

INTRODUCTION

Next-generation protein sequencing is a transformational tool for protein science to unlock new insights into the function of proteins in health and diseases. Quantum-Si's Platinum™ technology brings the insights of protein sequencing to every lab with a space-friendly benchtop instrument, a simple end-to-end workflow, and single-molecule resolution that enables detection of protein variants and modifications.

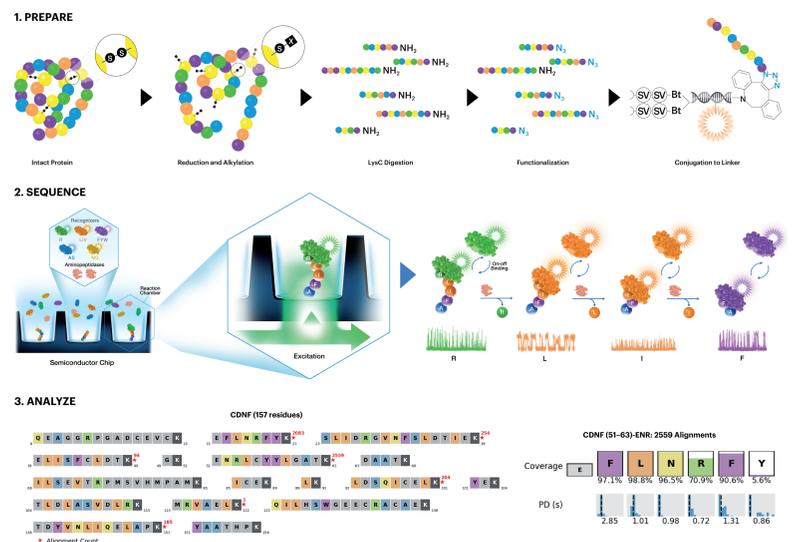
Herein, we employed Platinum to sequence and identify both single proteins or a mixture of proteins, proteins either enriched or immunoprecipitated from biofluids, as well as protein bands extracted from electrophoresis gels.

Results demonstrate that Platinum can be used to effectively identify protein variants with single-molecule resolution in a simple workflow.



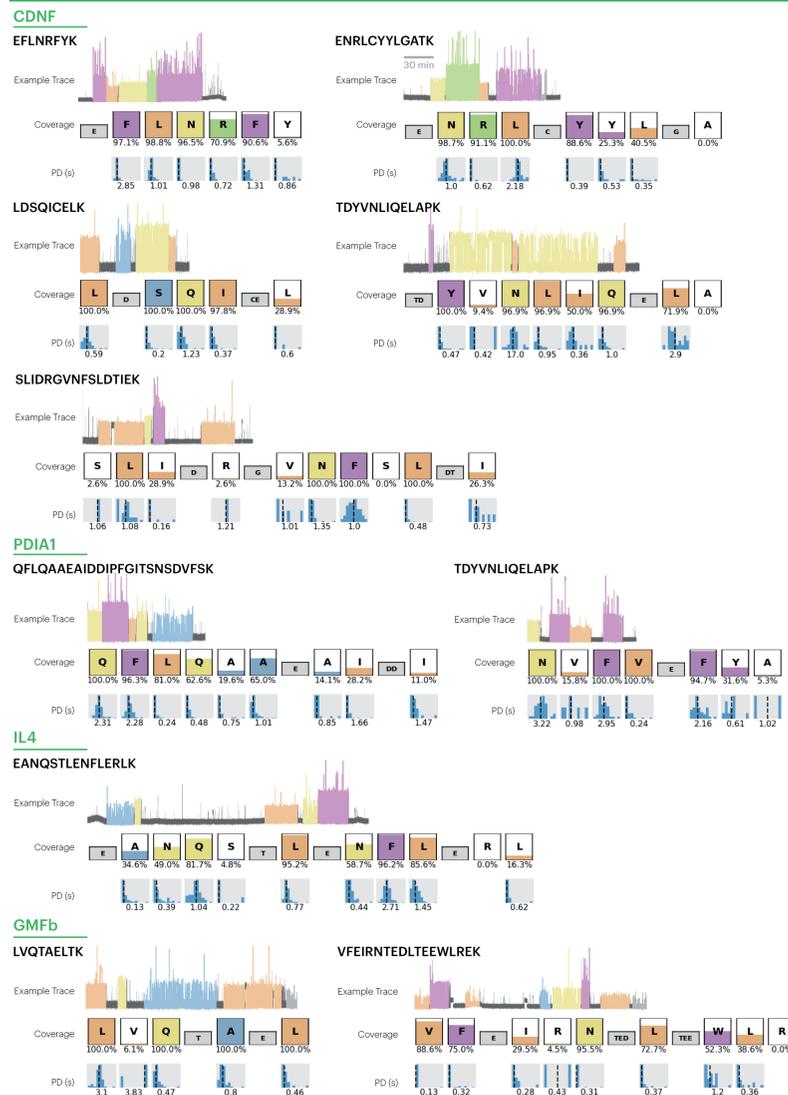
METHODS

- Proteins are reduced, alkylated, and digested with LysC.
- Peptides are functionalized, conjugated, and immobilized on the surface of a proprietary semiconductor chip.
- Fluorescently labeled N-terminal amino acid (NAA) recognizers and aminopeptidases are added to the semiconductor chip.
- Fluorescent intensity and duration of each NAA binding event generates a unique kinetic signature.
- Kinetic signatures are converted into amino acid calls to identify peptides and proteins.

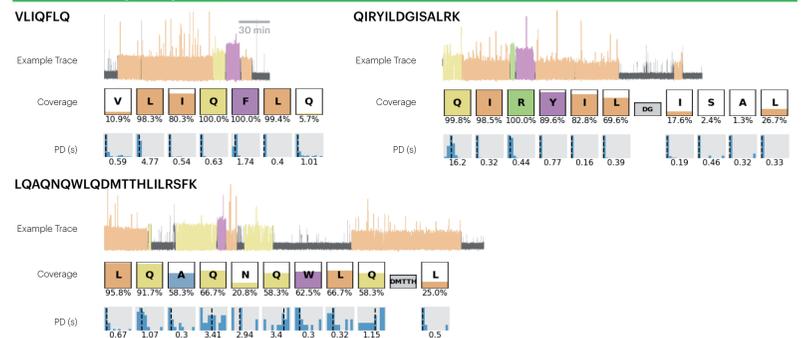


RESULTS AND DISCUSSION

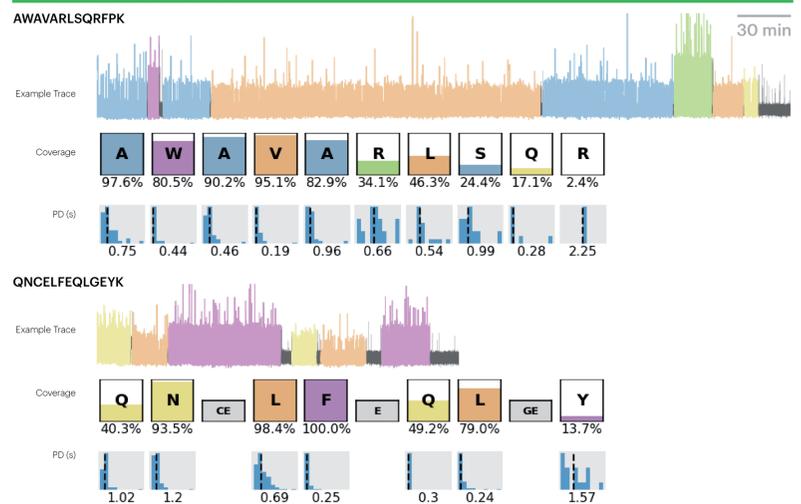
Protein Mixture



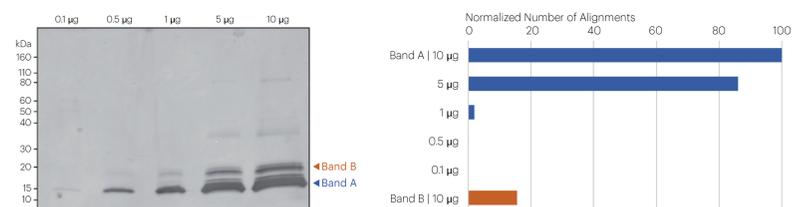
IL6 Immunoprecipitated from Human Serum



HSA Enriched from Urine



CDNF from SDS-PAGE Gel



CONCLUSION AND OUTLOOK

Quantum-Si's Platinum next-generation protein sequencing workflow provides insights into all individual components of a protein mixture containing CDNF, PDIA1, IL4, and GMF-beta at single-molecule resolution.

IL6 and HSA were enriched from human serum and urine, respectively, and successfully sequenced with Platinum. These results showcased Platinum's ability to enrich and sequence low-abundant proteins from complex biofluids.

CDNF extracted from SDS-PAGE gel was successfully sequenced with Platinum, offering an alternative method to antibody-based western blotting.

REFERENCE

Brian D. Reed et al, Science 2022, 378 (6166) 186–192.

TRADEMARKS/LICENSING

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