

2nd World Congress and Expo on Nanotechnology and Material Science April 04-06, 2016 at Dubai, UAE

Microrheology of Mucin: Tracking Particles and Helicobacter Pylori Bacteria in Mucin

Rama Bansil, Joseph Hardcastle and Maira Constantino

Physics Dept., Boston University, 590 Commonwealth Ave., Boston MA USA

Mucin is the major glycoprotein that is responsible for the viscoelastic properties of mucus gel that lines the stomach epithelial surface. The rheology of mucin is influenced by infection with the gastric ulcer and cancer causing bacteria, *Helicobacter Pylori* which swim across the mucus lining and colonize in the harsh acidic environment of the stomach. In this talk we present results on microrheology obtained by tracking spherical tracer particles in culture broth solution and in solutions of pig gastric mucin. The elastic and viscous moduli obtained by tracking particles in the mucin solutions are found to decrease in the presence of bacteria. We also examined the Brownian motion of the bacteria themselves and found that both motile and immotile bacteria can be used to probe the local rheology of mucin solutions and gels. We observed that in mucin solutions motile bacteria display super-diffusive anomalous Brownian motion implying that bacteria reduce the effective viscosity of the mucin solution. In contrast, the immotile bacteria exhibit regular diffusive Brownian motion. Results at different pH will be presented.