

Stem cell discovery paves way for targeted treatment for osteoarthritis

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Scientists at the University of York have made a significant advance that could make cell-based treatments for arthritis less of a lottery.

Researchers in the Departments of Biology and Physics at York, working with colleagues at the Erasmus Medical Centre in Rotterdam, have identified individual stem cells that can regenerate tissue, cartilage and bone.

The stem cells are mixed within human bone marrow stromal cells (MSCs) but are similar in appearance and previously, scientists had difficulty in distinguishing between them. The York researchers isolated individual MSCs and analysed their different properties. This allowed researchers to identify those stem cells which are capable of repairing damaged cartilage or joint tissue opening the way for improved treatment for arthritis.

The research which was funded by Arthritis Research UK is published in the latest issue of *Stem Cell Reports*.

The York team also isolated a rare subset of stem cells in bone marrow that while having no capability for tissue repair appeared to have a prominent role in immune function.

Dr Paul Genever, who led the research at York, said: "While stem cell therapy is an exciting new development for the treatment for osteoarthritis, up to now it has been something of a lottery because we did not know the precise properties of each of the cells.

"This project has helped us to establish which cells are good at regenerating tissue, cartilage and bone respectively. It will help in the search to develop more targeted therapies for arthritis patients."

Co-Lead author Dr James Fox said "Working with colleagues across the Arthritis Research UK Tissue Engineering Centre will help to bring our discovery closer to patient treatment".

Director of research at the charity Arthritis Research UK Dr Stephen Simpson added: "There are 8 million people in the UK living with the pain and disability caused by osteoarthritis. We are fighting to find better treatments and one day, a cure. This research is exciting and promising. Identifying specific stem cells that could help the damaged joint to repair itself, takes us a step closer to our aim of developing an injectable, safe, stem cell therapy for people with osteoarthritis."

More information: The paper 'Multiparameter analysis of human bone marrow stromal cells identifies distinct immunomodulatory and differentiation-competent subtypes' is published in *Stem Cell Reports*.

Provided by University of York

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