Docket #: S23-477

Reagent for Detecting Biomarkers without Sample Preparation

Traditional ELISA methods are highly sensitive, but they require multiple steps of adding antibodies, washing, and adding enzymatic substrates. The complexity of ELISA assays also requires technicians and/or expensive laboratory equipment. These reasons limit assay throughput and confine them to laboratory and clinical settings.

The Soh Lab at Stanford has invented a method that enables the detection of protein targets in complex biological media without the need of preparation or washing. This invention unlocks potential for high-throughput, multiplexed, highly sensitive sensors to be used in the point of care settings. The method relies on the linking of existing affinity reagents to environmentally sensitive fluorescent dyes. This conjugation can be formed with self-labeling enzyme techniques through fusion-protein engineering, or through direct linkage via incorporation of non-natural amino acids engineered into the affinity reagent backbone. Instead of using a conventional structural switching mechanism, this invention relies on the dye for signaling. Upon binding target, the local environment surrounding the dye will be altered, leading to a change in the fluorescent intensity of the dye. The methodology provides an efficient technique to facilitate quick and easy screening of protein targets.

Stage of Development
Research - in vitro

Applications

- Life sciences research
- Clinical diagnostics
- High throughput screening

Advantages

- Could be used as a sample-prep free, large-scale diagnostics platform
- Compatible with a panel of affinity reagents
- Time-efficient and reduces resources needed

Publications

- Wu, H. D., Trinh, T., Li, T., Thapa, S., Lee, R. B., Nguyen, T. T. T., ... & Tom Soh, H. (2025). " A Generalizable Fluorescence Sensor Platform for Sample Preparation?Free Protein Detection". Advanced Materials, 37(44), e19662.

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