

SOME FACTS ON HAIR - WHY IT DROPS AND HOW IT GROWS

Relevant for: Science & Technology | Topic: Science and Technology- developments and their applications and effects in everyday life

Gene factors: Hair colour can be predicted based on a few DNA variations that occur in eleven genes in a human sample. | Photo Credit: [YunYulia](#)

The six-yard sheet that covers our body is the skin. There is 1.5 to 2 square metres of it, which offers us protection from a variety of external sources that may be harmful. This protection is done by covering the skin through hair. Scalp is the skin covering the head, excluding the face – thankfully! Hair is produced by the cells at the outermost layer of the skin, using what are called follicles which are mini-organs which produce a variety of proteins.

The entire list of these proteins, or what biologists call as the ‘proteosome’ or ‘proteome’, is a subject of contemporary interest which is being worked out. These mini-organs play key roles in producing hair, protecting the skin from external insults such as infections, offering temperature control and so on.

The proteome offers pigments that colour the hair – and for us humans, these pigments come largely in three lots – black, brown or shades of red. Lack of pigmentation causes hair to turn white (as we age). During evolution, we humans seem to have found these colours best suited for us. Indeed, relating the changes in pigmentation with time as we age offers us a picture of life events of an individual as he or she ages.

This is somewhat like how tree rings offer information about what all a tree has gone through in time. As we age, our hair turns white. A group of dermatologists have done a quantitative mapping of hair colour and find that there are over 300 proteins that are more or less abundant in white hair than in dark hair. Many of these proteins are involved in energy production in the cell. Several of these are involved in increasing energy metabolism and in synthesising lipids and amino acids. Hair colour agents and hair tonics, with all their nice and refreshing smells do the same.

Hair colour can also be predicted by looking at a small number of DNA variations that occur in eleven genes in a human sample. This test can predict whether the individual being sampled have black, brown, red or blonde hair colour with 90% accuracy. And this test goes beyond scientific curiosity. It can be very useful in forensics, as hair colour is an externally visible characteristic.

Hair goes grey as we age. Is this due to psychosocial stress, also called life stress events? Indeed, changes in hair colour appear to be associated with changes in stress levels. Researchers have found that greying is related to energy metabolism. As the latter decreases, the former increases. It may be possible to halt, or at least temporarily reverse, greying by triggering energy metabolism. How can this be done? Here is where proteome analysis will be of use.

Drug chemists have suggested the use of compounds called phthalates, which smell good and promote hair health. However, there is a catch in this. Too much usage of these chemicals can lead to lung damage and kidney failure.

But there are far easier ways to do this. Nutritionists point out that healthy appearing hair indicates excellent general health. If you have adequate nutrition, your hair grows well. Malnutrition, alcoholism, advanced age – all of these cause hair colour to change, get weakened or be lost. Deficiency of vitamins (A, C, E and selenium) does this, too.

So, where do we go for these nutritious materials? Not too far. Our everyday meals, wherein we use onion, garlic and ginger, green vegetables, fruits and protein-rich pulses such as dal, soyabeans, will suffice.

Traditional yoga exercises are seen to stimulate the growth of hair by increasing blood circulation in the scalp. No wonder we see all yoga gurus full of hair! Yoga not only relieves stress and anxiety but also helps in massage. Some of the yoga *asanas* suggested by them are: *aadho mukha savasana* (the downward dog pose), *sarvangasana* (erect shoulder stand) and *uttarasana* (standing forward bend pose). These are well worth practising. In addition, doing breathing exercises such as *pranayamam* (deep breathing and holding for several seconds) also help. So, let us go for these as well and stay healthy and let our hair look attractive and plentiful!

What about loss of hair as we age? Epidemiological studies suggest that moderate to extensive hair loss is seen in 16% of men in the 18-29 years age group, and 53% in those aged 40-49. Premature loss of hair can lead to strange psychosocial effects. Here too, proteomic comparison of dermal papilla cells, found in the hair follicle, from balding and non-balding males, indicates 128 up-regulated and 12 down-regulated proteins. Some of these differently expressed proteins may one day be ameliorative targets for baldness.

(This article has been written by D. Balasubramanian in collaboration with Sushil Chandani who is a professional computational biologist, sushilchandani@gmail.com)

dbala@lvpei.org

[Our code of editorial values](#)

This study was completed before the emergence of the Delta variant of SARS-CoV-2 now dominating in the U.K.

END

Downloaded from crackIAS.com

© **Zuccess App** by crackIAS.com