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Method for rapid mechanical profiling of cells

A high-throughput method to measure cell-generated forces and ligand binding affinity by monitoring the internalization of ruptured DNA tension sensors.

IP Status: Utility Patent Pending; Application No. 18/992,445

Applications

- Rapid mechanical profiling of cells
- Binding kinetics of mechanotherapies
- CRISPR screening of genes that drive malignant mechanical phenotypes
- Sorting cells with distinct mechanotypes for downstream -omics analysis
- High-throughput screening for cancer metastasis therapies
- Screening of ligands, antibodies, or TCRs for immunotherapies

Technology Overview

This technology allows for the high-throughput measurement of cell adhesion and forces generated by individual cells. It uses HUH-tags to link ligands of choice to DNA probes. Cells plated on the probes rupture fluorescently tagged DNA probes based on cellular forces generated and affinity of ligand-receptor engagement. The assay uses novel readout of ruptured DNA-based tension gauge tethers (TGTs), where the internalized DNA is measured via flow cytometry or next-generation sequencing. This method enables the analysis of heterogeneous cell populations, a significant improvement over existing bead-based systems that cannot be used for large-scale experiments like CRISPR or drug screens.

Phase of Development

TRL: 4-5
Active validation and testing with multiple cell lines and ligands. Ligands used so far include multiple recombinant proteins and antibodies. Cell lines include immortalized cell lines, patient derived xenografts, patient derived immune cells.

Desired Partnerships

This technology is now available for:

- License
- Sponsored research
- Co-development

Please contact our office to share your business' needs and learn more.

Researchers

- Wendy Gordon, PhD Professor, Department of Biochemistry, Molecular Biology, and Biophysics

References

Technology ID
2022-256

Category
All Technologies
Life Sciences/Biologics
Life Sciences/Diagnostics & Imaging
Life Sciences/Research Tools

View online

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