POST-DOCTORAL RESEARCH FELLOWSHIP IN NEUROIMAGING

We are seeking a post-doctoral research fellow to join us to explore, analyze, and publish findings from a rich dataset we are collecting through a NIH-funded project on human hippocampal structure and function in healthy controls and patients with epilepsy. The backbone of our data collection is ultra high resolution in vivo imaging of the hippocampus that allows clear and consistent visualization of hippocampal subfields along the entire length of the hippocampus from head to tail. We are using a MRI acquisition method developed during a previous project and employing it on a Prisma 3T scanner and 7T scanner (also Siemens). In addition to the high resolution structural imaging, we are also collecting hippocampal MRS (including glutamate), multi-shell DTI, and rs-fMRI at 3T, and hippocampal memory task-based fMRI and GluCEST at 7T. In addition to the imaging data, we are collecting neuropsychological data including broad IQ and memory measures on all participants that can be correlated with our multimodal imaging data and hippocampal morphology. Lastly, we will be collecting hippocampal tissue on patients undergoing epilepsy surgery, and through excellent partnerships with basic science collaborators we will be exploring biochemical, synaptic, and epigenetic data collected from each hippocampal subfield. Together these data provide a structure of vertically integrated multi-scale neuroscience including technical, clinical, behavioral, cellular, molecular, and genetic domains.

Populations under study:

- Healthy adults
- Temporal lobe epilepsy patients with well-controlled seizures
- Drug-resistant temporal lobe epilepsy patients
- Epilepsy surgery patients

Major goals of the project and other major areas of interest:

- Compare the performance of ultra high resolution hippocampal imaging at 3T and 7T
- Assess differences in the internal structure of the epileptic hippocampus between well-controlled and drug-resistant patients
- Understanding the relationship between hippocampal morphology and memory
- Advancing techniques in high resolution hippocampal imaging and analysis, particularly in regard to morphology and direct visualization of subfields
- Determine how subtle imaging abnormalities on in vivo ultra high resolution imaging relate to histopathologic and molecular findings in ex vivo tissue
- Explore epigenetic changes associated with tissue changes in the epileptic human hippocampus

Qualifications:

Given the broad scope of this project, applicants from a range of backgrounds are encouraged to apply and need not have expertise in all the areas described above. A PhD or MD/PhD in neuroscience, engineering, computer science/image analysis, psychology, or related fields will be considered. Expertise either in analysis of functional/structural MRI or computer image analysis, especially segmentation or machine learning approaches, is desired. Excellent verbal communication skills, critical thinking, and self-direction are essential.

The PI, Dr. Larry Ver Hoef, is an Associate Professor of Neurology and Biomedical Engineering at the University of Alabama at Birmingham (UAB) with expertise in clinical epilepsy, epilepsy surgery, clinical MRI interpretation, and MRI physics. The greater Birmingham area has a population of ~1 million, and is considered by many to be the “Best-kept secret of the South”. Residents enjoy a low cost of living, allowing post-docs and students to live close to work with a high quality of life. Please send a CV, a statement of research interests and background, and 3 references to Dr. Ver Hoef at LVERHOEF@UABMC.EDU. Feel free to email questions you have as well.