Picking Your Brain at the Molecular Level

Jacob Hooker

Associate Professor in RadiologyDirector of RadiochemistryAssociate Director of PET Core

CURRENT RESEARCH

Developing imaging tools to probe the living human brain for disease diagnostics and treatments

Our brain is an intricate network of neurochemicals, some of which communicate directly with each other while some others spectate until prompted to carry out a function. Imbalance in or dysfunction of these chemicals often triggers onset of mental illness, and therapeutics are designed to manipulate this brain—or neurochemical—activity. It is thus striking that we still have an incredibly limited understanding of how chemistry appears within the brain; we are developing drugs for something we know so little about! Dr. Jacob Hooker, Associate Professor of Radiology at Harvard Medical School, Associate Neuroscientist at Massachusetts General Hospital, and Director of Radiochemistry at the Martinos Center for Biomedical Imaging, develops imaging tools to non-invasively probe the living human brain at the molecular level during stimulation, at rest, and through drug manipulation. By creating novel techniques to enable data-rich, accessible imaging studies using positron emission tomography (PET) and magnetic resonance (MR), Dr. Hooker hopes to elucidate the molecules involved in healthy and diseased states of the brain and tissue.

Pioneers in visualizing neurochemistry, Dr. Jacob Hooker's inherently translational and interdisciplinary team involves a diverse group of biologists, chemists, and imaging scientists as well as collaborators in the Martinos Center for Biomedical Imaging and other academic specialists around the world. In order to understand the pathways involved in the onset and progression of disease, it is crucial to be able to see inside the living human brain to study its earlier time points and monitor development of the disease as it relates to physical symptoms over the course of a lifetime....

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AFFILIATION

Harvard University (Medical School)

EDUCATION

- Ph.D. in Chemistry, 2007,University of California, Berkeley
- B.S. in Textile Chemistry (Polymer Concentration), 2002 ,North Carolina State University
- B.S. in Chemistry, 2002,North Carolina State University

AWARDS

- Inventor of the Year, 2008
- Young Alumnus of the Year, 2009
- Outstanding Mentor Award, 2010
- Presidential Early Career Award for Scientists and Engineers (PECASE), 2010
- Talented 12 Award C&E News, 2015
- and 2 more...

RESEARCH AREAS

Life Science, Diagnostics, Immunology / Inflammatory, Neurological / Cognitive

FUNDING REQUEST

Your contributions will support Dr. Hooker as he develops next generation imaging tools to probe the chemical activity taking place inside the living human brain. Donations will help fund the annual operating budget of ~$2M required to support personnel, animal models, and equipment. With your generosity, Dr. Hooker's interdisciplinary lab will be able to develop and apply novel imaging scanners to study the molecular basis of Alzheimer's, schizophrenia, autism, and more!