

Non-invasive PET/MR imaging of CBF and CMRO₂

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The gold standard for imaging cerebral blood flow (CBF) and the cerebral metabolic rate of oxygen (CMRO₂) are complex and invasive PET techniques. Hybrid PET/MR imaging can greatly simplify the procedures by acquiring PET data while simultaneously obtaining MRI measurements of whole-brain (WB) CBF and CMRO₂. The aim of this work is to present hybrid PET/MR methods to image CBF and CMRO₂. PET/MR imaging of CBF (PMRFlow) and oxidative metabolism (PMRO_x) can either calibrate PET data explicitly by incorporating the WB MRI measurements into the PET kinetic model, or by scaling the IDIF obtained from the WB time-activity curve and performing a fitting routine. The implementation of PMRFlow and PMRO_x allow for head-to-head comparisons between emerging MR methods and well-established PET measurements for imaging cerebral metabolism.

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