

Is there a continued role for PET in studies of normal human cognition?

Organizers:

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In a recent commentary (Cumming, Neuroimage, 2013), it was argued that the neuroimaging field no longer employs positron emission tomography (PET) to any great extent in studies of normal human cognition. Although still an important imaging device in patient studies, PET seems to have been supplanted by fMRI. In this workshop, we hope to demonstrate that there are still many cognitive neuroscience questions that PET can help address. Barry Horwitz will discuss how PET can continue to be used in studies that require interrogation of brain processes (e.g., language production) or brain areas (e.g., temporal pole) that are difficult to image with fMRI. Hartwig Siebner will show that important advances will continue to be made in terms of integrating neurotransmitter involvement with functional activation. As examples, investigation of dopamine function in cognitive processes will be presented by Kristina Simonyan for speech production and by Alain Dagher for reward response to stimuli such as music. We hope that the functional imaging community will learn that performing PET may well provide increased insight into the neural basis of normal cognitive function.

Learning Objectives:

1. Attendees will increase their understanding of recent PET studies that provided insight into specific aspects of normal human cognition.
2. Attendees will increase their understanding of the use of PET to measure various neurotransmitter signals in humans during the performance of specific cognitive tasks.
3. Attendees will increase their understanding of how PET neurotransmitter investigations can be combined with fMRI activation and network analysis studies.

Introduction and PET activation studies of language production and comprehension

Barry Horwitz, NIDCD-NIH, Rockville, United States

Multimodal PET/MRI studies - new developments

Hartwig Siebner, DMSc, Danish Research Centre for Magnetic Resonance, Hvidovre, Denmark

Combining neurotransmitter data with fMRI in speech production studies

Kristina Simonyan, Mount Sinai School of Medicine, New York, United States

PET Measures of in vivo dopamine signaling in reward processing

Alain Dagher, McGill University, Montreal, Quebec, Canada