

Tracer dynamics in E-coli suspensions

Xinliang Xu, Beijing Computational Science Research Center

Active matter systems are driven out of equilibrium as each individual propels itself, as each fish swims in a school. At high concentration, active matter systems display collective dynamical behavior commonly known as 'flocking', as all individuals move in coordination. At phenomenological level, traditional theories assume an alignment interaction between individuals at a characteristic separation, predicting collective dynamics at concentrations relevant to the characteristic separation. However, the microscopic mechanism underlying this alignment is not well understood. Through close collaboration between experimental and theoretical studies of the motion of a passive ellipsoidal tracer suspended in an E-coli bath, here we try to unveil the interaction between bacteria in details.