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## 367. Intensity distribution segmentation in ultrafast doppler combined with scanning laser confocal microscopy for assessing vascular changes associated with ageing and degeneration in murine hippocampi

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The hippocampus plays an important role in learning and memory, requiring high neuronal oxygenation.

Understanding the relationship between blood flow and vascular structure - and how it changes with ageing - is physiologically and anatomically relevant. Ultrafast Doppler ( $\mu$ Doppler) and scanning laser confocal microscopy (SLCM) are powerful imaging modalities that can measure in vivo cerebral blood volume (CBV) and post mortem vascular structure, respectively. Here, we apply both imaging modalities to a cross-sectional and longitudinal study of hippocampi vasculature in wild-type mice brains. We introduce a segmentation of CBV distribution obtained from  $\mu$ Doppler and show that this mice-independent and mesoscopic measurement is correlated with vessel volume fraction (VVF) distribution obtained from SLCM - e.g., high CBV relates to specific vessel locations with large VVF. Moreover, we find significant changes in CBV distribution and vasculature due to ageing, highlighting the sensitivity of our approach. Overall, we are able to associate CBV with vascular structure - and track its longitudinal changes - at the artery-vein, venules, arteriole, and capillary levels. Recently we apply this strategy to compare CBV in wild type and Trembler-J mice, as Charcot-Marie-Tooth neurodegenerative model. We believe that this combined approach can be a powerful tool for studying other acute (e.g., brain injuries), progressive (e.g., neurodegeneration) or induced pathological changes.

**Palabras clave:** Ultrafast Doppler, Confocal Microscopy, ageing, hippocampi