New throat cancer gene uncovered

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Researchers at King's College London and Hiroshima University, Japan, have identified a specific gene linked to throat cancer following a genetic study of a family with 10 members who have developed the condition.

The study, published today in American Journal of Human Genetics, uncovered a mutation in the ATR gene, demonstrating the first evidence of a link between abnormality in this gene and an inherited form of cancer. The researchers say this finding raises new ideas about genetic factors linked to throat cancer and provides a platform for exploring the role of ATR more generally in cancer biology.

Scientists carried out a genome-wide linkage study in a US family with an unusual hereditary condition affecting 24 members of the family over five generations. Characteristics include developmental abnormalities of hair, teeth and nails as well as dilated skin blood vessels. Strikingly, nearly every person with the condition involved in the study had developed throat cancer (oropharyngeal squamous cell carcinoma) in their 20s or 30s.

The team took blood samples from 13 members of the affected family, as well as samples from 13 unaffected people. After analysing these samples they found a single mutation in ATR was present in all the people with the condition, but none of the unaffected people had the mutation. Ten of the 13 people with the condition had developed throat cancer.

Professor John McGrath from the King's College London Genetic Skin Disease Group at St John's Institute of Dermatology, based at Guy's Hospital, said: 'This is an intriguing study which not only provides a genetic explanation for an unusual syndrome, but also provides a unique novel insight into how the ATR gene may be associated with a specific form of cancer. It is a classic example of how we can use rare conditions to give us insight into more common diseases.

'Key known risk factors for developing throat cancer include consumption of alcohol and tobacco as well as viral infections such as HPV (humanpapilloma virus). But this is the first evidence connecting abnormalities in the ATR gene with susceptibility to this type of cancer. We know that ATR encodes a protein critical to the way cells repair their DNA, and is therefore a vital mechanism. We now plan to investigate the cancer pathways in more detail to try to find new treatments.'

More information: 'Germline mutation in ATR in autosomal dominant oropharyngeal cancer syndrome', *American Journal of Human Genetics*.

Provided by King's College London