Multiscale modeling of cerebral blood flow and oxygen transport

PI: Timothy W. Secomb
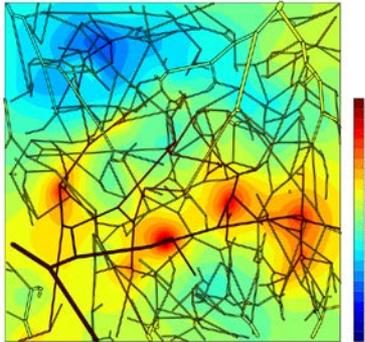
Aspects of model validity/credibility

Technical validity: are assumptions underlying the model accurately represented by the mathematical or computational method?

Biological credibility: does the model faithfully represent relevant aspects of the biological system behavior?

Technical validity

- Write-up of model developed in parallel with code
- Code tested against other methods and analytic solutions for special cases
- Extensive graphical outputs generated online

0.2 mm

Biological credibility

- Close collaboration with experimentalists
- Parameterized for control state, predictions made for reduced blood pressure or blood oxygen levels
- Sensitivity analyses test model robustness
- Models as hypothesis tests: "failures" guide model development