MMB15 CONFINED MEDIA: FUNDAMENTAL TO APPLICATION

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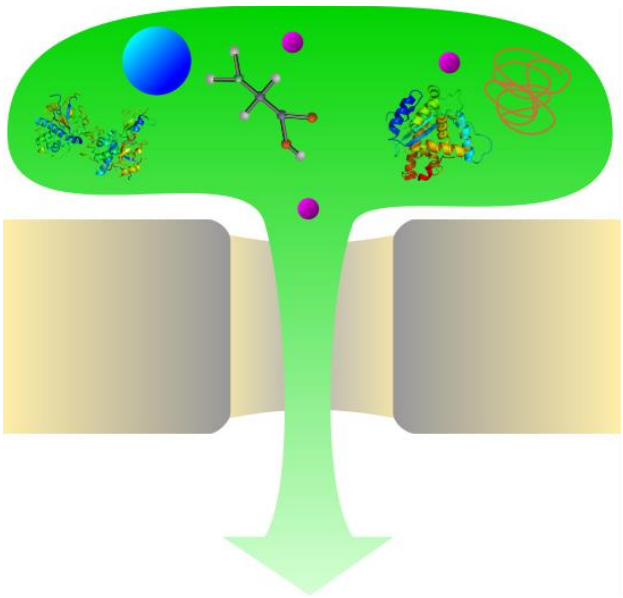
Parrainage ou lien avec des sociétés savantes, des GDR ou autres structures :
DIM Respore (http://www.respore.fr/), LabEx NanoSaclay (http://nanosaclay.fr/), LabEx STORE-EX (RS2E, https://www.energie-rs2e.com/fr), du GDR « Approches quantitatives du vivant » (http://nonlineaire.univ-lille1.fr/AQV/)

Résumé
The single nanopores (protein channel, solid-state, biomimetic) lead to a new generation of sensor devices. This technology combined with the microfluidics covers a wide scope of application at the nanoscale level from the low-cost DNA sequencing, "blue energy" enhancement to diagnostic tools.
Nevertheless, physical processes involved in these confined media are not really understood. Beside physical effects involved in volume (electrophoretic forces, ionic flow), the interactions due to the large specific surface usually occurring in porous media or MOF (charge density, double layer, structure, composition, defects, and slippage) must be taken into account. Then, it is really a challenge to theoretically describe and to modelize all these complex mechanisms to control specifically all these interactions between analytes and the inner side of the confined media. To reach this goal, it is necessary to develop a multidisciplinary collaboration at the frontier between physics, chemistry and biology. This approach allows improving specific sensing of nanoscale analytes from small macromolecules, bio-polymers (DNA, protein, polysaccharide, Ø<20 nm) to self-assembly systems (protein aggregate, fibril and amyloid) or nanoparticles (Ø>10 nm) at the single-particle level. Moreover, nanopore is not only a nano-sensor, but it is really a new nano-probe to describe polymer conformation or biological processes such as protein folding/unfolding at the nanometer scale.
This mini-colloquium is aimed at a broad and multidisciplinary audience at the frontier between chemistry, biology, soft and condensed matter physics, which is interested by transport phenomena in confined media. It will offer a place to open multidisciplinary discussion, share the knowledge in this field and initiate new collaborations. All contributions about the transport at nanoscale and confined media are welcome including theory, simulation and experiments.



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