

# OSHIMA LAB.

## [Bio fluid mechanics, micro-fluid and biochemical system]

Department of Mechanical and Biofunctional System /  
Center for Research on Innovative Simulation Software

<http://www.oshimalab.iis.u-tokyo.ac.jp/>

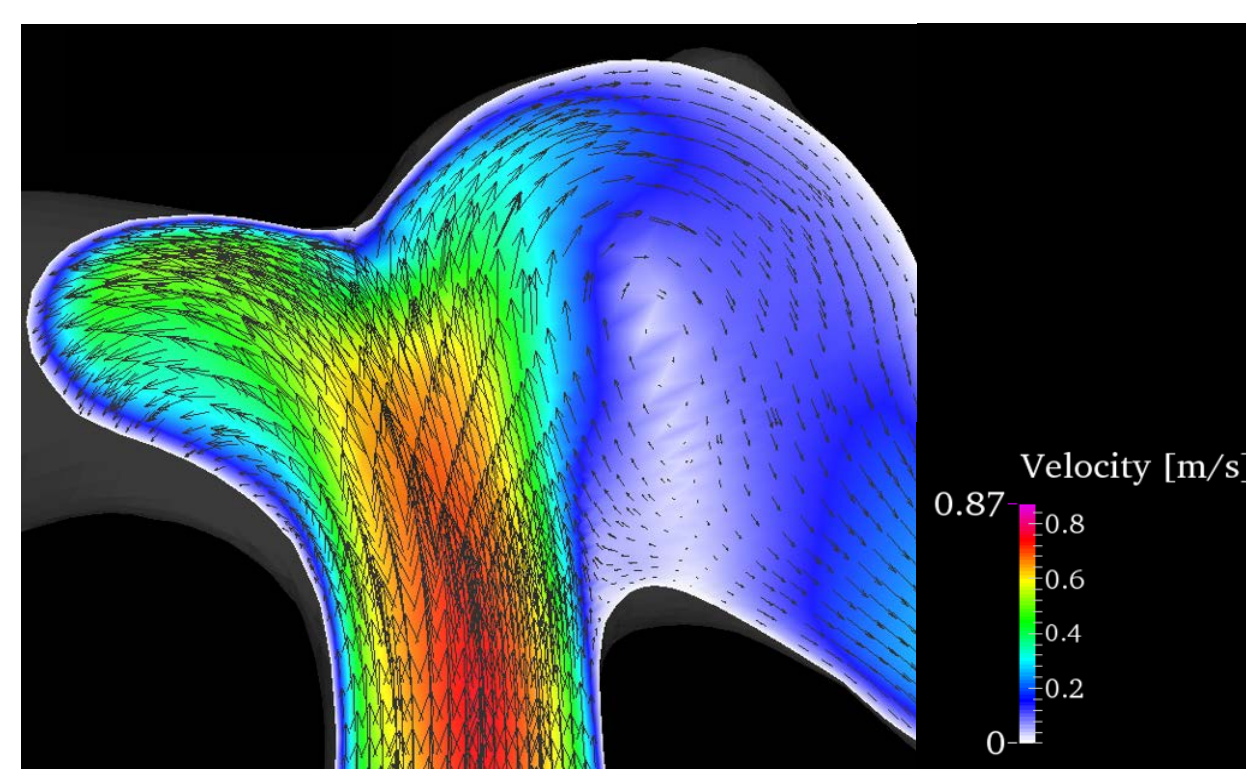
Department of Mechanical Engineering /  
Interfaculty Initiative in Information Studies

Computational Fluid Dynamics

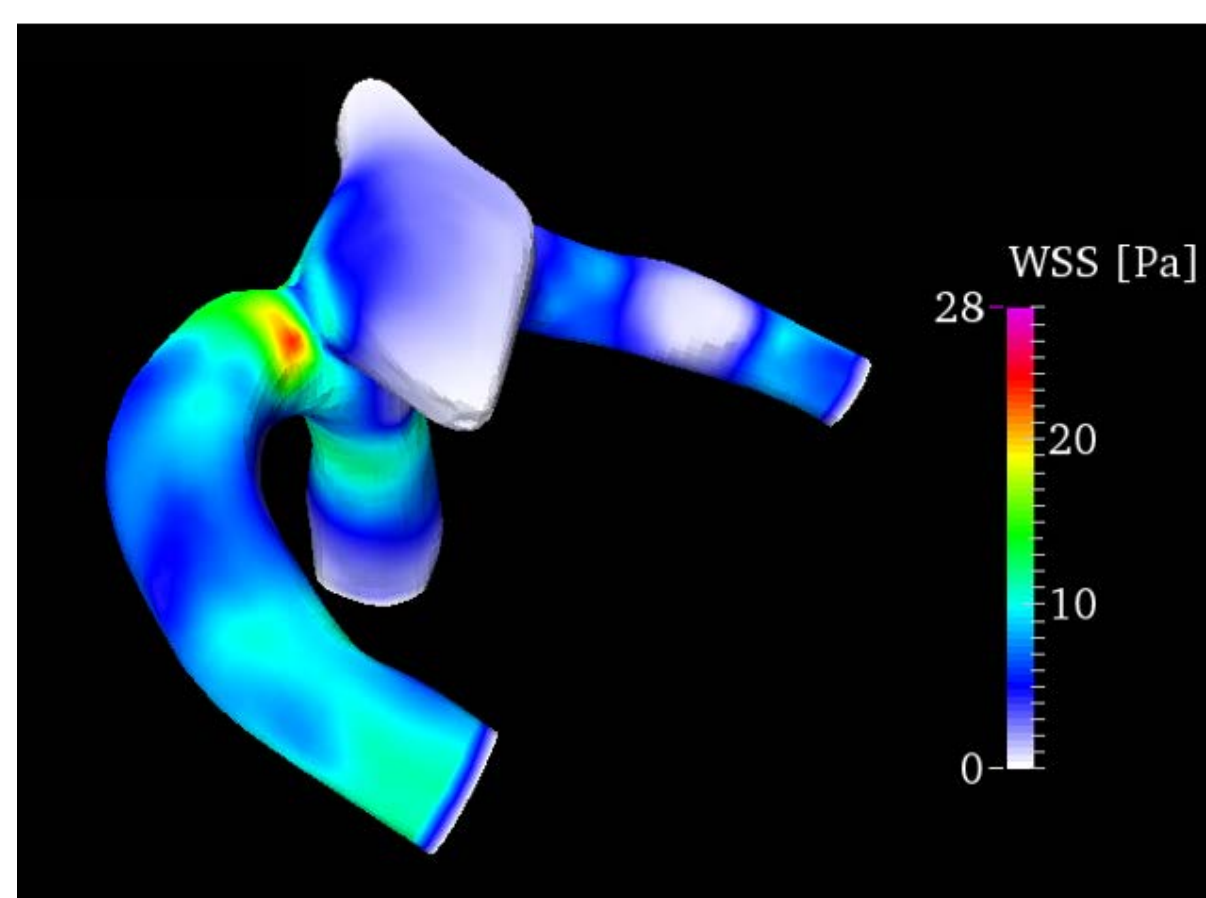
## Investigation of Bio/Micro-fluid Mechanism

### Objectives:

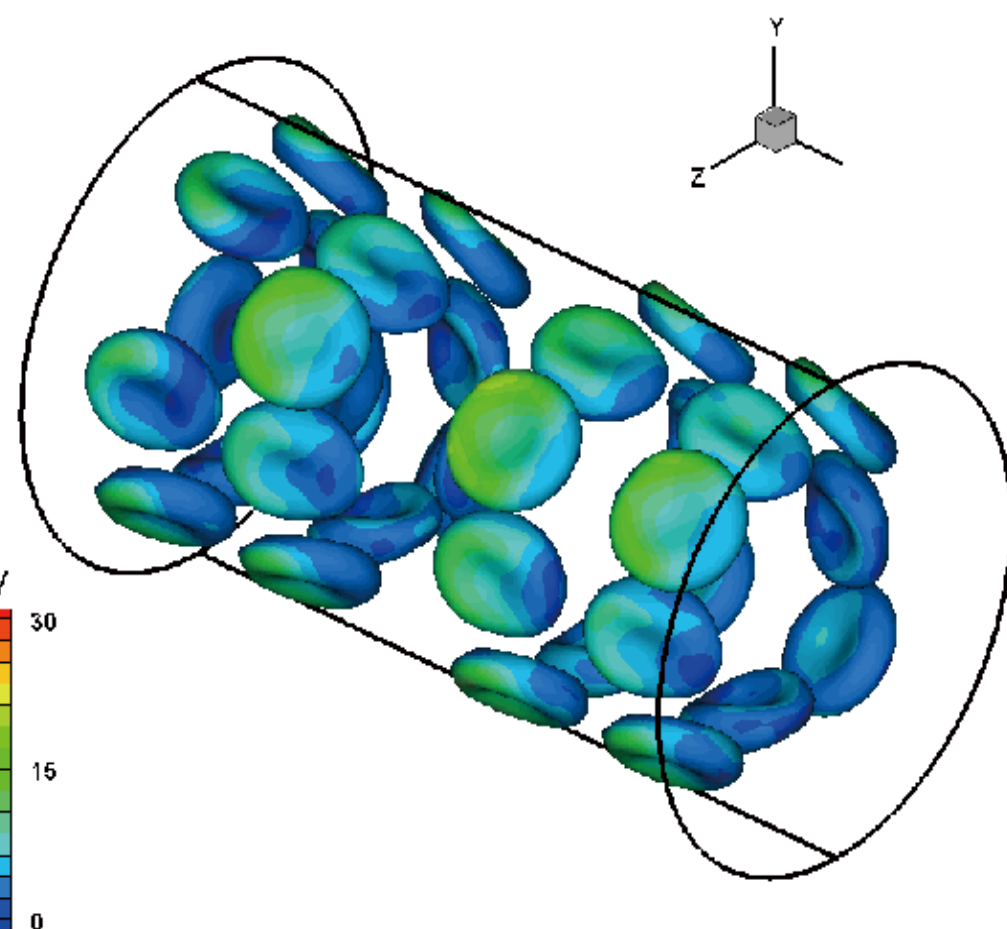
To investigate and elucidate the influences of vascular geometry on the hemodynamics  
To develop a simulation system for the clinical study and treatment



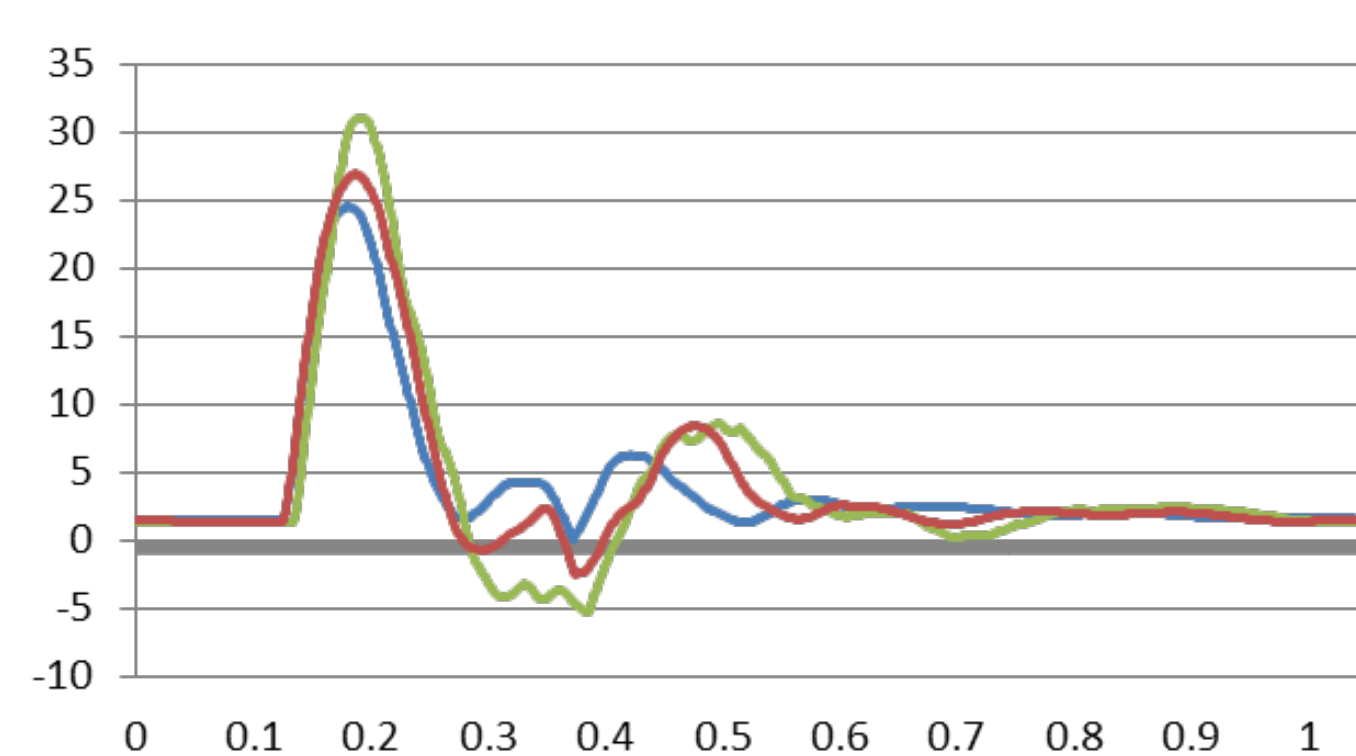
- Velocity of the blood flow in the cerebral aneurysm by the FSI simulation



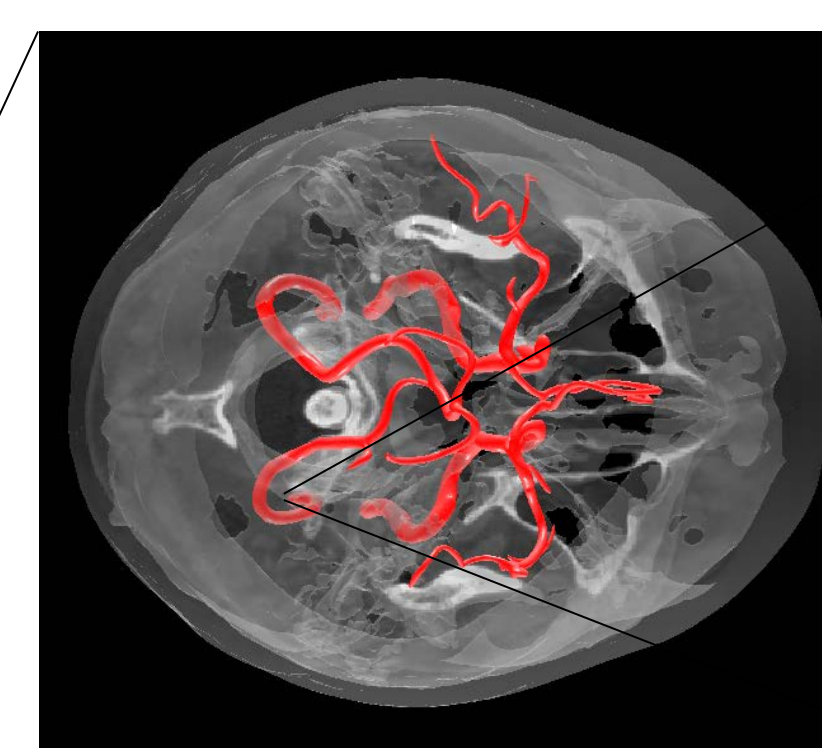
- Wall shear stress(WSS) of the cerebral aneurysm by the FSI simulation



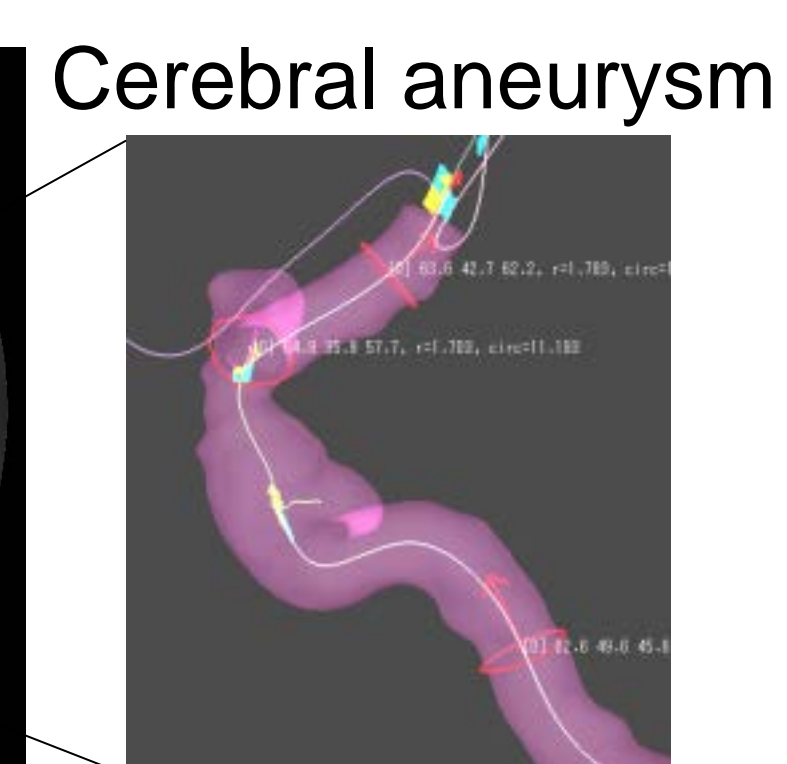
- Three-dimensional simulation of the red blood cell(RBC)s by Lattice Boltzmann method



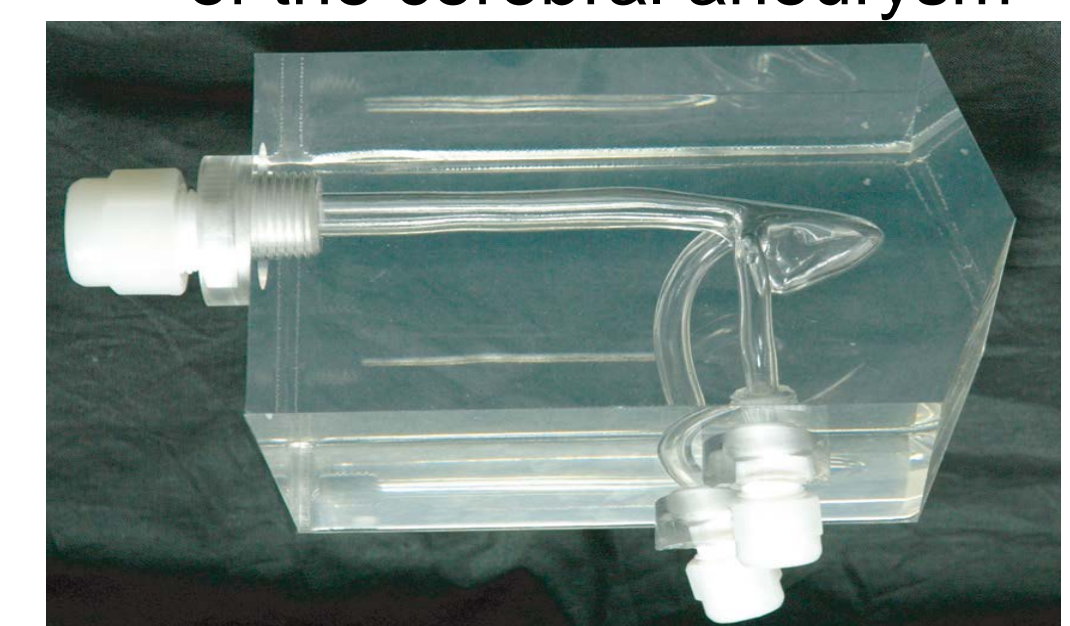
- Velocity profile by the 1D-0D bloodflow simulation



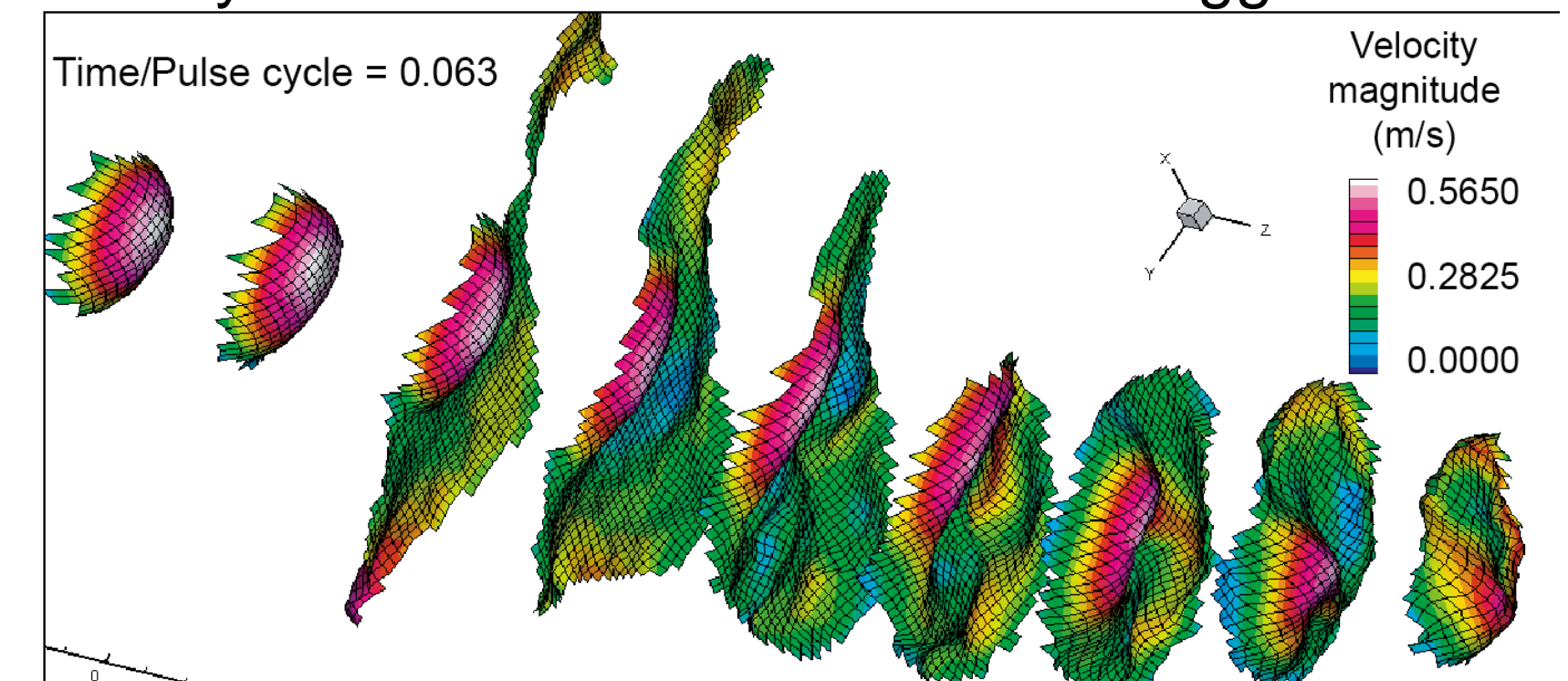
- Three-dimensional geometric modeling from medical images



Geometric model of the cerebral aneurysm

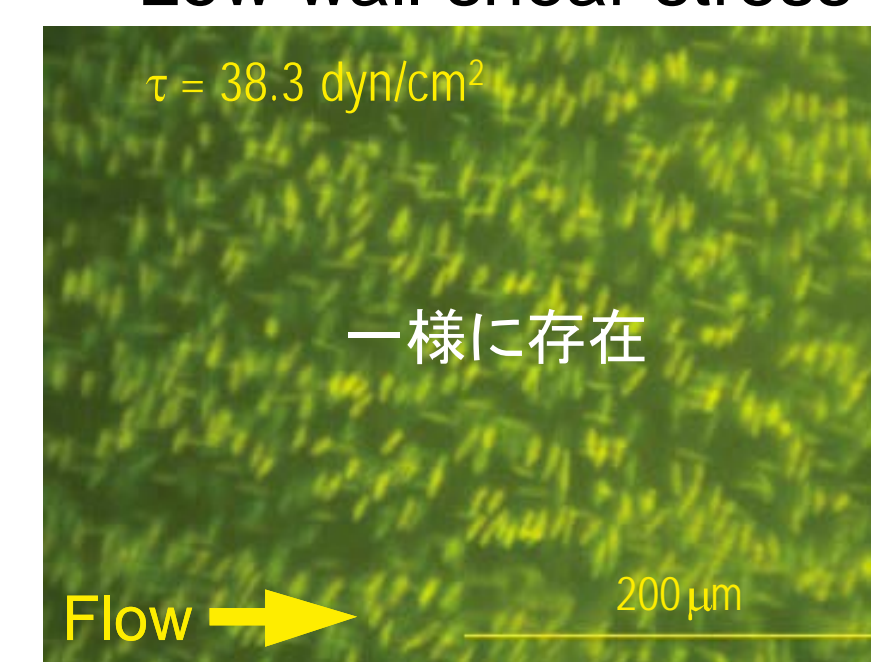


Velocity distribution at the time of the biggest inflow

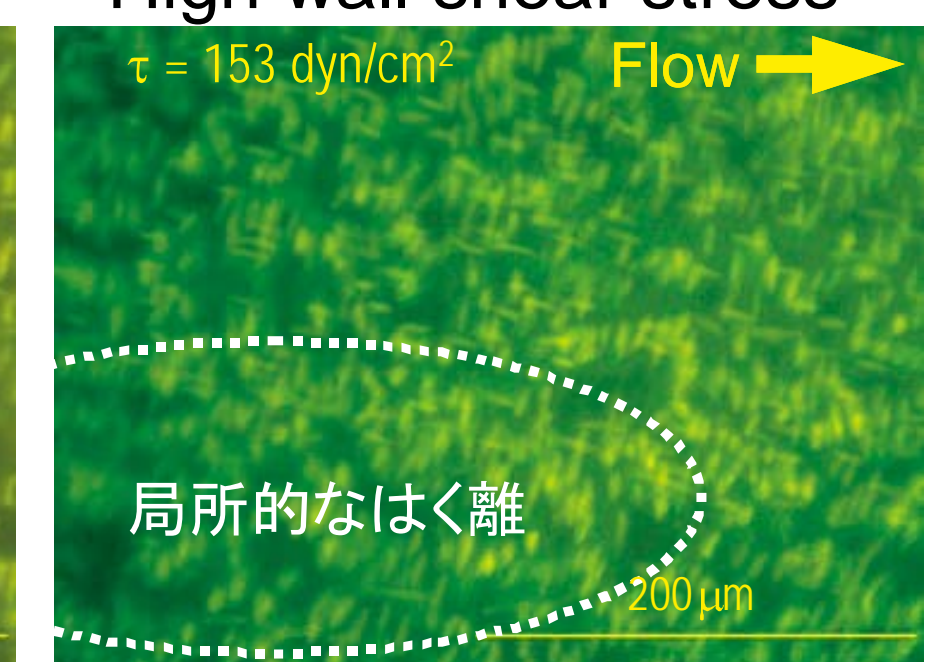


- Stereo PIV measurement of blood flow in the realistic geometric model

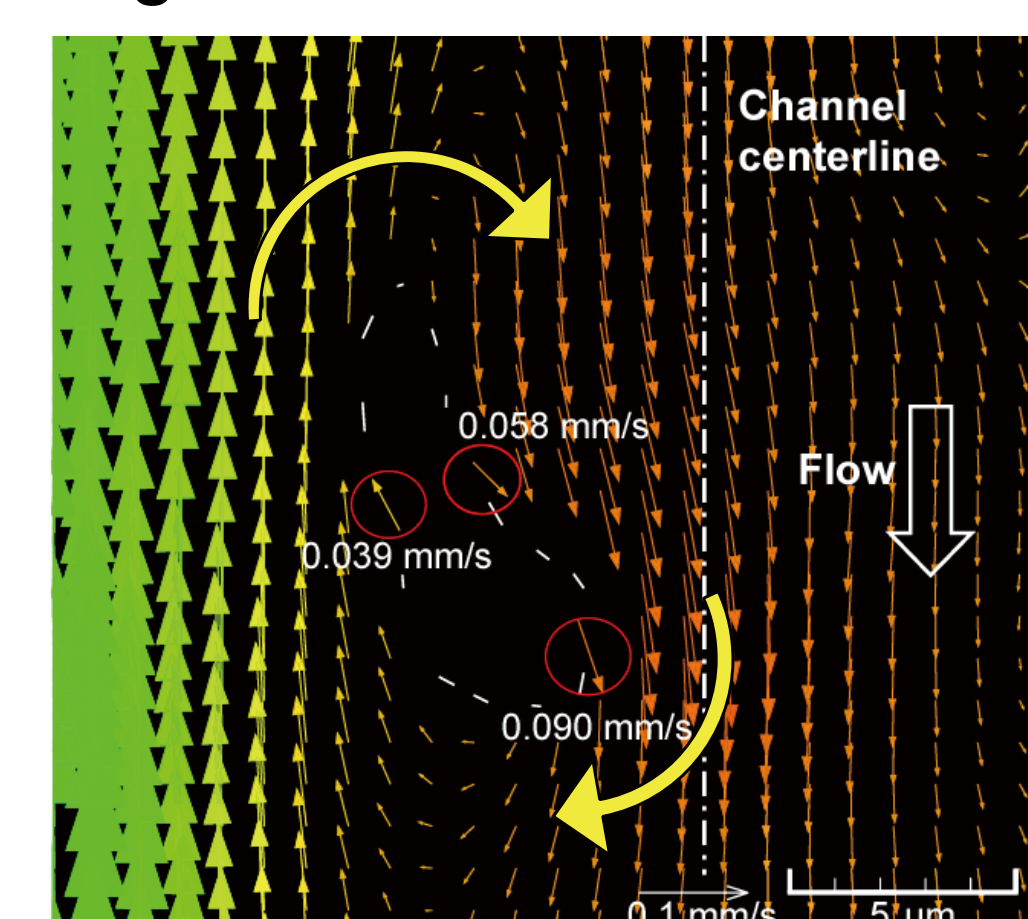
Low wall shear stress



High wall shear stress



- Experiment of the effects of high WSS loading on the endothelial cells



- Tank Treading motion of a RBC and flow velocity distribution around the RBC