Docket #: S22-026

A single cell screening platform for Osteoarthritis drug candidates

Stanford inventors have developed a single cell screening platform that can be used to predict the therapeutic effects of osteoarthritis (OA) drugs on individual patients by defining consequent changes in the cellular landscape. Osteoarthritis is a complex and heterogeneous disease with many factors known to influence the etiology, for which clinical care is limited to pain management and joint replacement. The heterogeneity between patients with OA and poorly defined molecular underpinnings of the disease contribute to a high rate of failure for drugs that reach clinical trials. To address this limitation, researchers in the Bhutani lab developed a patient specific high-resolution screening method that enables examination of drug-induced changes in the cellular landscape. The method employs cytometry by time-of-flight (cyTOF) to cluster cells into subpopulations before and after drug treatment based on the expression profiles of certain cellular, inflammatory, and signaling factors. In heterogeneous populations, patients can be stratified into responsive and non-responsive groups based these profile changes, enabling personalized OA treatments based on cellular response. Overall, this method provides a high-resolution examination of therapeutic potential for OA drugs based on a given patient's particular disease and allows more thorough preclinical testing that could save significant time and money.

Stage of Development
Proof of Concept

Applications

- Drug development and screening for Osteoarthritis
- Osteoarthritis pathogenesis
- Cartilage repair research

Advantages

- Cost and resource effective
- Patient specific
- Enables thorough preclinical testing to better inform Osteoarthritic drug development
- Enables mechanistic study of Osteoarthritis therapeutics

Publications

- Neety Sahu, Fiorella C Grandi, Nidhi Bhutani. "A single-cell mass cytometry platform to map the effects of preclinical drugs on cartilage homeostasis." JCI insight, e160702. 4 Oct. 2022.

Patents

- Published Application: WO2023146979

Innovators

- Nidhi Bhutani
- Neety Sahu
- Fiorella Grandi

Licensing Contact

Eileen Lee

Email