

Pinpointing asthma susceptibility in Japanese adults

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Figure 1: The respiratory disease asthma, although controllable, affects millions of people worldwide and can be fatal. Credit: 2011 iStockphoto/bendao

A team of geneticists has identified five specific gene regions associated with asthma susceptibility among Japanese adults. Mayumi Tamari of the RIKEN Center for Genomic Medicine, Yokohama, led the research.

Asthma is a [chronic inflammatory disease](#) affecting the airways and lung. With an estimated 300 million sufferers worldwide, symptoms include recurrent wheezing and coughing, and [shortness of breath](#). Although controllable in most cases, serious [asthma attacks](#) can be fatal.

"Asthma is caused by a combination of genetic and environmental factors," explains Tamari. "By identifying asthma genes and studying their function, biologists hope to elucidate mechanisms underlying asthma development and progression, leading to more effective treatments."

Other researchers have identified regions of the human genome containing genes associated with

asthma. For example, one recent large-scale, consortium-based study identified nine of these so-called susceptibility loci in European populations. "Little is known about genetic differences contributing to asthma [susceptibility](#) among other ethnic groups such as Asians," says Tamari.

With this in mind, Tamari and her colleagues conducted a genome-wide association study involving a total of more than 7,000 adult Japanese asthma sufferers and around 28,000 unaffected individuals from the same population. By statistically analyzing nearly half a million genetic markers called single nucleotide polymorphisms (SNPs) distributed across the human genome, they identified five susceptibility loci in the Japanese population.

Two loci identified by the researchers were reported previously in Europeans. One was found in the vicinity of the major histocompatibility complex (MHC) on chromosome 6, which contains genes encoding molecules important for the functioning of the immune system. The other previously reported locus spans a region containing two genes, TSLP and WDR36. TSLP is already known to play a role in allergies.

In addition, Tamari and colleagues found three chromosomal regions significantly associated with asthma susceptibility in the Japanese population. They identified a locus on chromosome 10, a gene-rich region on chromosome 12, and a region on chromosome 4 spanning two known genes, USP38 and GAB1. These two genes encode, respectively, an enzyme called ubiquitin-specific peptidase 38, the biological function of which is unknown, and a protein involved in signaling within the immune system. Interestingly, they found that the strongest association with asthma among Japanese adults was close to a SNP in a gene called AGER within the MHC previously shown to be important for lung function.

"Our findings contribute to a better understanding of the genetic contribution to asthma susceptibility, opening the way to further functional studies," concludes Tamari.

More information: Hirota, T., et al. Genome-wide association study identifies three new susceptibility loci for adult asthma in the Japanese population. [Nature Genetics](#) 43, 893 - 896 (2011).

Provided by RIKEN

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