Minicolloque n° MMB15 X Oral CONFINED MEDIA: FUNDAMENTAL TO APPLICATION

Poster

Single nanopore applications : from biomimetism to protein detection

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Single nanopore technology is considered as one of the major breakthroughs in the field of nanotechnology over the last decades¹. The main challenges followed in this scale are to develop biomimetic channel (i.e. to reproduce at best the amazing biologic properties using protein confinement)² or single protein sensor able to sequence DNA strand³ or to detect the protein size⁴. Among all the technologies aimed at confirming such applications, numerical simulations such as molecular dynamics are usual tools able to predict or to understand at the molecular level, the biophysical behavior of the simulated systems. We will present during this talk our results issued from diverse simulations. These results will show that the precise control of the nanopore geometry allows confining proteins in their biological conformation to give specific properties of ionic selectivity or DNA sequencing to the nanopore. We will also demonstrate that the internal functionalization of the nanopore wall can discriminate the size of the amyloid fibril that translocate through it in order to develop a precise nanoscale sensor.

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Figure 1: Top :PEG functionalization of a conical nanopore. Bottom: Three kinds of amyloid fibrils

Acknowledgments: This work was founded by Agence Nationale de la Recherche (ANR Transion ANR-2012-BS08-0023 ; ANR-19-CE42-0006, NanoOligo). Calculations were performed at the supercomputer regional facility Mesocentre of the University of Franche-Comté. This work was also granted access to the HPC resources of IDRIS, Jean Zay supercomputer, under the allocation 2019 - DARI A0070711074 made by GENCI. Finally, part of this work was performed using computing resources of CRIANN (Normandy, France)