Docket #: S22-252

Microbeads with Radiometric Lanthanide Encoding for Drug Screening

Researchers at Stanford have developed a new method of drug screening using lanthanide-encoded beads.

Protein-protein interactions are one of the most fundamental biological processes which biomedical science has sought to engineer. Many currently available medications selectively modulate one binding partner of a protein of interest for therapeutic benefit. Therefore, it is advantageous to be able to screen protein-protein interactions in an unbiased and high-throughput manner. Multiplexed microbead assays allow for massively multiplexed high throughput evaluation of a myriad of biological proteomic interactions. However, these assays often have a limited possible coding space with fluorescently encoded beads.

Stage of Development
Research -

in vitro

Stage of Research
The inventors have developed a method of screening that modulates protein-protein interactions. Specifically, a library of microfluidically-produced hydrogel beads encoded with radiometric combinations of lanthanide nanophosphors (MRBLES) are produced. Subsequently, a library of bead-bound peptides with bind site sequences are synthesized on the surface of those MRBLES. The MRBLES have embedded with lanthanide spectral codes that correspond to the binding site sequences. MRBLES with bind site sequence peptides are then incubated with a protein of interest and a factor, for example a small molecule that is thought to modulate binding between protein of interest and binding site sequences. Binding interactions in each well of

an array are quantified via a detectable label (e.g. an antibody with an attached fluorophore). This then gives a read out of the binding interactions between many binding site peptides and a protein of interest in parallel in the presence and absence of a modulating factor.

Technology Reference Nos.

- CZ Biohub ref. no. CZB-259S
- Stanford ref. no. S22-252

Applications

- Multiplexed drug screening of small molecule inhibitors with specific binding sites of interest

Advantages

- Full protein expression is not necessary, only binding site sequences are produced on beads.
- MRBLES use of lanthanides allows for a greater possible coding space given that they have narrow and well-separated emission spectra

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