

Scientists develop method for discovering rare cells

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Scientists of the Hubrecht Institute Utrecht developed a new method for identifying rare cell types by single-cell mRNA sequencing. The newly developed algorithm, called RaceID, is very useful for identifying rare cell types in normal and diseased tissue. The research, funded by an NWO Vici grant, is published ahead of print on the website of *Nature* the 19th of August 2015.

For a good understanding of the development and function of an organ, it is essential to understand all characteristics of its cell types. To distinguish between different cell types, the [gene expression levels](#) of cells are measured. With the emergence of advanced single cell mRNA sequencing thousands of gene expression levels in an individual cell can be measured. This way a fingerprint of cell can be made, called a transcriptome, which reveals the identity of a cell.

However, the expression of a gene in a given cell type can be highly variable and the experimental procedure to sequence the transcriptome of a cell introduces additional variability. This makes it very challenging to identify cell types, in particular rare cell types that occur at very low frequency within an organ. Identifying rare cell types is crucial to acquire a better understanding of normal or [diseased tissue](#) biology, because they can carry out important functions in an organ. Stem cells, for example, which give rise to all other cell types of an organ are typically rare and characterizing these cells could be the basis for regenerative medicine.

RaceID

The scientists of the Hubrecht Institute developed an algorithm for rare cell type identification in complex populations of single cells. This algorithm, called RaceID, was used to analyse cultured mini-intestines (organoids). In these organoids the scientists discovered a new subpopulation of hormone producing intestinal cells. These so called enteroendocrine [cells](#) are important for gut homeostasis and are therefore crucial for the digestive function of the intestine.

In the future RaceID can be used to discover rare cell types and their marker genes. Knowing the full repertoire of [cell types](#) in various systems such as developing embryos or adult organs will lead to a better understanding of these systems and can provide basis for disease therapies.

More information: "Single-cell messenger RNA sequencing reveals rare intestinal cell types." *Nature* (2015) [DOI: 10.1038/nature14966](https://doi.org/10.1038/nature14966)

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