

## CONFERENCE REPORT

# 183<sup>rd</sup> American Association for the Advancement of Science Annual Meeting, Boston MA, USA Feb 16-20, 2017

## “Serving Society through Science Policy”

Hari S. Sharma<sup>1,\*</sup>, Stephen D. Skaper<sup>2</sup>, and Aruna Sharma<sup>1</sup>

<sup>1</sup>International Experimental CNS Injury & Repair (IECNSIR), Department of Surgical Sciences, Anesthesiology & Intensive Care Medicine, University Hospital, Uppsala University, SE-75185 Uppsala, Sweden; <sup>2</sup>Department of Pharmaceutical and Pharmacological Sciences, University of Padua, Largo “E. Meneghetti” 2, 35131 Padua, Italy

The 183<sup>rd</sup> annual meeting of the American Association for the Advancement of Science (AAAS) was held in the Hynes Convention Center, Boston, MA, USA from Feb 16 to 20, 2017. This year’s theme was “*Serving Society through Science Policy*”, and attracted more than 20,000 participants from around the world including students, basic and industrial researchers, policy makers, healthcare specialists, environmentalists, engineers, space scientists, lawmakers and government officials from both the USA and abroad. Family science activities to promote a greater awareness of science for school children - as well as the general public - was once again a key event. More than 1000 families participated in this open science fair. The key developments in science with regard to medicine and health perspectives, policy decision, neuroscience research and related disciplines are summarized below.

### Thursday, February 16

The 1<sup>st</sup> day started with a special session organized by WesleyNexus Inc. (Bethesda, MD) on the “Wicked Problem” of climate change: what is it doing to US and us? This was followed by a seminar on scientist motivation, support and challenges for public engagement organized by Jessica Sickler (Pittsburgh, PA) comprising 3 speakers. Tracey Hollaway (Madison, Wisconsin) talked on connecting NASA data with user needs as a case study in public engagement.

\*Address correspondence to this author at the International Experimental CNS Injury & Repair (IECNSIR), Department of Surgical Sciences, Anesthesiology & Intensive Care Medicine, University Hospital, Uppsala University, SE-75185 Uppsala, Sweden; Tel/Fax: +46 18 24 38 99; Cell: +46 70 2011801; E-mail: [Sharma@surgsci.uu.se](mailto:Sharma@surgsci.uu.se)

Promoting meaningful public engagement: how and why to get scientists involved was discussed by Ezra Markowitz (Amherst, MA). Sriram Sunderarajan (Ames, Iowa) presented instilling a “Broader Impact” identity at Iowa State University. The other notable special session was the Bioscience Entrepreneurship organized by the AAAS. An afternoon key seminar was held on ‘The online scientist: Social media and public engagement’, organized by Erika Shugart (Bethesda, MD) in which 3 speakers presented their views. Raychelle Burks (Austin, TX) discussed ‘Scientist online: Visibility, vagaries and victories’. ‘Communicating science online: Scientist-media interactions’ was the topic of Sara Yeo (Salt Lake City, Utah). Nsikan Akpan (Arlington, VA) spoke on ‘Please watch: Navigating the social video snake pit’. The day closed with the AAAS President’s Address by Barbara Schaal (St. Louis, MO), followed by a lavish presidential reception for all delegates at the Hynes Convention Center.

### Friday, February 17

On 2<sup>nd</sup> day of the congress 4 special sessions and 2 seminars were held. The section “**Biology & Neuroscience**” comprised of 5 symposia, 3 of which were held on the 17<sup>th</sup> and 2 the next day. On 17<sup>th</sup> February Jane Roskmas (Vancouver, BC, Canada) and Terrence Sejnowski (La Jolla, CA) organized a symposium entitled ‘Innovative neurotechnologies and strategies from BRAIN initiatives’, with 3 speakers. Novel approaches to high-speed imaging of neural activity in the behaving brain were discussed by Elizabeth Hillman (Vancouver, BC, Canada). Sarah Stanley (New York, NY) presented on ‘Remote regulation of neural activity. Imaging

a human in motion'. The ambulatory microdose positron emission tomograph scanner was discussed by Julie Berfczynski-Lewis (Morgantown, VA). 'Optical nanoscale imaging: Unraveling the chromatin structure-activity relationship' was the theme of the 2<sup>nd</sup> Symposium organized by Vadim Backman (Evanston, IL). Xiaowei Zhuang (Cambridge, MA) demonstrated super resolution imaging of chromatin organization in individual chromosomes. Leonard Mirny (Cambridge, MA) elaborated on physical models of chromosomal domains, while Hao Zhang (Evanston, IL) presented on label-free super resolution imaging of chromatin structure and dynamics. The 3<sup>rd</sup> and final symposium focused on 'Science, ethics and engagement of the governance of gene drives: It takes a village', and was organized by Keegan Sawyer and Andrey Thevenon (Washington DC). Speakers included James P. Collins (Tempe, AR) discussing 'What are gene drives? How do they work? Why are they important?' Elizabeth Heitman (Nashville, TN) talked about informing the development of responsible governance with responsible science. Lastly, Jason Delborne (Raleigh, NC) discussed 'Incorporating public engagement in research and governance'.

In relation to AAAS and public policy another important scientific session was organized by Aidan Gilligan (Brussels, Belgium) and Peter Gluckman (Auckland, New Zealand), on 'A new blueprint for the ethics and principles of science policymaking'. Four speakers presented on a range of viewpoints. Julian Kinderlerer (Cape Town, South Africa) discussed 'Why science into policy has never been about "Truth" only: Our initiative's story', followed by Wilson Compton (Bethesda, MD) on 'What should we expect from the scientific community?' Michael Kazatchkine (Geneva, Switzerland) next discussed 'What we expect from the policymaking community?', with the session closing on Kathrin O' Hara's (Ottawa, Canada) talk on 'What we expect from the public, industry, media and interest group community?'

Shifting perspectives on dementia, science and health policy was the subject of a session under Medical Science and Public health program, organized by Ann Lam (Washington DC) and built around 3 talks. Rhoda Au (Boston, MA) presented 'Roads to dementia prevention: leveraging the past and enabling the future', followed by Jessica Langbaum (Phoenix, AZ) talking on 'The need for national engagement in Alzheimer's disease prevention strategies'. The final presentation, 'Alzheimer's disease: Prevention through dietary interventions' was discussed by Neal D. Barnard (Washington DC). Microbes and Humans: Effects on Health, Disease and Society was another session put together by Janet Rossant (Toronto ON, Canada), with talks by B. Brett Finlay (Vancouver BC, Canada) on the role of microbes in early childhood, followed by 'Deciphering the diet-microbiome-metabolism axis (Eran Elinav, Rehovot, Israel), and Hendrik Poiner (Hamilton, Canada) covering 'The benefits of time travel: Reconstructing ancient genomes and microbiomes'.

The highlights of the day include 3 topical lectures, and 1 plenary lecture. Alta Charo (Madison, WI) delivered 1<sup>st</sup> topical lecture on Human Gene Editing: Recommendations from US National Academics. Daniel Nocera (Boston, MA) delivered his talk on Global Energy Challenge. Solutions from Science to technology transition. John P. McGovern Award Lecture in the behavioral Sciences was given by Henry L. Roediger III (St. Louis, MO) entitled Making it Stick: The Science of Successful Learning.

The day's scientific sessions concluded with a plenary lecture by Naomi Orskes (Boston, MA) on 'The Scientist as Sentinel'.

### AAAS Awards and Prizes 2017. Special Events

The evening of the 17<sup>th</sup> was dedicated to the awarding of AAAS annual prizes on various categories. The AAAS Phillip Hauge Abelson Prize went to Ioannis Miaoulis, Museum of Science (Boston, MA). The Science Diplomacy Award was presented to Grace Naledi Mandisa Pandor from the Ministry of Science and Technology, South Africa. The Award for Scientific Freedom and Responsibility was bestowed on Kurt Gottfried of Cornell University (Ithaca, NY). Suzanne Gage (Liverpool, UK) received the AAAS Early Career Award for public engagement with science. Richard Tapia (Rice University, Houston, TX) received the Public Engagement with Science Award. The AAAS Mentor Award went to Ami Radunskaya of Pomona College (Claremont, CA) and the AAAS Mentor Award for Lifetime Achievement was given to Margret Werner-Washburne, University of New Mexico (Albuquerque, NM).

### Saturday, February 18

The 3<sup>rd</sup> day of the meeting continued the session "**Biology & Neuroscience**" organized around two additional symposia. 'RNA splicing at 40: Reflecting on scientific progress, policy and social justice' was the topic of the 4<sup>th</sup> Symposium organized by Pinna G. Abir-Am (New Haven, CT), with talks by Pinna G. Abir-Am on 'Historical perspectives on scientific anniversaries: Science policy to social justice', Louise Chow (Birmingham, AL) on 'Discontinuation of genes and regulation of high eukaryotic gene expression', and Ruth Sperling (Jerusalem, Israel) on 'From virus structure to spliceosome function via RNA splicing'. The 5<sup>th</sup> symposium, on 'The neuroscience of time and memory', was organized by Sheena Josselyn (Toronto, ON, Canada), with presentations by Howard Eichenbaum (Boston, MA) on 'Time, cells and memory', Alcino Silva (Los Angeles, CA) on 'Hippocampal engrams and time', and Sheena Josselyn (Toronto, Canada) on 'Temporal context and emotional memory'.

Other key highlights of this day were topical lectures delivered by Venki Ramkrishnana, 2009 Nobel Laureate in Chemistry (London, UK) speaking on 'Potential and risks of recent developments in Biotechnology'. Leila Takayama

(Santa-Cruz, CA) next discussed ‘Robotics: Towards a more human-centered future’, followed by Susan Lindee (Philadelphia, PA) on ‘The rise of the genome: Genetics after the bomb’.

The day ended with lavish international reception at the Presidential Tower of the Skywalk Observatory, presented by the UK Research Council.

### Sunday, 19 February

The 4<sup>th</sup> day of the meeting started with a session on ‘Assessing the impact of medical marijuana: The grass could be greener’ organized by Staci Gruber (Baltimore, MD). ‘Cannabis pharmacovigilance: Lessons from a living laboratory’ was presented by Mark Ware (Montreal, Canada), followed by Ryan Vandrey (Baltimore, MD) talking on ‘Cannabis research and policy: Lessons from the lab and field’. Staci Gruber (Belmont, MA) then discussed ‘Marijuana on the mind: Assessing the impact of medical marijuana’. The topical subject of ‘Serving aging societies globally through science, technology and innovation policy’ was organized by Naoki Saito and Kuniko Urashima (Tokyo, Japan), with participation by Luke Georgiou (Manchester, UK) discussing ‘Integrating health and social care to cope with an aging population: Innovation challenges’, followed by ‘Immigration, medical research and robots: US science and technology policy for an aging society’ given by David Hart (Arlington, VA), and then Nares Damrongchai (Bangkok, Thailand) discussing ‘Internationalization of aging in Thailand and the importance of biomedical innovation’.

Erin Faulconer (Seattle, WA) organized a symposium on ‘Big data synthesis in health policy’ with talks by Abraham Flaxman (Seattle, WA) on ‘Global burden of disease: Determining priorities on a global scale’, followed by Scott Dowell (Seattle, WA) who discussed ‘Big data needs for informing childhood investment policies’. Finally, Geospatial analysis: Distributing resources and interventions at a subnational level was presented by Peter Gething (Oxford, UK).

The day ended with a plenary lecture by S. James Gates Jr. (Baltimore, MD) on ‘Who talked about science and evidence-based policymaking’. This was followed by the Bill and Melinda Gates Foundation: Open Access to Scientific Research Reception for all delegates with the message of free and immediate access to research findings for the future of scientific innovation.

### Monday, 20 February

A highlight of the day was a Meeting with Science Editors special event where Jeremy M. Berg, Editor-in-chief of Science hosted a reception for all delegates with coffee and light refreshment. In this reception the Science family of journals was discussed with ethics of scientific publication at the final concluding session of the meeting.

### Poster Sessions

One important facet of the annual AAAS meeting are the poster sessions, which are divided into Student and General Poster sessions on several themes in the categories of Animal Science, Cellular Science, Environmental Science, Medicine, Brain and Behavior, Cellular and Molecular Biology, Medicine and Public Health, along with the physical, chemical, ecology, plant and computer sciences.

Selected key poster presentations in the neurosciences are summarized below.

### February 17

Friday’s poster session was devoted to the American Junior Academy of Science (AJAS) with 11 posters in Animal Science, 12 in Cellular Sciences, and 16 from the medicine section (apart from chemistry, earth science, engineering and other branches of science). Among the more interesting neuroscience-related posters were those: describing the effect of gabapentin on *Dugesia Tigrina*’s nervous system (Allison Kohl, Nebraska Academy of Science, Lincoln); using caffeine and taurine to improve memory retention in *Dugesia Dorotcephala* (Alex Jayyosi, Massachusetts Academy of Science, Worcester); studying the effects of toluene on memory retention in *Planaria* (Tal Usvyatsky, New Jersey Academy of Science, Piscataway); window to the brain using retinal biomarkers to diagnose Alzheimer disease (Archana Murali, Minnesota Academy of Science, St Paul); the effects of polyphenols in spices on the aggregation of amyloid beta peptide 1-40 (Swathi Srinivasan, Ohio Academy of Science); combinatorial effects of bitter melon and temozolomide on glioma cells (Farheen Zaman, Virginia Academy of sciences, Fredericksburg).

### February 18

This day’s poster session comprised of general session (8), Brain and Behavior (17), and Medicine and Public health (46). The student poster session dominated the day. Among the general posters some notable results related to neuroscience include: deconstructing depression (Per Svensson, Solna, Sweden); nanodelivery of drugs for neuroprotection in sleep deprivation-induced brain pathology (Aruna Sharma, Uppsala University, Sweden); a preliminary study showing that alcohol and carbon nanoparticles exacerbate nicotine neurotoxicity (Suraj Sharma, Uppsala University); neuroprotection in Alzheimer disease by nanodelivery of neprilysin with cerebrolysin (Hari Sharma, Uppsala University); evidence showing cerebrolysin reduces neuron-specific UCHL1 and brain pathology in Alzheimer disease (Dafin Muresanu, Cluj-Napoca, Romania); effects of waterpipe water on reward, antinociceptive and locomotor activity in rats (Ahmad Altarif, Irbid, Jordan).

Some key developments relating to Brain and Behavior posters included: Sox17 transgenic mice revealed functional suppression of beta-catenin in neuroprotection (Kimberly

Cruz, Washington, DC); a tool for diagnostic and staging synucleinopathies (Claire Erikson, Columbus, OH); neuroprotective efficacy of P7C3 compounds in models of Huntington disease (Lance Heady, Iowa City, IA); the role of dopamine D2 receptors in modulating alcohol-related behaviors (Vanessa Kob, Kingston, RI); evidence for peripheral actions of calcitonin gene-related peptide in migraine-like behavior (Anne Ojo, Twickenham, UK); exploring *Drosophila* HIFA regulation in neuronal cell mitochondrial retro-

grade signaling (Amara Thind, Irvine, CA); neuronal cell activity patterns predict cortical viability in a rodent model of ischemic stroke (Ellen Wan, Irvine, CA).

Overall the 183<sup>rd</sup> AAAS meeting was a highly highly successful even in which more than 20,000 delegates participated. The 184<sup>th</sup> AAAS annual meeting is scheduled for Austin, TX from February 15-19, 2018. All interested are welcome!