

Marcus E. Raichle, a neurologist, is a Professor of Radiology, Neurology, Neurobiology and Biomedical Engineering at Washington University in St Louis. He is a member of the National Academy of Sciences, The Institute of Medicine and the American Academy of Arts and Sciences and a Fellow of the American Association for the Advancement of Science.

He and his colleagues have made outstanding contributions to the study of human brain function through the development and use of positron emission tomography (PET) and functional magnetic resonance imaging (fMRI). Their landmark study (Nature, 1988) described the first integrated strategy for the design, execution and interpretation of functional brain images. It represented 17 years of work developing the components of this strategy (e.g., rapid, repeat measurements of blood flow with PET; stereotaxic localization; imaging averaging; and, a cognitive subtraction strategy).

Another seminal study led to the discovery that blood flow and glucose utilization change more than oxygen consumption in the active brain (Science, 1988) causing tissue oxygen to vary with brain activity. This discovery provided the physiological basis for subsequent development fMRI and caused researchers to reconsider the dogma that brain uses oxidative phosphorylation exclusively to fuel its functional activities.

Finally seeking to explain task-induced activity decreases in functional brain images they employed an innovative strategy to define a physiological baseline (PNAS, 2001; Nature Reviews Neuroscience, 2001). This has led to the concept of a default mode of brain function and invigorated studies of intrinsic functional activity, an issue largely dormant for more than a century. An important facet of this work was the discovery of a unique fronto-parietal network in the brain that has come to be known as the *default network*. This network is now the focus of work on brain function in health and disease worldwide. Of particular interest is the fact that this newly-discovered network is a primary target of Alzheimer's disease.

In summary, the Raichle group has consistently led in defining the frontiers of cognitive neuroscience through the development and use of functional brain imaging techniques.