Cell Barcoding for Multiplexed Pooled Screening of Perturbations in Cells

The solution is a novel pooled screening approach, called CellCode, that utilizes lentiviral barcoded libraries to encode perturbation histories in cells that are then decoded in downstream assays.

What is the Problem?

Current methods of profiling environmental factors, such as signaling molecules or pharmacological inhibitors, are typically performed in conventional multi-well plate assays. Such approaches, however, are not easily scalable to enable screening of combinations of factors and are also confined to an in vitro context.

What is the Solution?

The present technology provides a novel pooled screening approach, called CellCode, that utilizes lentiviral barcoded libraries to encode perturbation histories in cells that are then decoded in downstream assays. The innovation allows for the study of many different treatment conditions in a pooled manner using a barcode-to-treatment map. Using CellCode, cells from different treatment conditions can be mixed together and subjected to a variety of follow-up assays, such as fluorescence-activated cell sorting, in vitro growth assays, single-cell RNA sequencing, and adoptive transfers into animals.

What is the Competitive Advantage?

The competitive advantage of this innovation lies in its ability to track barcoded cells from different treatment conditions that can be transferred in vivo after pooling, enabling highly parallel interrogation of many different treatments in animal models. The process of barcoding cells, splitting into hundreds of wells with different treatments, then pooling and assaying cells can be repeated multiple times to layer perturbations over time and enable unprecedented scaling of cellular assays. By offering scalable methods for screening environmental perturbations in cells, this technology can help accelerate research and development across a wide variety of fields including CAR T cells and the drug discovery market.

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Category

Therapeutics/Platform Technology
Selection of Available Technologies

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