

What Your Gray Hair Says about You...

Gray hair, according to new findings, is caused by a massive build up of hydrogen peroxide due to wear and tear on hair follicles. The peroxide winds up blocking the normal synthesis of melanin, your hair's natural pigment.

All hair cells make a tiny bit of hydrogen peroxide, but as you age, the amount increases. Essentially, you bleach our hair pigment from within, and your hair turns gray and then white.

Researchers made this discovery by examining cell cultures of human hair follicles. They found that the buildup of hydrogen peroxide was caused by a reduction of an enzyme that breaks up hydrogen peroxide into water and oxygen.

They also discovered that hair follicles could not repair the damage caused by the hydrogen peroxide because of low levels of the enzymes MSR A and B, which normally serve this function. The high levels of hydrogen peroxide and low levels of these enzymes also disrupt the formation of tyrosinase, another enzyme that leads to the production of melanin in hair follicles.



Sources:

» [Science Daily February 24, 2009](#)

» [The FASEB journal : official publication of the Federation of American Societies for Experimental Biology](#)

» [The New York Times March 9, 2009](#)

Dr. Mercola's Comments:

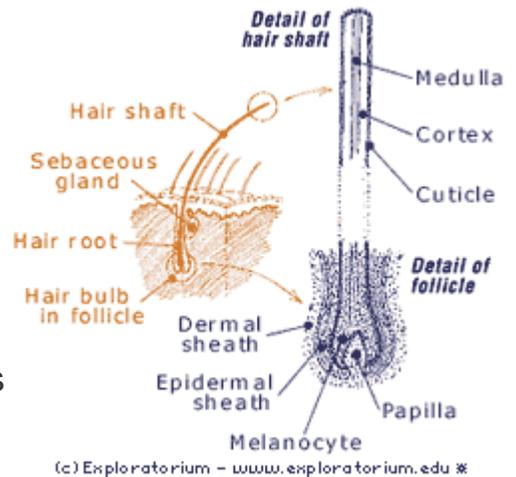
Whether we admit it or not, the color of your hair seems to communicate something about yourself to the world.

Now researchers are finally starting to unravel what your color says about what's going on inside your body, which might lead to new strategies for prevention or reversal of the hair graying process.

Why Your Hair Turns Gray

There have been a number of studies into what causes the graying of your hair as you age. As you likely know, your hair grows from follicles in your skin. These follicles are pit-like structures that contain layers of cells that perform different functions. At the base of the follicle is the hair bulb, from which your actual hair grows.

The color of your hair is determined by a protein called melanin. There are two kinds of melanin: eumelanin colors your hair brown to black, and pheomelanin turns it yellow-blond to red. The levels of each of these two kinds of melanin will determine the color and shade of your hair.



The cells in your hair follicles that create melanin are called melanocytes. When your hair turns gray, the melanocytes have stopped creating melanin.

This recent study found that the increased production and build up of hydrogen peroxide in your hair follicles as you age blocks this natural synthesis of melanin, and hence you start going gray.

But although they've seemingly been able to pinpoint the enzymes responsible for this chain of events, they have not necessarily discovered the real underlying cause.

Heredity likely plays a part, as some studies have shown. The *New York Times* article states that whites tend to gray the earliest, often as early as in their mid-30s, followed by Asians and then Africans. About half of all people over the age of 50 are at least 50 percent gray.

But other research may be on to something to explain the process of why you go gray as well.

Work done by scientists from the Harvard Medical School and the Hokkaido University Graduate School of Medicine in Japan has revealed that stem cells may be a major player involved in the process, which I'll discuss a little later.

WARNING -- Trying to Maintain Your Hair Color with Dyes May Damage Your Health

There's no doubt gray hair is an issue of some importance to many people, judging by the popularity of hair dyes on the market. However, many of these products contain an *astounding* array of potentially toxic chemicals. (The FDA does not regulate hair dye ingredients, whether they're synthetic or natural.)

For example, The Environmental Working Group found that 69 percent of hair-dye products tested for their [Skin Deep](#) database may pose cancer risks!

Some are worse than others.

For example, between the two leading men's hair color brands, [Grecian Formula](#) has a **max hazard score**, whereas Just For Men scored slightly lower, falling in the moderate hazard range. For more information about some of the hazardous ingredients in hair dyes, and their potential ramifications to your health, please review this [previous article](#).

Many are now starting to dye their hair in their teens, but if your son or daughter is thinking about switching color, it may be wise to consider some of the potential long term risks.

One [1994 National Cancer Institute report](#) states dark dyes used over long periods of time appear to raise your risk of cancers such as non-Hodgkin's lymphoma and multiple myeloma. And a 2001 *International Journal of Cancer* study found that [people who use permanent hair dye are twice as likely to develop bladder cancer](#) as those who keep their hair au natural.

There are ways to limit your exposure of course, while still giving your hair some added pizzazz. Many professional salons now work with formulas that are ammonia-free, herbal-based, low-PPD, and dyes that are lead-, toluene- and coal tar-free.

Refraining from all-over dye jobs and getting highlights or lowlights instead is also safer, as the dye is not placed in contact with your scalp.

Or, you could just accept what nature has given you, which would be the safest option, at least for the time being.

Is Stem Cell Stimulation Therapy the New Answer to Avoid Gray Hair?

I believe *adult* stem cell therapy maybe the wave of the future as there seems to be no limit to their applications, whether it be something as complex as [regrowing organs](#) or using them for the more mundane purpose of keeping a full head of healthy hair in its original color.

If you're not familiar with the basic tenets of this fascinating field of science and medicine, this [link](#) to the National Institutes of Health provides great basic information about stem cells.

As it turns out, melanocytes -- those special cells that make melanin -- come from stem cells. Halfway up your hair follicle, above the bulb, there is a pocket that houses melanocyte stem cells. These stem cells turn into melanocytes when old melanocytes die off.

However, as you get older, your stem cells diminish in quality and quantity. Likewise, the stem cells in your hair follicles decrease over time, and eventually no new melanocytes are produced and hence melanin synthesis stops, and your hair turns gray.

So the idea is that by stimulating the stem cells with special polypeptide signals you may be able to reverse this process and keep both your hair color, and your hair. I'm actually beta testing one of these polypeptide signal topical therapies right now, and my hair is slowly starting to come back in, so it's pretty exciting stuff and most of the gray is disappearing. I look forward to giving you further updates on that product later on.

Interestingly enough, there is some evidence from recent animal studies indicating that [physical exercise can reverse the age-related decline in the production of neural stem cells](#) by restoring a brain chemical that promotes the production and maturation of new stem cells. Yet another reason to start or stick to a regular exercise routine!

Reference website: <http://articles.mercola.com/sites/articles/archive/2009/03/17/Why-Your-Hair-Turns-Gray-as-You-Age.aspx>