

Conference Report

182nd AAAS Annual Meeting, Washington DC, February 11-15, 2016

Hari S. Sharma^{1,*}, Stephen D. Skaper² and Aruna Sharma¹

¹*Cerebrovascular Research Laboratory, Department of Surgical Sciences, Anesthesiology & Intensive Care Medicine, University Hospital, Uppsala University, SE-75185 Uppsala, Sweden*

²*Department of Pharmaceutical and Pharmacological Sciences, University of Padua, Padua, Italy*



Hari S. Sharma

The 182nd Annual Meeting of American Association for the Advancement of Science (AAAS), the world's largest general scientific society, was held in the Washington Marriott Wardman Park Hotel February 11-15, 2016. The focal theme of the congress was "Global Science Engagement". More than 3000 delegates from academia and industry, as well as policy makers attended this event. Meeting attendance included school children from various grades along with their parents, as part of the "Family Days Program" for promoting and inculcating young minds to science.

The annual AAAS meetings are the largest gathering of scientists across the world involved in the fields of biology, medicine, engineering, computer science, earth science, astronomy, chemistry, mathematics and statistics, pharmaceutical science, neuroscience, physics, environmental science, communication and intelligence, federal science policy, medicine and public health, microbiology, and related disciplines [1]. The salient highlights relating to medicine and neuroscience and their links to innovation and globalization are presented below.

On the 1st day of the meeting, February 11, 2016, Frances A. Córdoba (Director, National Science Foundation, Arlington, VA) and David Skorton (Secretary, Smithsonian Institution, Washington DC) welcomed the delegates in the opening ceremony. This was followed by the Presidential address given by AAAS President Geraldine Richmond (University of Oregon, Eugene, OR). She welcomed the delegates and emphasized the need for more participation of women in science. Her address focused on laser spectroscopy and computational methods for increasing our understanding of the chemistry and physics of complex interfaces relevant to energy production, and environmental and atmospheric chemistry. The Presidential reception held that evening in the headquarters hotel provided delegates with opportunities to interact across disciplines and strengthen scientific networking across the globe.

Highlights from the 2nd day of the meeting, February 12, 2016, included a plenary lecture by Christopher Dye (Director General, World Health Organization, Geneva, Switzerland, and a Reviewing Editor for Science) on "A problem shared: teaming up to fight epidemic diseases". Three topical lectures were also delivered by eminent scholars on key topics. Thaisa Bergmann (Rio Grande do Sul, Brazil) spoke on "Supermassive black holes and the evolution of the Universe". "The near-horizon future of science in National Parks" was discussed by Gary Machils (US National Park Service, Washington DC). May-Britt Moser (Trondheim, Norway) discussed "Brain, Space and Memory".

Several Symposia on February 12, 2016, focused on biology and neuroscience. These included the subject of discovery and development of CRISPR-Cas genome editing, organized by Hong Li (Tallahassee, FL) which comprised three speakers: Martin Jinek (Zurich, Switzerland), Emmanuelle Charpentier (Berlin, Germany), and John van der Oost (Wageningen, The Netherlands). Kevin Finneran and Anne-Marie Mazza (Washington DC) organized a symposium on the topic of global response to human gene editing, with three speakers: Françoise Baylis (Halifax, Canada); Robin-Lovely Badge (London, UK) and Ernst-Ludwig Winnacker (Munich, Germany). Neuroplasticity: Insights in Neuronal Connectivity Illuminate Brain Function was organized by Thomas Franke (New York, NY). Other speakers included Amy Robinson (Cambridge, MA); Wenbiao Gan (New York, NY) and Michael Cahill (New York, NY).

The three symposia in the Medical Science and Public Health section generated considerable interest across delegates and the general public alike. Daniel Conklin (Tuxedo, NY) organized a symposia on "New and Emerging Tobacco Products: Biomarkers of Exposure and Injury" in which three speakers, Ilona Jaspers (Chapel Hill, NC); Judith Zeikoff (Tuxedo, NY) and Daniel Conklin participated.

*Address correspondence to this author at the Laboratory of Cerebrovascular Biology, Department of Surgical Sciences, Anesthesiology & Intensive Care Medicine, University Hospital, Uppsala University, SE-75185, Uppsala, Sweden; Tel/Fax: +46 18 243899; E-mail: Sharma@surgsci.uu.se

“Lessons from the Ebola Outbreak: Designing Vaccine Trials for Emerging Diseases” was organized by Elizabeth Halloran (Seattle, WA) with three speakers: Ana Maria Henao-Restrepo (Geneva, Switzerland); Ira M. Longini (Gainesville, FL) and Phillip Krause (Silver Spring, MD).

That evening, two grand receptions were organized in the adjacent Omni Shoreham Washington Hotel. The AAAS Award Ceremony and Reception, a very old tradition [2] was held in Palladium Ballroom where the Philip H. Abelson Prize was awarded to Eric Lander (Harvard Boston MA), followed by the Science Diplomacy Award to Sir Peter Gluckman (Auckland, New-Zealand). The Scientific Freedom and Responsibility Award was presented to Jean Maria Arrigo (Berkeley, CA), the Public Engagement with Science Award to Mark Rosin (Los Angeles, CA) and Mark Miodownik (London, UK), the Mentor Award to Christine Grant (Chapel Hill, NC), and the Lifetime Achievement Award to Sandra Yancy McGuire (Baton rouge, LA).

The other key event was “Forum of Global FORA” held in the Blue Room, in which a VIP networking reception was hosted 150 comprising leading science diplomats, chief science advisers and ministers. The Korea Foundation for the Advancement of Science and Creativity (KOFAC) was also represented. The 2016 Keynote Thematic Address “Animal Testing Was Yesterday – Here is the Future!” was delivered by Thomas Hartung, Chair of Evidence-Based Toxicology at Johns Hopkins University, Bloomberg School of Public Health, celebrating its 100th anniversary this year.

The Humane Society and US National Environment Protection Agency’s Program Director for Chemical Safety for Sustainability, Dr. Tina Bahadori was the guest of honor. South African Science Forum, EuroScience Open Forum (ESOF) 2016 Manchester, Science Agora Tokyo, and the World Science Forum Jordan joined by HRH Princess Sumaya bint El Hassan addressed the gathering followed by lavish receptions and a call for co-operation among the delegates for development of science networks beyond their national borders.

On the 3rd day of the congress (February 13, 2016), apart from several plenary lectures, topical lectures and symposia, the student poster competition and general poster sessions were held in the biological sciences and public health, brain and behavior category throughout the day. The general poster sessions are the backbone of the AAAS annual conference. Posters are subject to a rigorous selection process by a reviewing committee in each category, and only those with novel data providing scientific advances are presented.

Jennifer Doudna’s (Berkeley, CA) plenary lecture: “The CRISPR-Cas9 Genome Editing Revolution” was followed by three topical lectures: “Disaster Management: Robots, Informatics and People” by Robin Murphy (College Station, TX), “Coalition of Derogation? Psychological Perspectives of Race Evolution” (Jennifer Richeson, Evanston, IL) and “Can Your Lifestyle Make You Older or Younger? Metaphors for Communicating Chronic Risks” (David Spiegelhalter, Cambridge, UK).

Key symposia on this day included “Neuroscience Clues to the Chemistry of Addiction and Mood Disorders” organized by Mary Baker and Aidan Gilligan (Brussels, Belgium). Other speakers were Thomas Hartung (Baltimore, MD); Wilson Compton (Bethesda, MD) and Wayne C. Drevets (Titusville, NJ). Maria Spiropulu (Pasadena, CA) organized a symposium on “Artificial Intelligence: Imaging the Future”, with participation by Christof Koch (Seattle, WA), Demis Hassabis (London, UK) and Lisa Joy Nolan (Burbank, CA).

In addition, there were 77 student posters and 24 general posters covering Medicine and Public Health, Cellular and Molecular Biology and Brain and Behavior.

Posters receiving the most attention in the student category included those dealing with observations that a high fat diet impairs insulin receptor-mediated insulin uptake by brain endothelium (Sarah Gray, Charlottesville, VA), cellular tracking in a three-dimensional microengineered tumor model (Nitish Peela, Tempe AZ), and identification and characterization of novel regulators of cell invasion in *C. Elegans* (Hui Yi and Grace Lim, Durham, NC). Among the general posters highlighted were those discussing alignment of cell function as a selection criteria for chemotherapeutic treatment (Se Jong, Charlottesville, VA), and the role of DNA methylation in naïve pluripotent stem cells (Katherine Sheu, Los Angeles, CA).

Poster highlights in the afternoon’s student group covering Brain and Behavior included investigations on the origin of theta oscillations in the rat posterior parietal cortex (Andreas Camarena, Irvine, CA), sex-specific patterns of the epigenome as a putative mechanism in fear-related memory (Michael Emami, Irvine, CA), the association of a greater loss of slow wave sleep with metabolic and cognitive problems in boys (Jordan Gaines, Hershey, PA), de novo emergence of odor category representations in the human brain (Lisa Qu, Evanston, IL), cellular mechanisms by which social status alters behavioral response to stress (Sahba Seddighi, Knoxville, TN), the role of neuritin-a synapse maturing protein in striatal dendritic morphology (Anastasia Vasilyeva, New York, NY), and control of respiratory circuits by brainstem astrocytes (Shahriar Sheikhabaei, London, UK).

Noteworthy posters from the afternoon general category included those discussing netrin1 and neuroblast lineage plasticity in subventricular zone of injured neonatal brain (Stephanie Fox, Washington DC), cold environment exacerbation of nicotine-induced brain pathology (Suraj Sharma, Uppsala, Sweden), exacerbation of concussive brain injury pathophysiology by silica and carbon nanotubes (Dafin F. Muresanu, Cluj-Napoca, Romania), magnetic iron oxide nanoparticles and brain ubiquitin expression in hyperthermia (Aruna Sharma, Uppsala, Sweden), Worm school: collaborative neuroscience research with high school students (Elizabeth Waters, New York, NY), and application of TiO₂ nanodelivery of cerebrolysin to reduce pathology in Parkinson disease (Hari S. Sharma, Uppsala, Sweden).

The 4th day of the meeting (February 14, 2016) began with a plenary lecture by Jad Abmurad (New York, NY), the founder of Radiolab, on Science, Philosophy and Human Experience. He emphasized experimenting with sound to find even more effective and entertaining ways to explain ideas and to tell a story – especially to youth. Dr. Abmurad was awarded the AAAS-Kevill Science Journalism Award 2009. Several interesting symposia were also held on that day. “I Can’t Hear Myself Think: Noise and Developing Brain from Infancy to Adulthood” was organized by Nan Bernstein Ratner (Baltimore, MD) with Lori Leibold (Omaha, NE), Rochelle Newman (Baltimore, MD) and Amir Lahav (Providence, RI). “Evolutionary Biology Impacts on Medicine and Public Health” was organized by Cynthia Beall (Cleveland, OH) and Randolph Nesse (Tempe, AZ) with six other speakers: Katie Hinde (Cambridge, MA), Pascal Gagneux (San Diego, CA), Mervyn Singer (London, UK), Andreas Graham (Princeton, NJ), Robert A. Gateby (Tampa, FL) and Christina Warinner (Norman, OK). Susan Goldin-Meadow and Daniel Casasanto (Chicago, IL) sponsored a symposium on “How the Body Shapes the Mind” in which Jessica Witt (Fort Collins, CO) and Sian Beilock (Chicago, IL) also participated. “From Toxins to Culture: How Environment Shapes the Infant Brain” was coordinated by Marie-Francoise Chesselt (Los Angeles, CA), with Beate Ritz and Elaine Y. Hsiao from same Institution, together with Bruce McEwen (New York, NY) and Moshe Szyf (Montreal, Canada). Margret Rogers (Rockville, MD) in collaboration with Nan Bernstein Ratner chaired the symposium “At a Loss for Words or Losing Mind? New Views on Language Problems in Aging” in which Argye Elizabeth and Franc Lin (Baltimore, MD), and Joseph Duffy (Rochester, NY) participated. Patrick Regan and Ulrich Marsch (Munich, Germany) organized a symposium on “Fighting Cancer and Chronic Infections with T cell Therapy: Promise and Progress”. Other speakers in this symposium were Stanly Riddell (Seattle, WA), Chiara Bonini (Milan, Italy) and Dirk Busch (Munich, Germany).

In the evening, delegates enjoyed screening of a 2-h documentary on “My Love Affair with the Brain” at the Omni Shoreham Hotel Palladium Ballroom.

On 5th and final day (February 15, 2016), three topical lectures were on the program. David Kaiser (Cambridge, MA) delivered the Sarton Memorial Lecture on the history and philosophy of science entitled Einstein’s Legacy: Studying Gravity in War & Peace. The John P. McGovern 2016 Award Lecture in Behavioral Sciences was delivered by Elizabeth Spelke (Boston, MA) on Origins of Knowledge. Samuel Wasser (Washington DC) delivered a key lecture on Forensic Science, Organized Crime, and the Illegal Ivory Trade: The Elephant in the Room.

Another highlight of the day was a Meet with Science Editors forum that was open to all delegates. Marcia McNutt, Editor-in-Chief of Science hosted a lavish reception for the delegates and discussed key issues on science publication and ethics [3, 4].

Keeping pace with previous years, the 2016 AAAS annual meeting was highly successful thanks to numerous innovative lectures, cutting edge science presentations and educative exhibition platforms sponsored by the National Academy of Sciences, National Aeronautics and Space Administration, National Institutes of Health, European Union for Science, National Institute of Drug Abuse and other key non-profit organizations from across the globe. Family days proved highly popular with the general public. In spite of very wintry weather, more than 200 enthusiastic school children participated in the event.

The 183rd AAAS annual meeting will be held in Boston, MA, February 16-20, 2017 on the theme “Serving Society through Science Policy”. All interested candidates are welcome!

REFERENCES

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