



Dandruff Fact Sheet

What is Dandruff?

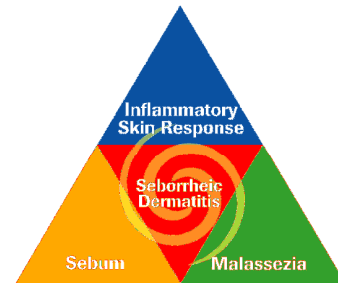
Dandruff is an irritating condition that causes itching, tightness and excessive skin flaking of the scalp. Dandruff is caused by a combination of factors triggered by the presence of a common fungus called *Malassezia*. The particular species implicated in human skin disease, *Malassezia globosa* (*M. globosa*), generally resides in lipid-rich areas such as the scalp, face, chest and back.

Dandruff and the more severe seborrheic dermatitis affect more than half of the adult population and all ethnicities around the world. With such high incidence of the conditions, the socio-economic impact is also very high. The direct, indirect, and intangible health care costs of treating seborrheic dermatitis in the U.S. exceeded \$1.2 billion in 2004, and current global consumer product spending on the control of dandruff and seborrheic dermatitis is approximately \$6 billion annually.

Dandruff Etiology

Both dandruff and seborrheic dermatitis appear when the three components of a noxious triangle are present:

- Sebum: The scalp naturally produces oils called sebum that protect the hair and scalp, including triglycerides and fatty acids. The ideal growing environment for *Malassezia* is created when sebum is present.
- *Malassezia*: These fungi live on the skin of all humans, thriving in areas with high concentrations of sebum. The genome sequence of *M. globosa* reveals that it is unable to make fatty acids, a key nutritional requirement of the organism. Therefore, the fungus obtains fatty acids from sebum.
- Inflammatory skin response: Individuals with an inborn tendency to have an inflammatory response (redness, itching) to fatty acids are prone to suffer from dandruff and dermatitis. The primary factors in individual susceptibility to dandruff are still being studied, but may relate to the strength of the skin's natural barrier.



Common Myths About Dandruff

There are a number of myths associated with dandruff:

- Myth: Those suffering from the condition have poor personal hygiene.
 - Individuals suffering from dandruff and dermatitis have a genetic susceptibility to develop symptoms. Trying to compensate with excessive cleansing using regular soaps and shampoos can only further aggravate this condition.
- Myth: Dandruff and seborrheic dermatitis treatments are susceptible to tachyphylaxis (a rapid decrease in response following an initial benefit).
 - Extended-use clinical trials with pyrithione zinc-based shampoos prove that is not the case. Additionally, a study presented at the 2007 American Academy of Dermatology

meeting, proved that when pyrithione zinc-based shampoos are used as directed, patients do not develop a resistance to the medicine and dandruff symptoms are reduced.

- Myth: Dandruff and seborrheic dermatitis are seasonal conditions.
 - Clinical studies show that both flake severity and the presence of causative organism, *M. globosa*, are consistent throughout the year.
- Myth: Dandruff treatments cause loss of dye from color-treated hair.
 - Modern antidandruff shampoos are mild and safe for color-treated hair. Successive washing of color-treated hair with a pyrithione zinc shampoo shows it to be no different than a cosmetic shampoo, or even regular tap water.

For more information on the mapping of the *Malassezia globosa* genome or about P&G Beauty, please visit www.pgbeautyscience.com.

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