



Award for Excellence in Technology Transfer

Diffusion Tensor Magnetic Resonance Imaging

Department of Health and Human Services

Eunice Kennedy Shriver National Institute
of Child Health and Development

Diffusion tensor imaging (DTI) is an MRI method that produces in vivo magnetic resonance images of biological tissues sensitized with the localized and contrasting characteristics of water diffusion, producing microscopic images of tissues. Water molecules become excited when exposed to a strong magnetic field, which causes the protons in water molecules to move in a coordinated and precise way. The intensity of each image element (voxel) reflects the best estimate of the rate of water diffusion at that location. Because the mobility of water is driven by thermal agitation and highly dependent on its cellular environment, the hypothesis behind DTI is that findings may indicate (early) pathologic change. The main clinical application of DTI has been neurological disorders, especially for the management of acute stroke patients.

The NIH Office of Technology Transfer (OTT) licensed the patent estate (mainly U.S. Patent 5,539,310) claiming this technology to the “big-three” MRI instrumentation manufacturers: General Electric, Philips, and Siemens. The three companies have a DTI feature built into their existing MRI devices, which have been helpful in the imaging, diagnosis, and prevention for stroke patients.

NIH OTT also granted a license to Bruker BioSpin for use of the technique in MRI devices directed toward laboratory animals. Drs. Peter Basser, Denis LeBihan, and Carlo Pierpaoli, the inventors of the technique, were instrumental in actively identifying collaborators, potential licensees, and infringers of the technique.

Contact:

Michael Shmilovich
301-435-5019
shmilovm@mail.nih.gov

Nominator:

Steven Ferguson
Deputy Director, Licensing &
Entrepreneurship
National Institutes of Health

Other Winners:

Dr. Peter J. Basser
Dr. Denis LeBihan
Dr. Carol Pierpaoli