PROJECT NUMBER

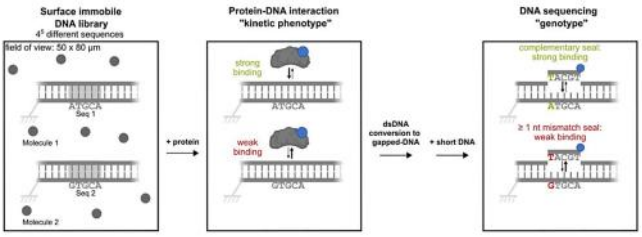
14526, 22262

Single-molecule phenotyping coupled with in situ single-molecule DNA sequencing

DNA sequencing is a key method that has had a huge impact on diagnostics, genomics and functional analysis. Although many single-molecule sequencing methods exist, there is currently no proficient way to connect the functional properties of a single DNA molecule with its sequence.

Researchers at the University of Oxford have developed a single-molecule sequencing method capable of connecting the functionality (reactions or interactions) of a single molecule with its sequence. This novel method is expected to support screening libraries of candidate therapeutic or agrichemical targets.

Applications: Diagnostics, FRET, SELEX, Aptamer Discovery



Features	Benefits
High-Throughput Sequencing: Link the sequence of a single DNA molecule to its functional properties with this advanced high-throughput technique, enabling detailed genetic and phenotypic analysis	Enables functional sampling of a large sequence space; Offers comprehensive insights into how individual bases affect specific biochemical processes
Holistic Measurement Platform: Gain comprehensive insights with one platform that simultaneously measures single-molecule kinetics, protein-DNA interactions, and distances within complexes	Identify crucial genetic elements influencing biochemical reactions; Facilitates targeted screening for sequences connected to a phenotype desirable for a certain application

Features	Benefits
Real-Time Interaction Monitoring: Directly detect heterogeneity and monitor interactions and conformational changes in real-time, providing dynamic and accurate data	Streamlines analysis with integrated measurements; Requires no DNA amplification; Enhances data accuracy and consistency, saving time and resources while driving advanced discoveries
Non-Equilibrium Reaction Analysis: Study non-equilibrium reactions and their kinetics to uncover transient states and detailed mechanisms of DNA-protein interactions	Provides direct, detailed mechanistic views on dynamic processes; Offers detailed insights into the conformational changes of proteins and/or DNA during protein-DNA interactions
	Reveals dynamic processes and transient states of DNA-protein interactions, providing deeper insight into molecular mechanisms that drive biological functions
	Understanding the kinetics of DNA-protein interactions aids in designing targeted therapies and more effective treatments for diseases involving these crucial interactions

Patented and Available for

- Co-development
- Consulting
- Licensing

To find out more, contact enquiries@innovation.ox.ac.uk and quote the project number.

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