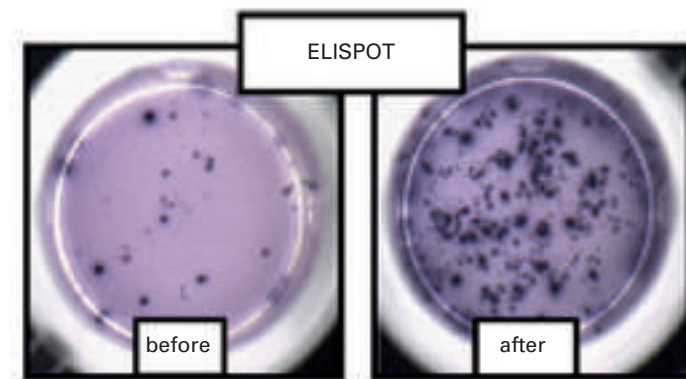


Adoptive T Cell Therapy: New Perspectives for Translational Research

Institute of Molecular Immunology

Efforts to destroy tumour cells with the help of the immune system have a long tradition at the GSF. They began with Professor H.J. Kolb's pioneering work which showed that donor lymphocyte infusions (DLI) in patients who had undergone allogeneic bone marrow transplantation led to a clear regression of chronic myeloid leukaemia (CML), which lasted for many years.

Unfortunately the "graft-versus-leukaemia" effect is often accompanied by a "graft-versus-host" reaction, which is often fatal. Furthermore, the DLI approach was most successful for the treatment of slowly growing malignant tumours, such as CML, since in this case enough time is available for a



Immune monitoring

ELISPOT is used to quantify the immune response of specific T-lymphocytes using their cytokine production. A colour reaction makes the activated lymphocytes (spots) visible (picture on the right), their number is used as a standard for the reactivity of T cell responses and, thus, allows a standardised assessment of the immune reaction in the course of the therapy.

developing immune response to gather sufficient strength for tumour rejection.

In order to stimulate a similarly effective immune response against uncontrolled infections in transplant patients, fast growing leukaemias, or even solid tumours, it is essential to have technologies which enable the rapid generation of antigen-specific T-cells on the one hand, and which, on the other hand, also allow large numbers of adoptively

Monitoring Processes in the GSF Platform

Sterile cell sorting

T-cell receptor analyses

Multiparameter cytometry

Investigation of the T-cell receptor diversity

Identification of special cell populations by antibody staining

Quantification of cytokines and identification of human leukocyte antigens

ELISPOT quantification of the immune response of specific T-lymphocytes using their cytokine production

Live cell imaging

transferred cells to be given to recipients, in order to prevent the both problems of time limits for the development of an effective immune response and the risk of “graft-versus-host” disease. These T-cells need to have receptors with sufficient avidity to recognise and destroy tumour cells effectively and they should be transferred into an in vivo environment that supports their further expansion, function, and survival. Important breakthroughs during the last few years prove the increasing significance of adoptive T-cell therapy for the effective treatment of infections and tumour diseases. However, to achieve the necessary technological development common action is required. Therefore, 14 research groups, seven each from Munich and Berlin, have started their

collaboration in a transregional collaborative research centre (SFB-TR) with the aim of defining the ‘Principles and Applications of Adoptive T Cell Therapy’. Thomas Blankenstein from Berlin und Dolores Schendel from Munich are coordinating this SFB-TR, which was officially initiated in July 2006. Six of the Munich projects are led by GSF scientists, demonstrating the competence of the GSF in this area of research. The activities of the SFB-TR are fully embedded in the GSF research programme. They supplement the clinical objectives of a number of clinical co-operation groups and are firmly focused on future developments in ‘Immune Monitoring’.

For this reason this joint SFB-TR initiative broadens the GSF’s efforts to further promote cooperation with local university hospitals in the long run, thereby opening up possibilities for an exciting new era of the immune therapy of tumours and infectious diseases, with the aim of transferring fundamental research into the hospitals and even opening up therapeutic concepts for diseases like asthma, allergy and autoimmunity in the future.



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