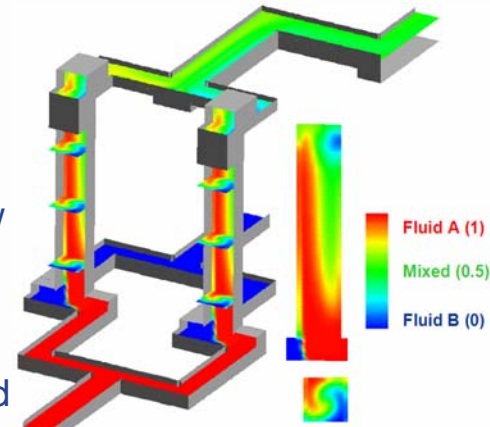


Mechanism of Formation of Preferential Flow Paths in Microcirculation Vessels (Microfluidic mixer)

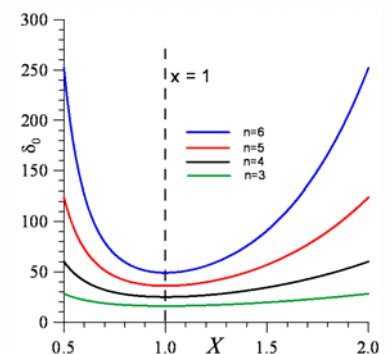
Objectives

- Study of model network of „blood vessels” for transporting and mixing 2 fluids
- Design of microfluidic manifolds and hierarchical fluid distribution based on generalized Murray’s law
- Optimization of branching parameter X which minimizes the total flow resistance as well as residence time of mixing fluids
- Numerical modelling of 3D flow in square-sectioned branching networks for validation of generalized Murray’s law



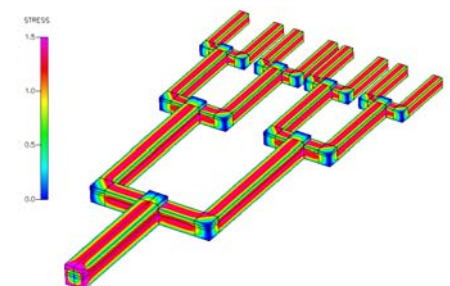
Partners involved and roles

- WUT Warsaw, PL: formulation of generalized Murray’s law that can be applied to the design of microfluidic channels and manifolds, software developing
- CCLRC Daresbury Laboratory, UK: numerical simulations of mixing process in square-sectioned branching networks



Summary of results

- Formulation of simple 1D model for calculation of channels dimensions, mean velocity, wall shear stress, flow resistance, residence time, mixing coefficient for each successive generation
- Numerical validation of mixing and stress distribution in square-sectioned branching networks
- Software for calculations and visualisation of various hydrodynamic parameters of microfluidic mixers



Offer to industry

- Software for microfluidic mixer design

Contact

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Project status

Finished

