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Direct visualization of remyelination in multiple sclerosis using T₂ weighted high-field MRI

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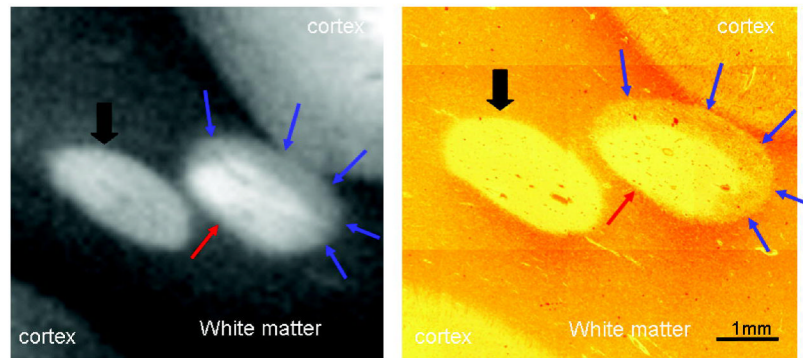
In multiple sclerosis (MS), remyelination may restore conduction and prevent axonal degeneration¹. Ability to monitor remyelination in MS *in vivo* would benefit natural history studies and clinical trials of novel drugs². High-field MRI (3T) is a promising tool to detect remyelination. We scanned a block of *post mortem* MS brain at 9.4T. Histology revealed two areas of demyelination, and one showing remyelination. These findings corresponded to distinct changes visible on the T₂ weighted MRI (figure). As human high-field MRI systems become increasingly widespread, remyelination in patients with MS may become detectable on T₂ weighted scans.

References

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 Demyelinated (block arrow) and partially remyelinated (red arrow= demyelinated; blue arrows= remyelinated) lesions in *post mortem* MS brain. Spin-echo MRI (relaxation time= 3000ms, echo time= 60ms, field of view= 30×30mm², matrix size 256×256 [$\sim 117\mu\text{m}^2$ in-plane resolution], 16 averages). The corresponding histological section was immuno-stained for myelin basic protein.