

Sorting stem cells

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When an embryonic stem cell is in the first stage of its development it has the potential to grow into any type of cell in the body, a state scientists call undifferentiated.

A team of researchers from Scotland has now demonstrated a way to easily distinguish undifferentiated <u>embryonic stem cells</u> from later-stage stem cells whose fate is sealed. The results are published in the <u>American Institute of Physics</u>' (AIP) journal *Biomicrofluidics*.

The researchers used an electric field to pull stem cells through a fluid in a process called dielectrophoresis. They varied the frequency of the voltage used to generate the electric field and studied how the cells moved, a response that was affected by the cell's <u>electrical properties</u>.

The researchers found that differentiated stem cells could store a significantly greater charge on their <u>outer membranes</u>, a characteristic that might be used to effectively identify and separate them from undifferentiated cells.

The researchers write that the wrinkling, folding, and thinning of a cell's membrane as it differentiates may explain why the later-stage cells can store more charge. The sorting method may prove useful in separating cells for biomedical research or ultimately for treatments of diseases such as Parkinson's.

More information: "Dielectrophoresis based discrimination of human embryonic stem cells from differentiating derivatives" is published in



the journal *Biomicrofluidics*: <u>bmf.aip.org/resource/1/biomgb/v6/i4/p044113_s1</u>

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