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Can Onion Juice Reverse Thinning Hair and Slow Graying?

Analysis by Dr. Joseph Mercola | April 06, 2024

STORY AT-A-GLANCE

- With powerful anti-inflammatory properties, onions have the potential to calm inflammatory conditions, including alopecia areata, which causes hair loss in about 2% of the world's population
- Onion juice led to re-growth of terminal coarse hairs — the type that grows on your scalp and forms your eyelashes and eyebrows — after just two weeks in people with alopecia areata
- By four weeks, 73.9% of those applying onion juice had hair re-growth, which increased to 86.9% by week six
- Low-level laser therapy (LLLT), which uses near-infrared light, is another promising option to stimulate hair growth
- Near-infrared-based LLLT stimulates your mitochondria to release nitric oxide (NO) and boost adenosine triphosphate (ATP) production, which is the energy currency of the cell; together, your mitochondria, NO and ATP work in concert to promote healing effects, such as DNA repair and cellular regeneration

Onions are a veritable superfood, rich in antioxidants and organosulfur compounds that help ward off chronic disease. Still, splashing onion juice on your scalp probably hasn't crossed your mind — but perhaps it should. With powerful anti-inflammatory properties, onions have the potential to calm inflammatory conditions, including alopecia areata, which causes hair loss in about 2% of the world's population.[1]

While the causes of hair loss — and hair graying — are complex, there's little harm in giving onion juice a try. Plus, research supports its use as a natural, topical treatment to support hair re-growth.[2] That said, there are other more powerful options you can also consider, like the use of near-infrared light therapy, which stimulates cellular activity, promoting hair growth.[3]

Near-Infrared Light Therapy Stimulates Hair Growth

Over the past few decades, more than 5,000 studies have been published about red and near-infrared light therapy, also known as photobiomodulation (PBM), for a wide range of ailments, from combating wrinkles and cellulite to hair regrowth and much more. As about 40% of sunlight is in the **near-infrared spectrum**, it strongly supports the idea that this is an important frequency to be exposed to.

Low-level laser therapy (LLLT), which uses near-infrared light, is one promising option to stimulate hair growth. "The 'optical window' for biological tissue is approximately 650-1200 nm [nanometers]. The tissue penetration is maximum at these wavelengths, and thus red or near-infrared light (600–950 nm) is utilized in LLLT," researchers wrote in the Journal of Cutaneous and Aesthetic Surgery.[4]

Essentially, what you're doing with near-infrared-based LLLT is stimulating your mitochondria to release nitric oxide (NO) and boosting adenosine triphosphate (ATP) production, which is the energy currency of the cell. Increased ATP production may energize hair follicles, potentially reversing hair thinning and promoting more robust hair growth.

Together, your mitochondria, NO and ATP work in concert to promote healing effects, such as DNA repair and cellular regeneration. Near-infrared light therapy can also improve blood flow to your scalp, ensuring that hair follicles receive a steady supply of oxygen and nutrients. This enhanced circulation can support the health of hair follicles, making them more likely to produce hair.

Near-infrared light therapy might extend the anagen, or growth, phase of the hair growth cycle, leading to longer, denser hair. In fact, studies show LLLT stimulates hair growth in both men and women, with effectiveness similar to the hair loss medication minoxidil (Rogaine).[5] Researchers explained:[6]

> *"It [LLLT] is assumed to stimulate anagen phase re-entry in telogen hair follicles (HFs), prolong the duration of anagen phase, and increase rates of proliferation in active anagen HFs. In addition, it also helps to promote reparative regeneration, which occurs during wound healing, and physiological regeneration, which occurs during the hair cycle, which relies heavily on cell proliferation.*
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> *These laser actions may normalize physiological regeneration of scalp HFs affected in various hair loss disorders such as male and female AGA, alopecia areata (AA), and chemotherapy-induced hair loss."*

You can learn more about the benefits of near-infrared light in my interview with Brian Richards, founder of SaunaSpace, above. While you can gain benefits via sauna use — specifically a near-infrared sauna using high-powered incandescent light bulbs — be aware that the typical infrared sauna sold in the U.S. is far-infrared. These low-energy wavelengths provide virtually no photobiomodulation health benefits.

Onion Juice Twice Daily Helps Hair Growth

Alopecia areata is an autoimmune skin disease. In those affected, the immune system attacks healthy hair follicles, leading to varying degrees of hair loss. Both genetics and environmental factors play a role, but in the early stage, alopecia areata is associated with inflammation in the upper dermis skin layer.[7]

Garlic has been used as a topical treatment for the condition,[8] and since onions share many chemical similarities with garlic, researchers with Baghdad Teaching Hospital in Iraq investigated the effects of onion juice on the skin disease.

For the study, 23 people with alopecia areata applied onion juice twice daily for two months. A control group of 15 people applied tap water over the same period. Significant differences were found, with onion juice leading to re-growth of terminal coarse hairs — the type that grows on your scalp and forms your eyelashes and eyebrows — after just two weeks.

By four weeks, 73.9% of those applying onion juice had hair re-growth, which increased to 86.9% by week six. Significantly more men (93.7%) experienced hair re-growth than women (71.4%). For comparison, only 13% of those in the tap water group had hair re-growth.[9]

"The present study showed that the use of crude onion juice gave significantly higher results with regard to hair re-growth than did tap water ($P<0.0001$), and that it can be an effective topical therapy for patchy alopecia areata," the researchers concluded.[10]

Onion juice's effectiveness of 86.9% is better than that of commonly used topical and systemic therapies for alopecia areata, including BCG immunotherapy, which has an effectiveness rate of 69%, and topical immunotherapy, which is 58% effective.[11]

Why Does Onion Juice Stimulate Hair Growth?

It's possible, the Baghdad Teaching Hospital team suggested, that onion's benefits to hair growth are due to antigenic competition, which refers to the inhibition of the immune system's response to one antigen when another antigen is administered. They explained:[12]

> *"Previous reports have stated that onion can induce allergic contact dermatitis in some individuals; however, more recent studies showed that onion extract can inhibit skin allergic reactions, suggesting that onion juice may induce an immunological reaction, possibly as a mild form of dermatitis that can stimulate hair re-growth through antigenic competition.*
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> *… If there were a relative lack of T-suppressor cells in the lymphocytic infiltrate of alopecia areata, the generation of non-specific T-suppressor cells might*

> *inhibit the ongoing autoimmune reaction. Another possible mechanism, is that onions belong to the genus Allium, which is rich in sulphur and phenolic compounds, both of which are known skin irritants. Onion may cause an irritant contact dermatitis."*

Quercetin, an antioxidant flavonoid in onions, may also be involved, helping to reduce inflammation.[13] Quercetin also enhances the expression of the antioxidant enzyme catalase[14] in your scalp, which helps break down hydrogen peroxide that contributes to cell damage and thinning hair.[15]

Can Quercetin Help Keep Gray Hair Away?

By breaking down hydrogen peroxide, catalase — and by extension, quercetin — may also be beneficial for slowing down hair graying. Hydrogen peroxide is a well-known tool for bleaching your hair, but many people aren't aware that your hair cells make hydrogen peroxide, too.

As you age, the amount produced increases, which researchers believe ultimately bleaches out your hair pigment, turning your hair gray and then white.[16]

Quercetin is well known for maintaining oxidative balance in the body, both by inhibiting and alleviating oxidative stress.[17] This is another way that it may help keep gray hair away. Oxidative stress is the state in which your body's free radicals (from pollution, poor diet, stress) outnumber your antioxidant defenses (from healthy diet).

Graying hair may be an indicator of oxidative stress-induced damage.[18] Research has also shown that people with premature graying had a higher level of pro-oxidants and lower levels of antioxidants than those with normal hair.[19] As researchers noted in the FASEB Journal, compounds that slow oxidative stress may be useful for slowing down or stopping hair graying:[20]

> *"We conclude that oxidative stress is high in hair follicle melanocytes and leads to their selective premature aging and apoptosis. The graying hair follicle, therefore, offers a unique model system to study oxidative stress and aging and*

to test antiaging therapeutics in their ability to slow down or even stop this process."

What Causes Hair Loss and Graying Hair?

A combination of genetics and your environment — diet, stress, pollution and more — affect the health of your hair and the rate at which it turns gray. Desmond Tobin, Ph.D., from the University of Bradford in England, has suggested that each hair follicle has something like a biological clock that either slows or stops the activity of melanocytes.[21] He believes your genetics have a large influence on how quickly your hair loses pigment.

The color of your hair is determined by melanocyte stem cells that produce pigment. As you age, the number goes down. This means your hair doesn't take on a gray pigment but loses pigment and becomes gray. After there is complete loss, your hair turns white.[22]

In 2005, Harvard Medical School researchers suggested failure of melanocyte stem cells[23] to produce melanocytes could be behind gray hair.[24] In 2020, another team of researchers revealed that stress could also turn hair gray.[25]

Scientists exposed mice to three different types of stressors, including psychological stress. During the testing of each one, they found that melanocytes were depleted, leading to white hair on the mice, regardless of the phase of hair growth.

They discovered the melanocyte stem cells had receptors that respond to noradrenaline. This is a neurotransmitter produced by the body during a high stress response, commonly called a "flight-or-fight response."

Noradrenaline is produced by the adrenal glands, but even removing the adrenal glands did not prevent the mice from turning gray. It is also produced by the sympathetic nervous system, which the team showed supplies hair follicles. By blocking noradrenaline from the sympathetic nervous system, the researchers could prevent the graying of their hair.[26,27]

In an accompany editorial, researchers explain that the many anecdotal reports of stress-induced gray hair may, in fact, have a scientific explanation after all:[28]

> *"It has been said that Marie Antoinette's hair went completely white on the night before her beheading. This story might be apocryphal, but rapid greying of the hair is now widely referred to as Marie Antoinette syndrome. It is often assumed to be caused by stress — a phenomenon perhaps best exemplified by photographs of heads of state before and after they held office.*
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> *… Signaling from the sympathetic nervous system of mice when subjected to stress leads to the depletion of a stem-cell population in their hair follicles. This discovery sheds light on why stress turns hair prematurely grey."*

What Else Works for Hair Loss and Gray Hair?

There are many other natural strategies to help stimulate hair growth — and prevent hair loss and premature graying in the first place. There is a significant association between tobacco use and graying of hair, for instance.[29] Cigarette smoking is also linked to premature hair graying, with the onset of gray hair occurring before the age of 30.[30]

Vitamin B12 deficiency is also linked to premature gray hair, and there is at least one report of pigmentation returning to hair after the vitamin deficiency was resolved.[31] As for hair loss, ginsenosides, the major bioactive compounds in ginseng, are known to promote hair growth.[32]

There are three cycles of hair growth.[33] The anagen phase is the growth phase in which the matrix cells of the hair follicle are fully pigmented and undergoing vigorous growth activities. Catagen is the resting phase, when activity decreases.

In the third phase, telogen, the hair detaches from the follicle and falls out. During normal hair cycles, about 90% of hair follicles are in the anagen phase, 1% are in the catagen phase and 9% are in the telogen phase. In the International Journal of Molecular Sciences, it's noted:[34]

> *"In the field of dermatology, ginseng and ginsenosides have been shown to regulate the expression and activity of major proteins involved in hair-cycling phases. The promotion of hair growth and prevention of hair loss by ginseng and its metabolites are associated with the induction of anagen and delaying of catagen phases."*

Pine bark extract is another natural compound heralded for its ability to improve hair density. A double blind, randomized, placebo-controlled study revealed pine bark extract increased hair density by 30% among postmenopausal women after two months of treatment, and 23% after six months, with researcher suggesting it "might have the potential to reduce hair loss in postmenopausal women."[35]

Another option is scalp massage. While this will feel relaxing to you, the stretching of skin on your scalp is a form of mechanical stress that may lead to increased hair thickness.[36] Adding diluted rosemary oil to your scalp massage may improve results even more, with research showing it works as well as minoxidil to increase hair count in people with hair loss.[37]

If you want to give onion juice a try to increase hair growth, simply place a couple of onions in a blender, then strain off the juice. Apply it to your scalp, especially the roots, and let it sit for 30 minutes before rinsing and washing your hair.[38]

It's a good idea to test this out first, however, by applying a small amount to an area of your skin. If redness or itching occurs, try diluting the onion juice with water or coconut oil to see if the irritation resolves.

Harness the Power of Near-Infrared Light for Hair Loss

As mentioned, near-infrared light therapy is a powerful tool if you're struggling with hair loss. You can gain many of these benefits by using a zero-EMF near-infrared sauna as described in my interview with Richards. While SaunaSpace offers this type of sauna, it's a significant investment.

If this is out of reach, you can build your own starter sauna that will provide benefits, but will not protect you from EMFs. The core of the sauna is four **250-watt Philips incandescent bulbs**, which can be purchased for less than $40.

If you already have an infrared sauna, you can turn it into a near-infrared one by removing the bench and installing SaunaSpace bulb panels. I described how to do this in "**The Stunning Health Benefits of Sauna Therapy**."

Richards recommends staying in the sauna for 20 to 30 minutes, or until you reach subjective fatigue, which is a sign you've maxed out the benefits you're going to get. It's not about reaching a point of suffering — just that point where you're feeling mildly anxious and tired and want to get out.

As for frequency, research has consistently shown that the effects are dose-dependent, so the more often you do it, the greater the benefits — to a point. The sweet-spot seems to be right around four times a week, because you'll also be losing minerals along with toxins. So, you need to rehydrate and replenish those minerals.

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