Massively-Parallel Genetic Screening Tool

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BACKGROUND

Most high throughput genetic screening technology relies on phenotypes that can be coupled to an easily-detectable phenotype, such as fluorescent cell sorting, cell imaging, or cell death. However, many genetic variants may result in a phenotype that is much more subtle and cannot be easily detected by existing screening technologies.

It is currently difficult for researchers to examine a variety of different outcomes in one setting, with many of those parameters not being possible to quantify. Being able to assess the functional outcomes on a larger number of individual cells may substantially improve the efficiency of screening.

TECHNOLOGY DESCRIPTION

UC San Diego researchers have developed a method that enables the detection of subtle genetic phenotypes, by assaying changes in gene expression that result when a genetic perturbation is made. This allows analysis of a broader phenotype covering the expression levels of more than 20k genes. Beyond this, the tools allow interrogation of gene pathways and regulatory networks in a novel fashion, facilitating a direct read-out the effect of genetic perturbations on all genes.

This invention is a method for highly efficient characterization of the functional consequences of cellular genetic modifications, and to be able to do so in many individual mammalian cells in parallel. It is based on the principles of the CRISPR system, leveraged such that the exact genetic modification in each cell, as well as the functional consequences of the modification in the form of gene expression, can be determined in a massively parallel manner.

This patent-pending technology will have a number of important applications, including comprehensive characterization of disease-causing genetic mutations, screening of potent T-cells for immunotherapy, high throughput production optimization, and discovering therapeutically relevant neutralizing antibodies.

INTELLECTUAL PROPERTY INFO

Patent pending; available for licensing

PATENT STATUS

Country	Type	Number	Dated	Case
United States Of America	Published Application	US-2019-0330661	10/31/2019	2016-290
Patent Cooperation Treaty	Published Application	2018005691	01/04/2018	2016-290

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OTHER INFORMATION

KEYWORDS
CRISPR, Cas-9, screening, high-throughput, genomics, precision medicine, mutation

CATEGORIZED AS
- Biotechnology
  - Genomics
- Research Tools
  - Screening Assays

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