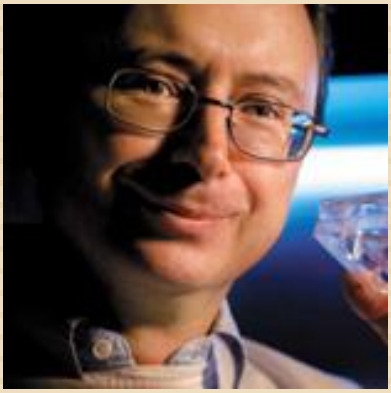
神戸大学グローバルCOEプログラム
「次世代シグナル伝達医学の教育研究国際拠点」特別セミナー

第44回シグナル伝達医学グローバルCOE学術講演会



日時：2011年7月29日(金)17:00～

場所：臨床研究棟 5F B講義室

Dr. G.M. Halliday

Professor,
Departments of Dermatology, Bosch Institute and Sydney Cancer Centre,
Central Clinical School, University of Sydney

UV induced immune suppression in humans, a critical role for energy balance and complement

Both the UVB and UVA wavebands within sunlight are potently immunosuppressive in humans. The action spectrum shows two immunosuppressive peaks, one in the UVB range at 300 nm and a second peak in the high wavelength UVA at 370 nm with wavelengths between these peaks being less effective. This suggests that there are at least two chromophores for UV immunosuppression and most likely several mechanisms involved. In humans UVB and UVA can suppress not only the induction of primary immunity but also reactivation of secondary immunity. Murine studies into the cellular mechanisms involved in UV immunosuppression indicate that UV suppresses activation of T cells and their development into both cytotoxic T cells and long-lived skin homing memory T cells. Our studies show that a critical event in UV induced immunosuppression is that UV radiation inhibits glycolysis and energy production in human keratinocytes, resulting in an energy crisis with low levels of ATP being available in the skin. This is likely to be a key event in UV immunosuppression. This can be prevented by augmenting mitochondrial function with nicotinamide (vitamin B3). Nicotinamide is metabolized to NAD^+, an essential coenzyme in ATP production and is able to prevent the depletion of keratinocyte ATP that occurs in response to UV. Nicotinamide consequently prevents both UVA and UVB induced immunosuppression in humans. The alternative complement pathway is also critical for UVA induced immunosuppression and it is likely that UVA activation of this pathway leads to the cellular changes that mediate immunosuppression. UV induction of regulatory cells is a crucial component of UV immunosuppression and it is likely those activated regulatory cells then prevents the activation of effector and memory lymphocytes. Our studies indicate that low doses of UV radiation can activate a unique population of B regulatory cells, and that mast cells are involved in this cellular response to UV. While UV immunosuppression is likely to contribute to the ability of developing neoplastic cells to escape immune destruction and grow into a tumour, it may also have the health benefit of reducing the incidence of autoimmunity. Due to the large impact of UV on human health it is important to understand how it affects the immune system of the skin.

For more information
TEL: 078-382-5370 E-mail：gcoestm@med.kobe-u.ac.jp
Hosted by: Dr. Chikako Nishigori
Divisions of Dermatology（Ext. 6131）