

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

Juraj Majtán<sup>a,\*</sup>, Pawan Kumar<sup>b</sup>, Ján Koller<sup>c</sup>, Jana Dragúňová<sup>c</sup>, and Ján Gabriž<sup>d</sup>

<sup>a</sup> Institute of Zoology, Slovak Academy of Sciences, Dúbravská cesta 9, 845 06 Bratislava, Slovakia. Fax: +4 21-2-59 30 26 46.

E-mail: Juraj.Majtán@savba.sk

<sup>b</sup> Laboratory of Molecular Immunology, Blood Research Institute, Milwaukee, WI 53226, USA

<sup>c</sup> Burn and Reconstructive Surgery Department, Medical Faculty of Comenius University and Faculty Hospital, Bratislava, Slovakia

<sup>d</sup> Pleuran s.r.o., Súkennícka 15, 821 09 Bratislava, Slovakia

\* Author for correspondence and reprint requests

Z. Naturforsch. **64c**, 597–600 (2009); received February 25/March 16, 2009

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 -D-glucan in hydrogel form, offers a natural alternative to more common chemically derivated soluble -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 these zymogens 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