

## SYSTEM FOR MAGNETIC RESONANCE SPECTROSCOPY OF BRAIN TISSUE FOR PATTERN-BASED DIAGNOSTICS

### Technology Summary

The need for noninvasive evaluation of brain anomalies is evident. Computed Tomography and Magnetic Resonance Imaging (MRI) appearance have been used for early detection of cancer. However, by either method one cannot consistently distinguish radiation necrosis or benign lesions from malignant tumors. MRS has shown promise since patterns indicative of abnormal tissue appear in brain MRS scans while the corresponding MRIs still appear normal. Use of reliable MRS-based patterns could enable earlier detection and, if the scans contain sufficiently distinctive and reliable markers, augment or substitute for histological grading, guide surgical intervention at tumor margins and areas of local invasion, and monitor radiation or chemotherapy progress

**Available for licensing and commercial development is a system for preprocessing magnetic resonance spectroscopy (MRS) data of brain tissue for pattern-based diagnostics.** The MRS preprocessing system includes an MRS preprocessing module that executes an operation that normalizes MRS spectrum data, recalibrates, and scales the normalized MRS spectrum data, and then renormalizes the scaled MRS spectrum data. The resulting preprocessed MRS data is used to assist in identifying abnormalities in tissues shown in MRS scans. Raw MRS spectrum data and scaling the raw MRS spectrum data is achieved by a plurality of weighting constants to generate a preprocessed MRS spectrum data. The method may also include providing raw MRS spectrum data, recalibrating the raw MRS spectrum data, and scaling the recalibrated MRS spectrum data by using a plurality of weighting constants to generate a preprocessed MRS spectrum data.

### Potential Commercial Applications

- MRI Imaging
- Brain Imaging
- Neurology

### Competitive Advantages

- Preprocessing of MRS spectra can significantly improve their diagnostic utility for automated consultation of pattern recognition models
- Use of several techniques in combination greatly increases available proton MRS information content

**Inventors:** Jon Wilkes, Dan Buzatu

### Publications:

“Improving proton MR spectroscopy of brain tissue for noninvasive diagnostics.” *J. Magn. Reson. Imaging*. 2010 Oct;32(4): 818-29. PMID: [20882612](#)

### Intellectual Property:

United States patent: US [8,880,354](#) B2, issued 11.04.2014

European patent application: [EP2010830773.7](#), filed 11.12.2010

**Product Area:** Devices

**FDA Reference No:** E-2009-011

### Licensing Contact:

Bill Ronnenberg, JD, MIP, MS  
FDA Technology Transfer Program  
Email: [FDALicensing@fda.hhs.gov](mailto:FDALicensing@fda.hhs.gov)  
Phone: 240-402-4561