

IP Internship project 6:
The regulation of IgG4 antibody production

Introduction: In addition to IgE antibodies, often IgG4 antibodies can be found during allergy, especially after treatment with allergen injections. There are indications that this reduces allergen-specific IgG4 allergic symptoms.

IgG4 antibodies appear to behave, in many respects, differently than "normal" IgG antibodies. For example, they appear to be a swinger; they exchange half-molecules with other IgG4 antibodies. As a consequence, bi-specific antibodies are formed.

Aim: This project focuses on another peculiarity of IgG4: IgG4 antibody production appears to be strongly dependent on chronic antigen stimulation. This can be demonstrated in a study of the development of antibodies against bee venom in novice beekeepers. Initially, mainly IgG1 antibodies are made however, after 3-6 months of bee stabbing the contribution of IgG4 antibodies is becoming increasingly important. After two years more than 80% of the antibodies is of the IgG4 type. This points to an abnormal development of IgG4-producing B-cells.

In the project, characteristics of IgG4-producing B cells will be examined. By using quantitative and semi-quantitative PCR, we will especially look at the different types of mRNA for the gamma4 heavy chain in cultured B cells from peripheral blood. These B cells (cultured with or without IgG4-switch inducing cytokines) will be isolated using magnetic beads. Besides analyzing on mRNA level, analysis by FACS will also be done and the production of IgG4 in the cell culture will be measured using ELISA.

Techniques

- (RT)-PCR
- FACS
- ELISAC

Duration: at least 5 months. Students that study molecular biology or a related study, who are looking for a dynamic and interesting internship and are interested in the above project are encouraged to contact the group leader, Theo Rispens, either by e-mail: t.rispens@sanquin.nl.