Application Note 2

Protein-Nucleic Acids Interactions

Introduction

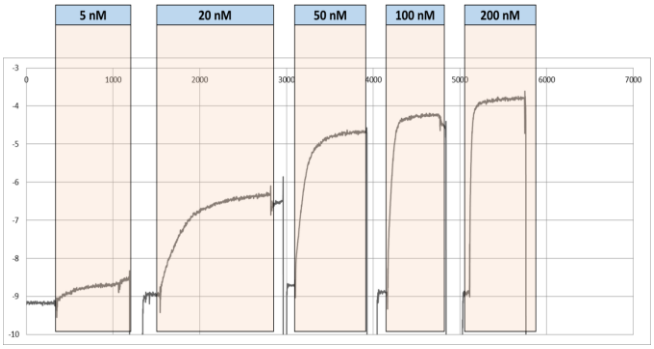
Nucleic acids such as DNA, RNA, and PNA can adopt an active structure that binds to a protein's active site. Similarly to protein-antibody binding, protein-nucleic acid (NA) binding exhibits various affinity. The affinity of a protein-NA pair can be modulated by changing the NA's sequence. This screening strategy of designing a NA sequence to reach a specific affinity range with a target protein is used in emerging applications such as personalized medicine. SPR (Surface Plasmon Resonance) is a powerful label-free technique that can provide protein-NA binding kinetic data to support academic and clinical research in understanding and modulating core cellular processes such as transcriptional regulation.

Affinité P4SPR

Affinité's P4SPR has a unique approach to identifying binding partners on DNA, quantifying target proteins, and determining binding affinities and binding kinetics. The simplicity of NA immobilization and ease of use of the instrument make this method intuitive for anyone (undergraduate to astronauts; senior chemists to weekend scientists) within a few minutes of training.

Affinité's technology has been implemented for the determination of protein-DNA interactions. In this assay, a double stranded DNA fragment is hybridized on the SPR chip. The interaction with a soluble protein is monitored in a label-free approach. The method is suitable for application of any thiolated nucleic acid strand.

LacI repressor protein / dsDNA



Step-wise sensing of protein using dsDNA.

Key experimental steps

Affinité's peptide SPR chip

Thiolated oligonucleotide

PBS 1 X pH 7.4 buffer

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