Lipid membranes are fundamental constituents of cell membranes and are now used in lap-on-a-chip technology. Membranes in living cells contain a significant fraction of proteins,which undergo lateral random movements due to thermal fluctuations and shear forces imposed by the solvent fluid. Natural and biotechnological systems where membranes are highly sheared include the plasma membrane of endothelial cells, and membranes used in bio-sensors. In these systems membrane is in direct contact with the mainstream suspension flow, which is driven by pressure gradients. The efficiency and function of these systems depend on the properties of suspension flows, diffusion of lipid and protein molecules, and transverse stability of membrane fluctuations. In this talk, we present the results of coarse grained molecular dynamics simulations of bio-membranes. We have investigated dynamics of sheared membranes with trans membrane proteins. We then focus on the flow of suspensions in microfluidic devices and show that Brownian diffusion due to thermal fluctuations can destabilize the distribution of particles and increase the volume fraction near the walls. Finally, we introduce a continuum model for the dynamics of lipid membranes under shear flow, and carry out a linear stability analysis to calculate critical wavelengths of time-varying membrane oscillations.