

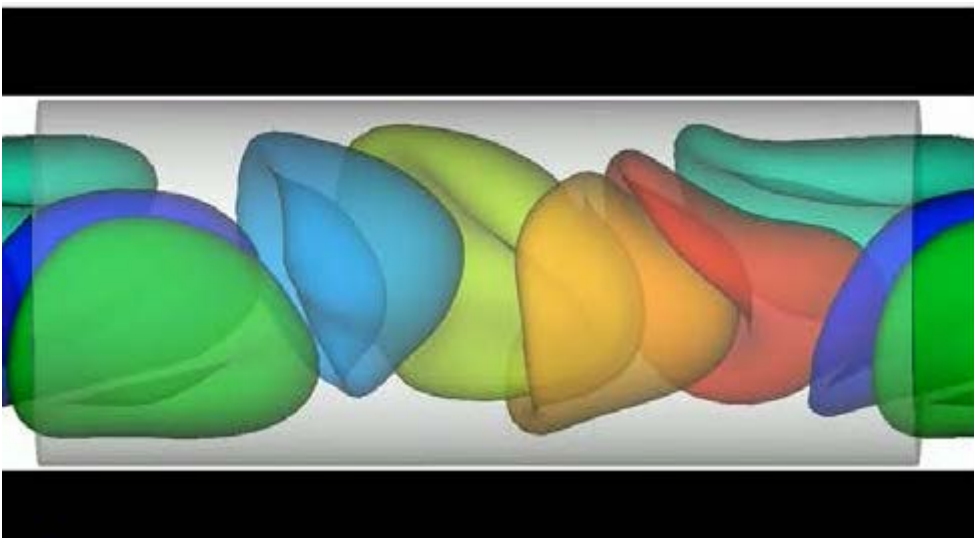
[MatComPhys explores software and numerical techniques for biological transport systems](#)

Biomedical simulations provide a crucial tool to understanding physical processes in the human body. For the MatComPhys project, funded under the European Research Executive Agency FP7-PEOPLE-2011-IEF framework, BSC researcher Alberto Gambaruto developed mathematical models and software code for applications to demonstrate transport phenomena in the human body.

His research focused on two areas of significant interest: blood flow in microvessels, for which he developed new software and numerical techniques, and the respiratory system, for which he used BSC's record-breaking Alya software suite. These tools may be used to research the process at different scale: inflammation, coagulation and metastasis on the one hand, and olfaction, air filtration and drug delivery during inspiration on the other.

Three animations produced as part of the project are available to view on the BSC YouTube channel:

- [Simulation of red blood cells in a retina capillary](#)
- [Simulation of red blood cells in a small circular pipe](#)
- [Visualization of Airflow Through the Human Respiratory System](#)



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