**LRDC Joint Appointments Spreading Across the University**

The Department of Neurological Surgery isn’t the first area that comes to mind when you think of LRDC joint appointments, but that’s exactly where Walter Schneider has recently received an appointment. Working with colleagues at LRDC and UPMC, Walt has developed methods to map human network level cortical processing—providing information on the component structures of the brain.

Walt has been at the forefront of studies of brain imaging since its inception, beginning with identifying the first Nature paper in fMRI back in 1993. His recent work in brain connectivity methods have made it possible to identify hubs—the brain's most globally connected regions. Hub regions are essential for coordinating brain functions because of their connectivity with numerous regions with a variety of specializations.

Taking this knowledge one step further, Walt has applied his expertise about connections in the brain to high definition fiber tractography (HDFT), a brain imaging technique that shows how cognitive functions are transmitted through fibrous brain tracks, and how those functions are connected throughout the brain. HDFT has multiple applications in neurosurgery and neuroscience. Walt and colleagues at the University of Pittsburgh Medical Center (UPMC) and the Surgical Neuroanatomy Lab, have been using HDFT for precise neuroanatomical studies of brain connectivity for two years and have produced dramatic progress. The HDFT technology was a critical element in the first ever projection of fiber tracts to the surface of the skull in real time during brain surgery to aid tumor removal. Other applications of HDFT include diagnosis of Traumatic Brain Injury (TBI), neurosurgical planning, and training programs to increase both brain tissue and cognitive capacity. A colorful representation of HDFT is on the cover of Neurosurgery Department 2010 Annual Report and on the department’s website. Read more about Walt’s work and view a HDFT presentation in the LRDC lobby display case.

**Recent Publications**