Induction of Metalloproteinase 9 Secretion from Human Keratinocytes by Pleuran (β-D-Glucan from Pleurotus ostreatus)

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Glucan preparations, primarily modified water-soluble glucans, are involved in the activation of the body’s natural defense mechanisms and in the acceleration of the skin’s wound-healing processes. Pleuran, an insoluble β-D-glucan in hydrogel form, offers a natural alternative to more common chemically derivated soluble β-D-glucans. Pleuran was applied to human keratinocyte primary cultures, and after 24 h of incubation the release of matrix metalloproteinase 9 (MMP-9) and metalloproteinase 2 (MMP-2) by stimulated keratinocytes was detected using gelatine zymography. There was a concentration-dependent increase in pro-MMP-9 release after treatment with pleuran over the concentration range of 2 to 200 µg/ml, but pro-MMP-2 was detected at a constant level. Moreover, the active forms of both MMPs were not detectable, indicating that in vitro autoactivation of thesezymogens did not occur. The results indicate that pleuran is a potent keratinocyte stimulator of pro-MMP-9 release, which implies its application in dermatological therapies.

Key words: MMP-9, Glucan, Keratinocytes