Development possibilities of new control methods for immunology and infectious diseases

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The research group led by Professor Toshio Hattori of International Research Institute of Disaster Science, Tohoku University, has discovered a new immune response and inflammatory regulatory cell.

A mammalian lectin Galectin-9 (Gal-9) has become known to be a prominent immune regulator; it suppresses pro-inflammatory IL-17-producing helper T cells (Th17) and augments anti-inflammatory Foxp3+ regulatory T cells (Treg). However the cells responsible for producing the lectin have yet to be elusive. We discovered a set of Th cells that express Gal-9 on the surface and secrete Gal-9 by T cell receptor stimulation. The cells, named ThGal-9, regulated Th17/Treg development in a manner sensitive to a Gal-9 antagonist but insensitive to the blockades of IL-10 or TGF-β even though the cells produce these regulatory cytokines together with Gal-9. The discovery of ThGal-9 will improve our understanding of immune regulation and may provide clinical utilities for diagnosis or cell-based therapy in the future. This achievement has been published online in Plos ONE on November 8, 2012. The paper's title is "Cell Surface Galectin-9 Expressing Th Cells Regulate Th17 Foxp3 + Treg Development by Galectin-9 Secretion". This research study has been conducted in cooperation with Professor Emeritus Mitsuomi Hirashima and Assistant Professor Toshiro Niki of Kagawa University.

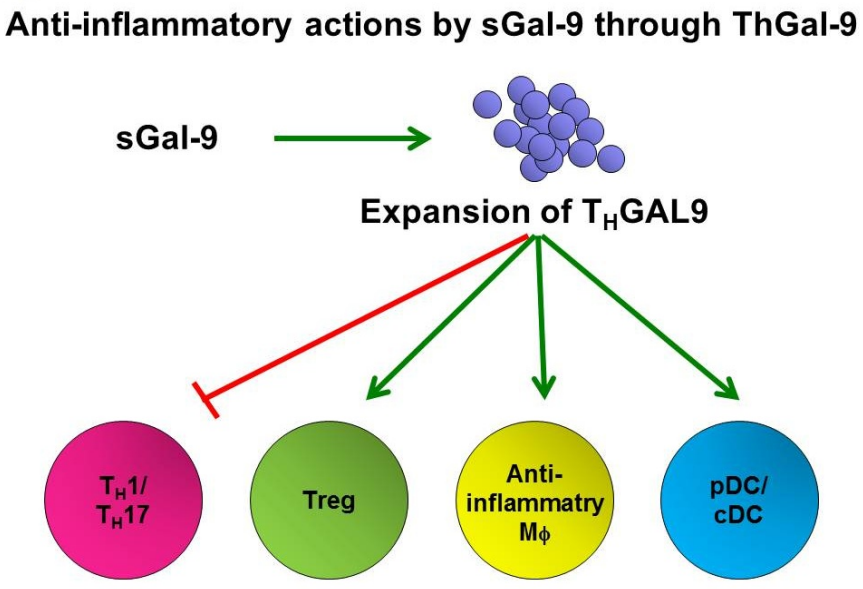

Figure 1. Therapeutic MOA of sGal-9 Administration
Gal-9 ameliorates hyper-immune conditions in infectious disease such as acute HIV and Dengue virus infections.

"Cell surface galectin-9 expressing Th cells regulate Th17 and Foxp3+ Treg development by galectin-9 secretion."
Oomizu S, Arikawa T, Niki T, Kadowaki T, Ueno M, Nishi N, Yamauchi A, Hattori T, Masaki T, Hirashima M.
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