Computational Fluid Dynamics for Optimization in Biomedicine:

Solving Numerically the Balance Equations of Multi-phase Systems

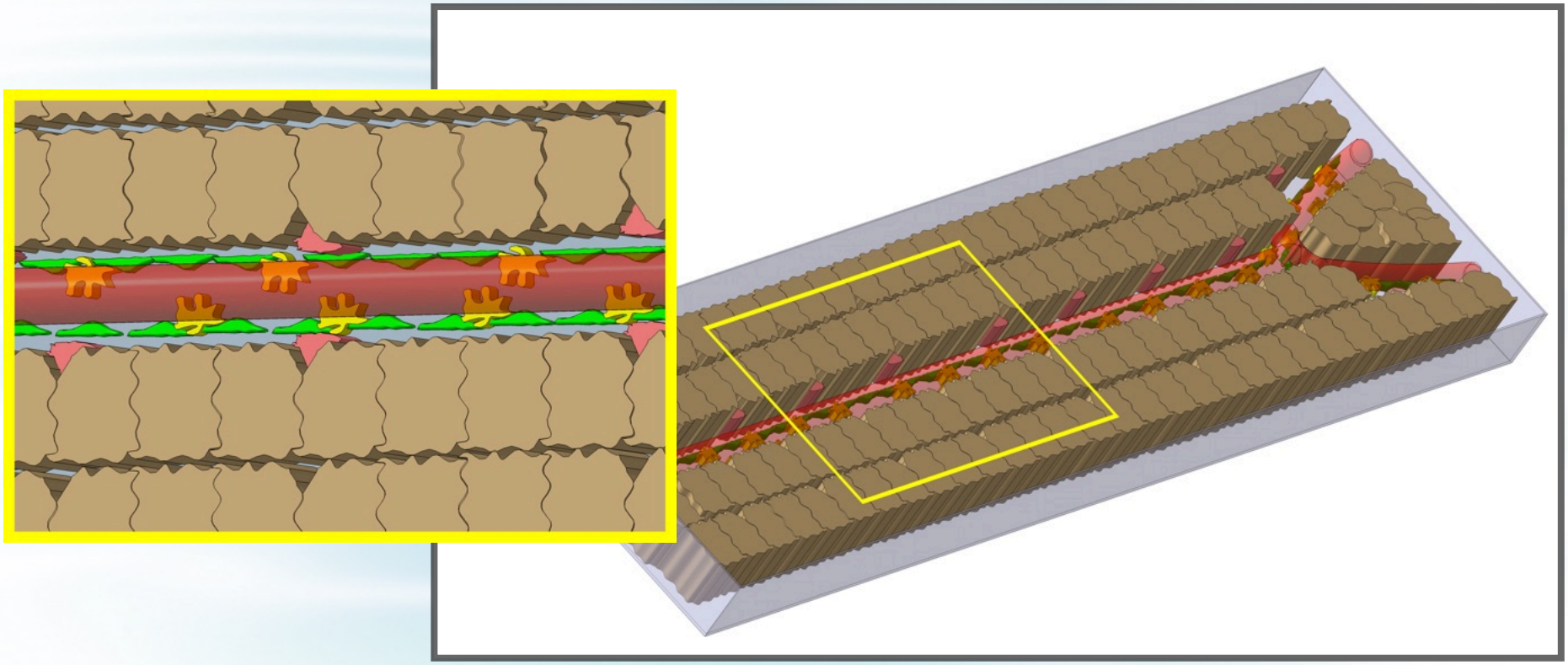
Peter Farber

IMH - Institute of Modelling and High-Performance Computing, Hochschule Niederrhein, Krefeld, Germany

Liver-on-a-Chip

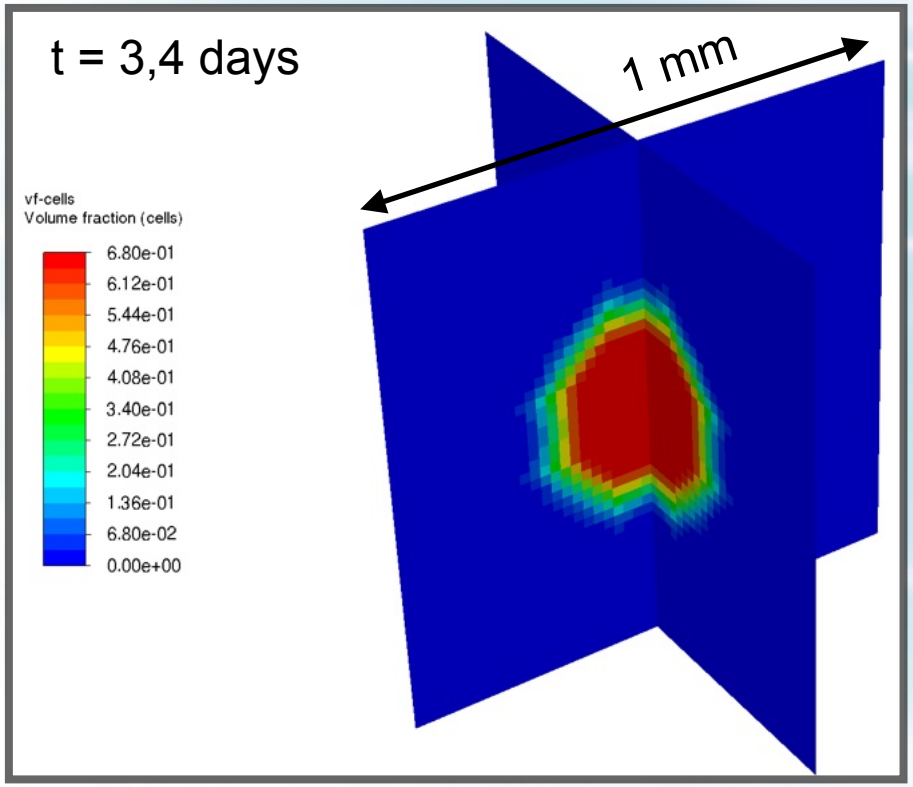
Bundesministerium
für Bildung
und Forschung

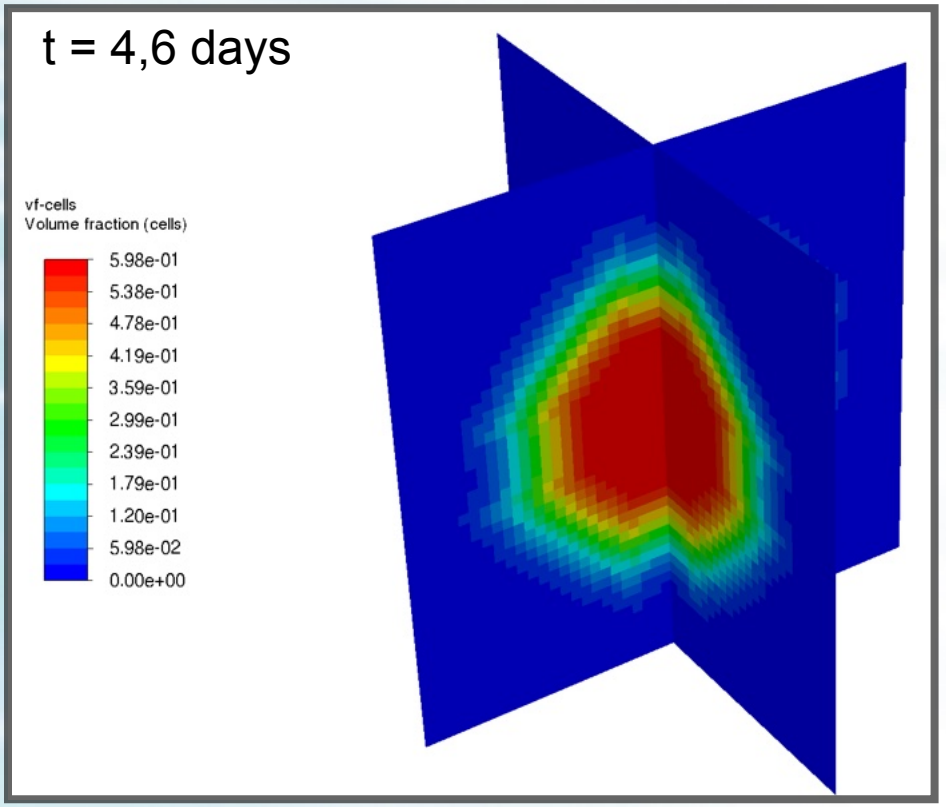
- **Mathematical model of a liver-on-a-chip to optimize shear stresses and oxygen supply**



Multi-phase model of tumour growth - 1

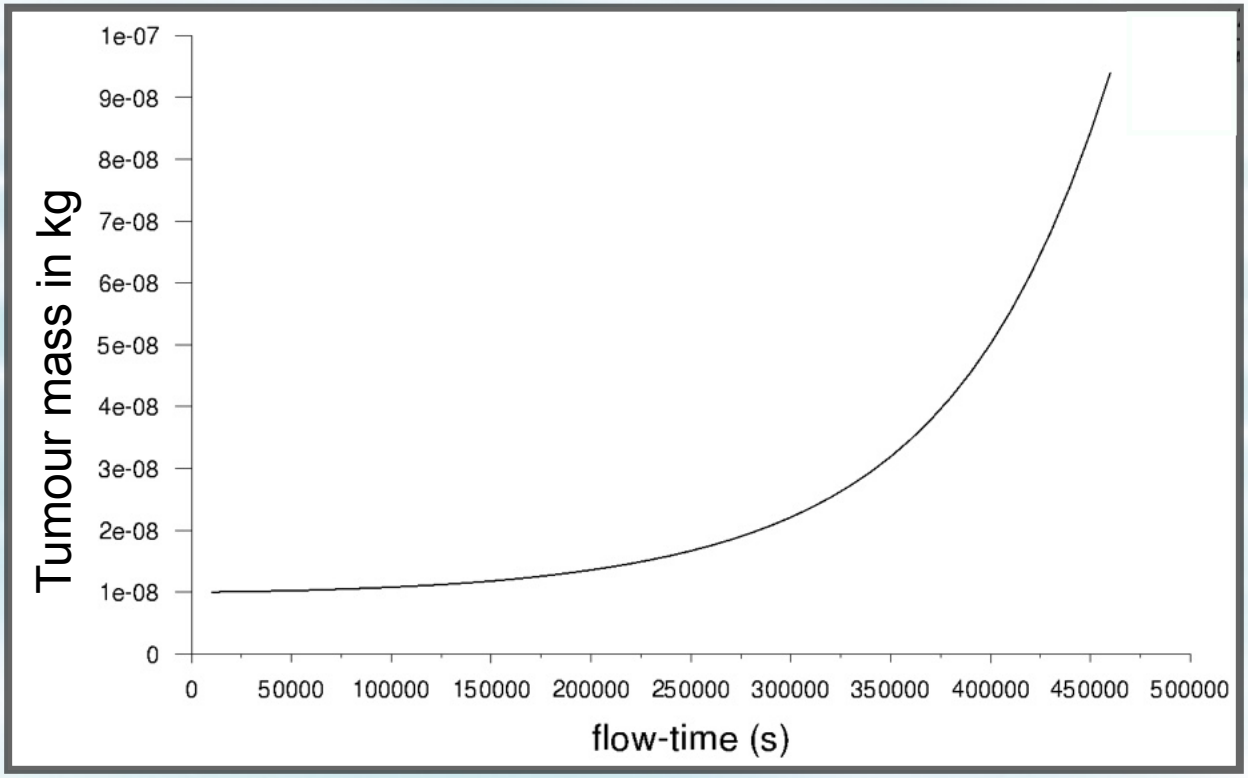
- **The figures show the volume fraction of tumour cells in the total volume at each point**



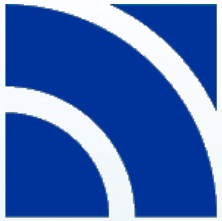


Multi-phase model of tumour growth - 2

- The figure shows the total tumour mass in the model as a function of time



Next steps: Increasing the complexity of the model by adding phases and species



Hochschule Niederrhein
University of Applied Sciences

IMH
Institut für Modellbildung
und Hochleistungsrechnen
Institute of Modelling
and High-Performance Computing

https://www.hs-niederrhein.de/imh/

peter.farber@hs-niederrhein.de

ORCID ID: http://orcid.org/0000-0002-7640-6555