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Selection-based Sensing using DNA-Encoded Probes

A highly sensitive, cost-effective, and high-throughput platform uses DNA sequencing to profile enzymatic activity in complex samples for applications like cancer diagnostics and drug development.

Molecular biologists and clinicians studying and diagnosing critical biological problems, including human disease and cancer, rely on methods to detect the activity of proteins that are often costly, not amenable to high-throughput detection, limited by their sensitivity, and ineffective for complex samples. A sensitive method to detect protein activity that overcomes these challenges has the potential to speed the pace and improve the quality of countless endeavors in biomedical research and diagnostics.

Researchers at Purdue University have developed a platform that detects enzymatic activity in complex samples with high sensitivity that is cost-effective, high-throughput, and easily analyzed with current instrumentation. To accomplish this, a DNA sequence is used to encode a protein sample's activity in response to the presence of a drug or another change in conditions for each sample in a high-throughput assay. This technology has been successfully employed to detect activity of the metabolic protein, protein kinase A, and the proteins important to cancer biology, farnesyltransferase and caspase 3.

Advantages:

-Low cost

-Highly sensitive

-High-throughput profiling

Potential applications:

-Cancer diagnosis and characterization

-Basic research

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Category

Biotechnology & Life Sciences/Biomarker Discovery & Diagnostics

Biotechnology & Life Sciences/Analytical & Diagnostic Instrumentation

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-Drug development

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