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Novel High Throughput Technology to Identify Direct Upstream Kinases

A high-throughput platform combines protein-fragment complementation with mass spectrometry to rapidly and accurately identify upstream kinases, significantly advancing drug discovery and development.

Identification of upstream kinases is extremely important to drug discovery, especially for finding drug lead compounds, improving drug efficacy, and combating drug-resistant diseases. Currently available technologies identify kinase substrates; however, there is no existing high throughput technology for identification of a key phosphoprotein's upstream kinases.

Purdue University researchers have developed a high-throughput platform to isolate and analyze proteins that only transiently interact under physiological conditions, such as upstream kinases and their substrates. The platform achieves this by combining a protein-fragment complementation assay with mass spectrometry. The researchers use fluorescence protein fragments to stabilize the weak and transient kinase-substrate interactions for mass spectrometry analysis, a method termed fluorescence complementation affinity proteomics (FCAP). Mass spectrometry allows for the unambiguous sequencing of interacting proteins and provides the ability to distinguish specific interacting partners from false identifications through quantitative proteomics. Major applications include pharmaceutical and biotechnology research and development.

Advantages:

-High throughput technology

-Identifies upstream kinases

-Does not introduce false positives

-Identifying drug lead compounds

-Improves drug efficacy

-Combats drug-resistance diseases

Technology ID

66261

Category

Biotechnology & Life Sciences/Analytical & Diagnostic Instrumentation

Pharmaceuticals/Research Tools & Assays

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Potential Applications:

-Drug discovery

-Pharmaceuticals

-Biotechnology

Related Publications:

Lingfei Zeng, et al. Identification of Upstream Kinases by Fluorescence Complementation Mass Spectrometry. ACS Central Science, June 19, 2017. DOI: 10.1021/acscentsci.7b00261.

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