

Manipulating serotonin can promote healthy repair in chronic liver disease

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(Medical Xpress) -- Publishing in the leading medical journal *Nature Medicine*, a team led by Newcastle University academics have identified serotonin receptors which can be targeted with drugs to enhance the natural healing properties of the liver.

In liver disease, extent of [tissue damage](#) depends on the balance between the generation of [scar tissue](#) and the regeneration of new [liver cells](#). In a significant minority of people who get injury to their organs instead of repairing them, they form scars. This can progress to chronic liver disease and cirrhosis where the scarring is so extensive the liver is unable to clean blood or produce vital hormones and clotting factors. Liver scars also provide an ideal environment for the development of cancers.

Publishing in *Nature Medicine* and showcased in *Nature Research Highlights*, the paper describes how working in mouse models the team were able to tip this balance to favour healthy [tissue regeneration](#) and block scarring by manipulating the actions of serotonin - the “happy” drug.

Normally when a liver is injured – by a virus such as Hepatitis C or B, by alcohol, environmental factors or by a metabolic or autoimmune condition – specialised blood cells known as platelets make general repairs and secrete serotonin.

However, the team found that when scar-forming cells - Hepatic stellate cells (HSC) – are present they are instructed by the serotonin to make

more scar tissue and switch off the healthy regeneration.

Identifying the receptor called 5-HT2B through which serotonin instructs the scar forming cells to switch off regeneration, they found that this resulted in less scarring and more regeneration.

Of the work funded by the Medical Research Council and the Wellcome Trust, lead author, Professor Derek Mann said; “These are promising results in mouse models of liver disease and suggest that chemicals targeting 5-HT2B , which are currently in clinical trials for mood disorders and pulmonary hypertension might also have an application in the treatment of [chronic liver disease](#).”

The group believe the mechanism may also be found in other organs and offers an exciting opportunity for study in the future.

More information: Stimulating healthy tissues regeneration by targeting the 5-HT2B receptor in chronic liver disease, Derek A Mann et al. *Nature Medicine*.10.1038/10.1038/nm.2490

Provided by Newcastle University

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