

FURUKAWA LAB.

Physics of complex fluids

Department of Fundamental Engineering

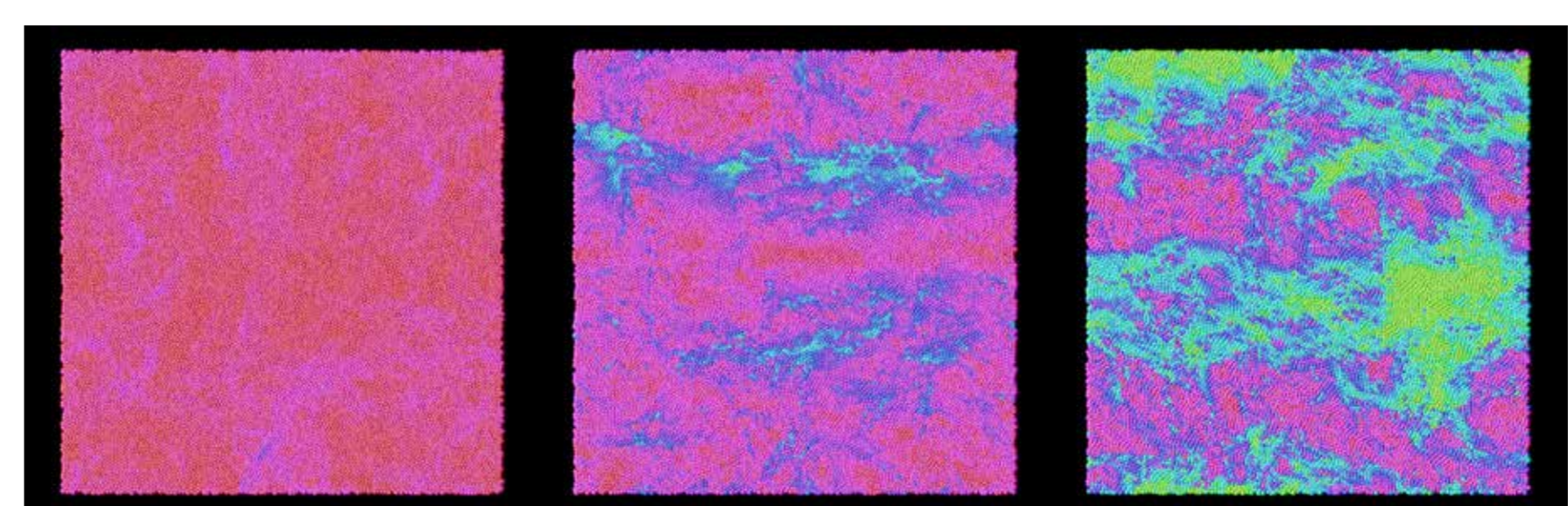
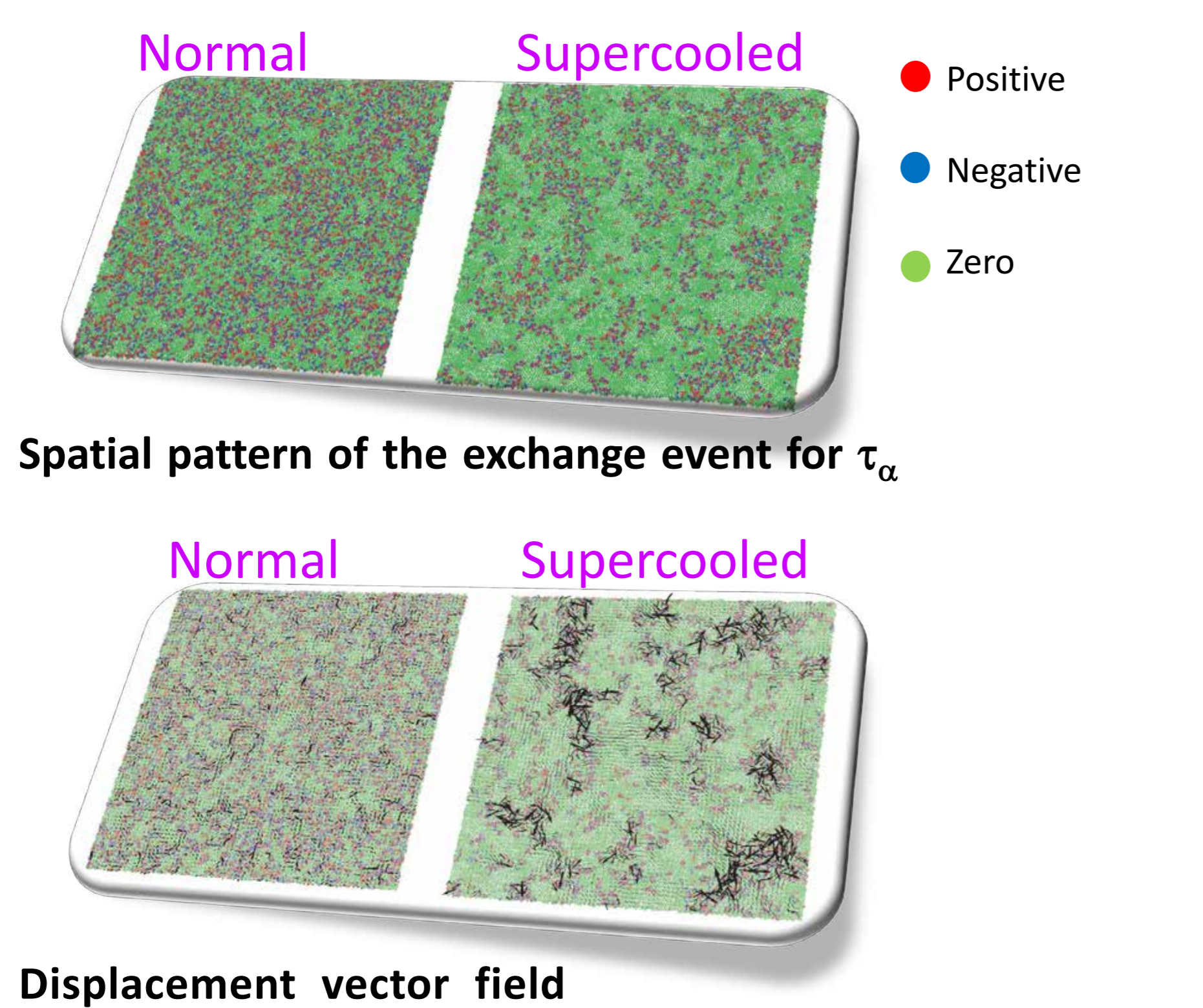


Physics of Complex Fluids
 Department of Applied Physics, Graduate School of Engineering <https://sites.google.com/g.ecc.u-tokyo.ac.jp/complexfluid/>

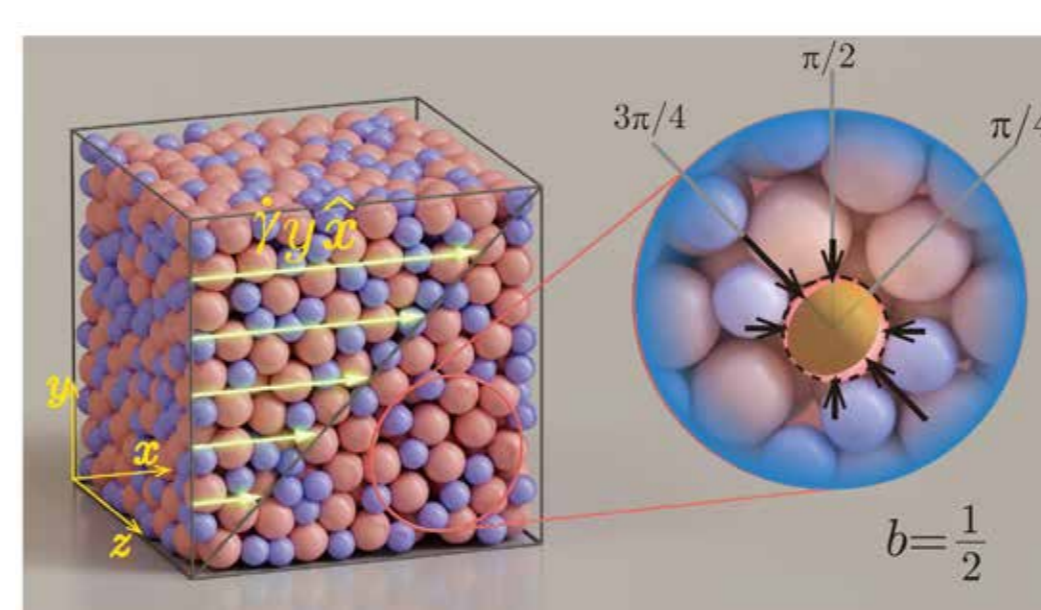
We theoretically study non-linear and non-equilibrium phenomena in various soft materials and complex fluids, from glasses, colloids and granular systems to bacteria.

In recent years, we have primarily focused on the following problems:

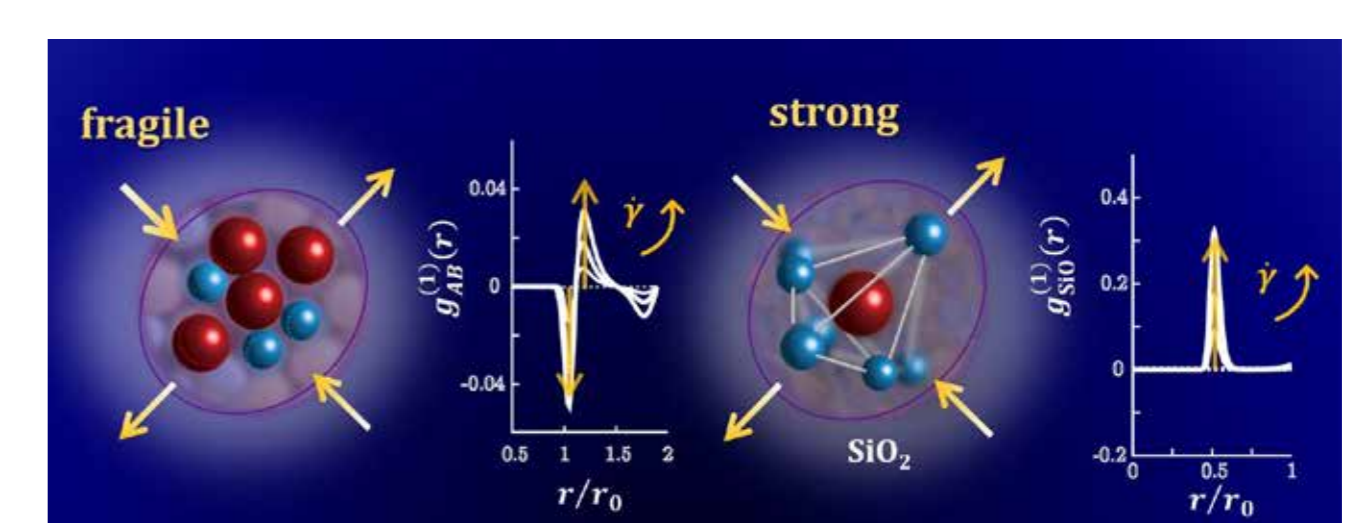
- (1) The origin and role of spatial correlations of anomalous hydrodynamic transport in supercooled liquids
- (2) Non-Newtonian rheology of glassy and granular materials (shear-thinning, shear-thickening, fracture, etc.)
- (3) The effects of (near-field) hydrodynamic interactions on the collective dynamics of bacterial suspensions.



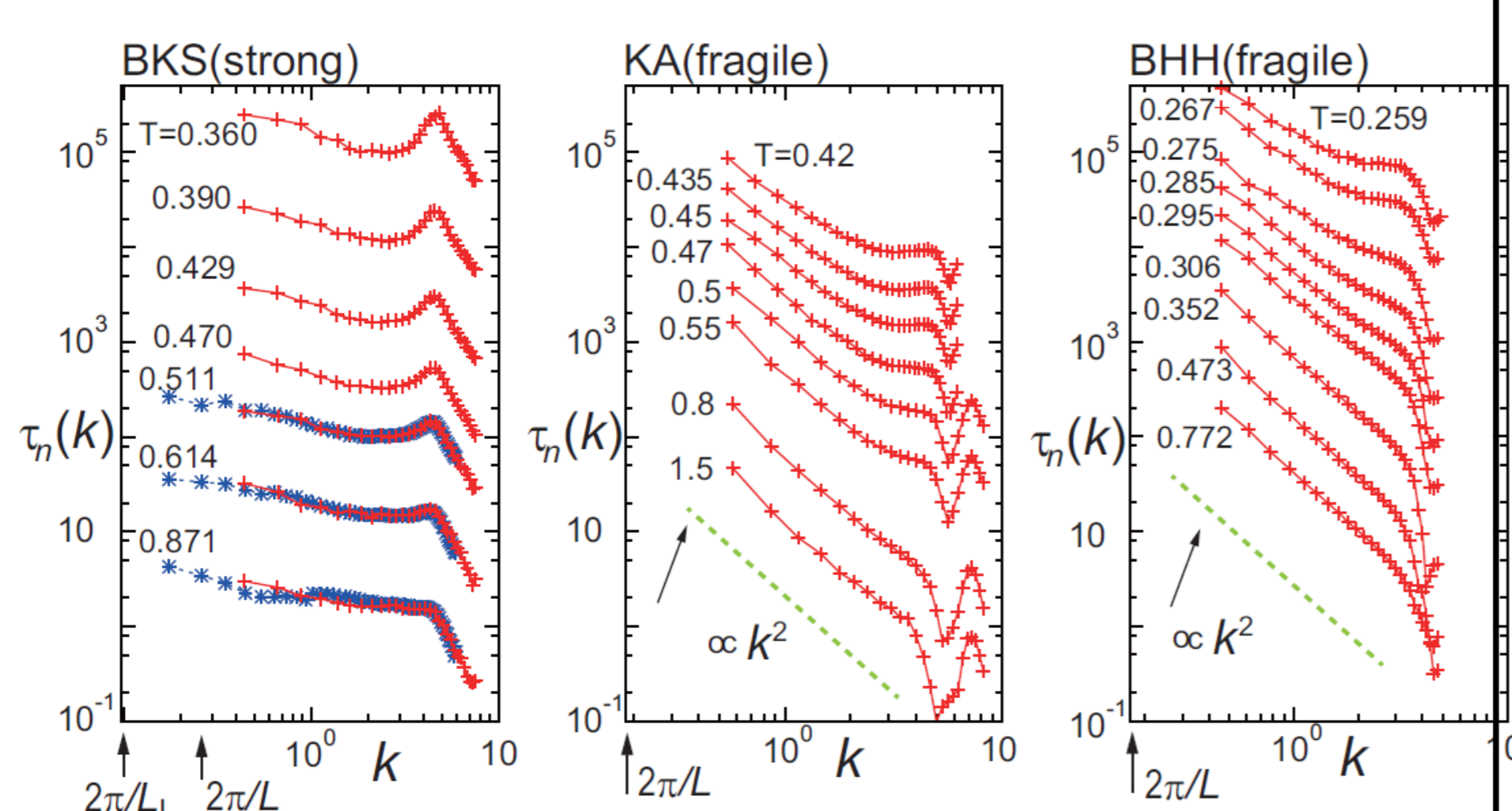
Shear band formation in supercooled liquids



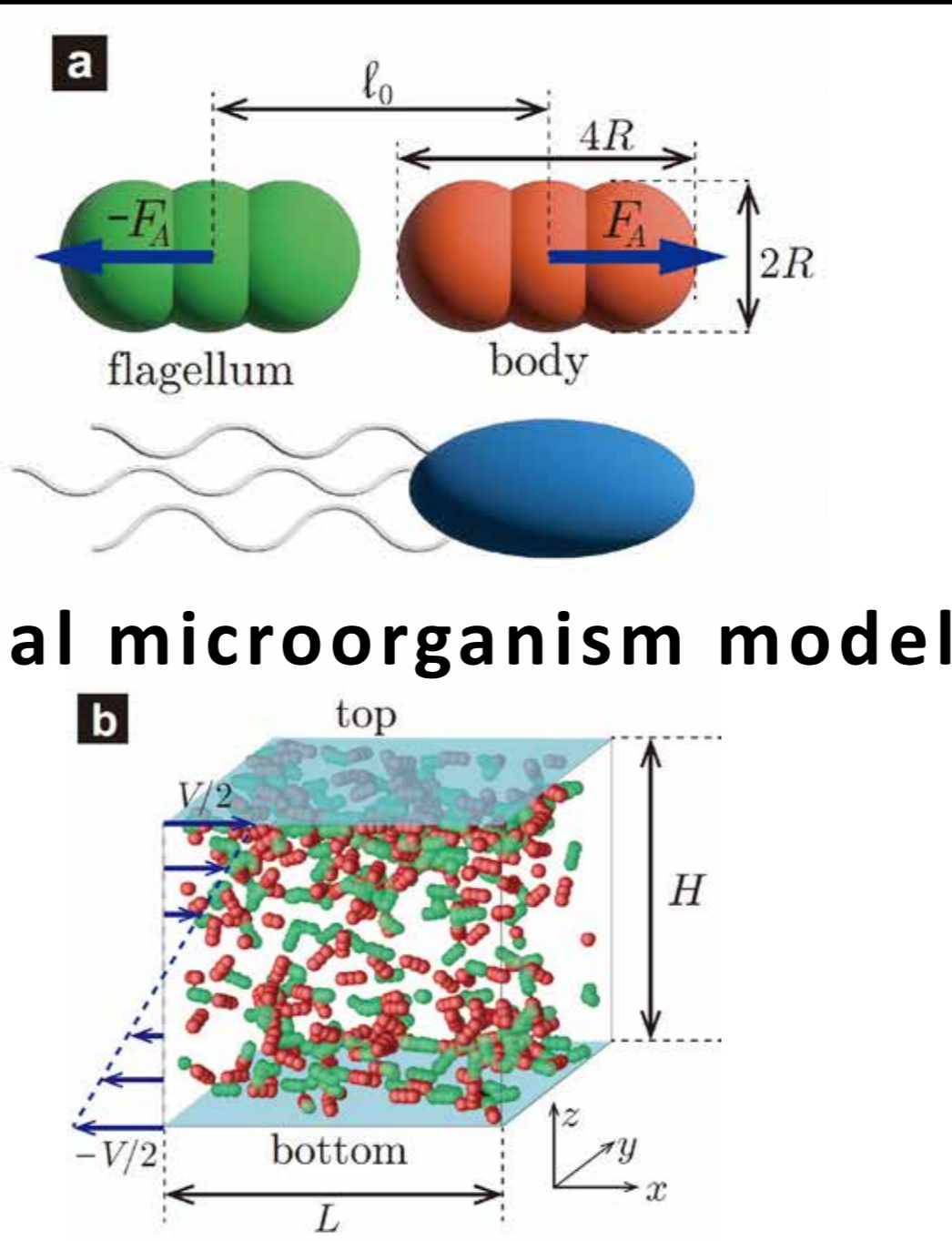
Shear-induced reduction in the effective volume fraction



Particle configuration under shear flow

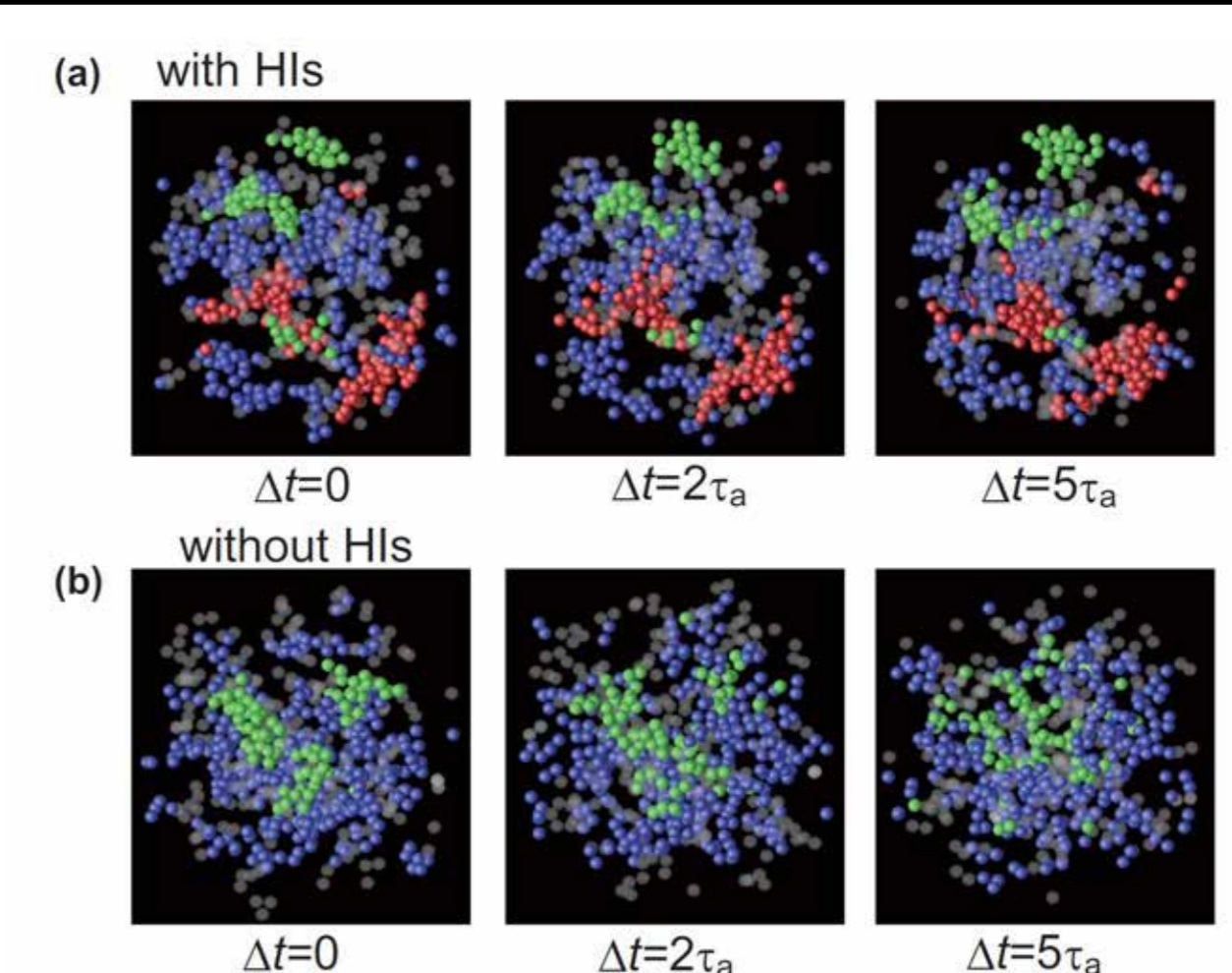


Relaxation time of density fluctuations



Minimal microorganism model

Rheology of active suspensions



Hydrodynamic effect on the collective dynamics of bacterial suspensions