

Scientists uncover the key to controlling how stem cells develop

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(PhysOrg.com) -- The results of a new study involving a McMaster University researcher provide insight into how scientists might control human embryonic stem cell differentiation.

In collaboration with researchers from SickKids and Mount Sinai hospitals, Dr. Jon Draper, a scientist in the McMaster Stem Cell and Cancer Research Institute, focused on producing early endoderm cells from human embryonic stem cells.

The research is published in the August issue of *Cell Stem Cell*, a Cell Press journal.

Human embryonic stem cells are the building blocks for every organ and tissue in the body. Aside from their ability to self renew, they are also capable of differentiating, or turning into, any type of cell in the body, including bone, muscle and blood cells.

An endoderm is the innermost of three primary layers of the human embryo. The endoderm forms certain organs in the embryo such as the respiratory and digestive tracts, the lungs, liver and pancreas.

The researchers focused on generating stable progenitor cells capable of producing all endoderm cell types. The cells were able to maintain their distinct profiles through many stages of cell culture without losing their ability to self renew.

One of the biggest barriers preventing the clinical use of human embryonic stem cells is the inability to effectively control the process of cellular differentiation. This study provides a clear picture of how the early steps of endoderm tissue differentiation might be controlled.

Dr. Cheryle Seguin and Dr. Janet Rossant, both of the Developmental and Stem Cell Biology program at SickKids, conducted the research along with Draper and Dr. Andras Nagy, of Mount Sinai Hospital.

Draper is an assistant professor in the Department of Pathology and Molecular Medicine. He joined McMaster University in February.

Provided by McMaster University

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