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Nanopore spectrometry for the detection of proteins and their modifications

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Propositions

belonging to the thesis

Nanopore spectrometry for the detection of proteins and their modifications

Roderick Corstiaan Abraham Versloot

1. The development of single-molecule, high-throughput techniques to study the proteome is essential for the advancement of personalised medicine. (Chapter 1)
2. Biological nanopores are promising biosensors for the detection of peptides and proteins at the single-molecule level. (Chapter 1)
3. The tuning of nanopore-peptide interactions can greatly improve the ability of nanopores to identify peptides as well as their modifications. (This thesis)
4. The introduction of acidic-aromatic sensing regions in β -barrel nanopores significantly increases their ability to detect and discriminate peptide mixtures at low pH. (Chapter 2)
5. Protein glycosylation can be detected and quantified from peptides and proteins directly using biological nanopores. (Chapter 3)
6. The ability of nanopores to measure the physico-chemical properties of peptides rather than their mass alone, allows for the direct detection of peptide modifications that would not easily be resolved in mass spectrometry measurements. (Chapter 4)
7. Given the heterogeneity of charge, hydrophobicity and size of peptides, a combination of different nanopores or nanopore mutants will be required to measure complex samples. (Chapter 5)
8. Freshly made Groninger Mosterdsoep should be served daily in canteens around the campus; it provides a nice addition to your lunch and might help to improve the view of international students on the Dutch cuisine.
9. Groningen has a decent train connection for a city of its size.
10. Playing chess not only helps to survive long electrophysiology experiments, but may also improve you as a scientist, as reflected in the quote by Benjamin Franklin: "We learn by chess the habit of not being discouraged by present bad appearances in the state of our affairs, the habit of hoping for a favorable change, and that of persevering in the search of resources".