Applications of functional brain imaging have evolved from blood flow, metabolism, neurochemistry, to 'molecular' imaging during the past 3 decades in parallel to continuing developments of brain imaging technology and radiotracers. These imaging technologies have unveiled physiology of the brain and pathophysiology of various brain disorders in living human subjects. Owing to widespread clinical availability of tomographic scanners and radiotracers, some of these technologies and medical findings have been translated to clinical applications such as dementia workup and presurgical epilepsy evaluation. In this session, recent research developments and clinical applications of functional brain imaging will be reviewed, and future directions of brain imaging research will be discussed.