ImmunoTools IT-Box-139 Award 2012

Wolfgang Ernst

PhD Supervisor: Prof. Dr. Daniela Männel

Institute of Immunology, University of Regensburg, Germany

Generation of a neonatal sepsis model in humanized mice

Streptococcus agalactiae (group B streptococcus (GBS)) is a gram-positive bacterium and a harmless commensal in the gastrointestinal and vaginal flora of healthy adults. In neonates however, GBS is a leading cause for pneumonia, respiratory failure, bacteremia, sepsis and meningitis. In my PhD project, a new animal model for GBS-induced sepsis is introduced, a mouse featuring a human immune system (humanized mouse). The immune system of humanized mice and human neonates exhibit similar deficiencies, making the animals a well suited infection model for human newborn infants. This novel animal model is used to analyze the effect of two drugs routinely used in the clinic: Betamethasone, for fetal lung maturation and Indomethacin to prevent labor. Although both drugs are frequently utilized in the perinatal care, little is known about their effect on the human neonatal immune system and on disease progression in GBS-induced sepsis. This animal model was chosen, since it features a human immune system. Various studies have shown that the sepsis therapies, which have been developed and successfully used in the mouse model, practically all failed in more than 25 clinical trials. In addition, drugs, especially glucocorticoids like Betamethasone affect mice and humans differently. Therefore, this novel animal model, featuring a naive human neonatal-like immune system should be well suited to analyze the effect of both drugs, and might help optimizing already existing therapies or even develop and analyze new therapies.

The key method in my PhD thesis is flow cytometric analysis, to investigate the changes (proliferation, apoptosis, migration etc.) in leukocyte populations in various organs (peripheral blood, spleen, liver, lung, bone marrow and peritoneum) caused by the GBS infection alone and in combination with treatment with Betamethasone or Indomethacin. Since I analyze human leukocytes (CD45), T cells (CD3, CD4, CD8), myeloid cells (CD33, CD80, CD86, HLA-DR) and B cells (CD19, CD20) among others, the ImmunoTools antibodies would be used to analyze these cell populations. Since ImmunoTools offer reasonably priced products, our lab would be able to afford a larger amount and/or additional antibodies, to perform more experiments and even analyze additional leukocyte subpopulations.

ImmunoTools IT-Box-139 for Wolfgang Ernst include 100 antibodies

FITC - conjugated anti-human CD1a, CD3, CD4, CD5, CD6, CD7, CD8, CD14, CD15, CD16, CD19, CD21, CD25, CD29, CD35, CD36, CD41a, CD42b, CD45, CD45RA, CD45RB, CD45RO, CD49d, CD53, CD57, CD61, CD63, CD80, CD86, HLA-DR, IL-6, Control-IgG1, Control-IgG2a, Control-IgG2b, Annexin V

PE - conjugated anti-human CD3, CD4, CD8, CD11b, CD15, CD14, CD18, CD19, CD20, CD21, CD22, CD31, CD33, CD38, CD40, CD45, CD45RB, CD50, CD52, CD56, CD58, CD62p, CD72, CD95, CD105, CD147, CD177, CD235a, HLA-ABC, IL-6, Control-IgG1, Control-IgG2a, Control-IgG2b, Annexin V

PE/Dy647 -tandem conjugated anti-human CD3, CD4, CD8, CD14, CD19, CD20, CD25, CD54

APC -conjugated anti-human CD2, CD3, CD4, CD8, CD10, CD11a, CD11c, CD14, CD16, CD27, CD37, CD42b, CD44, CD45, CD59, CD62L, CD69, CD71, IL-6, Control-IgG1, Control-IgG2a, Control-IgG2b, Annexin V

DETAILS