Mode of action

Cyclopeptide-5 is the first cyclic peptide being used as active ingredient in cosmetic applications. As it binds selectively to certain extracellular receptors in the skin such as to αvβ5- and αvβ6-integrins, on the one hand, the gene expression of enzymes degrading the extracellular matrix is reduced. Due to the addition of cyclopeptide-5, for instance, gene expression of the enzymes collagenase 3 and elastase A2 was by 47% and 23% downregulated, respectively. As the extracellular matrix is the structural backbone of skin, a reduced degradation of it can slow down the aging process. On the other hand, cyclopeptide-5 stimulates the synthesis of extracellular matrix proteins such as collagen and laminin.

In vitro studies

Evidence for the efficacy of this novel active ingredient could be provided by various in vitro studies. In Figure 1 the increase in collagen and laminin in the skin is illustrated. This increase in extracellular matrix components can reduce lines and wrinkles.

Because of its comparatively low molecular mass cyclopeptide-5 can penetrate into deeper skin layers in order to reach its receptor at the target cell. Furthermore, our formulations contain special penetration enhancers improving the penetration of cyclopeptide-5 in deeper skin layers. Consequently the efficacy of this active ingredient is augmented.

In vivo studies

These in vitro results were also confirmed by in vivo studies in 20 volunteers in the age range between 37 and 63 years. In Figure 2 the reduction in wrinkles and the improvement of smoothness is shown.

Fig. 1. Increase in the biosynthesis of collagen 4 and laminin A4 by cyclopeptide-5 [Study: Merck KGaA, Darmstadt, Germany]

Fig. 2. Improvement in smoothness by twice daily treatments with cyclopeptide-5 after 14 days and 28 days [Study: Merck KGaA, Darmstadt, Germany]