Mild traumatic brain injury impairs the coordination of intrinsic and motor-related neural dynamics

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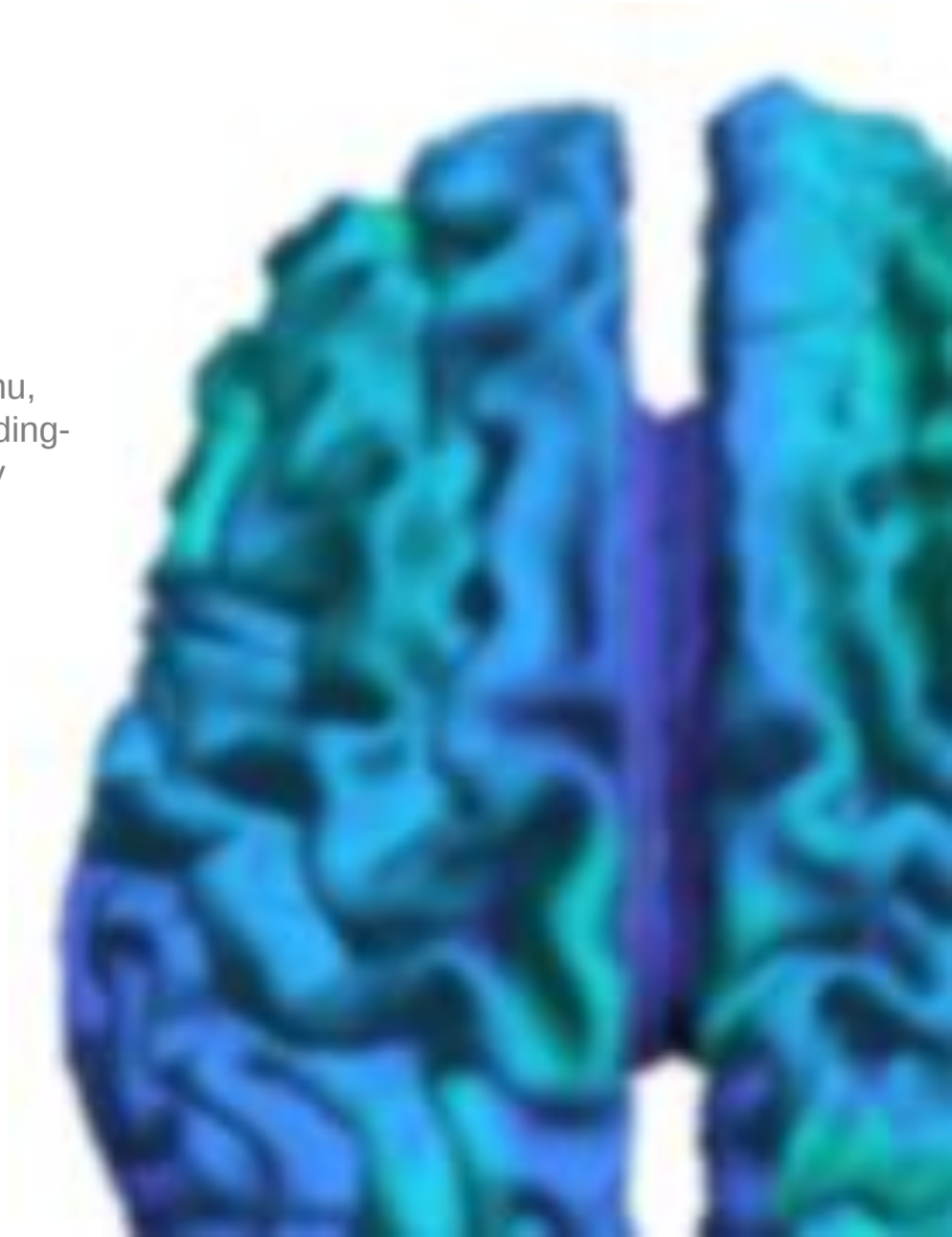
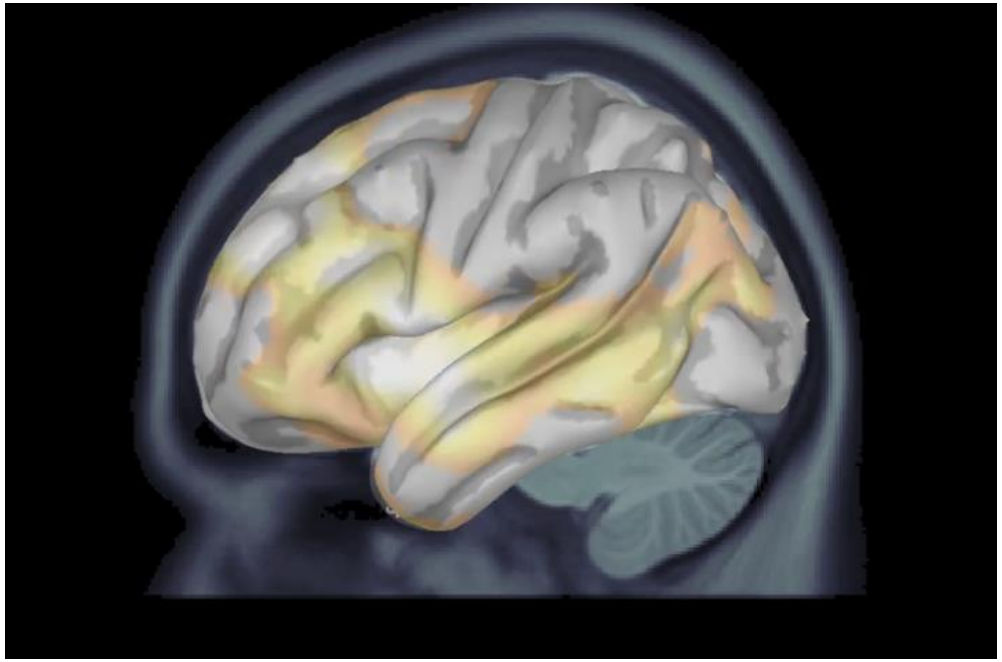


Brain activity at the speed of thought



Magneto/Electroencephalography

Neural activity

Objective: Measure transient neural bursting, a marker of thalamocortical and corticocortical circuits, mTBI in the subacute phase (mTBI n=26, control n=22)

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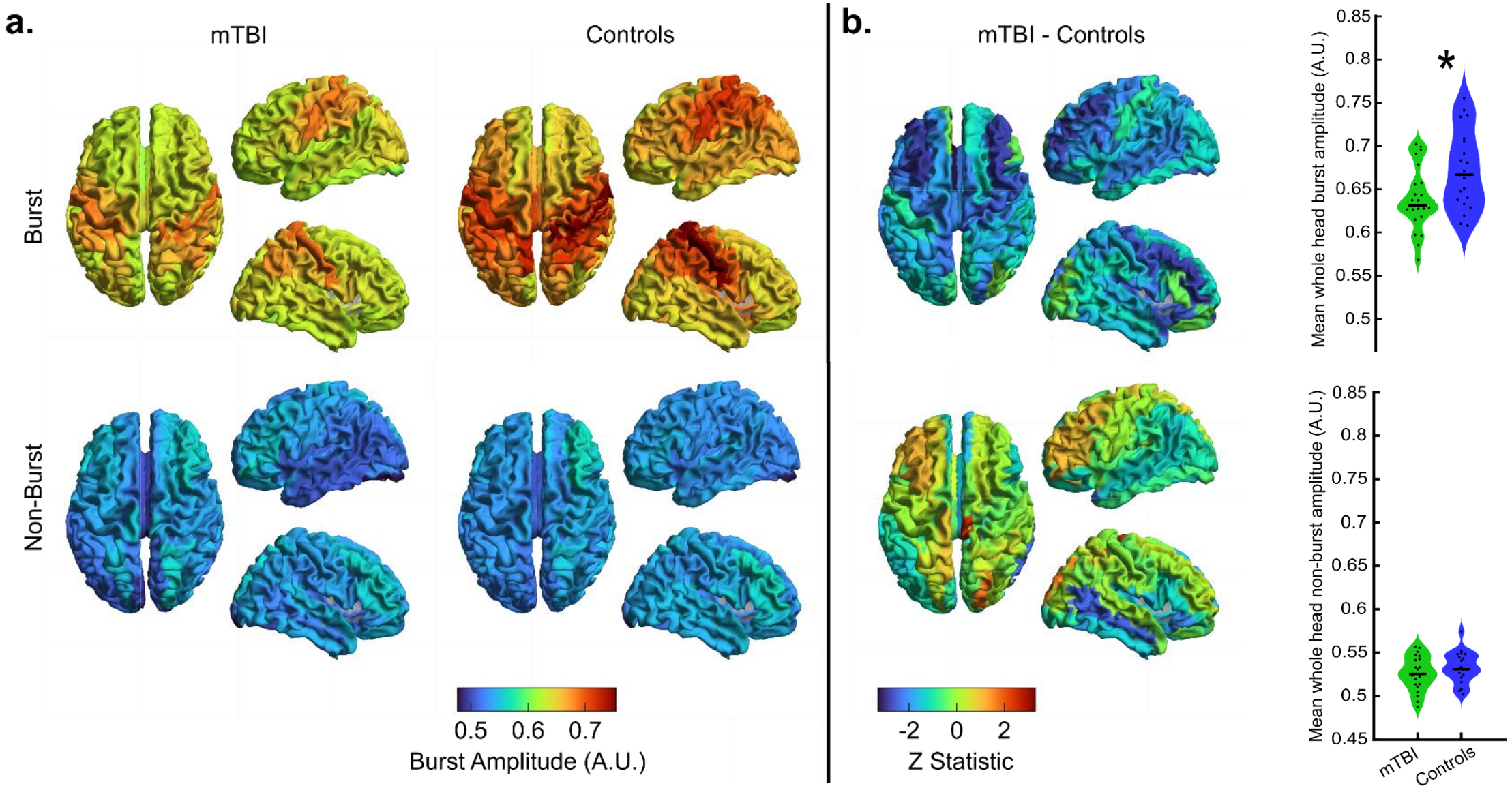
mTBI compromises activity in the neural burst state



Source: Rier et al 2021, *NeuroImage: Clinical*

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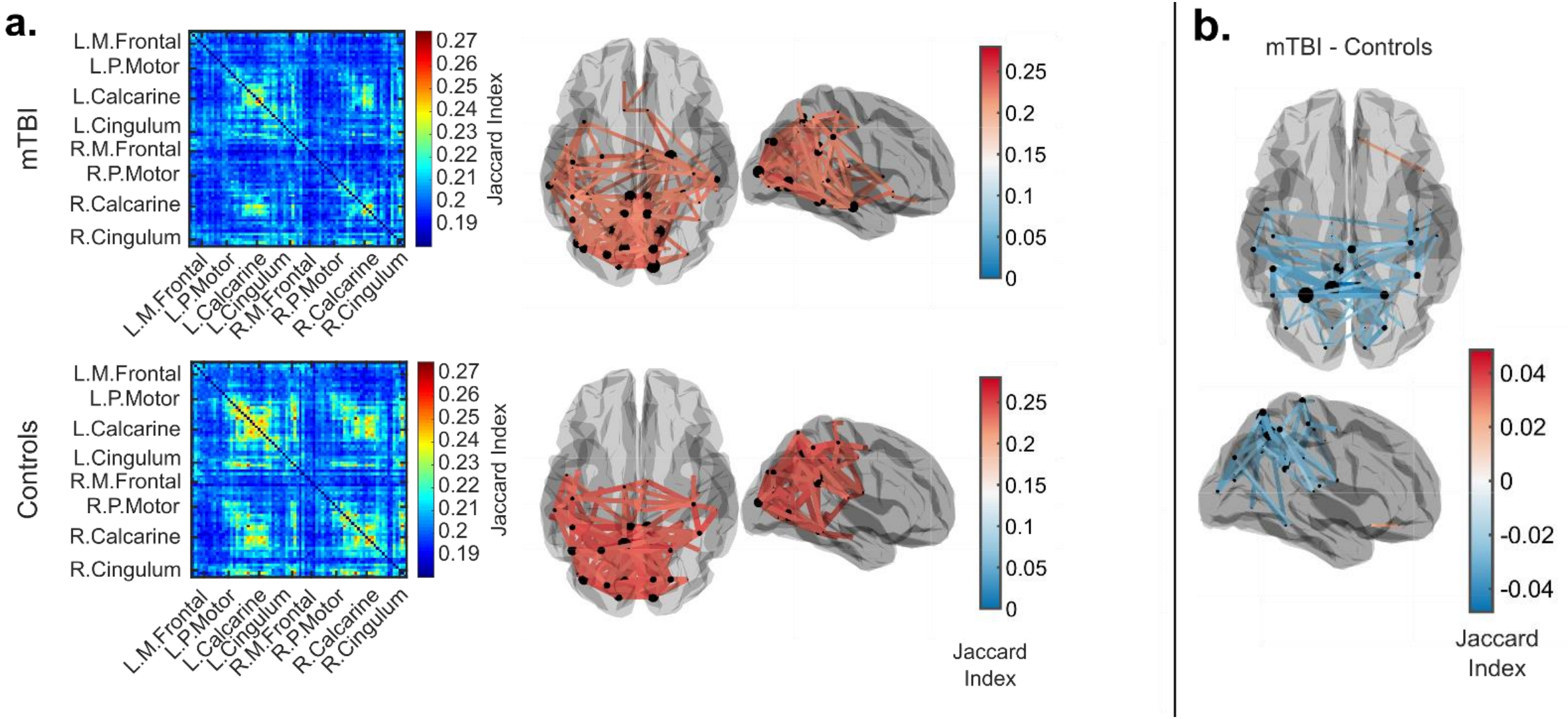
mTBI impairs the coordination of coincident neural bursting



Source: Rier et al 2021, *NeuroImage: Clinical*

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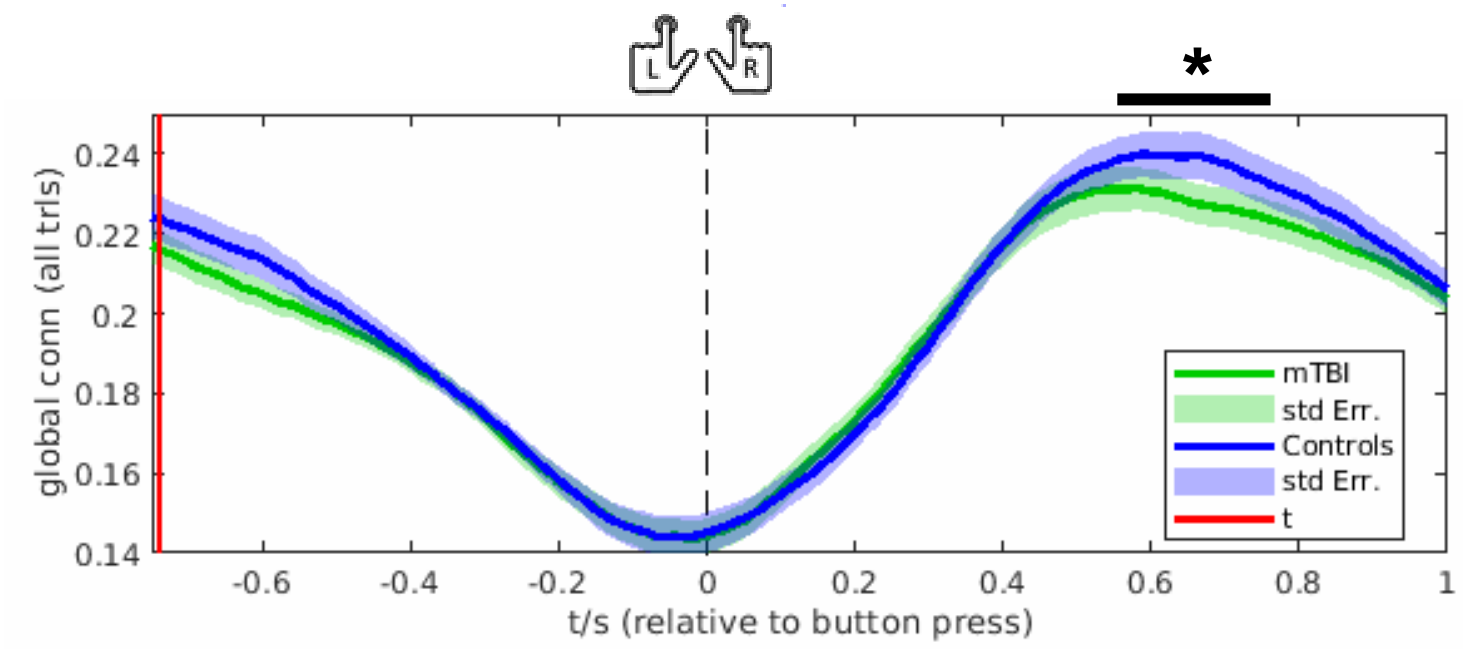
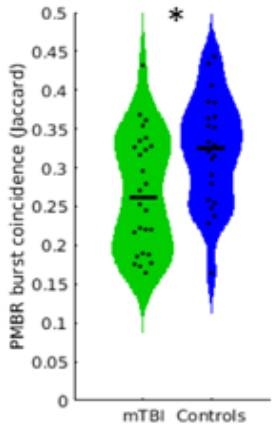
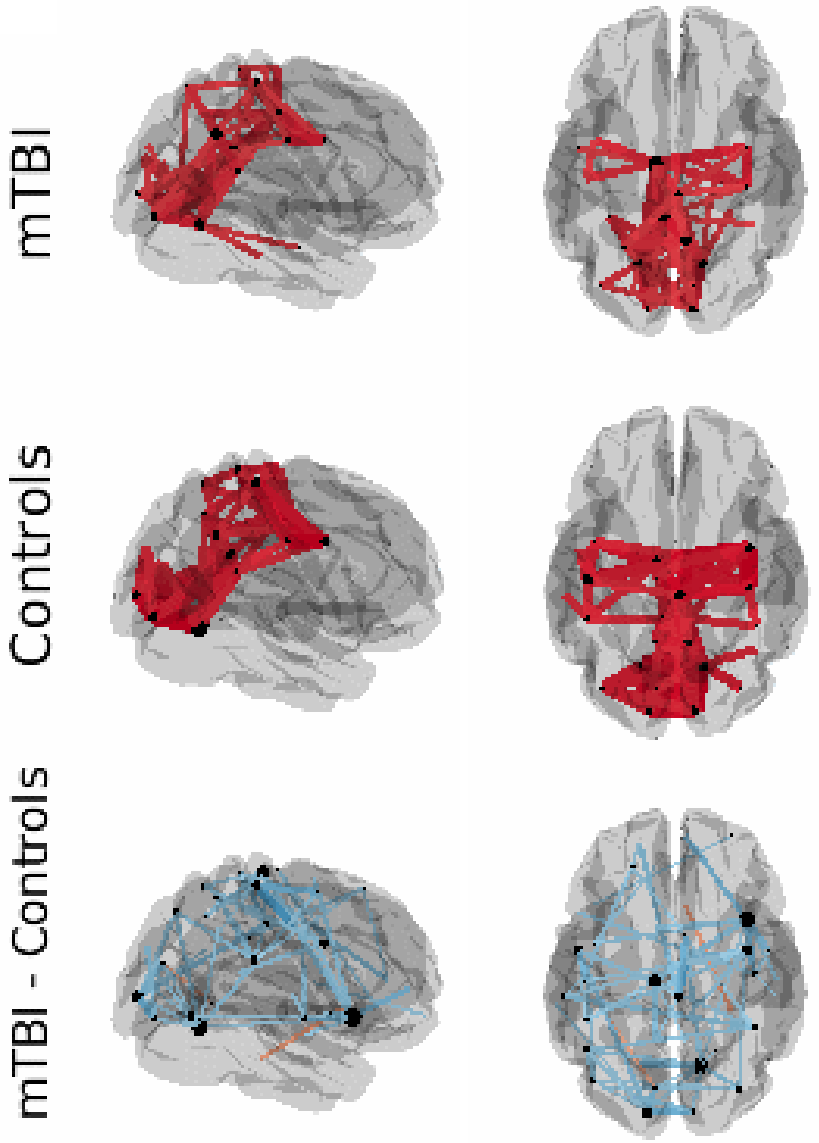
mTBI motor network dynamics are dysrhythmic

Post-movement motor system recalibration is deficit in concussion, evidenced by **bilateral burst decoupling – suggesting microstructural alterations to corpus callosum**







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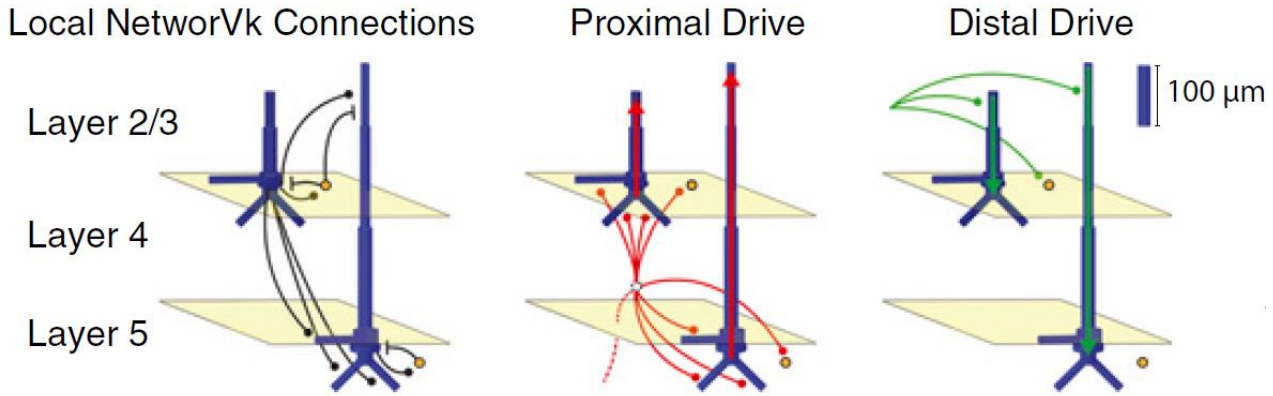
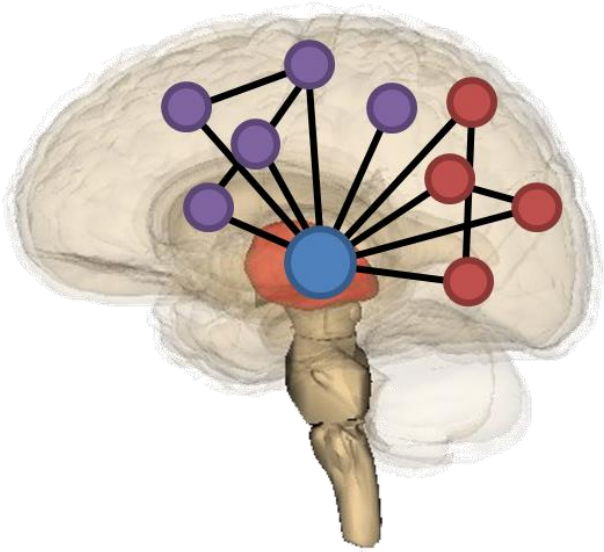
mTBI disrupts **bursting dynamics**

- mTBI results in multiscale neurophysiological disruption
- Manifests as deficits in transient neural events known as **bursts**
- These bursts are driven by interactions between thalamocortical and cortico-cortical inputs
- Suggesting large-scale perturbations in these circuits after mTBI
- **Future directions:** test in on-head MEG





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