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Scientists Find Gene That Controls Type of Earwax in People

By [NICHOLAS WADE](#)

Earwax may not play a prominent part in human history but at least a small role for it has now been found by a team of Japanese researchers.

Earwax comes in two types, wet and dry. The wet form predominates in Africa and Europe, where 97 percent or more of people have it, and the dry form among East Asians. The populations of South and Central Asia are roughly half and half. By comparing the [DNA](#) of Japanese with each type, the researchers were able to identify the gene that controls which type a person has, they report in today's issue of Nature Genetics.

They then found that the switch of a single DNA unit in the gene determines whether a person has wet or dry earwax. The gene's role seems to be to export substances out of the cells that secrete earwax. The single DNA change deactivates the gene and, without its contribution, a person has dry earwax.

The Japanese researchers, led by Kohichiro Yoshiura of Nagasaki University, then studied the gene in 33 ethnic groups around the world. Since the wet form is so common in Africa and in Europe, this was likely to have been the ancestral form before modern humans left Africa 50,000 years ago.

The dry form, the researchers say, presumably arose later in northern Asia, because they detected it almost universally in their tests of northern Han Chinese and Koreans. The dry form becomes less common in southern Asia, probably because the northerners with the dry earwax gene intermarried with southern Asians carrying the default wet earwax gene. The dry form is quite common in Native Americans, confirming other genetic evidence that their ancestors migrated across the Bering Strait from Siberia 15,000 years ago.

The Japanese team says that the gene that affects earwax, known to geneticists as the ATP-binding cassette C11 gene, lies with three other genes in a long stretch of DNA that has very little variation from one person to another. Lack of variation in a sequence of DNA units is often the signature of a new gene so important for survival that it has swept through the population, erasing all the previous variation that had accumulated in the course of evolution.

But earwax seems to have the very humble role of being no more than biological flypaper, preventing dust and insects from entering the ear. Since it seems unlikely that having wet or dry earwax could have made much difference to an individual's fitness, the earwax gene may have some other, more important function. Dr. Yoshiura and his colleagues suggest that the gene would have been favored because of its role in sweating.

They write that earwax type and armpit odor are correlated, since populations with dry earwax, such as those of East Asia, tend to sweat less and have little or no body odor, while the wet earwax populations of Africa and Europe sweat more and so may have more body odor. Several Asian features, like small nostrils, are conjectured to be adaptations to the cold. Less sweating, the Japanese authors suggest, may be another adaptation to the cold in which the ancestors of East Asian peoples are thought to have lived.