Klinikum rechts der Isar

Technische Universität München

Ventricular border movement drives CSF transport and clearance

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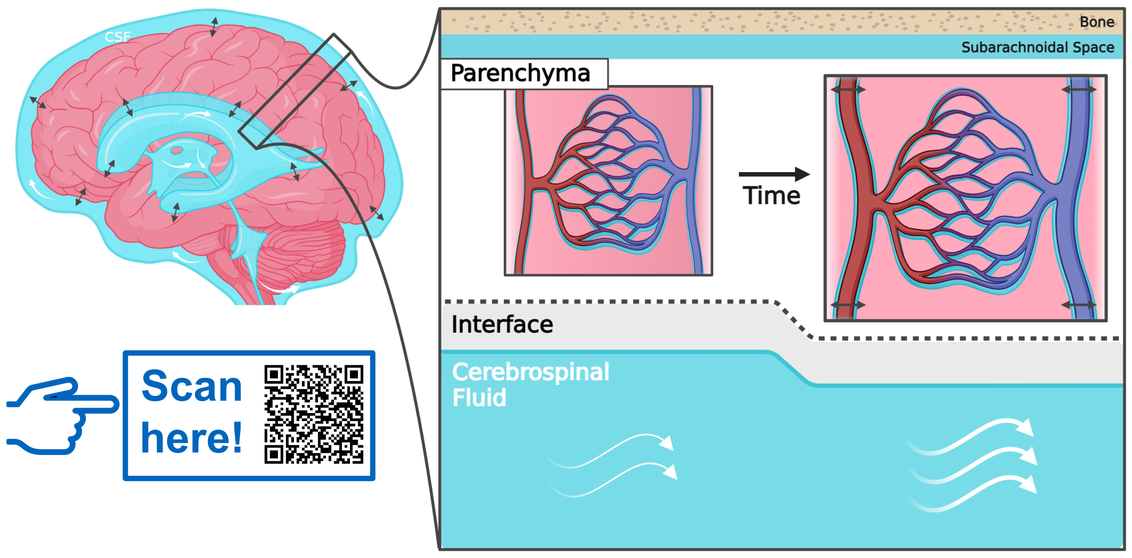
Introduction

- Human MRI-studies indicate that global grey matter (gGM) activity drives CSF flow [1,2,3,4]
- It is unclear, which mechanisms mediate gGM-effects on CSF
- **We hypothesize that gGM-activity induces ventricular border movement, which influences CSF flow and clearance**

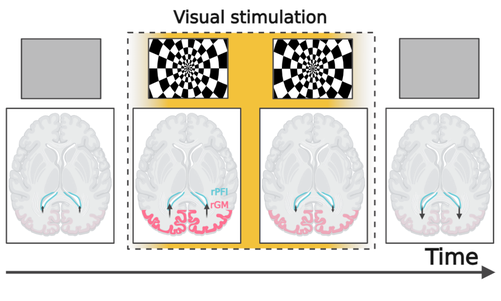
Methods

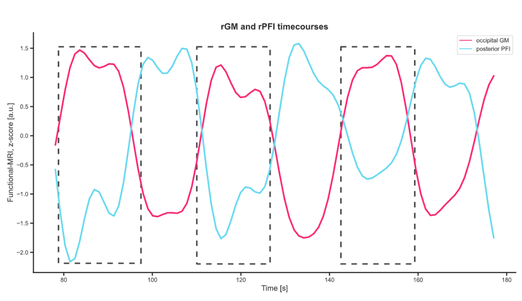
- Data used: open-source visual stimulation (n=16, 7T) and sleep (n=33, 3T) **fMRI-data**, [4,5] own awake **simultaneous** (n=57, 3T) **^{18}F-DOPA-PET/MRI data**
- Tracking partial volume effects at ventricular border: **Parenchyma-Fluid-Interface (PFI)**



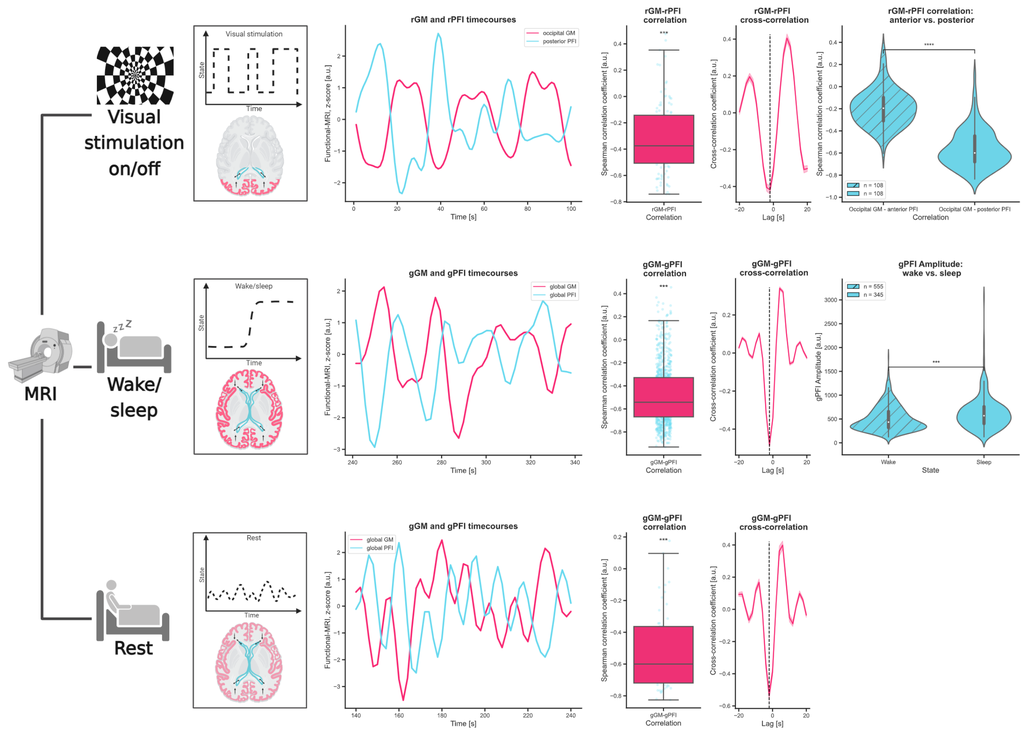
1. Visual stimulation induces regional PFI-activity

- Visualized in a 3D animation using fMRI data in the **upper right QR code**

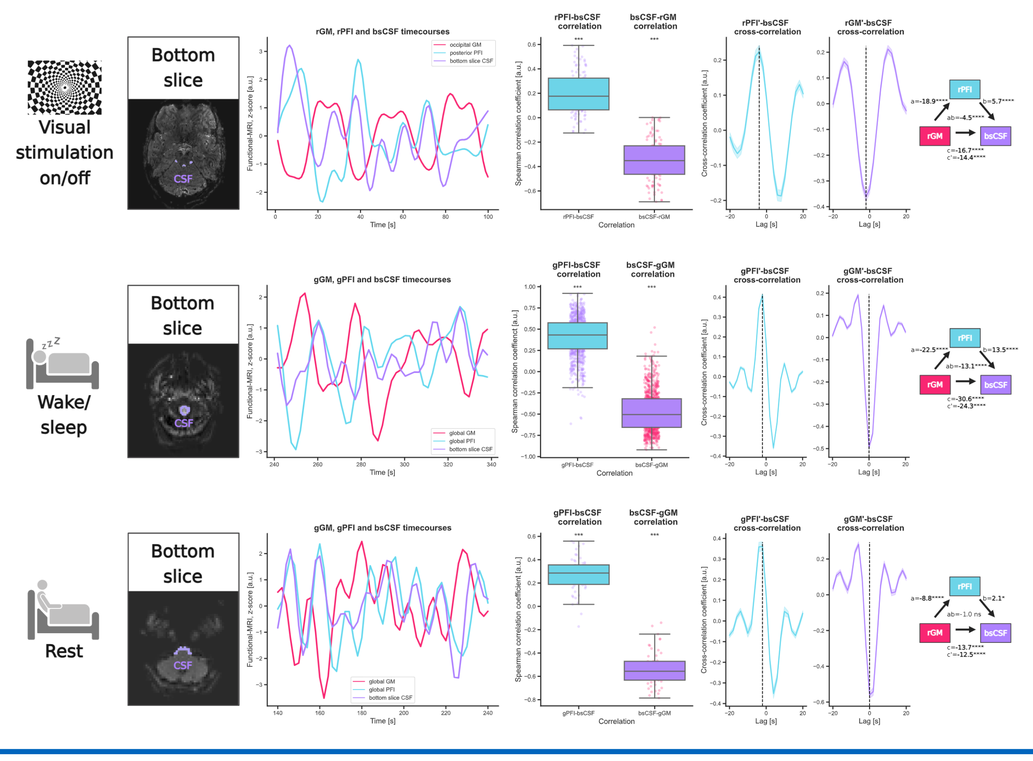




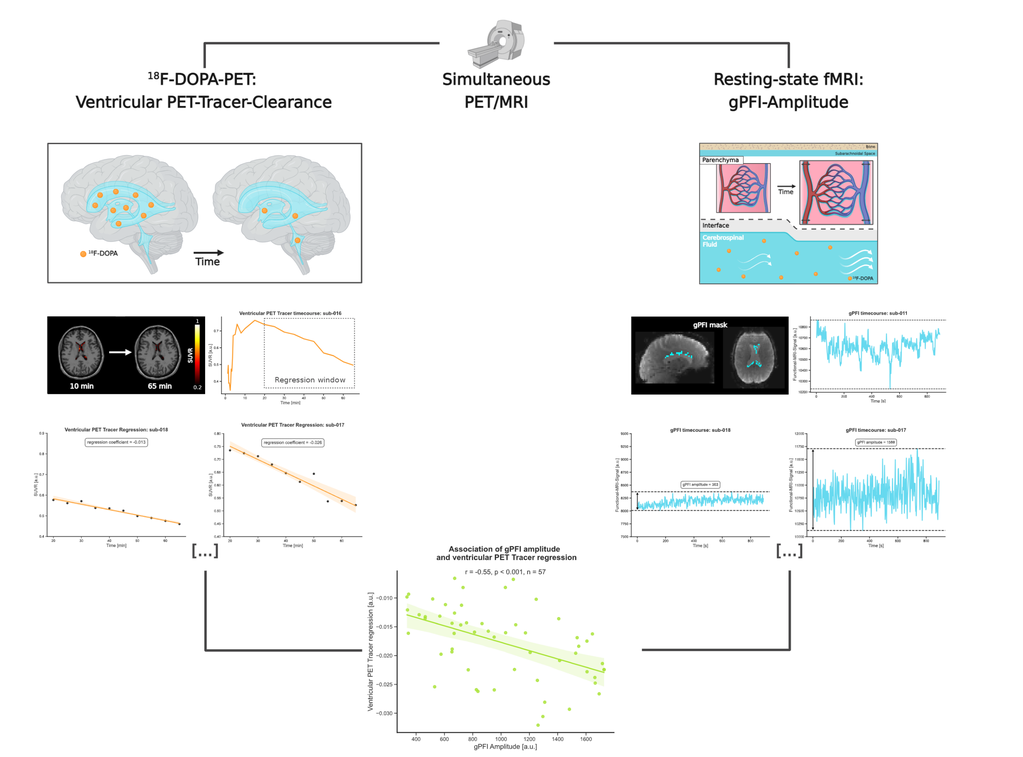
2. Regional and global GM activity induce PFI-activity



3. PFI mediates r/gGM-activity on bottom slice CSF



4. PFI amplitude links with PET-Tracer-Clearance



Conclusion

- Both regional and global GM activity induce corresponding PFI responses
- Regional and global PFI changes mediate r/gGM-activity on CSF flow
- Amplitudes in gPFI are strongly associated with clearance, measured by ventricular ^{18}F-DOPA-PET-Tracer clearance

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