

Detecting protein folding by thermal fluctuations of microcantilevers

Muñoz, Romina

Aguilar-Sandoval, Felipe

Bellon, Ludovic

Melo, Francisco

© 2017 Muñoz et al. This is an open access article distributed under the terms of the Creative Commons Attribution License, which permits unrestricted use, distribution, and reproduction in any medium, provided the original author and source are credited. The accurate characterization of proteins in both their native and denatured states is essential to effectively understand protein function, folding and stability. As a proof of concept, a micro rheological method is applied, based on the characterization of thermal fluctuations of a micro cantilever immersed in a bovine serum albumin solution, to assess changes in the viscosity associated with modifications in the protein's structure under the denaturant effect of urea. Through modeling the power spectrum density of the cantilever's fluctuations over a broad frequency band, it is possible to implement a fitting procedure to accurately determine the viscosity of the fluid, even at low volumes. Increases in viscosity during the denatur