

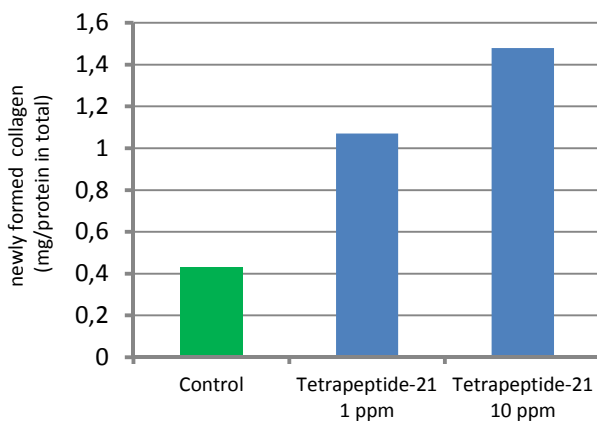
# Tetrapeptide-21

## Mode of action

The extracellular matrix is the structural backbone of skin and represents therefore a main target of cosmetic research. Of high interest are active ingredients that can stimulate the biosynthesis of extracellular matrix components such as collagen, elastin and hyaluronic acid. Based on this concept fragments that are formed during the degradation process of extracellular matrix components were identified as potent stimulators.

## In vitro studies

Out of various fragments tetrapeptide-21 was identified as the most active compound. In Fig. 1 the increase in collagen in dependence on the added concentration of tetrapeptide-21 is illustrated.

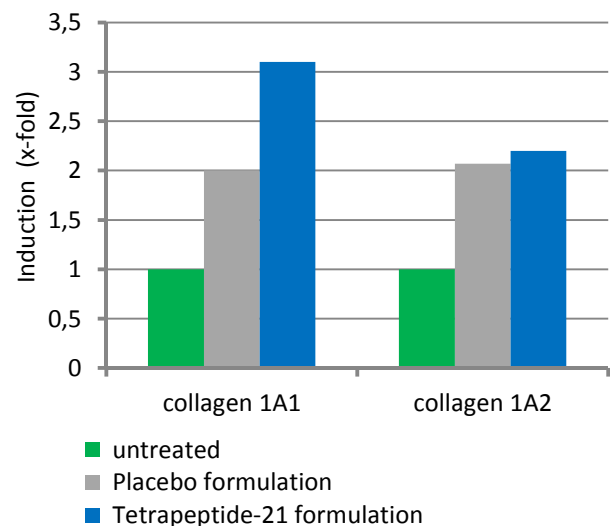


**Fig. 1.** Increase in collagen in dependence on the added concentration of tetrapeptide-21 [Study: Evonik Industries AG, Essen, Germany]

Because of its comparatively low molecular mass tetrapeptide-21 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 tetrapeptide-21 in deeper skin layers. Consequently the efficacy of this active ingredient is augmented.

## In vivo studies

Evidence for the efficacy of this novel active ingredient could be provided by various in vivo studies. In Fig. 2, for instance, the up regulation in the gene expression of collagen in skin after eight weeks of treatment with tetrapeptide-21 is shown.



**Fig. 2.** Induction of gene expression of collagen in skin after eight weeks of treatment with tetrapeptide-21 [Study: Evonik Industries AG, Essen, Germany]