

## Effect of oligoarginine conjugation on the antiwrinkle activity and transdermal delivery of GHK peptide

Ga-Hee Hur, Sang-Cheol Han, A-Reum Ryu, Youngsic Eom, Jhin-Wook Kim, Mi-Young Lee

**JOURNAL OF PEPTIDE SCIENCE**

First published: 01 December 2019

### **Abstract**

GHK (Gly-His-Lys), a natural peptide found in human skin and plasma, has been widely used in the cosmeceutical and pharmaceutical fields. The hydrophilic GHK and GHK-Cu are limited in their abilities to penetrate deeply into skin; because of this, various strategies for their skin delivery have been developed. In this investigation, Arg<sub>4</sub> was conjugated with GHK to get heptapeptide, GHK-R4, and then in vitro antiwrinkle activity and transdermal delivery were compared between GHK and GHK-R4. Notably, Arg<sub>4</sub> conjugation accelerated the cellular penetration of GHK both in vitro and in vivo. Furthermore, higher in vitro antiwrinkle activity and collagen biosynthesis was obtained with GHK-R4 at much lower doses than with control R4-free GHK. The enhanced activity and delivery of GHK-R4 might be due to the cell penetrating ability and matrix metalloproteinase (MMP) inhibitory activity of R4 itself.