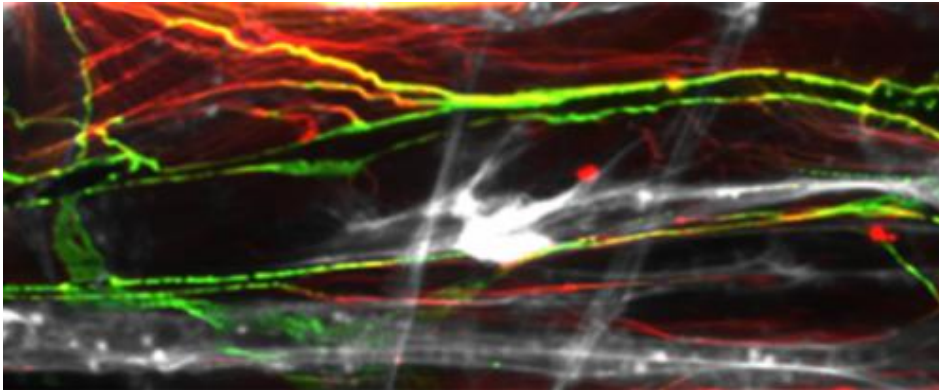


Stem cells on the road to specialization



Scientists at the University of Copenhagen have gained new insight into how both early embryonic cells and embryonic stem cells are directed into becoming specialised cell types, like pancreatic and liver cells. The results have just been published in the scientific journal *eLife*.

This latest research from the Danish Stem Cell Center (Danstem) at the University of Copenhagen, helps identify how stem cells create so called pathways and roads supporting their own specialisation. This understanding is an important step towards stem cell-based cell therapies for conditions like diabetes and liver diseases.

"The new insight that we have gained into the impact of the physical environment on cell development is highly valuable," says Professor Joshua Brickman from DanStem, "It enables us to create the optimal physical environment in the laboratory for stem cells and progenitor cells to develop into specific, mature cells."

On the road

Developing cells constantly move and while moving around, they organise and build a physical environment very much like a small city with pathways and roads. The new research published in the scientific journal *eLife* shows two important things. Firstly the embryonic cells receive signals from other cells that actually instruct them in how to organise and build the road leading the cells towards early stages of pancreas and liver cells.

Professor Brickman and his team also found that they could isolate these roads from the developing stem cells and literally freeze them. The saved roads were then used in a separate experiment which showed that in the absence of an important cell signal, the road alone can be used to improve the cells' development and differentiation towards mature cells.

"Apart from gaining new important insight into cell development, our work also suggests that some of the current approaches to human embryonic stem cells specialisation towards both pancreatic and liver cells may not have been effective, because the important role of these roads, the so called extra-cellular matrix, was ignored," says Joshua Brickman.

More information: elifesciences.org/lookup/doi/10.7554/elife.00806

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