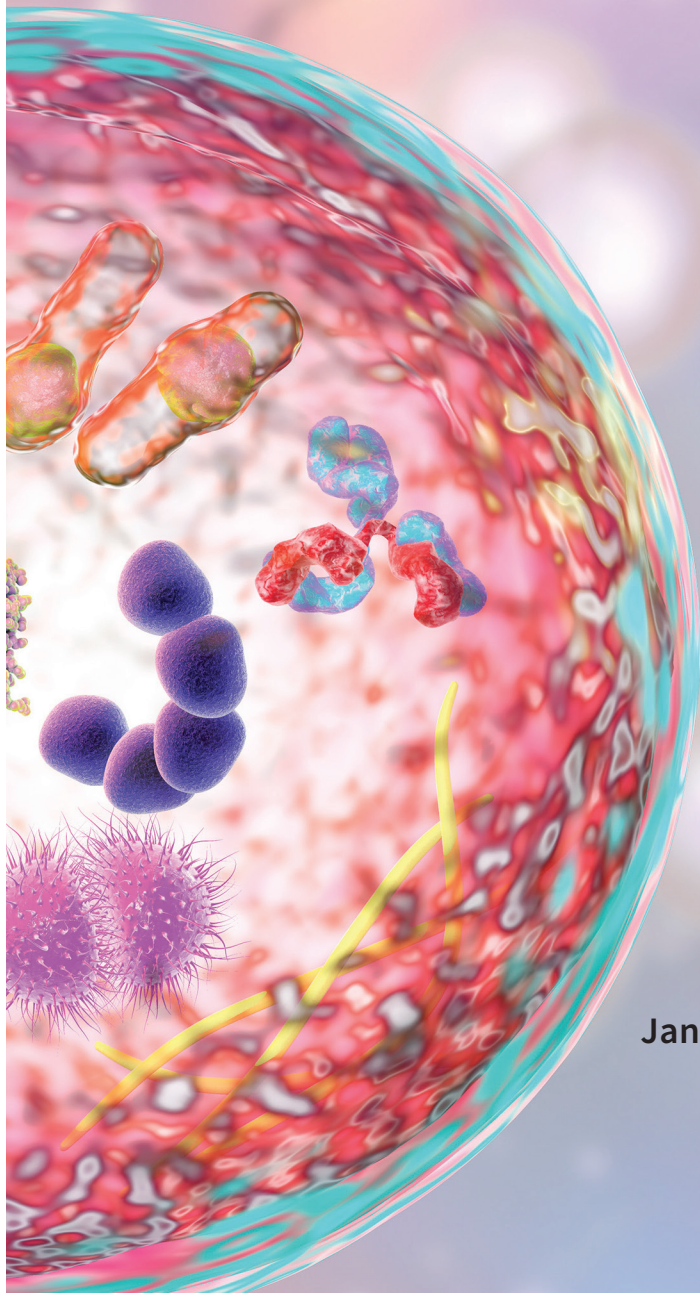


Needleman Symposium

Autophagy Research: Latest Advances and the Future of the Field



January 30, 2024



Needleman Symposium

Autophagy Research: Latest Advances and the Future of the Field

The Needleman Symposium is an annual event sponsored by the Philip and Sima Needleman Center for Autophagy Therapeutics and Research at Washington University School of Medicine. The center is a bold initiative dedicated to developing novel therapeutics that harness autophagy — a fundamental cellular pathway that has been implicated in age-dependent degeneration, cognitive decline, atherosclerosis, diabetes, obesity, infections, inflammatory diseases and cancer. The symposium highlights the work of center members and the research of invited guest speakers who are prominent leader in the field.

PROGRAM

9:00 a.m.

Welcome and remarks

DAVID H. PERLMUTTER, MD

Executive Vice Chancellor for Medical Affairs
George and Carol Bauer Dean
Spencer T. and Ann W. Olin Distinguished Professor
Washington University School of Medicine

PHILIP NEEDLEMAN, PHD

Former Professor and Head, Department of Pharmacology,
Washington University School of Medicine
Former Chief Scientist and Head of R&D, Monsanto/Searle/Pharmacia
Former Interim President, Donald Danforth Plant Science Center
Former Interim CEO, Saint Louis Science Center

9:15 a.m.

Overview of the Field of Autophagy

David H. Perlmutter, MD

9:30 a.m.

Molecular Mechanisms and Pathophysiological Roles of Autophagy

KEYNOTE SPEAKER

NOBORU MIZUSHIMA, MD, PHD

Professor, Department of Biochemistry and Molecular Biology,
Graduate School and Faculty of Medicine, University of Tokyo

10:30 a.m.

Break

10:45 a.m.

Rescuing Lysosomal Defects in Neurodegenerative Diseases

CELESTE M. KARCH, PHD

Professor of Psychiatry

Biomarker Core Leader, Knight Alzheimer Disease Research Center (ADRC)

Associate Director and Scientific Director, Dominantly Inherited

Alzheimer Network (DIAN)

Washington University School of Medicine

11:30 a.m.

Inducing Hepatocyte Fasting-Like Responses to Treat Metabolic Disease

BRIAN J. DEBOSCH, MD, PHD

Associate Professor of Pediatrics and of Cell Biology and Physiology

Washington University School of Medicine

12:15 p.m.

Closing remarks and lunch

DAVID H. PERLMUTTER, MD



PHILIP NEEDLEMAN, PHD

Philip Needleman, PhD, is former professor and chairman of the department of pharmacology at Washington University School of Medicine, former chief scientist and head of R&D at Monsanto/Searle/Pharmacia, former interim president of the Donald Danforth Plant Science Center and former interim CEO of the Saint Louis Science Center. Needleman discovered the first angiotensin receptor antagonist; discovered first pass drug metabolism (nitroglycerin); discovered

a new endocrine hormone system ANF (atriopeptin) a critical hormone that controls salt, water metabolism, blood pressure and cardiac performance (heart failure); and discovered the existence and critical role of cyclooxygenase-2 (COX-2) in inflammation and oncology. In the industry, he discovered and developed widely used therapeutics in arthritis (COX-2 inhibitors: Celebrex[®], Bextra[®], Parecoxib), heart failure (Eplerenone) and oncology (Sutent[®]).



DAVID H. PERLMUTTER, MD

David H. Perlmutter, MD, is the Spencer T. and Ann W. Olin Distinguished Professor, executive vice chancellor for medical affairs and George and Carol Bauer Dean of Washington University School of Medicine. As dean of the School of Medicine, Perlmutter leads a \$3.2 billion academic medical center. WashU Medicine is the third-largest research-intensive medical school in the U.S., with a \$1.2 billion annual investment in basic and medical research, one of the largest

academic clinical practice groups in the nation, and a faculty that currently includes 16 National Academy of Sciences fellows, 28 members of the National Academy of Medicine, and 12 investigators with NIH MERIT status.

As a physician-scientist, Perlmutter is internationally recognized for his research on alpha-1 antitrypsin deficiency (ATD), a genetic disorder in which accumulations of a misfolded protein can cause severe liver damage. His work has led to advances in the understanding of how cells dispose of misfolded proteins that cause cellular dysfunction as well as the development of a pipeline of ATD drugs that could eliminate the need for liver transplantation in those with the disorder. Since drugs in this pipeline target and enhance autophagy, a cellular degradation pathway that is critical for the functioning of all cells and declines with age, they also represent exciting candidates for prevention of cognitive decline and other degenerative diseases of aging. Perlmutter and his collaborators recently discovered that a drug currently used for Type 2 diabetes may slow age-dependent degeneration in the nervous system and in the liver.

Perlmutter is a member of the National Academy of Medicine and the American Academy of Arts and Sciences, past president of the Society for Pediatric Research, and past member of the Advisory Council of the National Institute of Diabetes and Digestive and Kidney Diseases. He has been honored with numerous awards, including the E. Mead Johnson Award for Research in Pediatrics from the American Pediatric Society and the Sass-Kortsak Award for Pediatric Liver Research from the Canadian Liver Association. He has authored more than 200 scientific publications and holds 10 U.S. patents or patent applications.



NOBORU MIZUSHIMA, MD, PHD

Noboru Mizushima, PhD, received his doctoral degree from Tokyo Medical and Dental University, where he studied molecular immunology. Following his doctorate, Mizushima completed post-doctoral studies at the National Institute for Basic Biology in Japan, in the laboratory of Yoshinori Ohsumi where he studied mammalian and yeast autophagy. As a laboratory head at Tokyo Metropolitan Institute of Medical Science, Mizushima began extensive investiga-

tion of the physiological role of autophagy using mouse genetics, as well as molecular mechanisms of autophagy in mammals. Currently, Mizushima is a professor of biochemistry and molecular biology at the University of Tokyo where his laboratory studies autophagy, the lysosome and intracellular protein/organelle degradation. He is the 2021 recipient of the Medal with Purple Ribbon of Japan, a former president of the Japanese Biochemistry Society, and a 2013 Thompson Reuters Citation Laureate, awarded to researchers whose work is worthy of Nobel Prize recognition.



CELESTE M. KARCH, PHD

Celeste M. Karch, PhD, is a professor of psychiatry at Washington University School of Medicine. The goal of the Karch lab is to understand the molecular drivers of Alzheimer's disease, frontotemporal dementia and other neurodegenerative diseases. To do this, the Karch lab uses functional genomics alongside stem cell and mouse models. The Karch lab has developed a somatic and stem cell collection containing deeply clinically characterized cell

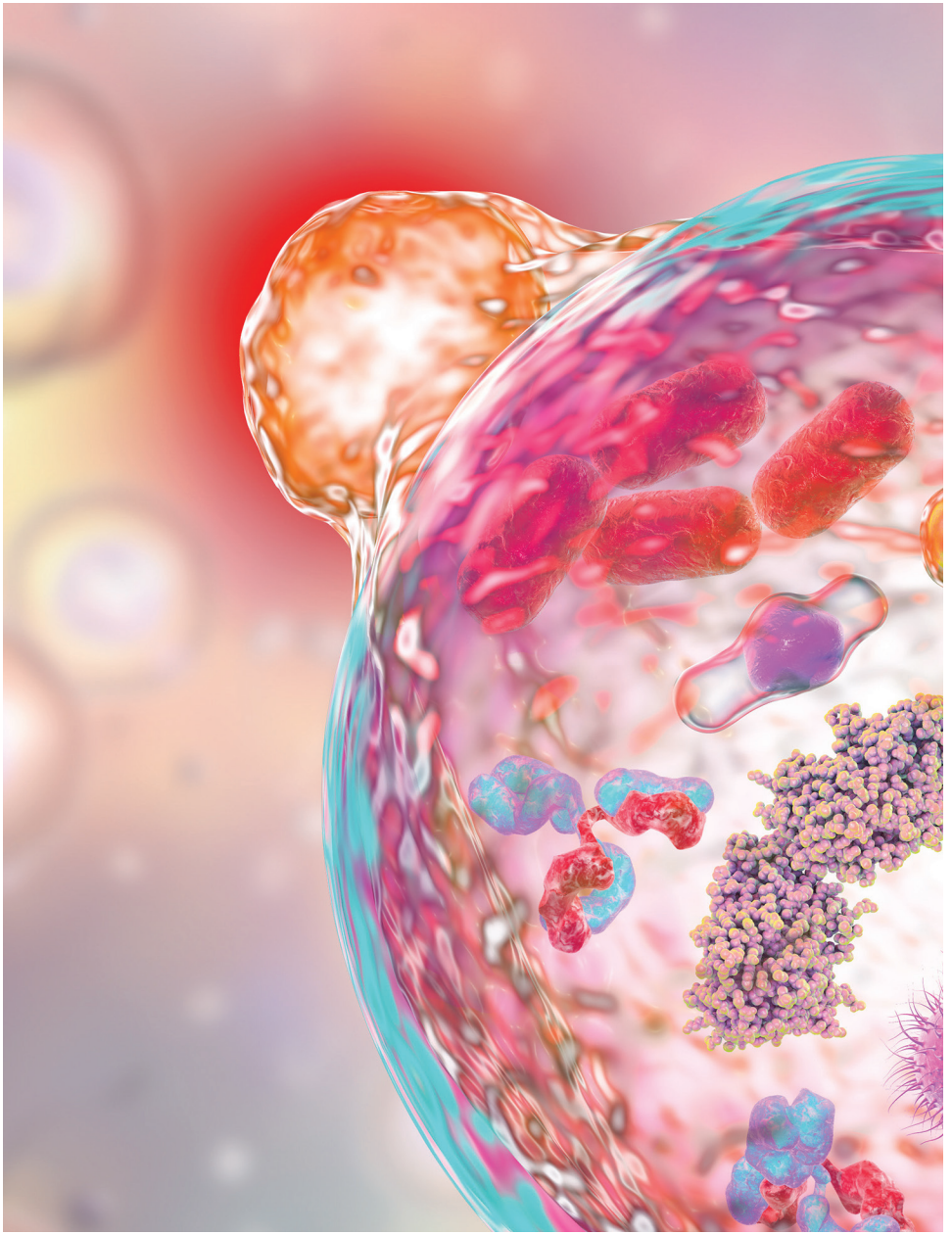
lines from individuals carrying genetic drivers of Alzheimer's disease, frontotemporal dementia, amyotrophic lateral sclerosis and Parkinson's disease. These cells are used to develop novel tools to interrogate mechanisms of neurodegenerative disease. Additionally, the Karch lab couples high-throughput transcriptomics and proteomics in stem cells and human brain tissues to identify disease signatures and to understand protein kinetics in disease. Karch is the Knight ADRC Biomarker Core leader and the associate and scientific director of the Dominantly Inherited Alzheimer Network (DIAN) at Washington University. In 2021, she was awarded the Rainwater Prize for Innovative Early Career Scientist from the Rainwater Charitable Foundation.



BRIAN J. DEBOSCH, MD, PHD

Brian J. DeBosch, MD, PhD, associate professor of pediatrics and of cell biology and physiology at Washington University School of Medicine, received his undergraduate degree from the University of Michigan, Ann Arbor, and did his medical and graduate training as part of the Medical Scientist Training Program at Washington University School of Medicine. During this time, he completed his doctoral thesis in the laboratory of Anthony J. Muslin, MD, studying signaling

pathways involved in cardiac hypertrophy. After MSTP training, DeBosch completed a pediatrics residency and gastroenterology fellowship as part of the Accelerated Research Pathway at St. Louis Children's Hospital. In July 2011, DeBosch pursued postdoctoral training as a Pediatric Scientist Development Program (PSDP) fellow in the laboratory of Kelle H. Moley, MD, in the Women's Health Science Research Center at Washington University School of Medicine. His work focuses on hepatic glucose metabolism and its interactions with fasting-like metabolic responses in health and disease.



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