

Brain Mapping Center SEMINAR SERIES

Sponsored by the UCLA Brain Mapping Center Faculty

The focus of these talks is on advancing the use of brain mapping methods in neuroscience with an emphasis on contemporary issues of neuroplasticity, neurodevelopment, and biomarker development in neuropsychiatric disease.

Hosted By: Roger P. Woods, MD, Neurology, UCLA

Total-Body Positron Emission Tomography: Imaging the Brain and Beyond



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The EXPLORER consortium recently completed construction of the world's first total-body PET/CT scanner. The 194.8 cm axial field of view of the EXPLORER scanner is sufficient to cover the entire human body in a single acquisition and allows total-body pharmacokinetic studies with frame times as short as 1 second.

The large increase in sensitivity arising from total-body coverage, as well as increased solid angle for detection at any point within the body, leads to roughly a factor of 40 signal gain over conventional PET/CT and PET/MR scanners for whole-body imaging. For a single organ, such as the brain, the gain is still a factor of 4-5. This allows PET studies to be acquired with unprecedented count density, improving the signal-to-noise ratio of the resulting images. Alternatively, the sensitivity gain can be used to acquire high-quality PET images at radiation doses on the order of that received for a roundtrip transatlantic flight, or with very short scanning times. The high sensitivity allows fast dynamic imaging at high signal-to-noise ratio, and the total-body coverage means that brain and cardiac blood pool are always in the field of view, greatly facilitating quantitative kinetic modeling studies. These capabilities could have a profound influence on how PET is used both in biomedical research and clinical practice.

This presentation will discuss the design and technical capabilities of the EXPLORER PET/CT scanner and report on the first human studies using a range of different protocols that provide initial evidence that support the capabilities of this system. Opportunities for studying the brain and brain-body interactions will be highlighted.

October 3, 2019 11:00am - 12:00pm

**Neuroscience Research Building (NRB 132)
Charles E. Young Dr. South**