

Toward Sequencing and Mapping of RNA Modifications

Committee

Brenda L. Bass

Co-Chair

Dr. Brenda L. Bass is a Distinguished Professor in the Department of Biochemistry at the University of Utah. She is known for her contributions in defining double-stranded RNA-mediated pathways, including the discovery of ADAR RNA editing enzymes, and models and experiments that established Dicer's role in RNA silencing. Dr. Bass is a member of the National Academy of Sciences, the American Academy of Arts and Sciences, and a Fellow of the American Association for the Advancement of Science. In 2007 she was elected and served as President of the RNA Society. She has received research support from the Pew Scholars Program, the David and Lucile Packard Foundation, the Howard Hughes Medical Institute, and her National Institutes of Health support includes a Director's Pioneer Award (2011) and Transformative Research Award (2020). Dr. Bass obtained a B.A. in chemistry from Colorado College, and a Ph.D. in chemistry from the University of Colorado, Boulder. She was a postdoctoral fellow at the Fred Hutchinson Cancer Research Center prior to joining the faculty of the University of Utah School of Medicine.

Taekjip Ha

Co-Chair

Dr. Ha is George Yancopoulos in honor of Frederick Alt Professor of Pediatrics at Harvard Medical School. He is also an Investigator for Howard Hughes Medical Institute. Ha's research is focused on pushing the limits of single-molecule detection methods to study complex biological systems. His group develops state-of-the-art biophysical techniques and applies them to study diverse protein-nucleic acid and protein-protein complexes, and mechanical perturbation and response of these systems both in vitro and in vivo. He is an elected member of NAS, NAM, and American Academy of Arts and Science, Dr. Ha received his B.S. (1990) from Seoul National University and Ph.D. from University of California-Berkeley (1996) in physics. Dr. Ha served on the NASEM committee on decal review of AMO Sciences.

Dr. Ha served as an expert witness in the patent litigation between Oxford Nanopore and Pacific Biosciences of California between August 2018 and March 2020.

Nicholas M. Adams

Member

Nick Adams is a Systems Design Engineer at Thermo Fisher Scientific and an Adjoint Associate Professor at Vanderbilt University. Nick spent the first part of his career as a Research Professor in the Department of Biomedical Engineering at Vanderbilt University, where he developed user-focused technologies that reduce the barriers for access to life-saving healthcare across the globe. The technologies he developed have been recognized as the “Top Ten” by the Society for Laboratory Automation and Screening (SLAS) and as the “Coolest Things on Earth” by GE Reports. Building on this academic experience, Nick now leads the development of the next generation of genetic sciences technologies in the R&D group at Thermo Fisher Scientific. After receiving Bachelor of Science degree in Biology at Utah Tech University, Nick completed a PhD in Chemical and Physical Biology at Vanderbilt University, followed by a postdoctoral fellowship in Biomedical Engineering at the same institution.

Juan D. Alfonzo

Member

Dr. Juan D. Alfonzo is currently the Executive Director of the RNA Initiative at Brown University and until recently was an Arts and Sciences Distinguished Professor of Microbiology and the former Director of the Center for RNA Biology at The Ohio State University. His research focuses on the study of tRNA processing and modification in various organisms, including humans. The Alfonzo laboratory uses a multi-pronged approach that involves a combination of Biochemistry, Cell Biology, Biophysics, and omics to characterize various modification and tRNA processing enzymes. A major emphasis of the Alfonzo laboratory is the enzymology of modification enzymes to understand the basis for substrate specificity and to connect such studies with how intracellular compartmentalization affects tRNA modification and function. He was the recipient of an OSU Distinguished teaching award and is an elected Fellow of the American Association for the Advancement of Sciences. He obtained his Ph.D. in Microbiology Biology at Indiana University followed a Postdoctoral Fellowship at UCLA working on the Biochemistry of RNA editing and modification in trypanosomes.

Dr. Alfonzo published an editorial in Nature Genetics in 2022 titled, “A call for direct sequencing of full-length RNAs to identify all medication,” in which he and his co-authors outlined future research needs related to mapping and sequencing RNA chemical modifications.

Jeffrey Baker

Member

Dr. Jeffrey Baker worked for over 20 years in the biopharmaceutical industry leading interdisciplinary technical teams supporting process development and commercial manufacturing. In 2011 he was appointed Deputy Director, Office of Biotechnology Products, CDER/FDA. In 2019 Dr. Baker was detailed to the Advanced Manufacturing National Program Office (Dept Commerce) until being recalled to FDA to participate in responses to the global pandemic. He retired from the Agency in 2021 but remains active in the biotech community as a Senior Fellow in NIIMBL and through a breadth of consortia and academic relationships.

Dr. Baker received the Eli Lilly President's Award twice for the development of two first in class protein therapeutics and six FDA Center Awards for leadership in review practice, guidance development, and inspection program management. In 2018 he received an FDA Honors Award for contributions to "modernizing the U.S. regulatory system for biotechnology products through sustained creative leadership and collaboration."

Dr. Baker holds a bachelor's degree in biochemistry and molecular biology from Northwestern University, doctorate in biochemistry from the University of North Texas, and pursued post-doctoral studies at the University of California, Berkeley. His academic research was on nucleic acid metabolism in procaryotic and eucaryotic systems.

Susan Baserga

Member

Dr. Susan J. Baserga is the William H. Fleming MD Professor of Molecular Biophysics & Biochemistry at Yale University. She is also Professor of Genetics and Therapeutic Radiology at the Yale School of Medicine. Her laboratory has pioneered the molecular basis of how ribosomes are made in our cells and is now pursuing the mechanistic basis of human diseases called ribosomopathies. In 2023, Dr. Baserga was elected to the National Academy of Medicine. She has won the Charles W. Bohmfalk Prize for basic science teaching at the Yale School of Medicine (2014), William C. Rose Award from the American Society for Biochemistry and Molecular Biology (ASBMB) for outstanding contributions to scientific research and a demonstrated commitment to the training of young scientists (2016), named an ASBMB Fellow (2023), Connecticut Technology Council Women of Innovation Category Winner in Research Innovation and Leadership (2018) and was elected to the National Academy of Inventors (2018). Dr. Baserga is a 1980 Yale College graduate and was the first woman graduate of Yale College to receive tenure in the biological sciences in the Faculty of Arts and Sciences at Yale. She completed her MD (cum laude, Alpha Omega Alpha) and PhD (Human Genetics) degrees at Yale in 1988.

Lydia M. Contreras

Member

Dr. Lydia María Contreras is currently a Professor in the Department of Chemical Engineering at the University of Texas at Austin. She has previously served appointments in the Institute for Cell and Molecular Biology (ICMB) and is currently a part of the graduate study committees of the Biochemistry, Cell Molecular Biology and Microbiology departments. Her expertise lies in conducting fundamental studies of cellular stress responses, and she leads efforts in using molecular assays and techniques to evaluate cell toxicity induced by different sources of air pollution. She has served as the Primary Investigator for multiple NSF and NIH projects and has received the American Institute of Chemical Engineers (AIChE) Food, Pharmaceutical and Bioengineering Division Early Career Award and ACS BIOT Young Investigator Award. She received a B.S.E in Chemical Engineering from Princeton University in 2003, a Ph.D. in Chemical and Biomolecular Engineering from Cornell University in 2008, and was a post-doctoral Fellow with Dr. Marlene Belfort at the Wadsworth Center (NYS Dept. of Health). She has previously served on the NRC's Panel on Life Sciences.

Markus Hafner

Member

Dr. Markus Hafner is a Senior Investigator at the National Institute for Arthritis and Musculoskeletal and Skin Diseases (NIAMS/NIH) where he leads the Laboratory of RNA Molecular Biology. Dr. Hafner studies posttranscriptional gene regulatory (PTGR) processes, including messenger RNA (mRNA) processing and splicing, transport and localization, translation, and turnover using systems-wide approaches in human cells. PTGR is controlled by dynamic ribonucleoprotein (RNP) complexes and Dr. Hafner developed widely used techniques to characterize RNA binding protein preferences and targets, as well as mechanisms of gene silencing by small RNAs. Before joining NIAMS in 2014, he completed postdoctoral training at Rockefeller University in the laboratory of Dr. Thomas Tuschl, one of the pioneers in the field of RNA interference. Dr. Hafner's interest in RNA was sparked during his graduate studies in Chemistry/Biochemistry at the University of Bonn, Germany, where he used RNA aptamers as tools to select small molecule inhibitors for a family of small GTPases.

Sarath C. Janga

Member

Sarath Chandra Janga obtained his PhD from the MRC Laboratory of Molecular Biology & University of Cambridge in 2010 and was a post-doctoral fellow as Institute for Genomic Biology Fellow at University Illinois at Urbana-Champaign from 2010-2012. He is currently an Associate Professor of Bioinformatics and Data Science at the School of Informatics and Computing, Indiana University Purdue University at Indianapolis (IUPUI) and a faculty member of the Center for Computational Biology and Bioinformatics at the Indiana University School of Medicine (IUSM). Dr. Janga's specific research interests include developing experimental and computational methods for mapping RNA regulatory networks by integrating cutting edge genomic technologies and data science approaches, within the broader field of computational and systems biology his lab works on. In particular, his lab employs single molecule RNA sequencing approaches for developing high-throughput methods to map RNA modifications in model and non-model systems. He has over 110 publications with a H-index of 37 and an i10-index of 79. His lab is supported by grants towards these research directions from NSF, NIH and Life Science industry. Dr. Janga has served on multiple national (Multiple NIH study sections, NSF CAREER, SBIR/STTR panels) and international (Swiss/Polish/Israel/Czech/Danish National Foundations and Wellcome Trust) grant panels and review committees covering genomics, imaging technologies and computational biology areas.

Patrick A. Limbach

Member

Patrick A. Limbach, Ph.D., is an Ohio Eminent Scholar and professor of Chemistry at the University of Cincinnati. He has been serving as the Vice President for Research for the University of Cincinnati since 2016 and is also the current Board President for the University of Cincinnati Research Institute. His research lab has been focused on the identification, quantification, and sequence placement of modified ribonucleosides with an emphasis on characterizing and understanding the modification profiles of transfer RNAs from a variety of organisms. He and his group have developed numerous mass spectrometry-based approaches, tools and reagents for the analysis of modified RNAs. He is a Fellow of the American Association for the Advancement of Science and a lifetime member of Phi Kappa Phi. He received his B.S degree from Centre College (Kentucky), his Ph.D. from Ohio State University training under Professor Alan G. Marshall, and conducted post-doctoral training at the University of Utah in the laboratory of Professor James A. McCloskey.

Dr. Limbach holds two patents related to mass spectrometry-based analysis of modified RNAs; one patent covers the preparation of ribonucleases (reagents used in the analysis) and the second patent covers a method for preparing samples for mass spectrometry analysis. Dr. Limbach served on the Scientific Advisory Board and was an NIH-funded collaborator with the startup company RiboNova through January 2021.

Julius B. Lucks

Member

Julius B. Lucks is Professor and Associate Chair of Chemical and Biological Engineering at Northwestern University. His research combines experimental and computational approaches to investigate the fundamental principles that govern how RNA molecules fold and function in living organisms, and how these principles can be used to engineer RNA biotechnologies. He has pioneered high-throughput approaches to measuring RNA structures that has helped to bring RNA structural biology into the 'omics' era, as well as approaches to engineering synthetic RNAs that act as sensors and circuits for scalable diagnostic technologies. Professor Lucks has been recognized with a number of awards including an Alfred P. Sloan Foundation Research Fellowship, an ONR Young Investigator Award, an NIH New Innovator Award, an NSF CAREER award, the ACS Synthetic Biology Young Investigator Award, a Camille-Dreyfus Teacher Scholar Award, and was most recently inducted into the American Institute of Medical and Biomedical Engineers. He is a founding member of the Engineering Biology Research Consortium. Lucks received his BS in chemistry from UNC Chapel Hill, an MPhil in theoretical chemistry from Cambridge University, a PhD in chemical physics from Harvard University, and was a Miller Fellow at UC Berkeley.

Dr. Lucks provided consultant services to Biogen Inc. and Translate Bio between May and September of 2021.

Mary A. Majumder

Member

Mary A. Majumder is a Professor in the Center for Medical Ethics and Health Policy at Baylor College of Medicine in Houston, Texas. Her work focuses on ethical, legal, and social issues associated with cutting-edge biomedical research. Recent projects have focused on policy challenges associated with sharing genomic and other health-related information through large-scale, longitudinal data resources or commons, sharing of variant and related phenotypic information in the context of hereditary cancer, and sharing data generated from BRAIN Initiative-funded studies and other neuroscience research. She has written extensively on issues of privacy and governance. Professor Majumder also participates in the Clinical Sequencing Evidence-Generating Consortium, which focuses on clinical translation of genomic science; she co-led a project on access to care and currently co-chairs the Consortium's ELSI and Diversity Working Group. She received a Ph.D. from Rice University and a J.D. from Yale Law School and completed a fellowship in clinical ethics at the University of Texas M.D. Anderson Cancer Center.

Nicole M. Martinez

Member

Dr. Nicole M. Martinez is an Assistant Professor in the Departments of Chemical and Systems Biology and of Developmental Biology at Stanford University. Her lab studies RNA modifications, mRNA processing and their roles in development and disease. Dr. Martinez is a K99/R00 NIH Pathway to Independence Awardee, a Chan Zuckerberg Biohub Investigator and a member of the RNA Society. She was a postdoctoral fellow at Yale University where she worked on RNA modifications and obtained her PhD from the University of Pennsylvania studying alternative splicing.

Kate D. Meyer

Member

Dr. Meyer is an Assistant Professor in the Departments of Biochemistry and Neurobiology at Duke University School of Medicine. Her laboratory studies how the RNA modification, m6A, is regulated in cells and its role in gene expression and cell function. Her lab has also developed tools for detecting m6A in cells and for studying how m6A binding proteins recognize target mRNAs. Prior to starting her lab at Duke, Dr. Meyer trained with Dr. Samie Jaffrey at Weill Cornell Medicine, where she helped develop the first method for global m6A profiling and uncovered key functions of m6A in regulating translation. She has received several awards recognizing her contribution to the field of epitranscriptomics, including the Blavatnik Regional Award for Young Scientists, the Tri-Institutional Breakout Prize for Junior Investigators, the Searle Scholars Award, and the Klingenstein-Simons Fellowship Award.

Keith Robert Nykamp

Member

Dr. Keith Nykamp is a Senior Molecular Geneticist at Invitae Corporation, where he leads research and development of Invitae's genetic insights platform. In addition to his work with Invitae, Dr. Nykamp serves as key personnel for The GREGOR Consortium, an NHGRI funded grant supporting genomics research focused on developing tools and approaches for elucidating the genetics of rare genetic disease. Technologies developed by his group support the interpretation of genetic variation and molecular diagnoses for millions of individuals each year. Dr. Nykamp's research employs large scale functional assays, computational biology, machine learning algorithms and software engineering to assess the impact of DNA variation on mRNA splicing and protein function. He received a PhD from the University of Florida studying mechanisms of mRNA export and polyadenylation with Professor Maurice Swanson and trained as a postdoctoral fellow with the Howard Hughes Medical Institute at the University of Wisconsin-Madison in Dr. Judith Kimble's laboratory, where he explored the role of RNA regulation in stem cell proliferation and differentiation.

Tao Pan

Member

Tao Pan is a Professor of Biochemistry and Molecular Biology at the University of Chicago. Throughout his career he has made significant contributions to several areas of RNA science including catalysis, folding, biology, modification, and functional genomics. His current interests focus on the functional genomics and biology of tRNA, and the dynamic epitranscriptome of RNA modifications. He has developed multiple technologies to study RNA modifications transcriptome-wide and applied those to biological investigations in basic and clinical science. He was the recipient of NIH director's pioneer award on adaptive mistranslation, and is a fellow of the American Association for the Advancement of Science. He received his Ph.D. in Biophysics and Biochemistry from Yale University and did postdoctoral research at University of Colorado at Boulder.

Steven Moss

Staff Officer