

MRI in an era of multi-scale neuroscience: Where do we go from here?

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In this talk, I will explore how MRI is currently used in neuroscience, the role the ISMRM community is (and isn't) playing in these investigations, and which areas of future development in MRI might yield the greatest impact to neuroscience. While one cannot hope to cover such a topic comprehensively in a brief lecture, I will choose illuminating examples from several of the following topics:

- FMRI: From functional localization to integration of function
- Diffusion, connectivity and the function-structure relationship
- Connections spans many scales - so must connectomics
- Quantitation and brain tissue microstructure
- Stimulation and the power of causal experiments
- The need for validation and animal models
- Glia: brain glue or neural overlords?
- Multi-modal imaging: when MRI is not enough
- MRS and the role of neurotransmitters
- Big data, open data