

Largest ever genetic study of liver function could point the way to new treatments

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Researchers have identified a large number of areas in the human genetic code that are involved in regulating the way in which the liver functions, in a new study of over 61,000 people, published today in the journal *Nature Genetics*.

The work is an international collaboration led by Imperial College London and it identifies 42 [genetic regions](#) associated with [liver](#) function, 32 of which had not been linked to liver function before. The work should lead to a better understanding of precisely what goes wrong when the liver ceases to work normally. Ultimately, it could point the way to new treatments that can improve the function of the liver and help to prevent liver damage.

The liver is the body's largest [internal organ](#) and the British Liver Trust estimates that around two million people in the UK have a liver problem at any one time. The liver carries out hundreds of different tasks, including making proteins and blood clotting factors, and helping with digestion and energy release. It also purifies the blood of bacteria, and of the by-products of digestion, alcohol and drugs.

In the new genome-wide association study, the researchers compared the [genetic makeup](#) of over 61,000 people, in order to identify areas of the genetic code that were associated with liver function.

The team assessed the function of the volunteers' livers by looking at the concentrations of [liver enzymes](#) in their blood. People who have [liver](#)

[damage](#) have high concentrations of these enzymes, which are associated with an increased risk of conditions such as cirrhosis, type 2 diabetes and cardiovascular disease.

Dr John Chambers, the lead author of the study from the School of Public Health at Imperial College London, said: "The liver is a central hub in the body and because it has so many diverse functions, it is linked to a large number of conditions. Our new study is a big step towards understanding the role that different genes play in keeping the liver working normally, and towards identifying targets for drugs that can help prevent the liver from functioning abnormally or becoming susceptible to disease."

The researchers identified 42 areas on the [genetic code](#) associated with [liver function](#) and they then went on to pinpoint 69 associated genes within these areas. Some of the genes are known to play a part in other functions in the body, including inflammation and immunity, and metabolising glucose and carbohydrates.

Professor Jaspal S Kooner, the senior author of the study from the National Heart and Lung Institute at Imperial College London, said: "This massive international research effort provides in-depth new knowledge about the genes regulating the liver. We are particularly excited about the genes whose precise role we don't yet know. Investigating these further should help us to fill in the gaps in our understanding about what happens when the liver ceases to function normally and how we might be able to tackle this."

Professor Paul Elliott, also a senior author of the study, from the School of Public Health at Imperial College London, said: "Liver problems affect a huge number of people and they can have a devastating effect on a person's quality of life. This study represents a vast discovery that opens up multiple new avenues for research."

More information: "Genome-wide association study identifies loci influencing concentrations of liver enzymes in plasma" *Nature Genetics*, October 16, 2011.

Provided by Imperial College London

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