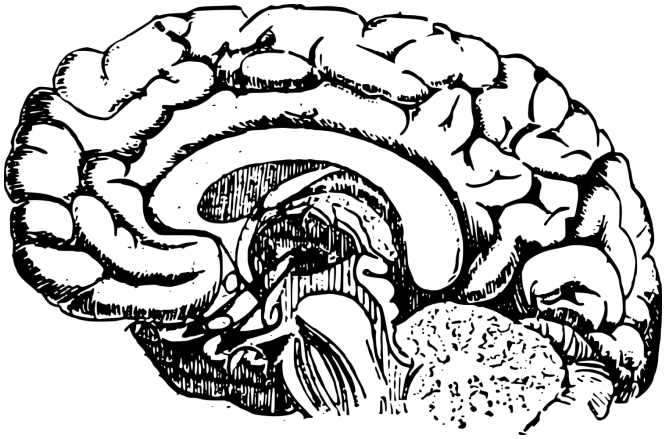
BOLD view of white matter

15 January 2018, by Bill Snyder



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The brain consists of gray matter, which contains the nerve cell bodies (neurons), and white matter, bundles of long nerve fibers (axons) that until recently were considered passive transmitters of signals between different brain regions.

Now Zhaohua Ding, Ph.D., and colleagues in the Vanderbilt University Institute of Imaging Science have detected synchronous BOLD signals in white matter reflecting neural activity both in a resting state and in response to functional loading.

Their findings, published in the *Proceedings of the National Academy of Sciences*, support the notion that synchronous BOLD correlations representing functional connectivity are present in white matter and that neural activities are encoded in white as well as gray matter.

The BOLD (blood oxygenation level dependent) signal detected by functional magnetic resonance imaging reflects changes in the magnetic properties of blood as it transports oxygen to brain tissue.

These findings suggest a new way to investigate diseases such as Alzheimer's and multiple sclerosis associated with a failure of white matter functional integrity.

More information: Zhaohua Ding et al. Detection of synchronous brain activity in white matter tracts at rest and under functional loading, *Proceedings of the National Academy of Sciences* (2017). DOI: 10.1073/pnas.1711567115

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