

Abstract Submitted
for the MAR17 Meeting of
The American Physical Society

Diffusion of a protein: the role of fluctuation-induced hydrodynamic coupling PIERRE ILLIEN, RAMIN GOLESTANIAN, University of Oxford
— The question of what determines the diffusion coefficient of a protein, or a macromolecular complex in general, is addressed by using a simple generic model of an asymmetric dumbbell that is made of two hydrodynamically coupled subunits. It is shown that equilibrium fluctuations can lead to an interplay between the internal and the external degrees of freedom and give rise to negative contributions to the overall diffusion coefficient. These fluctuation-induced contributions are controlled by the strength of the interactions between the subunits and their geometric characteristics. Our findings provide a significant step toward understanding the diffusion properties of proteins, which play a crucial role in their function and intracellular organization.

Pierre Illien
University of Oxford

Date submitted: 09 Nov 2016

Electronic form version 1.4