

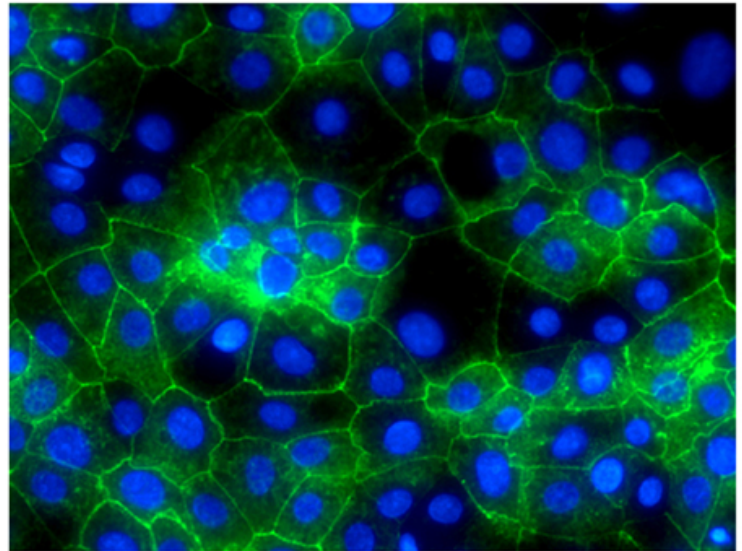
Chronic liver disease: how could regenerative medicine help?

What do we know?

The liver is the only internal organ in the human body capable of regenerating itself after being damaged.

In chronic liver disease, damage to the liver over long periods of time leads to the accumulation of scar tissue that limits the ability of the liver to function and repair itself. This disease is the fifth largest killer in the EU and presently can only be treated with liver transplants.

Researchers have successfully used embryonic stem cells and induced pluripotent stem cells to make new liver cells in laboratories, which may potentially be used to treat liver disease in the future.



Cells similar to the hepatocytes found in the liver. These cells were grown in the lab from human embryonic stem cells. Image: David Hay, University of Edinburgh

What are researchers investigating?

Researchers want to learn how stem cells in the liver are able to regenerate liver tissue. It may be possible to develop treatments that harness the natural ability of liver stem cells to regenerate the liver.

Treatments using pluripotent stem cells to create new liver cells for transplantation into the liver are being researched and developed. More work must be done to make sure that the liver cells created are safe and reliable.

Studies are also exploring if a person's own bone marrow stem cells might be used to create cells that remove scar tissue from the damaged liver.

What are the challenges?

Liver transplants require patients to take immunosuppressants to prevent transplant rejection. Researchers are looking for new ways to make transplants of all kinds more resistant to immune rejection.

Many stem cell treatments could potentially avoid the issue of immune rejection, however a great amount of work must still be carried out to make sure that stem cell treatments, particularly pluripotent stem cell treatments, create reliable and predictable liver cells that are safe for transplantation in large enough quantities.