

The 2017 Pioneer Awardees



Dr. Jill B. Becker is an internationally recognized expert on sex differences in the brain, with an emphasis on sex differences in motivated behaviors and addiction. Dr. Becker received her Ph.D. in 1980 in Neuroscience from the Univ. of Illinois, Urbana-Champaign. She moved to the University of Michigan in 1980

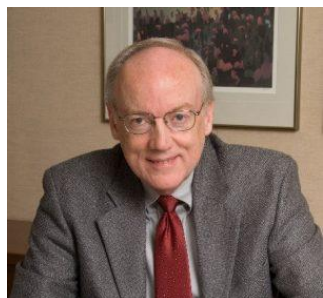
where she is now the Patricia Y. Gurin Collegiate Professor of Psychology, Research Professor in the Molecular and Behavioral Neuroscience Institute, and Senior Neuroscience Scholar. Dr. Becker is the author of over 130 articles or chapters and has had numerous grants from the National Institutes of Health and the National Science Foundation. She has received many awards including the Louise Hanson Marshall Award from the Society for Neuroscience and the Ting-Kai Li Keynote Lecture at the Research Society on Alcoholism in 2016.

In 1980, Dr. Becker published her dissertation research demonstrating sex differences in gonadal hormone regulation of the striatum. This was the first demonstration of a functional sex difference outside of the hypothalamic pituitary axis of mammals. Her pioneering research went on to describe consequences of that sex difference for behavior. She has demonstrated that the regulation of the reward system by ovarian hormones in the female rat are important for reproductive behaviors, reproductive motivation, and motivation for taking drugs of abuse.

One of the most challenging aspects of science for Dr. Becker was that both the field of sex differences in the brain and the finding that estradiol rapidly modulates dopamine release in the striatum by acting directly on membrane receptors in the striatum challenged the prevailing theories of the time. Now it is generally accepted that there are rapid membrane receptor-mediated effects of estradiol in the brain, but this was not the case in when Dr. Becker first published her findings demonstrating that estradiol was acting directly on the striatum to rapidly enhance stimulated striatal dopamine release in vivo and in vitro.

Dr. Becker first attended WCBR in 1982 and learned to ski at the meeting. Dr. Becker feels that the WCBR meeting is one of the most important meetings she attends – both for the science and for the networking opportunities. Many collaborations have been initiated on ski lifts, and new insights always come from the high quality scientific sessions. Dr. Becker has organized numerous scientific sessions, served repeatedly on the Executive Committee of

the WCBR, was Travel Fellowship Chair, and the WCBR Conference Chair from 2012-2013.



Dr. Bill Catterall received a B.A. in Chemistry from Brown University in 1968, a Ph.D. in Physiological Chemistry from Johns Hopkins in 1972, and postdoctoral training in neurobiology and molecular pharmacology as a Muscular Dystrophy Association Fellow with Dr. Marshall Nirenberg at the National Institutes of Health from 1972 to 1974. Following three years as a staff scientist at NIH, he joined the University of Washington as Associate Professor of Pharmacology, became Professor in 1981, and served as Department Chair from 1984 to 2016. Catterall discovered the voltage-gated sodium and calcium channel proteins, which initiate electrical and chemical signaling in excitable cells. His work has contributed significantly to understanding their structure, function, regulation, molecular pharmacology, and roles in disease. Catterall is a member of several science academies, including the U.S. National Academy of Science, National Academy of Medicine, and the Royal Society of London, U.K. He has received numerous awards, including the Gairdner International Award of Canada in 2010. He has been a regular attendee of WCBR over the last four decades, attending his first meeting in the late 1970s and helping to make WCBR a world-class meeting overall all these years.



Dr. Miles Herkenham was born in Yosemite National Park, California. He first started skiing at Badger Pass in the Park at the age of three. After living in two other National Parks (Yellowstone and Rocky Mountain), he ended up in Santa Fe, NM for high school (started ski racing there), Amherst College (captain of the Ski Team), Northeastern University (PhD), MIT (Post-doc), and then for the next 40 years, his permanent scientific home at the NIH in Bethesda, M.D. He merged his love of skiing and science at the WCBR, a meeting he first attended in 1979. Over the years, he formed numerous long-lasting personal and professional relationships with other WCBR regulars. He was Program Chair in the mid-1990s and a many-time winner of the Smitty Stevens ski race.

Miles' scientific career took off at MIT where, under the direction of Dr. Walle Nauta, he learned modern tract-tracing techniques and charted nonspecific thalamocortical and habenular connections. At the NIMH in the laboratory of Dr. Edward Evarts, he recognized the freedom of opportunity in the Intramural Research Program, took a "road less traveled" for neuroanatomists, and joined forces with Dr. Candace Pert to develop an autoradiographic technique for localization of opioid and other peptide and neurotransmitter receptors. A surprising finding from these studies was of "mismatches" between transmitter and receptor distributions, igniting a life-long interest in parasynaptic ("alt-synaptic") signaling. Then, as the Chief of the Section on Functional Neuroanatomy, NIMH, he was the first to localize the cannabinoid receptor in brain and soon discovered its presynaptic localization, heralding a revolution in understanding of endocannabinoids as retrograde messengers. He next used the newly developed in situ hybridization histochemistry method to disclose neuroendocrine and hormone pathways underlying mood disorders. Understanding the brain's stress circuitry and how antidepressant therapies affected it occupied the next phase of his career and led to the latest chapter—the study of neuroimmune signaling in psychological stress disorders. His recent WCBR Panels have represented those efforts. One effort is the understanding of the CNS immune response to stress, mediated by microglia, and the other is the role played by the adaptive immune system, i.e., lymphocytes, in regulating hippocampal neurogenesis and levels of anxiety and depression in rodents.

Miles strives to produce work that makes important contributions to the field with lasting impact. Many of his papers are highly cited. He continues to race in the Smitty Stevens race but has stiff competition and settles for wins in his age group.



Dr. George F. Koob is an internationally-recognized expert on alcohol and stress, and the neurobiology of alcohol and drug addiction. He was appointed Director of the National Institute on Alcohol Abuse and Alcoholism (NIAAA) in 2014 and oversees a wide range of alcohol-related research, including genetics, neuroscience, epidemiology, prevention, and treatment. George earned a B.S. in Zoology from Penn State University, his Ph.D. in Behavioral Physiology from Johns Hopkins University in 1972 and served as a post-doctoral fellow in the Department of

Experimental Psychology and MRC Neuropharmacology Unit at the University of Cambridge. He spent most of his career at The Scripps Research Institute, where he served as the Director of the Alcohol Research Center, and as Professor and Chair of the Scripps' Committee on the Neurobiology of Addictive Disorders. Early in his career, he served as a researcher in the Department of Neurophysiology at the Walter Reed Army Institute of Research and in the Arthur Vining Davis Center for Behavioral Neurobiology at the Salk Institute for Biological Studies. George is the recipient of many prestigious international honors and awards, the most recent being the 2016 Research Society on Alcoholism Seixas Award and most notably, the insignia of Chevalier de la Légion d'honneur (Knight of the Legion of Honor) from the government of France for his contribution to the development of scientific collaborations between France and the United States.

George's work has significantly broadened our understanding of the neuroadaptations of the reward and stress neurocircuits that lead to addiction. In addition, he has validated key animal models for addiction associated with alcohol and drugs and identified the major role that brain stress systems play in the development of addiction. This background led to investigations into why certain alcohol drinkers transition to addiction while others do not, and how the brain and body respond to excessive alcohol consumption. George is the author of more than 650 peer-reviewed scientific papers, and co-authored two widely acclaimed books: *The Neurobiology of Addiction* (2005) and *Drugs, Addiction, and the Brain* (2014).

George first attended WCBR in 1977 where he learned to ski on the bunny slopes. He has fond memories of skiing with Conan Kornetsky and colleagues (a group informally referred to as the Conan Kornetsky Ski Club), and a mogul lesson with Shelley Sparber at Steamboat. Scientifically, George has organized and contributed to numerous panels over the years. In addition to bringing junior colleagues to WCBR, George frequently brought his son, Cameron, who learned to ski at 4 years old with the help of Elliot Gardner. Subsequently, Cameron attended all the WCBR meetings with George between 1998-2013. Cameron would accompany him on the slopes, but eventually left George and friends in a cloud of snow.



Dr. Sarah F. Leibowitz heads the Laboratory of Behavioral Neurobiology at The Rockefeller University in New York, where she has been a member of the faculty for almost 50 years and fortunate to have continuous funding from NIH. Sarah's first field of study was the classical piano and music composition. After studying at the Manhattan and Mannes

Colleges of Music in New York, she spent a year at the prestigious Akademie für Musik in Vienna.

Upon her return to New York, she decided to enter the world of science, studying Psychobiology at New York University where she received her B.A. in 1964 and Ph.D. just 3.5 years later. Sarah then joined the Rockefeller University faculty, pursuing a multidisciplinary research program to characterize neurobiological mechanisms that control consummatory behavior and substance abuse in rodents. Sarah has published over three hundred articles in scientific journals and seventy review articles or book chapters. She is internationally recognized for her research on the role of neurochemicals, including norepinephrine, dopamine, neuropeptide Y, galanin and enkephalin, in mediating disorders of ingestive behavior. Her recent studies in zebrafish as well as rodents have focused on how maternal consumption of fat, alcohol and nicotine during pregnancy can impact embryonic development of the brain, leading to long-term behavioral pathologies. In addition to her research, Sarah has served on multiple Editorial Advisory Boards, Board of Directors, and committees for different scientific societies, while also remaining active in music and serving on the Board of the Orpheus Chamber Orchestra. She has been elected Fellow of different societies and served on the President's Council of the International Behavioral Neuroscience Society, the Human Rights of Scientists Committee at the New York Academy of Sciences, and a Member-at-Large of the AAAS Neuroscience Section.

Sarah first attended WCBR in 1972, when she had her first ski lessons with Conan Kornetsky who insisted on taking her down blue and even black mogul slopes. After surviving this initiation (while unknowingly being three months pregnant with her second child), she quickly fell in love with both the science and the skiing at WCBR. She has attended WCBR each year since then, frequently joined by her three daughters and husband, and has organized multiple panels and workshops, often in collaboration with her late friend and colleague, Bart Hoebel, of Princeton University.



Professor Roger Nicoll, M.D., grew up in Princeton, New Jersey and obtained his BA at Laurence University in Appleton, Wisconsin, and his M.D. from the University of Rochester School of Medicine in 1968. Following a medical internship at the University of Chicago he moved to the National Institutes of Health. From 1973-1975 he worked with Nobel laureate Sir John Eccles at the University of Buffalo, New York. In 1975 he moved

to the University of California at San Francisco and is currently Professor of Cellular and Molecular Pharmacology.

Roger has received numerous awards and honors, including NIH Career Development Awards (two times), MERIT Awards (three times), and the Javits award. He was elected to the National Academy of Sciences in 1994 and to the American Academy of Arts and Sciences in 1999. Of his numerous other awards and honors, most notable are the National Academy of Science Award in Neuroscience and three awards from the Society for Neuroscience: The Axelrod Prize, The Grass Lecture, and the Gerard Prize.

Roger has been a world leader in elucidating the basic mechanisms underlying synaptic transmission and synaptic plasticity in the mammalian brain. His numerous contributions over the last 40 years have laid the foundation for much of our understanding of how neurons communicate and the adaptations in synaptic communication that underlie normal and pathological behavior. In experiments of unusual clarity and rigor, he has revealed the subtlety and complexity of this signaling. Perhaps his most important contribution has been in elucidating a number of the key cellular and molecular steps by which the brain stores information, one of the most important and enigmatic functions of the brain.

Roger has been a regular WCBR attendee for many decades, attending his first meeting in 1970. His most memorable times have been skiing in fresh deep powder on East Greeley at Alta. Very few people ski this because it requires a rather gnarly high traverse, but for Roger the effort is worth it. He also thoroughly enjoys the science in the informal WCBR setting. He typically presents work in progress and values the feedback from colleagues. In Roger's words, "I can't think of a more relaxed forum for scientific exchange. Also the scientific discussions on the lifts are extremely valuable. I guess the most serious question is whether I would have attended all these meetings if skiing were not an option."



Charles P. O'Brien earned M.D. and Ph.D. degrees from Tulane University followed by residency training at Harvard, Tulane, University of London, and University of Pennsylvania in internal medicine, neurology and psychiatry, and became board certified in both neurology and psychiatry. As Chief of Psychiatry at the Philadelphia VA, he was responsible for over 9,000 psychiatric patients. Despite this large clinical responsibility, he was able to establish and direct a research program that has had a major impact on the treatment of addictive disorders. He was elected to membership in the National Academy of Medicine in 1991 and has received numerous awards for his research. Among his discoveries are the effects of alcohol on the endogenous opioid system, the role of Pavlovian conditioning on addictive behavior and a new medication for treatment alcoholism. His work in France was recognized by an honorary doctorate and a knighthood in the Legion of Honor.



Dr. R. Suzanne Zukin obtained her undergraduate degree from Bryn Mawr College and her PhD from the Johns Hopkins University School of Medicine. She performed her postdoctoral training with Daniel Koshland Jr. at the University of California at Berkeley. In 1977 Suzanne assumed the position of Assistant Professor at the Albert Einstein College of Medicine, and quickly established a vibrantly active laboratory. She is currently a Professor of Neurosciences and Director of the Neuropsychopharmacology Center.

Suzanne has published more than 188 peer-reviewed papers and over 50 book chapters. She has made landmark contributions to the understanding of glutamate receptor structure and function. Her early work identifying the phencyclidine binding site within the NMDA receptor-associated ion channel has become a citation classic. She has cloned and identified unique properties of NMDA receptor splice variants. She described key molecular mechanisms of NMDA receptor trafficking, as well as PKA regulation of calcium permeability and calcium signaling in dendritic spines. More recent work has helped to explain how adverse early life experience blocks mature NMDA receptor function via epigenetic mechanisms, and her description of REST-dependent epigenetic remodeling of AMPA receptors has led to the GluR2 hypothesis of neurodegeneration related to conditions such as ischemia and seizures. Overall, her discoveries have changed the way we think about memory, synaptic strength, and information flow in the nervous system, with

important implications for not only ischemia and seizures, but also stroke, spinal cord injury, amyotrophic lateral sclerosis, drug craving, withdrawal, and stress.

In addition to her research activities, Suzanne has served on several NIH Study Sections and numerous editorial boards. She was elected to the American College of Neuropsychopharmacology in 1983 and made a Lifetime Fellow in 2005. She has been the recipient of many honors and awards, such as the McKnight Neuroscience of Brain Disorders Award and the NARSAD Distinguished Investigator Award.

Suzanne first attended WCBR in 1978 and has returned nearly every year since. She enjoys the informal venue for meeting neuroscientists from a broad array of research areas, and has made life-long friends through WCBR. She also loves skiing powder snow, especially under blue skies. Suzanne has many fond memories of WCBR, including a particularly busy day on which she attended a morning session (7:30 to 9:30 am), skied until the lifts closed at 4 pm, chaired a session in the afternoon (4:30 to 6:30 pm), then hosted a dinner party for 28 guests — all while four months pregnant with her daughter, Valerie. That is a WCBR classic.