

Neurology and Neuroscience

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Society for Brain Mapping & Therapeutics, USA

From Nanoneurosurgery to supercomputing, and AI to smart intraoperative microscopy

The field of Brain Mapping has been evolving rapidly in the last few years. Brain Mapping is defined as the study of the anatomy and function of the brain and spinal cord through the use of a variety of techniques, including: imaging (including intra-operative, microscopic, endoscopic, and multi-modality imaging), immunohistochemistry, molecular & optogenetics methods, stem cell and cellular biology, engineering (material, electrical and biomedical), neurophysiology, and nanotechnology. Importantly, the field has gone from being defined by imaging alone to include not only imaging but also molecular/cellular and nano-level mapping with detailed genetic and connectomic maps.

In 2013 the Society for Brain Mapping & Therapeutics (SBMT), the Brain Mapping Foundation (BMF), and a few other organizations successfully helped the White House to formulate the Brain Research through Advancing Innovative Neurotechnologies (BRAIN) initiative. The Organization has also started a G20 Summit/Neuroscience-20 initiative as well as Brain technology and Innovation Park (BTIP). BMF has been funding a major partnerships with NASA and Federal Labs in order to integrate nanotechnology devices, imaging, cellular and molecular studies, artificial intelligence, supercomputing, and stem cell biology.

In this presentation, I will explain how SBMT's G20 Summit/Neuroscience-20 and BTIP advancing neuroscience globally by building international partnerships. I will demonstrate how we have impacted the field through innovation, integration, translation and commercialization of neurotechnologies. I will also discuss how emerging technologies such as nanoneuroscience, nanoneurosurgery, nanobioelectronics, neurophotonics, predictive modeling combined and Artificial Intelligence (AI) could provide game changing intraoperative brain mapping systems.

Speaker Biography

Babak Kateb is a neuroscientist with more than 20 years of research experience. His research has been focused on introduction of game changing diagnostics and therapeutics into clinical neuroscience. He is founding chairman and CEO of the Society for Brain Mapping and Therapeutics (SBMT), President and Scientific Director of the Brain Mapping Foundation and Director of National Center for Nano-Bio-Electronics and Director of Brain Technology and Innovation Park (BTIP); He is a recipient of NASA Tech Brief Award (2011) for his pioneering work on sniffing cancer cells using NASA's electronic nose and the SBMT Pioneer in Medicine Award (2015) for designing an FDA-approved device for microwaving cancer. He has edited two textbooks: "Textbook of Nanoneuroscience and Nanoneurosurgery", and "Neurophotonics and Brain Mapping". He has been involved in global neuroscience legislation/policies. He has chaired 7 briefings on Brain Mapping at the US Congress, chaired brain mapping days at the Canadian (2012) and Australian (2016) Parliaments. He has been one of the key players in President Obama's BRAIN initiative and co-author of the G20 summit/Neuroscience-20, and author of BTIP Initiative.

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