Microarray for Efficient, Inexpensive Testing on Rare Patient-Derived Cells

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Technology description

Reduces Costs by Allowing Researchers to Test Multiple Agents Simultaneously

This cell-based microarray allows testing of a wide range of biological or pharmaceutical agents on small numbers of cells from rare populations. Patient-derived cells such as cancer cells, stem cells and precancerous cells are difficult and expensive to obtain. Inefficient existing technologies only allow testing a few agents at a time on small populations of these rare cells, preventing large-scale testing. For example, colon cancer stem cells, recently identified as a potential cause of colon cancer, are of interest to many doctors and researchers who want to test the cells' response to drugs. Because they are rare, researchers and drug companies can't conduct large-scale testing on these cells. University of Florida researchers have developed a tool that allows the testing of multiple combinations of biological or pharmaceutical agents on small numbers of cells. Researchers will be able to test more agents without wasting these precious and expensive cells, reducing costs and increasing efficiency. The microarray separates the cells on a glass slide, allowing the user to test many agents at once: each agent targets just a portion of the cells on the slide.

Technology

A microarray is a support (in this case, a glass slide) onto which molecules are attached in a regular pattern for use in biochemical or genetic analysis. In the microarray developed by UF researchers, thin films of timed-release polymer are loaded with testing agents and microarrayed onto solid substrates, providing a background that resists cell adhesion. This tool permits the testing of multiple biological and/or pharmaceutical agents and their various combinations on rare cell populations that are present in small quantities. On a given glass slide more than 1,000 spots can be arrayed, allowing for as many agents to be applied to the cell population of interest. Then, non-adherent or non-reactive cells are removed, leaving separated areas of the cells that showed adherence. Researchers can measure cellular response including proliferation and differentiation, through immunostaining or by using contrast agents.

Application area

A microarray for the application of multiple agents on a small amount of reagent cells

Advantages

Requires only a small number of cells, lowering expenses and increasing productivity
Allows for the testing of multiple agents on small numbers of rare reagent cells, providing a competitive advantage
Slides can be stored long-term, decreasing waste and increasing utility
Does not require expensive automated microfluidics machines, decreasing costs

Institution

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