**Scientists find gene linked to alcohol consumption**

5 April 2011

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**Scientists have identified a gene that appears to play a role in regulating how much alcohol people drink, in a study of over 47,000 people published today in** [**Proceedings of the National Academy of Sciences**](http://www.pnas.org/content/early/2011/04/05/1017288108.abstract)**.**

The researchers say that finding a common genetic variation influencing levels of alcohol consumption may lead to a better understanding of mechanisms underlying alcohol drinking behaviour in the general population.

The gene, called “autism susceptibility candidate 2”, or AUTS2, has previously been linked to autism and attention deficit hyperactivity disorder, but its function is not known.

Today’s study, by an international consortium led by scientists at Imperial College London and [King’s College London](http://www.kcl.ac.uk), found that there are two versions of the AUTS2 gene, one three times more common than the other.

People with the less common version drink on average five per cent less alcohol than people with the more common version.

The gene is most active in parts of the brain associated with neuropsychological reward mechanisms, suggesting that it might play a part in regulating the positive reinforcement that people feel when they drink alcohol.

Alcohol consumption is known to be partly determined by genes but until now the only gene known to make a notable contribution was the gene encoding alcohol dehydrogenase, an enzyme that breaks down alcohol in the liver.

[Professor Paul Elliott](http://www1.imperial.ac.uk/medicine/people/p.elliott/), from the [School of Public Health](http://www1.imperial.ac.uk/publichealth/) at Imperial College London, said: “Of course there are a lot of factors that affect how much alcohol a person drinks, but we know from twin studies that genes play an important role.

The difference that this particular gene makes is only small, but by finding it we’ve opened up a new area of research into the biological mechanisms that control drinking.”

The researchers analysed DNA samples from over 26,000 volunteers to search for genes that appeared to affect alcohol consumption, and then checked their findings in another 21,000 people.

The volunteers reported how much alcohol they drank in questionnaires.

Once the researchers had identified AUTS2, they examined how much messenger RNA –a copy of the gene’s code that is used to make a protein – was present in samples of donated human brain tissue.

They found that the people with the version of the gene associated with lower alcohol consumption produced more of the messenger RNA, meaning that the gene was more active.

The researchers also investigated strains of mice that had been selectively bred according to how much alcohol they drink voluntarily.

They found that there were differences in the AUTS2 gene activity levels among different breeds of mice that drink more or less alcohol. In addition, the researchers found that blocking the effect of a related gene in fruit flies made the flies less sensitive to alcohol.

These results indicate that AUTS2 seems to be involved in regulation of alcohol intake in a number of different species.

Professor Gunter Schumann, from the [Institute of Psychiatry](http://www.iop.kcl.ac.uk/), [King’s College London](http://www.kcl.ac.uk), said: “In this study we combine genetic studies with investigations of animal behaviour. Since people drink alcohol for very different reasons, understanding the particular behaviour influenced by the gene identified helps us better understand the biological basis of these reasons.

This is an important first step towards the development of individually targeted prevention and treatments for alcohol abuse and addiction.”

The research was principally funded by the [National Institute for Health Research](http://www.nihr.ac.uk) Biomedical Research Centres at [Imperial](http://imperialbrc.org) and the South London and Maudsley NHS Foundation Trust/Institute of Psychiatry King’s College London, as well as the European Commission and the [Medical Research Council](http://www.mrc.ac.uk).

**Notes to editors:**

1. Journal reference: G. Schumann et al. Genome-wide association and genetic functional studies identify autism susceptibility candidate 2 gene (AUTS2) in the regulation of alcohol consumption. Proceedings of the National Academy of Sciences, published [online](http://www.pnas.org/content/early/2011/04/05/1017288108.abstract) 4 April 2011.

2. About Imperial College London

Consistently rated amongst the world's best universities, Imperial College London is a science-based institution with a reputation for excellence in teaching and research that attracts 14,000 students and 6,000 staff of the highest international quality. Innovative research at the College explores the interface between science, medicine, engineering and business, delivering practical solutions that improve quality of life and the environment - underpinned by a dynamic enterprise culture.

Since its foundation in 1907, Imperial's contributions to society have included the discovery of penicillin, the development of holography and the foundations of fibre optics. This commitment to the application of research for the benefit of all conti nues today, with current focuses including interdisciplinary collaborations to improve global health, tackle climate change, develop sustainable sources of energy and address security challenges.

In 2007, Imperial College London and Imperial College Healthcare NHS Trust formed the UK's first Academic Hea lth Science Centre. This unique partnership aims to improve the quality of life of patients and populations by taking new discoveries and translating them into new therapies as quickly as possible.

Website: [www.imperial.ac.uk](http://www.imperial.ac.uk)

3. About King’s College London

King’s College London is one of the top 25 universities in the world (2010 QS international world rankings), The Sunday Times 'University of the Year 2010/11' and the fourth oldest in England. A research-led university based in the heart of London, it has nearly 23,500 students (of whom nearly 9,000 are graduate students) from 140 countries and approximately 6,000 employees.

King’s has an outstanding reputation for providing world-class teaching and cutting-edge research. In the 2008 Research Assessment Exercise for British universities, 23 departments were ranked in the top quartile of British universities; over half of our academic staff work in departments that are in the top 10 per cent in the UK in their field and can thus be classed as world leading. The College is in the top seven UK universities for research earnings and has an overall annual income of nearly £450 million.

King’s has a particularly distinguished reputation in the humanities, law, the sciences (including a wide range of health areas such as psychiatry, medicine, nursing and dentistry) and social sciences including international affairs. It has played a major role in many of the advances that have shaped modern life, such as the discovery of the structure of DNA and research that led to the development of radio, television, mobile phones and radar. It is the largest centre for the education of healthcare professionals in Europe; no university has more Medical Research Council Centres.

Website: [www.kcl.ac.uk](http://www.kcl.ac.uk)

4. About the Medical Research Council

For almost 100 years the Medical Research Council has improved the health of people in the UK and around the world by supporting the highest quality science. The MRC invests in world-class scientists. It has produced 29 Nobel Prize winners and sustains a flourishing environment for internationally recognised research. The MRC focuses on making an impact and provides the financial muscle and scientific expertise behind medical breakthroughs, including one of the first antibiotics penicillin, the structure of DNA and the lethal link between smoking and cancer. Today MRC funded scientists tackle research into the major health challenges of the 21st century.

Website: [www.mrc.ac.uk](http://www.mrc.ac.uk)