Biomarker detection and conformational sensing using nanopores

The global population's aging and growth will likely lead to an increase in chronic aging-related diseases. Early diagnosis could enhance medical care and quality of life. Many diseases are associated with misfolding or conformational changes in biomarker peptides and proteins, which impact their function and binding properties. Current clinical methods face challenges in detecting and quantifying these changes. Therefore, there is a need for sensitive conformational sensors capable of detecting low-concentration analytes in biofluids. Nanopore electrical detection has demonstrated potential in sensing subtle protein and peptide conformation. I will present our latest publications on detecting peptide families of biomarkers for various human diseases using nanopores.

References :

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(5) Iesu et al., Single-molecule nanopore sensing of proline cis/trans amide isomers. *RSC Chemical Science*, **2025**
(6) Meyer et al., Discrimination of oxytocin, a behavioral neuropeptide hormone, and its structural variants by nanopore. Submitted, **2025**