

## Project title:

### In vivo requirements for activation of tumor-specific CD4+ T cells

Research area: immunology, cancer

Supervisors: Alexandre Corthay (postdoc) and Bjarne Bogen (professor)

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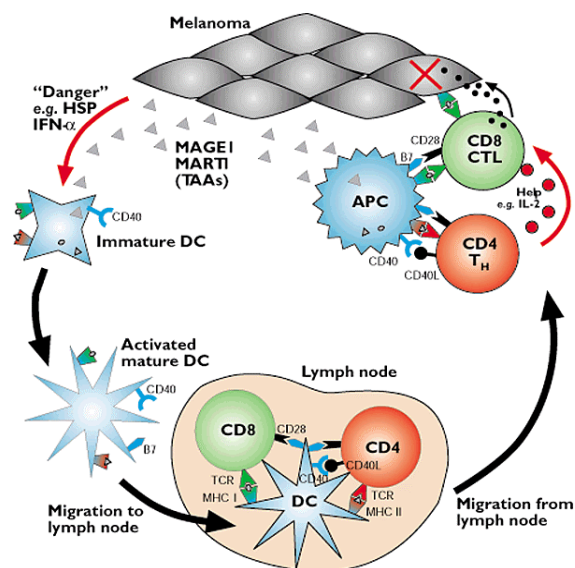
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Our goal is to understand how the immune system normally rejects tumors. Our hypothesis is that development of cancer is due to an unsuitable immune response and that cancer therapy may be achieved by proper activation of the immune system with a “cancer vaccine”.



Our research group consists of 1 professor (Bjarne Bogen), 1 senior scientist, 3 postdocs (including Alexandre Corthay), 4 PhD students and 2 technicians. As a whole, the Institute of Immunology (Rikshospitalet) employs approximately 110 scientists and technicians. Our laboratories are brand-new, spacious and well-equipped.

Project background: CD4+ T cells are believed to play a key role in antitumor immunity. However, it is unclear how tumor-specific CD4+ T cells become activated *in vivo*. In our studies, we employ T-cell receptor transgenic mice as a source of naive, tumor-specific T cells. Such idotype-specific, CD4+ T cells protect the transgenic mice against tumor development of a MHC class II negative plasmacytoma (MOPC315) and a MHC class II

positive B lymphoma (F9). Depletion of T-cell subsets showed that transgenic CD4+ cells were indispensable for tumor resistance.

Student project: the aim of the project will be to characterize the requirements for the *in vivo* activation of naive tumor-specific CD4+ T cells. For this purpose, we will use our T-cell receptor transgenic mice and test various parameters susceptible to influence the *in vivo* activation of T cells, e.g. tumor antigen secretion and tumor cell apoptosis/necrosis.

Methods: T cell activation will be monitored by four-colors flow-cytometry and RT-PCR analysis of gene expression. The experiments will be performed both *in vivo* (cell transfer and tumor challenge) and *in vitro* (cell culture and T cell proliferation assays). Affinity chromatography will be used for purification of proteins (immunoglobulins).

