

2017 RECIPIENTS: MCKINNEY AND CUNNINGHAM

Pediatrics



Christy McKinney, Ph.D., MPH is a UW Associate Professor of Pediatrics, Division of Craniofacial Medicine, and Adjunct Associate Professor of Oral Health Sciences. She is also an investigator in the Seattle Children's Research Institute's Center for Child Health, Behavior and Development, and part of the Seattle Children's Hospital Craniofacial Center.

Her research interests are focused on craniofacial and dental health and feeding in young children. Her research projects include environmental exposures from dental treatment in children, environmental risk factors for oral clefts, and feeding in infants with breastfeeding difficulties. Her global research collaborations involve partners in Thailand, India, and Ghana.

Michael Cunningham, M.D., Ph.D. is a UW Professor of Pediatrics, Division Chief of Craniofacial Medicine, and Adjunct Professor of Biological Structure, Oral Biology and Pediatric Dentistry. At Seattle Children's Hospital he is the Medical Director of the Craniofacial Center and the Jean Renny Endowed Chair in Craniofacial Medicine.



His clinical interests focus on the diagnosis and long-term interdisciplinary care of children with craniofacial malformations, with a particular interest in craniosynostosis. He is co-investigator on several research projects on craniosynostosis and other craniofacial conditions ranging from cell biology, genomics, epidemiology and childhood development. Dr. Cunningham co-founded PACT to health professionals in Africa create self-sustaining programs to treat cleft lip and palate.

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The NIFTY Cup development was spearheaded by Dr. McKinney and inspired by the Partners in African Cleft Training (PACT) program directed by Dr. Cunningham. The NIFTY Cup was developed in collaboration with Dr. Patricia Coffey at PATH and a multidisciplinary team from UW, Seattle Children's, PATH, and Laerdal Global Health. Available for purchase at a low price – \$1USD per cup through Laerdal Global Health, the NIFTY Cup has the potential to help 15 million infants who are born with breastfeeding difficulties each year worldwide.

2016 RECIPIENTS: BROWD, POSNER, AND REINHALL

Neurosurgery and Mechanical Engineering



Samuel Browd is a UW professor of Neurological Surgery, an Attending Neurosurgeon at Seattle Children's Hospital, Medical Director of the Seattle Children's Sports Concussion Program, adjunct professor of Bioengineering and affiliate faculty of the Foster School of Business. His research interests include concussion, hydrocephalus, surgical management of cerebral palsy and biomedical engineering solutions in Neurological surgery.

Jonathan Posner is the Bryan T. McMinn Endowed Associate Professor in both the UW Departments of Mechanical Engineering and Chemical Engineering, as well as adjunct faculty in Family Medicine. Dr. Posner directs the Engineering Innovation in Medicine program. His primary expertise is fluid dynamics and transport physics.



Per Reinhall is the Chair of the UW Department of Mechanical Engineering, Director of the Boeing Advanced Research Center, and a UW Presidential Entrepreneurial Faculty Fellow. His research includes the development of biomedical devices, noise, shock and vibration control, and automated assembly.

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2016 RECIPIENTS: BROWD, POSNER, AND REINHALL

Neurosurgery and Mechanical Engineering

Their collaboration led to a football helmet designed to mitigate the forces thought to contribute to concussions. In a market where little change has happened in football helmet technology in decades, they have created a helmet that provides a bumper in what is known as the offset -- the inch-and-a-half space between the athlete's head and the outside of the helmet.

The helmet technology revolves around a multilayered system that begins with a flexible outer shell made from a bendable plastic and ends with an inner shell and liner that are meant to provide a more customized fit around the head. Beneath the outer shell is the core layer, which is comprised of hundreds of flexible columns that act like shock absorbers. The columns, which vary in length and thickness depending on their position in the helmet, are made from a resilient polymer that bends in any given direction when compressed. This slows the acceleration of force before it reaches the player's head.

Engineering and medicine are working together to come up with a practical solution.

2015 RECIPIENT: DAVID R. EYRE, PH.D.

Orthopaedics & Sports Medicine



David Eyre trained at Leeds University with a B.Sc. Honours degree in Biochemistry in 1966, and Ph.D. in 1969. After postdoctoral positions at the Massachusetts General Hospital and Children’s Hospital he joined The Kennedy Institute of Rheumatology as a staff scientist. He returned to Harvard Medical School and Children’s Hospital in 1976 to a faculty position in Biological Chemistry and Orthopaedics.

He was recruited in 1985 as the first holder of the Burgess Chair for Orthopaedic Investigation at the University of Washington in Seattle. Dr. Eyre established a basic research program devoted to understanding underlying mechanisms of skeletal disease, specifically in the biology of collagen and genetic disorders, studying defects in collagen to develop a better understanding of how diseases of bones and cartilage, like osteoporosis and arthritis, develop.

His remarkable contributions to healthcare include the osteoporosis diagnostic test Osteomark® NTx that measures accelerated bone loss through detection of collagen breakdown, and is still considered the “gold standard” diagnostic for bone resorption. David Eyre holds nearly 50 patents. He was elected Fellow of the American Academy for the Advancement of Science in 1992 and received NIH Merit Award grants in 1994 and 2015.

2014 RECIPIENT: DAVID RUSSELL, M.D., PH.D.

Biochemistry



David Russell is a Professor of Medicine and Biochemistry at the University of Washington, with a Ph.D. from Rockefeller University and an M.D. from Cornell.

He has a long-standing interest in developing improved methods for manipulating the mammalian genome. He has received several awards, including American Society of Hematology Scholar, Fellow of the American Philosophical

Society, FDR Investigator of the March of Dimes, and the Presidential Early Career Award for Scientists and Engineers. He is a member of the American Society for Clinical Investigation, the Association of American Physicians, and is the current President of the American Society of Gene and Cell Therapy.

Dr. Russell has made major contributions in the fields of viral vectors, gene targeting, and the genetic manipulation of human stem cells. His current interests are focused on the creation of universal donor stem cells that allow a single cell line to be prepared for clinical use in many recipients. He is an inventor on several patents, including the original patents describing adeno-associated virus vector serotypes and parvovirus-mediated gene targeting.

2013 RECIPIENT: FRED SILVERSTEIN, M.D.

Gastroenterology



Fred Silverstein, UW Clinical Professor of Medicine has been selected as the 2013 Inventor of the Year for his remarkable contributions to the invention and development of a variety of medical devices that have positively impacted the work of gastroenterologists and their patients worldwide.

Dr. Silverstein's body of work has been ground-breaking for advancing the field of gastroenterology. He holds well over 50 patents, with eight pending. He has been instrumental in the development of products varying from catheters that coagulate bleeding ulcers, to catheters that detect blood flow, to tools to prevent contamination of endoscopes. He helped found two companies: Vision Sciences, a company dedicated to improving endoscopic cleaning to reduce risk of cross-contamination in patients; and Lucent Medical Systems, which is developing magnetic location systems for vascular access and for positioning of the CNS shunt valve.

Fred earned his B.S. degree from Alfred University and his M.D. from Columbia University. He did his Internship and Residency at Harborview Medical Center and UW Hospital. He authored over 135 medical papers as a tenured professor at the University of Washington. Remarkably, after winning "Teacher of the Year" from the Medical School four times, he was given the "Teacher of the Year in Perpetuity" Award in 1994.

2012 RECIPIENT: YONGMIN KIM, PH.D.

Bioengineering and Electrical Engineering



Yongmin Kim came to the UW nearly 30 years ago with a B.S. degree in electronics engineering from Seoul National University, and an M.S. and Ph.D. degree in electrical engineering from the University of Wisconsin.

Dr. Kim has been a Professor in Bioengineering and Electrical Engineering and an Adjunct Professor in Radiology, Computer Science and Engineering. From 1999 to 2007 he was Chair of

Bioengineering and from 2004 to 2007, he was the Hunter and Dorothy Simpson Endowed Chair in Bioengineering.

Dr. Kim has long been an international leader in the area of medical imaging and next-generation ultrasound. A singular achievement was the development of reprogrammable processors for use in ultrasound imaging. This technology reduced the cost of such instruments by allowing updating of their capabilities in software over several years of equipment lifetime, and their great capability allowed development of novel and enhanced imaging capabilities in two and three dimensions.

Dr. Kim and his research group have more than 85 inventions that have led to 60 patents, transferred the invented technologies to industry with 25 licenses, and helped commercialization of these technologies.

2011 RECIPIENT: DAVID BAKER, PH.D.

Biochemistry



David Baker is an Investigator of the Howard Hughes Medical Institute (HHMI) and Professor of Biochemistry with adjunct appointments in Genome Sciences, Bioengineering, Computer Science, Chemical Engineering, and Physics. Dr. Baker graduated from Harvard University in 1984, completed his Ph.D. in Biochemistry at University of California (Berkeley) in 1989, and then began working on protein structure as a postdoctoral fellow in Biophysics at

University of California (San Francisco). Dr. Baker is now regarded as a world-leading expert in computational protein structure prediction and design.

Dr. Baker has made fundamental progress in predicting and designing new macro-molecular structures, interactions, and functions. His Rosetta computational suite can predict protein structures from DNA sequence, and design new proteins of almost any shape or activity. This giant step forward enables the full potential of the human genome sequence to be realized in drug design, gene therapy, vaccines, and personalized medicine; and it opens the door to designing new proteins capable of green chemistry, bioremediation, and biofuel transformations. Baker has also developed exciting new modalities for engaging the general public in scientific research including FoldIt, a multi-player online game for predicting protein structures (<http://fold.it>).

2010 RECIPIENT: ROY MARTIN, PH.D.

Anesthesiology and Bioengineering



Roy Martin was a Research Professor at the University of Washington in the Departments of Anesthesiology and Bioengineering with a joint appointment in the Applied Physics Laboratory. He retired in 2004 and holds over 25 issued U.S. patents.

Dr. Martin has been an innovator for his entire academic career. He has used his engineering background to design new devices for the diagnosis and treatment of a variety of medical and dental conditions. His approach is to study a problem and then find a solution using technology. This has resulted in a variety of new devices, several of which have changed and improved healthcare. His initial effort was a new method to diagnose cardiac output. He then developed a method for detecting air emboli during neurosurgery.

Using ultrasound, he developed a probe which could be passed through an endoscope channel to detect blood flow prior to making an incision and to examine the GI wall structures for diagnosis. He developed a device for studying esophageal motility from the inside of the esophageal lumen. He worked on 3-D ultrasound cardiac imaging and performed some of the pioneering studies in this important field which have led to improved quantitative cardiac imaging to study myocardial contractility and cardiac output.

2009 RECIPIENTS: RAMSEY, SMITH AND MONTGOMERY

Pediatrics



Bonnie Ramsey is a UW Medicine Professor of Pediatrics with a pulmonary specialty and Director of the Research Center for Clinical and Translational Research at Seattle Children's, where she works in the Cystic Fibrosis Clinic. She is a beloved physician and internationally respected researcher. She earned her M.D. at Harvard.

Arnold Smith is a UW Professor of Pediatrics, Director of the Center for Childhood Infections and Prematurity Research at Seattle Children's. Currently his research focuses on the gene expressions of the numerous bacterium responsible for mucosal diseases. He earned his M.D. from the University of Missouri.



Bruce Montgomery is Gilead Sciences' Senior VP, Head of Respiratory Therapeutics. Dr. Montgomery founded Corus Pharma and worked for pathogenesis. He has devoted his career to development of cystic fibrosis drugs and moving them through the commercialization process. He earned his M.D. at the University of Washington.

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2009 RECIPIENTS: RAMSEY, SMITH AND MONTGOMERY

Pediatrics

The original idea for aerosolized tobramycin (TOBI), a drug for cystic fibrosis) came from the work of Drs. Smith and Ramsey, who also credit their entire research team at Seattle Children's. Tobramycin had been used to treat *Pseudomonas aruginosa*, an often fatal respiratory infection in patients with cystic fibrosis. However, use of the drug often resulted in severe kidney damage. To avoid the side effects to the kidneys, Dr. Smith created and refined an inhaled aerosol version of TOBI. This work was carried through early proof-of-concept work in clinical trials by Dr. Ramsey. Her work, with its national scope, revolutionized the clinical trials process and led to the development of new infrastructures and trials standards.

Dr. Montgomery brought his medical expertise in pulmonology and his keen business sense to bear in moving TOBI through the difficult phase of patent approval, as well as through the development and refinement of the concept into a product with commercial potential. Funds from the eventual sale of the TOBI royalties have enabled construction of new research laboratories for Seattle Children's and attracted increases in NIH research. Cystic Fibrosis Foundation royalty sale proceeds have returned to Seattle Children's to fund therapeutics and clinical trials network development.

The Seattle Children's partnership with PathoGenesis has had many direct and indirect economic impacts on the region's employment, real estate development, financial and legal sectors. The sale of PathoGenesis, and the subsequent sale of Corus Pharma, brought large amounts of capital to the region. Current annual income from TOBI is approximately \$300M, some of which is being used to develop new CF drugs. As an added patient and social benefit, TOBI has proven to be very cost effective by decreasing hospitalizations. Most importantly, thousands of children and young adults are alive because of this drug that was born and raised in the State of Washington. US patent # 5,508269 is the result of a model university-business community collaboration and illustrates the health and economic values that come from these relationships.

2008 RECIPIENT: IRWIN D. BERNSTEIN, M.D.

Hematology and Oncology



Irwin Bernstein is Chief of the Division of Hematology, Oncology and Bone Marrow Transplantation at Seattle Children’s Hospital & Regional Medical Center; Professor of Pediatrics and Director of the Division of Pediatric Hematology and Oncology at the University of Washington; and Head of the Pediatric Oncology Program at the Fred Hutchinson Cancer Research Center.

Dr. Bernstein is being honored for his discovery of a protein, CD33, found on the surface of most acute myeloid leukemia cells. Working with the biomedical industry he translated this discovery into the development of Mylotarg, a drug widely used for treating acute myeloid leukemia and the first FDA approved antibody-targeted chemotherapeutic agent. Mylotarg is based on a proprietary “linker” technology that combined a potent anti-tumor antibiotic with an antibody that binds to CD33 protein on a cancer cell. Healthy cells are spared as the agent is delivered directly to the cancer cell.

His current NIH sponsored studies of hematopoietic stem cells have led to a novel approach for expanding stem cell numbers in cord blood. This methodology is being tested in a clinical trial to improve cord blood transplantation.

2007 RECIPIENT: PHILIP GREEN II, PH.D.

Genome Sciences



Philip P. Green is a Professor of Genome Sciences, Adjunct Professor of Computer Science and Engineering and a Howard Hughes Medical Institute Investigator. He joined the UW faculty in 1994 following work at Princeton, the University of North Carolina, and Washington University. He has been elected to the National Academy of Sciences and the AAAS and has been honored with a prestigious Gairdner Foundation Award.

Dr. Green is recognized for his profound impact on the development and success of genome analysis. His remarkable suite of integrated software products - Phred, Phrap and Consed-Autofinish - have made the sequencing of the three billion pairs in the human genome possible and represents the most important technical advance in DNA sequencing of the 1990s. The programs were some of the first and are still among the most important licensed through UW Tech Transfer. Licenses have been purchased by over 250 commercial sites and are furnished at no cost to thousands of academic laboratories.

Proceeds from license activities are reinvested in his laboratory and used to support graduate students who are pursuing interdisciplinary training in the design and use of computational methods. Dr. Green's goal is "to help provide the computational methods necessary to achieve a complete, quantitative understanding of how cells function at the molecular level."

2006 RECIPIENT: DAVID C. AUTH, PH.D.

Bioengineering and Electrical Engineering



David Auth's work at the University of Washington's Departments of Electrical Engineering and Bioengineering focused on improving medical care using least-invasive surgery techniques. His early work improved the understanding of upper gastro-intestinal bleeding and how it could be controlled endoscopically. This NIH funded research resulted in methods to control bleeding using lasers and direct application of heat.

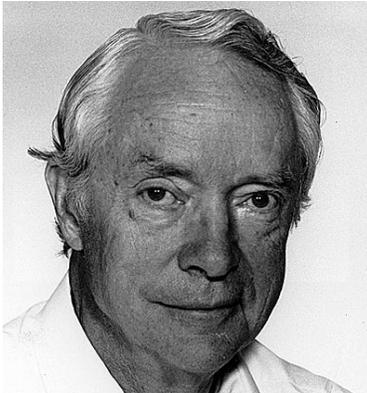
In 1981 he developed the technology for the Rotoblator system for cleaning out arterial plaque. The Rotoblator uses a diamond encrusted, football-shaped burr on the end of a catheter that, rotating at very high speeds, removes brittle plaque while leaving normal tissue intact.

Dr. Auth founded Heart Technologies, which received clearance to market Rotoblator for peripheral (leg) arteries in 1991 and for coronary arteries in 1993. By 1995 Heart Technologies had grown to 500 employees with revenues in excess of \$80 million per year. It was sold to Boston Scientific Corporation in 1995.

The Rotoblator technology is among Dr. Auth's 100 patents in the field of medical devices.

2005 RECIPIENT: EARL W. DAVIE, PH.D.

Biochemistry



Earl W. Davie, professor and former Chair of the School of Medicine's Department of Biochemistry, was honored as the second annual Inventor of the Year for proposing and substantiating the complex chain of biochemical events that result in fibrin clotting, the central process of blood coagulation.

During his long research career he has cloned and sequenced many genes that code for proteins involved in blood coagulation.

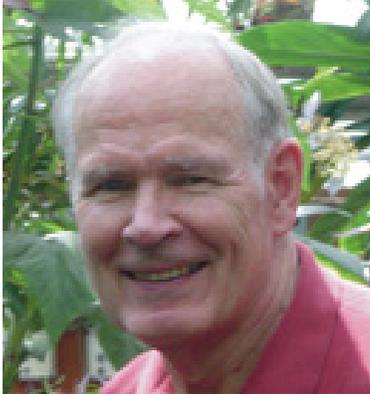
This work led directly to the development of safer clotting factors that hemophiliacs can self-administer to control their bleeding, a development that has vastly improved the management of the disease.

In the early 1980s Dr. Davie, with his colleague Kotoku Kurachi, Ph.D., cloned the gene for factor IX, a blood clotting protein. The technology was patented and later licensed for manufacture. In 1997 the FDA approved a pharmaceutical product for patients with hemophilia B.

In 1981 Dr. Davie cofounded Seattle-based ZymoGenetics which focuses on the discovery and development of protein therapeutics.

2004 RECIPIENT: BENJAMIN HALL, PH.D.

Genetics



Benjamin Hall, UW geneticist, was the first recipient of the UW Inventor of the Year Award. Dr. Hall is a legend in the field of genetics. In 1981, Dr. Hall and his colleagues invented a method for turning yeast cells into tiny biochemical factories, churning out proteins vital in the development of drugs. This manufacturing method is so successful that it is now used to make more than 1% of all drugs sold in the U.S.

The method has been licensed to several companies, including Seattle's Immunex (now Amgen), which used the method to create the drug Leukine. Leukine is a growth factor that replenishes the body's immune cells, thereby helping patients undergoing chemotherapy or bone marrow transplants. Years later, another biotech company, Berlex, bought the patent to the drug. Then, Berlex announced it would build a biotech plant in Snohomish County to produce Leukine. The move would provide about 70 new jobs and millions of dollars of investment in the local economy.

Dr. Hall's invention also led to the production of a hepatitis B vaccine and other biopharmaceuticals. Since the FDA approved the vaccine in 1986, new infections in the U.S. have dropped from about 250,000 per year to about 60,000. Millions of lives around the world have been saved through the prevention of new infections. Over 1 billion hepatitis vaccinations have been administered.