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Oxygen therapy of inflammatory skin diseases

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Traditionally, ROS have been implicated in the progression of various kinds of inflammatory diseases, including atopic dermatitis (AD) and psoriasis but several opposing observations suggest the protective role of ROS in inflammatory diseases. Many inflammatory diseases were aggravated in rodents and human with lowered levels of ROS, such as Ncf-1-/-, NOX2-/- mice and CGD patients, whereas attenuated in those with elevated levels of ROS, such as Gpx-1-/- and Prx II-/- mice, suggesting the anti-inflammatory role of ROS. In particular, the suppressive function of regulatory T cells (Tregs) seems to be closely linked to ROS level; Ncf1-/- Tregs were hypofunctional, while Gpx1-/- Tregs were hyperfunctional. Based on this background, we investigated animal models of AD and psoriatic dermatitis (PD) in mice with elevated or lowered levels of ROS, such as Ncf-1-/-and Gpx1-/- mice, or WT mice treated physically or chemically that may increase or decrease tissue levels of ROS; hyperbaric oxygen therapy or an oxygen-carrying chemical, perfluorodecalin increases, whereas antioxidants, such as N-acetylcysteine (NAC) or ascorbic acid decrease tissue ROS level. The results consistently showed appropriately elevated levels of ROS attenuated, whereas lowered levels of ROS aggravated, murine models of AD and PD. Correlation of Treg function with ROS level was also demonstrated in vitro by using DMNQ or NAC. In the present study, two molecules that may link ROS level and Treg function were investigated; Indoleamine 2,3-di-Oxygenase and Hypoxia-inducible factor-1α. The results of the present study suggest the potential therapeutic effect of oxygen therapy for inflammatory skin diseases.

Biography

Ju-Young Seoh has completed his PhD from Seoul National University four years after graduation from Medical College of the same university. He has then moved to Ewha Womans University and is currently working as Professor. He has studied in Osaka University in Japan from 2004-2005 and in UAB in USA from 2006-2007. He has published more than 68 papers in reputed journals.

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