The Journal of Immunology, Vol 138, Issue 5 1457-1463, Copyright © 1987 by American Association of Immunologists

ARTICLES

UV-irradiated epidermal cells produce a specific inhibitor of interleukin 1 activity

T Schwarz, A Urbanska, F Gschnait and TA Luger

UV irradiation of epidermal cells (EC) in vitro and in vivo leads to an enhanced synthesis of the immunostimulating cytokine interleukin 1 (IL 1). However, UV exposure in vivo also results in local as well as systemic immunosuppression. Therefore, it was tested whether UV-exposed murine EC in culture in addition to IL 1 release an inhibitor of IL 1 activity. Supernatants of UV-irradiated BALB/c EC and of a transformed keratinocyte cell line (Pam 212) were evaluated for their ability to suppress IL 1-mediated thymocyte proliferation. Crude supernatants derived from either UV-exposed or unirradiated EC did not interfere with IL 1 activity. When supernatants were subjected to HPLC gel filtration, fractions eluting at approximately 40 kD significantly blocked the activity of EC-derived IL 1 and murine recombinant IL 1. The release of this inhibitory cytokine (EC-derived contra-IL 1 [EC- contra-IL 1]) was confined to UV-exposed BALB/c or Pam 212 keratinocytes, since no inhibitory activity was detected in supernatants of unirradiated cells. EC-contra-IL 1 also blocked IL 1- induced fibroblast proliferation but did not suppress IL 2 or IL 3 activity. Moreover, EC-contra-IL 1 did not inhibit spontaneous proliferation of a variety of cell lines (Pam 212, P388D1, L 929, EL 4). With the use of chromatofocusing EC-contra-IL 1 exhibited a pI of 8.8, and upon reversed-phase chromatography it eluted within three distinct peaks. Therefore, murine UV-exposed EC, in addition to the production of immunoenhancing cytokines, also may release immunosuppressing mediators and thereby participate in UV-induced immunosuppression. These findings further support the notion that the epidermis may not only be considered as a simple barrier against harmful agents but represents an active element of the immune system.

This article has been cited by other articles:

The Journal of Immunology HOME

A. Sleijffers, B. Yucesoy, M. Kashon, J. Garssen, F. R. De Gruijl, G. J. Boland, J. Van Hattum, M. I. Luster, and H. Van Loveren

Cytokine Polymorphisms Play a Role in Susceptibility to Ultraviolet B-Induced Modulation of Immune Responses after Hepatitis B Vaccination

J. Immunol., March 15, 2003; 170(6): 3423 - 3428.

[Abstract] [Full Text] [PDF]

THE JOURNAL OF CLINICAL ENDOCRINOLOGY & METABOLISM HOME

T. Mühlberg, W. Joba, C. Spitzweg, H.-D. Schworm, H.-J. Heberling, and A. E. Heufelder

Interleukin-1 Receptor Antagonist Ribonucleic Acid and Protein Expression by Cultured Graves' and Normal Orbital Fibroblasts Is Differentially Modulated by Dexamethasone and Irradiation

J. Clin. Endocrinol. Metab., February 1, 2000; 85(2): 734 - 742.

[Abstract] [Full Text]