

Sweet success for new stem cell ID trick

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(PhysOrg.com) -- Biomaterial scientists in Manchester believe they have found a new way of isolating the ‘ingredients’ needed for potential stem cell treatments for nerve damage and heart disease.

And the technique could also be used in the future to improve the efficiency of bone marrow transplants.

Dr Catherine Merry and Dr Rebecca Baldwin from The School of Materials – working with colleagues from the Paterson Institute for Cancer Research and Nijmegen University in the Netherlands – have developed antibodies that can recognise different patterns within the natural sugars that coat cells in the body.

Writing in the journal *Stem Cells*, the Manchester scientists report how the technique allows cells to be clearly identified depending on whether the antibodies bind themselves to the cells or not.

Using this method, they can efficiently isolate blood stem cells generated from embryonic stem cells, which then have the potential to be used in the treatment of people with heart and blood cell problems.

The researchers report how the sugars displayed on the surface of a small population of blood stem cells allow them to be distinguished from similar cells which lack blood forming ability.

They believe these sugars may also allow these cells to respond better to the signals which instruct them to become mature blood cell types.

Dr Baldwin, who conducted the research, said: “We were surprised to find that populations of cells which we had previously thought to be all the same were actually mixtures of cell types with differences in their cell surface sugars.

“By using the sugar tags to pull apart this jumble of cells, we can potentially improve the efficiency with which we can make blood cells from embryonic stem cells. Usually we would need to genetically manipulate the DNA in the cells to allow us to tag them in this way.

“We believe our research suggests how sugars can be used to help embryonic stem cells grow in the lab – and also how they can be instructed to become cell types which could be of use in human therapies. These sugars are on the surface of almost all cells and we are looking to see if the same ‘trick’ can be used to make nerve cells.

“Our technique could also be used to improve the efficiency of bone marrow transplantation. After radiotherapy, it could be used to distinguish cells capable of rapidly producing blood cells.

“Although the prospect of creating cells from embryonic stem cells for use in human therapies is still a considerable time away, research such as ours helps move towards this goal.”

All cells that make up the tissues of the body – such as skin, liver, brain and blood – are surrounded by a layer of sugars that coat the cells. These sugars help the cells to know what type of cell they are and to respond to the other cells which surround them and the chemical messages that pass between them.

Provided by University of Manchester

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