Engineering biological nanopores for proteomics study

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Propositions

Belonging to the thesis

Engineering biological nanopores for proteomics study

Gang Huang

1. Nanopore technique is a sensitive single molecule tool to study biomacromolecules without labeling in aqueous solutions. (Introduction)

2. There are three strategies to analyze a protein with nanopores: identifying peptides after enzyme digestion of the protein, reading the individual amino acids or their modifications as the polypeptide chain is threaded through the pore, and detection of whole proteins. (chapter 1)

3. The Electroosmotic flow in FraC nanopores can be tuned to dominate the capture of different charged protein analytes. (Chapter 2)

4. The size of FraC nanopores can be engineered to obtain smaller pores for the detection of different length peptides. (Chapter 3)

5. The electrical signal of peptide obtained with nanopores correlates with the peptide mass at pH 3.8, regardless of the chemical (charge) composition of peptide. (Chapter 3)

6. It is possible to reconstitute the biological nanopores from membrane-attack complex/perforin (MACPF) and cholesterol dependent cytolysin (CDC) superfamily (MACPF-CDC) into artificial lipid bilayer system for large folded protein sensing. (Chapter 4)

7. "独学而无友，则孤陋而寡闻"--《礼记》. (Learning alone without exchanges with others leads to solitary and inexperienced individuals. From < Book of Rites>, ~3rd century BC, by disciples of Confucius and Mencius).