundation, Glaxo-Wellcome Foundation, and the Cotrell Foundation. He has also received the Eli Lilly Award, given to the most promising biological chemist in the country under the age of 37. He was inducted into the National Academy of Sciences (2010), the Institute of Medicine (2011), and the American Academy of Arts and Sciences (2011).

RICHARD B. SILVERMAN, PHD

John Evans Professor of Chemistry
Department of Chemistry
Northwestern University, Evanston, IL

Professor Silverman received his B.S. degree in chemistry from The Pennsylvania State University in 1968 and his Ph.D. degree in organic chemistry from Harvard University in 1974 (with time off for a two-year military obligation from 1969-1971). After two years as a NIH postdoctoral fellow in the laboratory of the late Professor Robert Abeles in the Graduate Department of Biochemistry at Brandeis University, he joined the chemistry faculty at Northwestern University. In 1986 he became Professor of Chemistry and Professor of Biochemistry, Molecular Biology, and Cell Biology. In 2001 he became the Charles Deering McCormick Professor of Teaching Excellence for three years, and since 2004 he has been the John Evans Professor of Chemistry.

His research can be summarized as investigations of the molecular mechanisms of action, rational design, and syntheses of potential medicinal agents acting on enzymes and receptors.

His awards include DuPont Young Faculty Fellow (1976), Alfred P. Sloan Research Fellow (1981-1985), NIH Research Career Development Award (1982-1987), Fellow of the American Institute of Chemists (1985), Fellow of the American Association for the Advancement of Science (1990), Arthur C. Cope Senior Scholar Award of the American Chemical Society (2003), Alumni Fellow Award from Pennsylvania State University (2008), Medicinal Chemistry Hall of Fame of the American Chemical Society (2009), the Perkin Medal (2009), the Hall of Fame of Central High School of Philadelphia (2011), the E.B. Hershberg Award for Important Discoveries in Medicinally Active Substances from the American Chemical Society (2011), Fellow of the American Chemical Society (2011), Sato Memorial International Award of the Pharmaceutical Society of Japan (2012), Roland T. Lakey Award of Wayne State University (2013), and BMS-Edward E. Smismann Award of the American Chemical Society (2013).

Professor Silverman has published over 300 research articles, holds 48 domestic and foreign patents, and has written four books (one [The Organic Chemistry of Drug Design and Drug Action] translated into German and Chinese). He is the inventor of Lyrica™, a drug marketed by Pfizer since 2005 for epilepsy, neuropathic pain, and fibromyalgia; currently he has completed Phase I clinical trials of another drug for infantile spasms.

GREGORY R. J. THATCHER, PHD

Hans W. Vahlteich Chair of Medicinal Chemistry
Professor and Assistant Head for Research
Department of Medicinal Chemistry and Pharmacognosy
University of Illinois at Chicago, Chicago, IL

Greg Thatcher, BSc (Manchester), PhD (Toronto) is a native of Brighton, England, who, after postdoctoral studies at Sheffield University, a Research Fellowship at Oxford, and 14 years in the Department of Chemistry at Queen's University, joined the faculty at the University of Illinois at Chicago where he is currently Professor and Hans W. Vahlteich Chair of Medicinal Chemistry in the University of Illinois College of Pharmacy and Director of UICentre (drug discovery @ UIC). His research is disease state agnostic, but the chemistry has led to emphases on cancer and neurodegenerative disorders; the latter providing a small molecule that completed Phase 1A clinical trials in Alzheimer's disease. Applying concepts of physical organic chemistry to translational research in medicinal chemistry, Thatcher's research group incorporates methodologies from drug design and synthesis to cell culture, animal behavioral studies, and chemical probe driven proteomics. A long-term interest in understanding and harnessing nitric oxide mimetic bioactivity continues alongside interest in other clinical drug classes in a variety of indications, most notably sex hormones.