MedicalXpress

Getting to the roots of hair loss

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A healthy individual loses around a hundred hairs a day. Nothing to worry about as long as they are constantly replaced and the losses occur evenly around the whole scalp. But when hair loss goes well beyond this level it can become quite a problem for those affected – not only superficially in terms of looks but also psychologically.

A breakthrough on the hair front has now been made by an international research team headed by scientists at the University of Bonn. After six years of research they have succeeded in identifying a gene that is responsible for a rare hereditary form of hair loss known as Hypotrichosis simplex. The scientists are the first to identify a receptor that plays a role in hair growth.

They now hope that their research findings will lead to new therapies that will work with various forms of hair loss. The study, due to appear in the March edition of *Nature Genetics*, can be accessed in advance on the internet (http://dx.doi.org/10.1038/ng.84).

"Although Hypotrichosis simplex is very uncommon, it may prove critical in our search for an understand of the mechanisms of hair growth," says project leader Dr. Regina Betz from Bonn's Institute of Human Genetics, summing up the research results. The disease is inherited and affects both men and women. Sufferers generally begin to go bald during childhood. The process of hair loss (alopecia) then advances with age, especially around the scalp.

The cause of Hypotrichosis simplex in the form examined in this project

is a genetic defect. It prevents certain receptor structures on the surface of hair follicle cells from being correctly formed. It has been found that when messengers from outside bind to these receptors they trigger a chain reaction in the cell interior which is apparently needed for the hair follicle to function normally. Such a receptor that plays a specific role in hair growth was previously unknown to scientists.

Key to new drugs to combat hair loss

As Professor Dr. Markus Nöthen, who holds the Chair of Genetic Medicine at Bonn University's Life & Brain Centre, explains, "The defective receptor structure falls into the category of what are known as G-protein-coupled receptors." This is good news, because, "they are particularly well suited as points of impact for drug treatments." The researchers have also been able to identify an endogenous messenger that binds in the hair follicle to the receptor. This opens up opportunities for developing new active agents. Looking to the future, Professor Dr. Ivar von Kügelgen from Bonn's Institute of Pharmacology and Toxicology says, "We can now search selectively for related substances that may be used in therapies for hair loss." The exciting possibility here is that such medicines will be able to benefit patients suffering from very different types of hair loss.

Another member of the project team has been the dermatologist Dr. Khalid Al Aboud from the King Faisal Hospital in Makkah, who was responsible for the clinical case studies. In 2002, he and his colleagues examined a Saudi-Arabian family with Hypotrichosis simplex. The medical scientists were able to analyse DNA samples from the parents and from nine of their ten children – including four sufferers. The family's genetic material gave the research project team the key to understanding some of the fundamental mechanisms of hair growth and hair loss. The researchers now hope that this individual genetic case will lead to developments that can benefit a far wider circle of patients in the

future.

Source: University of Bonn