

# Pathology Without the Biopsy



Eva-Maria Ratai  
Assistant Professor, Department of Radiology

## CURRENT RESEARCH

### Imaging results lead to unexpected diagnostic abilities

MR Spectroscopy (MRS) is a noninvasive tool used to measure the metabolism in the brain or other parts of the body. Thus, MRS offers doctors the opportunity to obtain chemical information from the brain non-invasively and non-surgically. Providers can then use the chemical information for diagnostics, for monitoring disease progression or the effects of therapeutic treatments, and for understanding the pathogenesis of disease. Dr. Eva-Maria Ratai, Assistant Professor at Harvard Medical School and Director of Clinical Magnetic Resonance Spectroscopy at Massachusetts General Hospital, is a leader in using MRS to investigate multiple types of central nervous system diseases. Through her research, Dr. Ratai hopes to advance understandings of central nervous system diseases through the application of advanced neuroimaging techniques, specifically MRI and MRS. Because of her strong focus on the advancement of these techniques, rather than a single disease, her work encompasses multiple diagnoses as she hopes to improve patient care, diagnosis, and prognosis.

So why does MRS have a leg up over other tools? Neurochemical changes often precede anatomical changes. Therefore, Dr. Ratai can make predictions about diseases prior to dysfunction. Additionally, she is in the unique position of working as both the Director of Clinical Magnetic Resonance Spectroscopy, where she has everyday exposure to pediatric and adult patients and as an investigator who, in her own research, is advancing imaging tools that will help improve diagnosis and prognosis for the diseases that can affect those patients. Because of her joint role of administrator and researcher, Dr. Ratai is able to witness the real life ramifications...

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## AFFILIATION



Harvard University (Medical School)

## EDUCATION

- B.S., Physical Chemistry, 1996, Westfälische Wilhelms-Universität, Münster, Germany
- Ph.D., in Physical Chemistry, 2000, Westfälische Wilhelms-Universität, Münster, Germany
- Postdoctoral Researcher, Chemistry, 2002 - 2004, University of California
- Research Fellow, in Radiology, 2002 - 2004, Massachusetts General Hospital

## AWARDS

- Elected to Sigma Xi Scientific Research Society, 2001
- New Entrant Stipend Travel Award, 2003
- Partners in Excellence Award, 2006
- Partners Radiology Research Award Finalist, 2009

## RESEARCH AREAS

Life Science, Diagnostics, Immunology / Inflammatory, Metabolic / Diabetes

## FUNDING REQUEST

Your contributions will support the continued research of Dr. Eva-Maria Ratai, Assistant Professor at Harvard Medical School, as she advances the understanding of the central nervous system. Donations will fund the necessary costs for each project including patient recruitment, personnel, and MRI scanning. While most of the funding will support personnel and their continued education, MRI scanning costs at \$588/hour and Dr. Ratai's lab could benefit from funds to reduce the burden of the cost. Join in directly impacting patient care through advanced neuroimaging techniques!