The interdependent relationship between the hair and the scalp is often overlooked – the hair protects the scalp against UV radiation, moisture loss, and the environment, while the scalp hosts the hair follicles as incubators for the preemergent hair fibers.

Though there are no significant differences in the hair follicles between individuals, the appearance of the hair is determined by the type of hair care the individual practises and by the hair follicles.

The condition of the scalp affects the natural growth and retention of the hair and therefore scalp care should be an essential part of the overall hair care routine. The scalp ages in a similar way than the skin, except that, with hair covering it, we do not notice any changes. Exposed scalp will undergo similar changes as the skin when exposed to UV rays such as photo-ageing, transepidermal water loss and irregular pigmentation. Oxidative stress plays a large part in the ageing process – as one ages, more free radicals are produced, while the body's ability to neutralise the free radicals decreases. Inflammation in the hair follicles caused by microbes, ultraviolet rays, pollutants or irritants, such as oxidative stressors, can result in alopecia (hair loss). Lipid oxidation is one of the main causes and can cause cell death (apoptosis) in hair follicle cells. Studies have shown that unhealthy or damaged hair follicles produce weak hair fibers with altered cuticles that are rough, rigid, with a pitted surface and because of these factors, have reduced shine.

Harsh chemicals treatments can lead to a sensitive, dry or irritated scalp which can cause itching, and lead to burning sensations. This condition is often the result of a disrupted skin barrier, which causes an increase in trans-epidermal water loss (TEWL) and leaves the skin vulnerable to external aggressors such as pollution, weather changes, or the use of harsh haircare treatments.

Avenaplex (*Avena sativa* (oat) kernel extract) is a 40% polar lipid fraction rich in skin identical and skin equivalent ceramides, sphingolipids and phospholipids. It is an anhydrous active that helps to rapidly repair the skin lipid barrier to reduce TEWL. It has a long-lasting moisturising effect on the scalp by up-regulating hyaluronan synthase 3, an enzyme that in humans is encoded by the HAS3 gene. The protein encoded by this gene is involved in the synthesis of the unbranched glycosaminoglycan hyaluronan, or hyaluronic acid, which is a major constituent of the extracellular matrix and key part of the skin's natural moisturising factor. Avenaplex replenishes skin lipids lost through ageing.

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Oat COM USP (*Avena sativa* (oat) kernel flour) helps to soothe sensitive and flaky scalps to relieve redness, itching, tightness, and other stubborn signs of irritation after only 7 days of use. It is often used in pet products.

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