

NIH HEAL Workshop: Target Validation for Non-Addictive Therapeutics Development for Pain

October 19-20, 2020

Workshop Chairs



Karen Akinsanya, Ph.D. - Schrödinger

Karen Akinsanya, Executive Vice President, Chief Biomedical Scientist, Head of Discovery R&D, joined Schrödinger in 2018. Karen leads our Discovery R&D group with responsibility for preclinical drug discovery and translational research. She has more than 25 years of experience in academia, pharmaceutical R&D, partnerships, and licensing. Karen joined Merck Research Labs in 2005 and held positions of increasing responsibility in clinical pharmacology as a development team leader working on first-in-human studies through late-stage label studies before joining Discovery Preclinical & Early Development as a therapeutic area lead and then a search and evaluation lead in business development.

Karen received her Ph.D. from the Royal Postgraduate Medical School at Imperial College in London, in endocrine physiology. After post-doctoral training at Imperial and the Ludwig Institute for Cancer Research (UCL), Karen joined Ferring Pharmaceuticals in R&D working across sites in the UK and US. At Ferring, she led the discovery of a family of dipeptidyl peptidases related to DPPIV and pre-clinical characterization of FDA-approved FIRMAGON® for prostate cancer.



Richard Hargreaves, Ph.D. - Bristol Myers Squibb

Richard Hargreaves holds a BSc and Ph.D. from Chelsea/Kings College, London University UK. He is currently Senior VP Head of Neuroscience Research and Early Development at Bristol Myers Squibb. Previously Corporate VP, Head of Neuroscience and Imaging Research at Celgene, VP, Head of the New Indications Research Unit (NIRU) and Research & Early Development Centers of Excellence (RED-CoEs) at Biogen and VP Discovery Head for Neuroscience and VP Imaging in Merck Research Laboratories. Richard has led teams that have advanced numerous novel CNS PET imaging agents and neuroscience drug candidates to the clinic contributing to the successful registration of MAXALT® for migraine, EMEND® and EMEND-IV® for chemotherapy-induced

nausea and vomiting, BELSOMRA® for insomnia, Ajovy® for prevention of migraine, Ubrelvy® for acute migraine and Zeposia® for relapsing multiple sclerosis. He is a board member for Target ALS and on the SAB for the Silverstein Parkinson's disease foundation. Richard has published >200 journal articles and been recognized by awards from the ASPCT for his work on CNS discovery imaging and the BPS with the Sir James Black Award for Drug Discovery.

Speakers



Peter Farina, Ph.D. – Canaan Partners

Dr. Peter Farina served as Senior Vice President of Development at Boehringer Ingelheim Pharmaceuticals, Inc. in Ridgefield, CT where he was responsible for North American pre-clinical development of drugs in the therapeutic areas of Immunology/Inflammation, virology and cardio-metabolic diseases. His career spanned 28 years and retired from the company in 2008. During his tenure as SVP, his interdisciplinary team worked on the development and successful registration of Aptivus®, an HIV protease inhibitor, Viramune XR® for HIV and Atrovent HFA® for COPD/emphysema and Jardiance® for diabetes. Prior to this position, he served as Vice President of Research at the Ridgefield Center. He has also held positions as

Director of Inflammatory Diseases and Director of Biochemistry. Prior to joining BI, Dr. Farina spent 6 years in the Corporate Research Laboratories and Medical Products Division of Union Carbide Corporation in Tarrytown, NY where he worked on immunodiagnosics. Dr. Farina's research interests have been focused on chemical and biological mechanisms impacting human disease. He has worked over his career to develop drugs to modulate inflammatory and immunological processes and was also engaged in HIV virology research which led to the discovery and successful registration of one of the first non-nucleoside reverse transcriptase inhibitors Viramune® (nevirapine).

Dr. Farina is currently an Executive in Residence at Canaan Partners, a venture capital firm located in Westport, CT. He is also the managing partner of Salient Science & Technology, LLC which advises several US and Asian biotech firms on strategic and technical matters in pharmaceutical R&D. Dr. Farina currently serves as the Co-Chair and Board Member of BioCT; the Advisory Board of the University of Connecticut School of Pharmacy(Emeritus); member of the NIH Blueprint Neurotherapeutics Network (BPN) Executive Oversight Committee; State of Connecticut Bioscience Innovation Fund Advisory Board, and was a Founder and CEO of Developing World Cures, a nonprofit company focused on neglected diseases. Dr. Farina has a PhD in organic chemistry from SUNY Buffalo and did postdoctoral work in bioorganic chemistry at Pennsylvania State University. He also received an honorary doctorate from the University of Connecticut.



Carrie Jones, Ph.D. – Vanderbilt University

Carrie Jones is currently Director of Development for the Warren Center for Neuroscience Drug Discovery (WCNDD) and Associate Professor of Pharmacology at Vanderbilt University in Nashville. She received her Ph.D. from the Indiana University School of Medicine. Prior to joining Vanderbilt, she served as in vivo pharmacologist at Eli Lilly and Company on several scientific teams focused on the development of novel therapeutics for schizophrenia and chronic pain. She provided the characterization of duloxetine in several preclinical models of inflammatory and persistent pain that directly contributed to the ongoing drug discovery effort for this molecule culminating with the approval of Cymbalta® (duloxetine HCl) for the treatment of chronic pain and depression associated with painful diabetic neuropathy and fibromyalgia. At Vanderbilt, Dr. Jones served as the founding Director of In

Vivo and Translational Pharmacology for WCNDD, her group provided the in vivo characterization of novel metabotropic glutamate receptor (mGluR) and muscarinic acetylcholine receptor (mAChR) subtype-specific ligands for ongoing hit to lead and lead optimization discovery programs for various psychiatric and neurologic disorders. Several of these programs advanced to partnerships with pharmaceutical companies, including

Johnson and Johnson, Bristol Myers Squibb, AstraZeneca, and Lundbeck Pharmaceuticals. More recently, as Director for Development at the WCNDD, Dr. Jones coordinated the successful bench to bedside translation of the clinical drug candidate VU319 from IND-enabling studies into Phase I clinical trials at the Vanderbilt University Medical Center for the treatment of cognitive impairments in AD; this clinical asset was recently acquired by Acadia Pharmaceuticals. To date, she has received funding from ANCORA Innovations, Barrus Foundation, Autism Speaks Foundation, NIMH, NIDA, and NIA and authored and/or co-authored over 130 peer-reviewed articles.



Walter Koroshetz, M.D. – National Institute of Neurological Disorders and Stroke

Before joining NINDS, Dr. Koroshetz served as Vice Chair of the neurology service and Director of stroke and neurointensive care services at Massachusetts General Hospital (MGH). He was a professor of neurology at Harvard Medical School (HMS) and led neurology resident training at MGH between 1990 and 2007. Over that same period, he co-directed the HMS Neurobiology of Disease course with Drs. Edward Kravitz and Robert H. Brown.

A native of Brooklyn, New York, Dr. Koroshetz graduated from Georgetown University and received his medical degree from the University of Chicago. He trained in internal medicine at the University of Chicago and Massachusetts General Hospital. Dr. Koroshetz trained in neurology at MGH, after which he did post-doctoral studies in cellular neurophysiology at MGH with Dr. David Corey, and later at the Harvard neurobiology department with Dr. Edward Furshpan, studying mechanisms of excitotoxicity and neuroprotection. He joined the neurology staff, first in the Huntington's Disease (HD) unit, followed by the stroke and neurointensive care service. A major focus of his clinical research career was to develop measures in patients that reflect the underlying biology of their conditions. With the MGH team he discovered increased brain lactate in HD patients using MR spectroscopy. He helped the team to pioneer the use of diffusion/perfusion-weighted MR imaging and CT angiography/perfusion imaging in acute stroke.



Jennifer Laird, Ph.D., D.Sc. - Eli Lilly and Company

Jennifer Laird, Ph.D., D.Sc. is VP, Search & Evaluation Pain & Neurodegeneration at Eli Lilly and Company, based at Lilly's European Headquarters near London, UK. The global Search & Evaluation team complements Lilly's internal R&D efforts by evaluating, in-licensing or acquiring assets and technologies and by advancing molecules through discovery and development in collaboration with external partners. Her team's remit starts with efforts in target identification and target validation and runs through discovery of new molecular entities and subsequent development of those potential medicines up to Phase 3.

Prior to joining Lilly in 2012, Dr. Laird held various leadership roles in Translational Science, Project Management and Pharmacology at AstraZeneca, in academia and Merck. Dr. Laird received doctorates from Bristol University, UK and University of Alicante, Spain.



Johan Luthman, Ph.D. - Lundbeck

In 1991, Johan Luthman began his career in the pharmaceutical industry in Astra, later AstraZeneca. In 2005, Johan became Head of Neuroscience Research at Merck Serono. In 2009, he became CEO of biotech start-up GeNeuro. From mid-2009 Johan joined Merck as VP & Franchise Integrator for Neuroscience and Ophthalmology. In 2014, he came to Eisai where he was Senior Vice President and Head of Clinical Development. Johan joined Lundbeck as Executive Vice President, R&D in March 2019.

Johan is a Swedish national and is trained as a Doctor of Dental Sciences from the Karolinska Institute, Sweden. He further holds a PhD in Neurobiology and Histology also from the Karolinska Institute, Sweden.

Breakout Session Co-Chairs



Seena Ajit, Ph.D. - Drexel University

Dr. Seena Ajit is currently an Associate Professor in the Department of Pharmacology & Physiology at Drexel University College of Medicine, Philadelphia. She received her PhD from Rutgers University. She then joined Neuroscience Discovery at Wyeth Research in Princeton NJ. She was part of the pain drug discovery efforts and worked on identification and validation of pain targets. Her research focus at Drexel is on elucidating the molecular mechanisms underlying pain with emphasis on noncoding RNAs and the translation of clinical findings to basic research and vice versa. She is investigating circulating miRNAs as biomarkers in patients with complex regional pain syndrome (CRPS) and rodent models of pain. She is also pursuing mechanistic studies on circulating miRNAs altered in patients

with CRPS, the role of small extracellular vesicles in intercellular communication, their potential utility as a pain therapeutic and the role of long noncoding RNA XIST in the predominance of chronic pain disorders in women.



Narender Gavva, Ph.D. - Takeda Research

Narender is the Head of Early Target Discovery (ETD) group at Takeda Research, California. The group focuses on gene expression, regulation and human genetics follow up TIDVAL for different indications in gastroenterology, neuroscience, and oncology Drug Discovery Units (DDUs). Prior to joining Takeda, he was a Scientific Director at Amgen Discovery Research where he spent 18 years in leading drug discovery projects and group of scientists in pain and migraine research, molecular biology, human genetics follow up, in vitro pharmacology, evaluation of new technologies, optimization of automated HTS assays, conducting focused screens, supporting lead optimization, clinical candidate selection. He led the teams that pursued small molecule, antibody and

peptide modalities toward clinical candidate nomination. Narender contributed to research reports, patents, and/or IND/IBs for AMG 517, AMG 333, AMG 747, AMG 334 (erenumab/Aimovig™). Prior to joining Amgen, Narender did a post-doctoral training in gene regulation at UC Davis and a PhD in University of Hyderabad, India.



Andrea Houghton, Ph.D. - Merck & Co Inc

Andrea Houghton is an Associate Vice President at Merck & Co Inc. where she leads the Quantitative Biosciences groups at South San Francisco and West Point. Research within the department is focused on Neuroscience, Infectious Disease and Cardiometabolic Disorders, including research and development of novel analgesics. Andrea's background is in sensory physiology. After completing post-doctoral positions (in USA & UK) where she studied the pharmacology of pain processing in rodents and primates using electrophysiology and behavior, she moved to the pharmaceutical industry. Over the last 20 years Andrea has led multiple drug discovery programs across different phase of drug discovery at Organon, Schering Plough and Merck.



Annemieke Kavelaars, Ph.D., M.S. - MD Anderson Center

Annemieke Kavelaars, Ph.D. spent most of her scientific career at the University Medical Center Utrecht in the Netherlands. She is now a full professor in the laboratories of neuroimmunology of the department of Symptom Research at M.D. Anderson Cancer Center. She began her work in the area of neuroimmunology as a graduate student. She has worked with experimental animal models of acute and chronic inflammatory diseases, and has used biochemical and cell biology techniques to understand mechanisms underlying the cross talk between the immune and nervous system, and has performed multiple translational studies.

The main focus of Dr. Kavelaars' current work in the pain field is on mechanisms underlying the transition from acute to chronic pain. Her lab was the first to identify a key role for the kinase GRK2 in regulating transition from acute to chronic pain. She showed that GRK2 in nociceptors prevents transition from acute to chronic pain by controlling the activity of the cAMP sensor Epac1. This work recently led to discovery of a novel fibroblast-derived protein (PI16) regulating pain in mouse models. As a neuroimmunologist she investigates the role of T lymphocytes and monocytes in the resolution of pain. Her recent work demonstrated that CD⁺ T cells and endogenous IL-10 signaling play a key role in resolution of pain after transient inflammation or completion of chemotherapy. Dr. Kavelaar's group also aims at identifying novel targets for treatment of chemotherapy-induced neuropathic pain. She has published > 250 peer reviewed papers.



Ajamete "Aj" Kaykas, Ph.D. - Insitro

As Chief Technology Officer, Aj is responsible for producing high-quality data sets to use in for machine learning-based target and drug discovery. He leads insitro's wet lab activities which consists of functional genomics, disease modeling, phenotyping, automation, and process engineering. Ajamete has spent over 28 years in both industry and academia, working in the areas of proteomics, genomics, and stem cell biology. Before joining insitro, Aj led the early target discovery team at Novartis Institutes for Biomedical Research in the Neuroscience unit. His team efforts have led to the discovery of multiple new disease targets and the development of better predictive preclinical models. He conducted his postdoc with Dr. Randy Moon at the

University of Washington/Howard Hughes Medical Institute on Wnt-signaling. While in Randy's lab, he conducted one of the first ever genome-wide RNAi screens and studied the role of Wnt-signaling in human disease and stem cell biology. He did his graduate work at the University of Wisconsin-Madison in Dr. Bill Sugden's lab where he studied virology, immunology, and oncology. In his free time, Aj enjoys traveling, kayaking, sailing, biking, making whiskey and most of all his family.



Gordon Munro, Ph.D. – Hoba Therapeutics

Dr Munro is the Vice President of Preclinical Development at Hoba Therapeutics. He graduated with a PhD in Physiology from the University of Edinburgh in 1994. Postdoctoral work within academia gradually progressed from research into mechanisms regulating opioid tolerance and dependence within the hypothalamus into spinal mechanisms regulating hyperexcitability after neuropathic injury. A transition from academic research into pain drug discovery started at the Danish biotech company NeuroSearch in 2000 where target-based pain activities focused primarily on developing modulators of ion channels as novel analgesics. The experience gained during this time provided a comprehensive knowledge of the drug discovery process from target identification and validation, through to engagement and PK/PD understanding in preparation for translation into humans. A subsequent move to Lundbeck in 2012 continued this approach, as well as providing more in depth experience of pain in-licensing and out-licensing opportunities. At both companies he established dedicated in house pain platforms which included complimentary behavioural assays for safety evaluation, trained and managed personnel and students and supplemented where necessary with an extensive academic collaborative network and outsourcing to CROs. With a strong emphasis on behavioural pharmacology and the importance of study design/reporting this has helped contribute directly to the development of 4 pain-related compounds which have progressed into humans. Dr Munro is also the author of more than 75 peer-reviewed publications within this field, and a co-applicant on multiple patent filings. After Lundbeck moved out of the pain therapeutic area to focus on core expertise within psychiatry, he moved to the Danish Headache Center to initiate research activities within the preclinical migraine field. He now works at Hoba Therapeutics, a recently established Danish pain specialty biotech which is developing a unique family of neurotrophic proteins for the treatment of sensory disorders including neuropathic pain.