

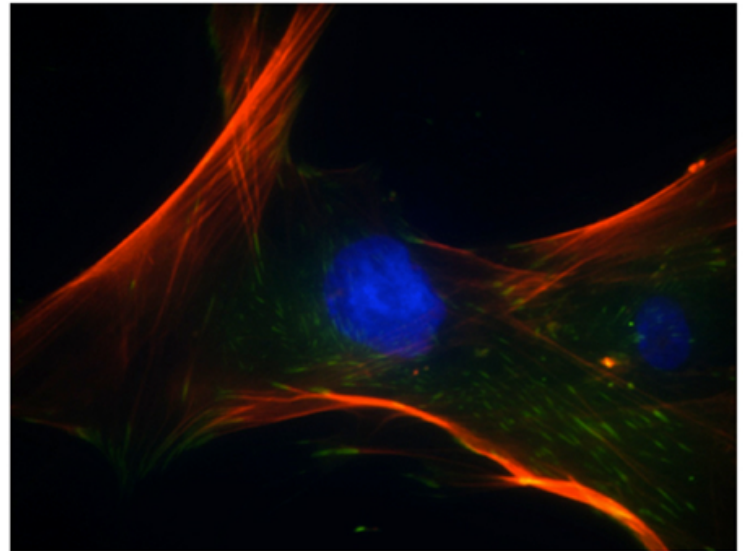
Mesenchymal stem cells: the 'other' bone marrow stem cells

What do we know?

Mesenchymal stem cells (MSCs) are multipotent stem cells found in bone marrow that are important for making and repairing skeletal tissues, such as cartilage, bone and the fat found in bone marrow. These are not to be confused with haematopoietic (blood) stem cells that are also found in bone marrow and make our blood.

MSCs make up a very small fraction of all the cells in our bone marrow, but researchers have been able to isolate MSCs so they can be studied.

Recent studies have suggested that MSCs are important for creating a niche environment or 'home' for blood stem cells in bone marrow.



Human mesenchymal stem cells.

Image: Marc Healy, National University of Ireland Galway.

What are researchers investigating?

MSCs treatments are being developed to help repair bone and cartilage, such as injuries to the knee meniscus or long-term accumulated damage that leads to osteoarthritis.

Studies are further investigating reports that show MSCs help new blood vessels form in damaged tissue. This could have major implications for fixing tissue damaged by heart attacks and diseases.

Researchers are also examining the ability of MSCs to reduce inflammation, slow the progression of autoimmune diseases and prevent transplant rejection.

What are the challenges?

Stem cell research is complex, detailed, slow and difficult. Conflicting results in early (and present day) MSC research are a reminder that stem cell research takes time to get right.

There is still a large amount of uncertainty in how MSCs can be successfully delivered to damaged tissues in the body.

Often, transplanted MSCs are rapidly removed from the body, which limits their ability to be used for treatments. Researchers are working to develop ways of holding MSCs in place and encouraging them to develop new cartilage or bone.