

2015 ASMS “Emerging Investigators” Focus Section

The health and vitality of any field of research can easily be determined by looking for the work being carried out by its emerging investigators. These investigators bring a vibrant energy to the subject, which infuses into the rest of the community. They also bring new ideas and perspectives that stimulate the development of innovative solutions to existing problems. The “Emerging Investigators” focus section contained within this issue of the *Journal of the American Society for Mass Spectrometry (JASMS)* highlights the exciting work being carried out by just some of the outstanding young researchers working today in the field of mass spectrometry and, in doing so, also captures emerging high-impact areas of research that have the potential to influence the future directions of our field. The prevalent theme of the research described in the focus section articles is the development and application of bioanalytical mass spectrometry and associated strategies for biomolecular analysis, commensurate with the immense impact that mass spectrometry has had, and continues to have, in solving some of the most difficult challenges facing the biological sciences over the past two and a half decades. Invitations to contribute to the focus section were based on suggestions solicited from the *JASMS* Editor, Associate Editors, and members of the Editorial Board, and from members of the ASMS Board of Directors. Although no firm criteria were used to distinguish between “emerging” and “established” scientists, the goal was to emphasize the work of investigators within the first 10 years of their independent careers, who, while relatively early in their careers, are already making important contributions to the literature and are expected to become future leaders within the field. Rather than summarizing the research described within these articles, the diverse range of which is immediately evident by scanning the Table of Contents for the issue, a brief biographical sketch is instead provided below to illustrate the diverse backgrounds and paths by which each of the contributing authors have converged upon the field of mass spectrometry, and the overall research interests of their laboratories. I look forward to seeing more of their exciting work in the future.

Lisa M. Jones is an Assistant Professor in the Department of Chemistry and Chemical Biology at Indiana University–Purdue University in Indianapolis. She earned a B.Sc. in Biochemistry (1999) from Syracuse University and completed a Ph.D. in Chemistry (2006) at Georgia State University, then carried out postdoctoral research in Structural Virology at the University of Alabama–Birmingham (2006–2008) and in Mass Spectrometry at Washington University in St. Louis (2008–2012), in the laboratory of Prof. Michael Gross. Dr. Jones’ current research focuses on the use of fast photochemical oxidation of proteins (FPOP) and other footprinting methods coupled with

high-resolution mass spectrometry to identify protein–protein interactions that occur during the life cycle of viruses.

David D. Weis is an Associate Professor in the Department of Chemistry at the University of Kansas. His research focuses on understanding how protein backbone flexibility can be modulated by protein–protein interactions and by changes in solution conditions. David earned his Ph.D. (1998) in Analytical Chemistry from Indiana University where he conducted research in IR spectroscopic methods for atmospheric aerosol analysis with George Ewing. He then carried out postdoctoral research in H/D exchange in the laboratory of Prof. John Engen at the University of New Mexico (2004–2006) where he studied viral activation of non-receptor tyrosine kinases and developed the widely used software package *HXExpress*. Prof. Weis has also held faculty appointments at Middlebury College (1998–2000) and Skidmore College (2000–2004).

Francisco Fernandez-Lima is an Assistant Professor in the Department of Chemistry and Biochemistry and the Department of Cellular Biology and Pharmacology at Florida International University. He earned B.Sc. (2001) and M.Sc. (2003) degrees in Nuclear Physics from the Institute for Applied Science and Technology, Havana, Cuba, and a Ph.D. in 2006 from Pontific Catholic University in Rio de Janeiro, Brazil. He then pursued postdoctoral research in the Department of Physical Chemistry at the Federal University of Rio de Janeiro, Brazil from 2006 to 2007 and in the Department of Chemistry at Texas A&M University from 2007 to 2010. From 2010 to 2012, he was a NIH K99 award (2010–2012) prior to joining FIU in 2012. One of the research objectives of the Fernandez-Lima laboratory is the development of fast separation/identification techniques that can be easily implemented for the analysis of complex biological mixtures (e.g., gas-phase, post-ionization separation in ion mobility spectrometry, and mass spectrometry) and the study of the conformational space of molecular ions for structural elucidation.

Stephen J. Valentine received his Ph.D. from Indiana University in 2000 where he worked in David Clemmer’s laboratory. He was one of the first employees of the biotechnology startup company Beyond Genomics, Inc., then later helped found and raise initial funding for the company Predictive Physiology and Medicine, Inc. Returning to academia in 2008, Stephen worked as an Associate Scientist at Indiana University where he assisted Professor David Clemmer in the development of the theory of Overtone Mobility Spectrometry—a new, high-resolution gas-phase separation technique. In 2012, Stephen joined the faculty at West Virginia University as an Assistant Professor in the C. Eugene Bennett Department of Chemistry. Stephen’s current research interests lie in the development of novel ion mobility spectrometry–mass spectrometry (IMS–MS) instrumentation and techniques for the

characterization of biomolecular structures in solution and in the gas phase.

Amanda B. Hummon earned her B.Sc. degree in Chemistry at Cornell University. She then completed her Ph.D. graduate research in the laboratory of Prof. Jonathan Sweedler at the University of Illinois, Urbana-Champaign using MALDI mass spectrometry to study neuropeptide processing. Following a postdoctoral fellowship at the National Cancer Institute, she was appointed the Walther Cancer Assistant Professor at the University of Notre Dame in 2009. Her laboratory uses and develops mass spectrometric methods to explore gene expression changes and drug metabolism in colorectal cancer.

Eric D. Dodds is an Assistant Professor in the Department of Chemistry at the University of Nebraska—Lincoln. He earned B.Sc. degrees in Cell/Molecular Biology and in Biochemistry from the University of Alaska Anchorage, then completed his Ph.D. in 2008 with Prof. Carlito B. Lebrilla at the University of California Davis. He then pursued postdoctoral research from 2008 to 2010 with Prof. Vicki H. Wysocki at the University of Arizona. Research activities in the Dodds laboratory are concentrated on the conception and implementation of MS, tandem mass spectrometry (MS/MS), and IMS-based strategies for the analysis of biomolecules, with a major focus on the development of new capabilities for carbohydrate and glycoconjugate analysis.

Yehia Mechref is a Professor in the Department of Chemistry and Biochemistry at Texas Tech University. He received his B.Sc. in Chemistry from the American University of Beirut, Lebanon and his Ph.D. with an honorable mention from Oklahoma State University. From 1997 to 2000, Dr. Mechref assumed a faculty position in the Department of Chemistry at the United Arab Emirates University. He was then director of the METACyt Biochemical Analysis Center and assistant director of the National Center for Glycomics and Glycoproteomics at Indiana University prior to joining TTU in 2010. Dr. Mechref's research is focused on the development of sensitive biomolecular mass spectrometry methods enabling qualitative and quantitative assessments of proteins, glycoproteins, and glycans in biological samples, with the ultimate goal being the comprehensive characterization of glycoprotein glycosylation sites and microheterogeneity.

Ronghu Wu obtained an M.Sc. degree in 1997 and his Ph.D. in Analytical Chemistry in 2000 from the University of Science and Technology of China, followed by postdoctoral research training (2009–2012) at Harvard Medical School in the laboratory of Prof. Steve Gygi, before starting his independent research as an Assistant Professor in the Department of Chemistry and Biochemistry at Georgia Tech. His research focuses on MS-based proteomics, and his group is developing innovative methods to globally identify and quantify protein modifications, especially glycosylation, and applying them for biomedical research.

Renã A.S. Robinson is an Assistant Professor in the Department of Chemistry at the University of Pittsburgh, where she started in the Fall of 2009. She received her B.Sc. degree in Chemistry from the University of Louisville and her Ph.D. in Chemistry at Indiana University under the auspices of Prof. David Clemmer in 2007. Dr. Robinson then received Lyman T. Johnson and UNCF/Merck postdoctoral fellowships to study Alzheimer's disease using redox proteomics in Prof. D. Allan Butterfield's laboratory at the University of Kentucky. Currently, her research group is investigating the molecular basis of aging in the immune system and Alzheimer's disease using novel proteomics techniques.

Leslie M. Hicks received her B.Sc. degree in Chemistry at Marshall University. She then completed her Ph.D. in Chemistry at the University of Illinois, Urbana-Champaign with Prof. Neil Kelleher, working on mass spectrometric characterization of non-ribosomal peptide and polyketide assemblies, and was the recipient of an NSF graduate research fellowship. Dr. Hicks then moved to the Danforth Center in St. Louis, MO as Director of the Proteomics and Mass Spectrometry core facility and became a Principal Investigator in 2012. She and her research lab moved to the Department of Chemistry at The University of North Carolina at Chapel Hill in July 2013, where she is now an Assistant Professor in the Analytical Division. Research in the Hicks lab focuses on development and implementation of mass spectrometric approaches for protein characterization including post-translational modifications, as well as the identification of bioactive proteins from/proteins from plants.

Demian Ifa received his B.Sc. degree in Pharmacy from the State University of São Paulo, Brazil in 1995, a M.Sc. in Organic Chemistry from the University of Rio de Janeiro in 1997, and his Ph.D. in Pharmacology from the University of São Paulo in 2001. He then worked as a postdoctoral fellow and associate research scientist with Prof. R. Graham Cooks in the Aston Labs for Mass Spectrometry at Purdue University. He joined the Chemistry Department at York University as an Assistant Professor in 2011. His major areas of research interests are in ambient ionization techniques, imaging mass spectrometry, structural biology, and clinical mass spectrometry.

Gavin E. Reid

Associate Editor, JASMS.

School of Chemistry,

Department of Biochemistry and Molecular Biology,

Bio21 Molecular Science and Biotechnology Institute,

The University of Melbourne,

Parkville, Victoria 3010, Australia

e-mail: gavin.reid@unimelb.edu.au