New functions of ICOS in humoral immune regulation identified by a Tsinghua research team

A research team led by Dr. Qi Hai at Tsinghua University has now discovered how ICOS, an important signaling molecule on the surface of T lymphocytes, tells the immune system to make antibodies. B lymphocytes are the cell to produce antibodies. However, these cells cannot do it on their own but require assistance from T lymphocytes. B cells typically live in a tissue environment called follicles, where T cells are not normally found. When the body is infected with germs, immune responses take place and some T cells will move into the follicle to help the B cells with antibody production. However, how T cells migrate into the follicle has not been fully understood. Dr. Qi and his colleagues found that T cells displayed the ICOS molecule on their cell surface. When ICOS is bounded by its ligand on the surface of B cells, it generates signals that make T cells protrude their cell membranes, a prerequisite for the cell to move. When T cells cannot express the ICOS molecule normally, as in patients of the Common Variable Immunodeficiency who suffer from repeated infections, these cells do not efficiently migrate into the follicle, leaving B cells without sufficient help to make antibodies. These results are reported in *Nature* on April 25, 2013 in a paper entitled "T- helper cell recruitment governed by bystander B cells and ICOS-driven motility."(*Nature* **2013**, 496(7446):523—7)

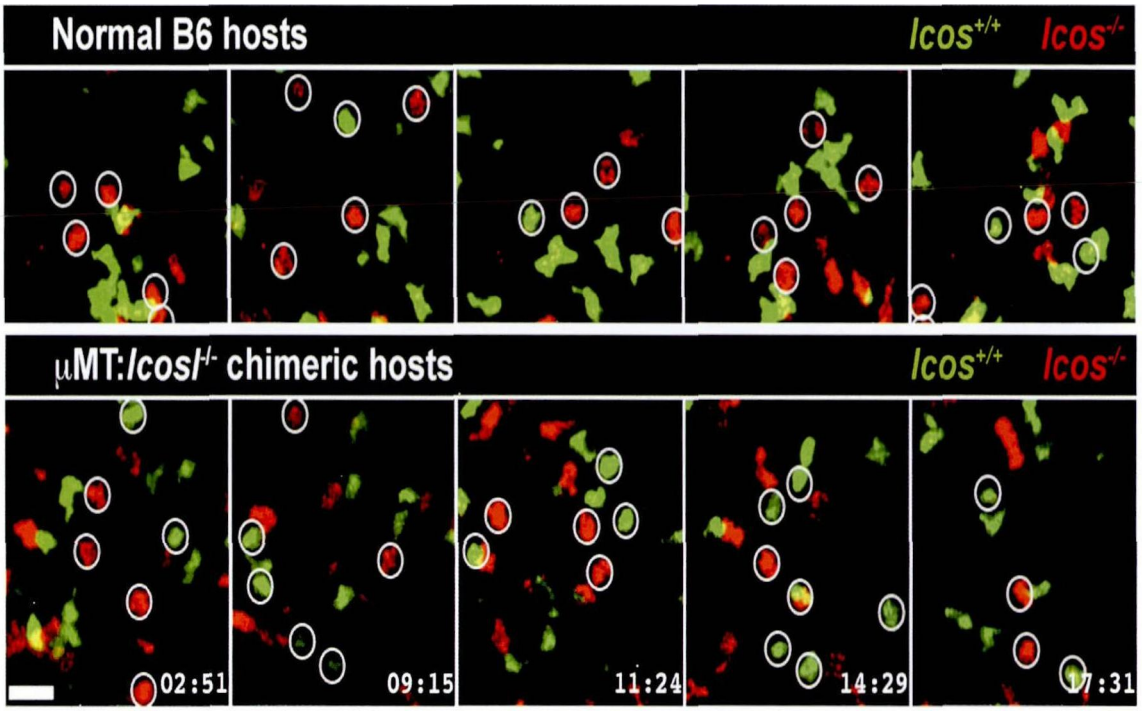

Figure Track and analyze the lymphocyte motility *in vivo*

Dr. Qi's team is interested in using their discovery to make better vaccines. For example, by allowing more T cells to move into the follicle, one may be able to increase the magnitude of antibody production. Because many other cells in the body express the ligand of the ICOS molecule, especially during inflammation, these researchers also consider the possibility to take advantage of ICOS-mediated regulation of T cell migration to fight inflammatory diseases such as asthma. This study was supported in part by NSFC.