

Master Chemical Nano-Engineering

Seminar

Biological nanopores in nanotechnology

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Biological nanopores are emerging as next-generation sensors for biological molecules. In this lecture I will introduce what are proteins and protein nanopores and explain why they are ideal materials to use in nanotechnology. We will then briefly review the basic concepts of nanopore analysis and nanofluidic transport [1]. Arguably, the most successful application of biological nanopores is the low-cost and high-speed sequencing of DNA [2]. Therefore, after a brief historical overview of nanopore analysis, I will explain how DNA is sequence using nanopores proteins can be re-engineered to control the motions of polymers across a nanoscale aperture to allow the sequence of DNA. Finally, I will provide a quick overview on the next frontier of nanopore analysis [3,4].

References

- [1] Reto B. Schoch, Jongyoon Han and Philippe Renaud. Transport phenomena in nanofluidics. *Reviews of modern physics*, 80, 2008
- [2] Hagan Bayley. Nanopore Sequencing: From Imagination to Reality. *Clin Chem*, 61 (1), 25-31 Jan 2015
- [3] Jiaxi Song, Amit Meller, Mark W Grinstaff. Single-molecule Protein Sensing in a Nanopore: A Tutorial. Nitinun Varongchayakul. *Chem Soc Rev*, 47 (23), 8512-8524 2018.
- [4] Chinappi, M., & Cecconi, F.. Protein sequencing via nanopore based devices: a nanofluidics perspective. *Journal of Physics: Condensed Matter*, 30(20), 204002, 2018

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VENUE: Room B11,

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TIME: 11:30 – 13:00