▣ Akimichi Morita, M.D., Ph.D.

Education

1996 Board certification for Dermatology
1994 Ph.D. (Dr. of Medical Science), Nagoya City University
(Thesis: TL antigen as a transplantation antigen recognized by TL-restricted cytotoxic T cells.)
1989 M.D. Nagoya City University Medical School

Training and Employment

2003～present Professor and Chairman
Department of Geriatric and Environmental Dermatology
Nagoya City University Graduate School of Medical Sciences
2002～2003 Associate professor of Geriatric and Environmental Dermatology
Nagoya City University Graduate School of Medical Sciences
2001～2002 Associate professor of Dermatology, Nagoya City University Medical School
1998～2001 Assistant professor of Dermatology, Nagoya City University Medical School
1997～1998 Postdoctoral research fellow
UT Southwestern Medical Center, USA
1995～1997 Alexander von Humboldt Foundation Research Fellow
Heinrich-Heine-University Düsseldorf, Germany
1994～1995 Head of Dermatology ward, Clinical assistant, Nagoya City University
1990～1994 Graduate student, Nagoya City University Medical School
Research fellow, Laboratory of Immunology, Aichi Cancer Center
1989～1990 Resident, Dermatology in Nagoya City University Hospital
1989 Passed the examination of national board
1988, 1987 Summer student, Laboratory of Biochemistry,
Institute of Developmental Research of Aichi Prefectural Colony

Societies

Japanese Society of Investigative Dermatology (Board of director)
Japanese Society of Dermatology (Council)
American Society for Photobiology
Society of Investigative Dermatology
Japanese Cancer Association
Japanese Rheumatism Association
Japanese Society of Immunology
Japanese Society for Psoriasis Research (Council)
The Photomedicine Society

Editorial Board of Journal

2000～2004 Photodermatology, Photomedicine, Photoimmunology
2002～ Der Hautarzt (Editorial international advisory board)
2005～ Journal of Dermatological Science (Section editor)

SL-1

Antigen-specific Peripheral Tolerance Induced by Topical Application of NF-kB Decoy Oligodeoxynucleotides and Ultraviolet Irradiation

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The induction of antigen-specific immune tolerance has long been targeted to control allergic or autoimmune disease activity without immunosuppressive agents. We successfully induced antigen-specific peripheral tolerance by topical application of NF-kB decoy oligodeoxynucleotides (ODNs) and a specific wavelength of ultraviolet irradiation.

NF-kB decoy ODNs induce antigen-specific peripheral tolerance in delayed-type hypersensitivity (DTH) through the induction of regulatory T cells (*JID* 2006). NF-kB has a significant role in the upregulation of co-stimulatory molecules and immunostimulatory cytokines. NF-kB decoy ODN ointment was applied and sensitized by 1 mg ovalbumin (OVA) on shaved abdominal skin of BALB/c mice. NF-kB decoy ODN suppressed the induction of DTH. Adoptive transfer of the cells from draining lymph nodes of the tolerant mice suppressed the induction of DTH. Adoptive transfer of $CD4^{+}CD25^{+}$T cells (Treg) from tolerant mice induced tolerance in the sensitized mice. Furthermore, topical application of the NF-kB decoy ODNs inhibited dendritic cell (DC) migration and upregulation of co-stimulatory molecules on DCs. These findings indicate that topical NF-kB decoy ODNs induces antigen-specific peripheral tolerance in DTH *in vivo*, and this tolerance is mediated by modulating DC activation and inducing Treg.

Phototherapy, e.g., narrow-band UVB and PUVA, generally induces a relatively long remission period in patients with psoriasis, which cannot be explained simply by UV-induced apoptosis. Therefore, the role of regulatory T cells should also be considered. We recently reported that narrow-band UVB suppresses DTH and contact hypersensitivity by inducing the production of regulatory T cells. The UV wavelength that induces regulatory T cells to DTH, however, was not known. We irradiated a mouse DTH model using a monochromator to produce several UVB wavelengths (290 nm, 300 nm, 310 nm, and 320 nm). All the wavelengths tested significantly suppressed DTH, with 300 nm inducing maximal suppression. Foxp3 expression in lymph node cells from tolerant mice was analyzed by real time polymerase chain reaction (mRNA) and FACS analysis (protein). Foxp3 induction was increased 2-fold at 300 nm compared with the controls. Similarly, interleukin (IL)-10 induction was increased 10-fold at 300 nm. Conversely, IL-17, IL-23, and IL-12 were suppressed by 40%, 25%, and 30%, respectively, at 300 nm. These data indicate that 300-nm UV light induces Foxp3-expressing T cells (Treg) and suppresses Th-17 cells. Besides inducing Foxp3-expressing Treg, the suppression of Th-17 cells might be important for the UV light-induced immune suppression.

The use of NF-kB decoy ODNs and a specific wavelength within the UVB range are new strategies for the induction of antigen-specific peripheral tolerance and provide a new potential treatment for allergic diseases.