

## Plasma Treatment of Skin Lipids

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In our current studies we analyze the influence of dielectric barrier discharge plasma at atmospheric pressure on the skin barrier, in particular the lipids of the stratum corneum, the outermost layer of the epidermis. The lipids of the stratum corneum are very important for the skin barrier function. In patients with ichthyosis or atopic dermatitis, the composition of the lipids is changed and leads to a modified and itchy skin. As the lipid layer is the uppermost layer of the skin it interacts primarily with the plasma.

The study tends to investigate how far the composition of the lipids can be influenced by plasma and whether a positive effect may be achieved in the treatment of ichthyotic or dermatitis skin.

The following diagnostic methods are used: optical emission spectroscopy (OES), X-ray photoelectron spectroscopy (XPS) and electrical measurements.

The lipid samples were obtained from the forearms of several people by a stripping test using cyanoacrylate adhesive. Subsequently the samples were analyzed with regard to the composition before and after a plasma treatment. In a further step the plasma treatment of the lipid samples was characterized in terms of power, homogeneity and temperature.

Before the plasma treatment was accomplished, the composition of skin lipids does not differ in males and females nor in subjects of different ages. After plasma treatment, however, the stoichiometric lipid composition was significantly affected. The total amount of carbon was reduced whereas oxygen as well as nitrogen increased. These alterations could be attributed to changed chemical bonds as we found a reduction in C-C bonds and an increase in C-O, C=O, C-N, and N-C-O bonds.