

Research could improve detection of liver damage

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Research at the University of Liverpool could lead to faster and more accurate diagnoses of liver damage.

The team used paracetamol as the basis for the study: research indicates that paracetamol can place temporary stress on the liver in around a third of people who take a normal dose (4g per day) but the liver returns to normal when the drug has left the system. Overdoses of the drug are a major cause of [liver failure](#) in both the UK and US.

Scientists have discovered that the presence of specific proteins in the blood are indicative of early liver cell damage and can determine the point at which cell death occurred, the type of cell death, and the extent of any damage. This could lead to [liver damage](#) being assessed faster and more accurately in the future - information which could prove valuable when treating people following drug overdoses.

The current blood test used by clinicians to assess [liver function](#) simply indicates whether liver enzymes leaking from dying cells can be detected in the blood. The test is not always reliable because positive results are often, but not always, an indicator of serious underlying liver problems.

Scientists induced a mild paracetamol overdose in mice and discovered that proteins released by cells in the liver - HMGB1 and keratin 18 - provided a detailed picture of the level of cell damage. The release of HMGB1 was associated with necrosis - a process in which a cell bursts and dies - while the release of different types of keratin 18 was

associated with both [apoptosis](#) - a process of normal cell renewal - and necrosis. This latter combination of both types of [cell death](#) is significantly less traumatic for the liver than [necrosis](#) alone in paracetamol overdose.

Pharmacologist, Dr Dominic Williams, from the University's Medical Research Council Centre for Drug Safety Science, said: "The findings are significant because knowing how the cells die will allow development of medicines to help them survive, and may also distinguish patients who have severe injury and require intensive care from those who have mild injury.

"The research has implications for determining how much stress has been placed on the liver in patients who are worried about an accidental overdose, as well as the more serious overdose cases."

More information: The research is published in *Molecular Medicine*.

Provided by University of Liverpool

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