High Throughput Method for Characterizing Ligand Binding using DNA-Linked Ligands

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Categories:
- Biotechnology
- Chemistry and Chemical Analysis

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- DNA
- High Throughput Screening
- Inhibition Constants

Purdue University researchers have developed a cost-effective and sensitive DNA-based ligand displacement assay for use in drug discovery and high throughput screening campaigns. Characterizing the binding of small molecule ligands to specific protein targets is central to the discovery of drugs and chemical probes. Current assays to characterize small molecule binding, including fluorescence polarization, the AlphaScreen bead-based assay, and time-resolved fluorescence resonance energy transfer, suffer from significant liabilities such as high costs or sensitivity of reagents to ambient light exposure. Purdue's technology capitalizes on low-cost DNA sequencing, measuring the recovery of a DNA-linked ligand after competition with free ligand to determine a ligand's affinity to protein targets with high sensitivity. Using this methodology, researchers determined the dissociation constants of 96 compounds to a protein target and determined a compound's half maximal inhibitory concentration for five protein targets simultaneously in a crude cell lysate. This approach achieves an unprecedented level of sensitivity and is readily applicable to high-throughput screening and will aid in the development of selective chemical probes.

Advantages
-Applicable to High Throughput Screening Campaigns
-Cost-effective

Applications
-Drug Discovery
-High Throughput Screening

Technology Validation:

This technology has been validated by determining the dissociation constants of 96 molecules to a protein target simultaneously. Also, this technology has been used on cell lysates to determine the half maximal inhibitory concentration of a compound for 5 protein targets simultaneously.

Related Publication: Multiplexed Small Molecule Ligand Binding Assays by Affinity Labeling and DNA Sequence Analysis.
10.26434/chemrxiv.14382056.v1

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