

Modeling blood flow and mass transfers in cerebral microcirculation

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After underlying the central role of cerebral microcirculation in brain physiology and in several brain pathologies, I will present the architecture of the microvascular cerebral network and show that it is the superposition of two types of structures: a mesh-like capillary structure, homogeneous over a cut-of length corresponding to the characteristic length of capillary vessels ($\sim 50 \mu\text{m}$), and fractal arborescent structures composed of arteries and veins.

Based on these results, I will present some of the approaches we develop for studying blood flow and/or mass transfer at various scales, most of which are based on methodologies developed for the study of multiphase or reactive flows in porous media. Finally, I will present some perspectives related to the role of cerebral microcirculation in neurodegenerative diseases.

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**MPIDS, Prandtl lecture hall,
Am Faßberg 11, Göttingen**

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