Postdoctoral Fellowships in 7 T Imaging Biomarker Development Targeting Frontotemporal Dementia

Perelman
**School of Medicine**
UNIVERSITY of PENNSYLVANIA

Description of Research:

Dr. Dylan Tisdall, together with Drs. Murray Grossman and Jim Gee, is recruiting two postdoctoral fellows to develop new 7 T imaging biomarkers to improve diagnosis, stratify phenotypes, and quantify treatment efficacy in frontotemporal dementia and related diseases. This project combines the resources of the Penn Image Computing & Science Lab (PICSL), the Robust Methods for Magnetic Resonance Group (RMMR), and Penn Frontotemporal Dementia Center (FTDC) at University of Pennsylvania. Depending on fellows' interests, work will include the development of:

- novel analysis methods to generate quantitative biomarkers from our imaging data, working with Dr. Gee in PICSL, and Dr. Corey McMillan's Imaging Core in the FTDC;
- novel pulse sequences for both *in vivo* and *ex vivo* applications, with Dr. Tisdall in the RMMR;
- *ex vivo* MRI/histopathology experiments, with Dr. David Irwin's histopathology lab in FTDC.

The major goals of the project will be 1) the integration of *ex vivo* whole-hemisphere (and potentially whole-brain) 7 T MRI with targeted histopathology to generate detailed understanding of the relationship between microscopic disease processes and mesoscopic imaging features; and 2) the translation of these findings to *in vivo* biomarkers using both novel pulse sequences and image analysis methods. The fellows will work with Dr. Tisdall to build on the existing *in vivo* and *ex vivo* 7 T MRI program at the FTDC, led by Dr. Grossman, in collaboration with image analysis researchers in PICSL, led by Dr. Gee.
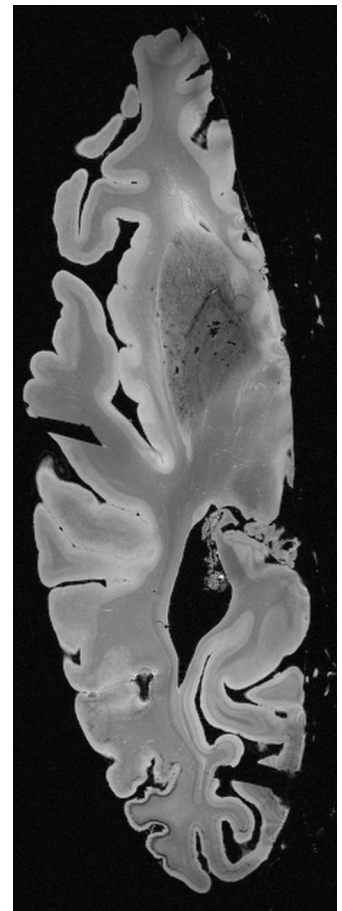
Qualifications:

Applicants should have a PhD in Biomedical Engineering, Computer Science, Electrical Engineering, or a related field. A track record of research in the acquisition and analysis of medical imaging data, particularly MRI, is preferred. Experience with ultra-high-field MRI neuroimaging is especially valued, as is experience with pulse sequence development and/or MRI reconstruction, particularly in the Siemens IDEA environment; however, researchers with strong computer programming backgrounds in C/C++ can also receive training and supervision to learn pulse sequence development during the fellowship. Experience with Python, Matlab, Mathematica, or other tools for rapid prototyping and data analysis is also desired.

Neuroimaging Research at Penn:

The University of Pennsylvania hosts a strong, collaborative, multidisciplinary research program in bioengineering and neuroscience with a focus on neuroimaging. Research-dedicated MRI instrumentation includes a 7 T Siemens Terra scanner, two 3 T Siemens Prisma scanners as well as research-shared 1.5 T and 3 T scanners in the adjacent hospital, and both large and small-bore systems for specimen and animal studies. Our research-dedicated 7 T and 3 T scanners also have Kineticor motion-tracking cameras installed, which can be integrated with the new sequences developed as part of this project.

Applying:

The University of Pennsylvania is an equal opportunity employer and women and applicants of underrepresented minorities are particularly encouraged to apply.

Please contact Dr. Dylan Tisdall (mtisdall@pennmedicine.upenn.edu) and provide 1) a cover letter outlining research interests, experience, and qualifications; 2) a CV; and 3) the names of two references.