New stem cell research

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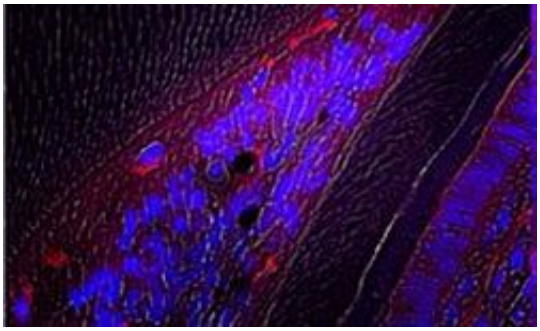

Blood vessel cells inside a tooth

(PhysOrg.com) -- Scientists from King's College London have uncovered the first genetic evidence that shows cells found on the surface of blood vessels can act as stem cells to assist in both organ growth and tissue repair.

The study, funded by the Medical Research Council, is published today in the journal, Proceedings of the National Academy of Sciences *(PNAS).*

Up until now it has not been possible to show that a blood vessel (perivascular) cell can transform into a different cell in vivo (in animals), but this study shows for the first time that they can in fact act as stem cells in this way.

Perivascular cells are scattered throughout the blood vessel walls and are

involved in the first response to tissue damage, as an increase in blood supply travels to the site of the damage. Therefore the number of these cells is naturally increased at the site. As these cells are present in most human tissue, they could be utilised to provide an effective natural mechanism for organ and tissue repair.

The researchers carried out experiments in rodent incisor teeth, which continuously sharpen themselves by the shearing action of their tips. As tissue is lost during sharpening, this must be continuously replaced. The experiment showed that perivascular cells act as stem cells and differentiate into specialised cells when needed. The team found that when a tooth is damaged, specific new tooth cells (odontoblasts) are made by these perivascular cells to regenerate the tooth.

Professor Paul Sharpe from the Department of Craniofacial Development in the Dental Institute at King's who led the study, said: 'This is the first time perivascular cells have been shown to differentiate into specialised cells during a natural tissue repair process. In addition to the obvious significance for understanding the cellular mechanisms of tissue repair, it also has wider implications for areas of regenerative medicine/dentistry directed towards stimulating natural repair following tissue damage or disease.'

Provided by King's College London