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Research interests

Our research focuses on the fields of cutaneous immunobiology, immunodermatology and allergology as well as cutaneous immunopharmacology. Our work contributed greatly to the current understanding of structure and functions of the skin immune system under physiological and pathological conditions and formed the basis for new strategies in the treatment of inflammatory and neoplastic skin diseases.

Thesis projects

The skin is a fascinating model for the investigation of the cellular and molecular networks operative in inflammatory and immunological reactions. Understanding the skin's immune functions under physiological and pathological conditions should offer us important opportunities for therapeutic intervention by interference with the various activating and inhibitory circuits of the skin immune systems.

Project 1

The impact of IFN- α on phenotype and cytotoxic effector functions of DCs in malignant melanoma.

IFN- α is licensed as adjuvant in the treatment of stage II and III malignant melanoma in patients with increased risk of developing metastases, but its exact mode of action has yet to be clarified. We and others have shown that IFN- α induces the expression of the killer molecule tumor necrosis factor-related apoptosis-inducing ligand (TRAIL) on T cells, NK cells, monocytes and plasmacytoid dendritic cells (pDCs). The aim of this project will therefore be to investigate the potential role of IFN- α -activated, cytotoxic pDCs in tumor immunity. Using tumor tissue and peripheral blood from melanoma patients undergoing IFN- α therapy we will investigate phenotype and cytotoxic potential of different leukocyte subpopulations and correlate these data with clinical progression. In addition, we plan to use relevant melanoma mouse models to gain a clear understanding of the in vivo significance of this cellular effector mechanism.

Project 2

T cell activation in the skin - a pathogenetic principle in psoriasis vulgaris?

Psoriasis, at least in its more severe manifestations (erythroderma, arthritis) and when associated with certain other autoinflammatory diseases, has a systemic component. On the other hand, evidence exists that the skin itself can actively trigger the disease process. The aim of this project is to identify and to phenotypically and functionally characterize the T cell reservoir apparently present in non-lesional psoriatic skin and to define the cellular and molecular events leading to its activation. These investigations should form the basis for the development and, ultimately, implementation of new and, hopefully, also topical therapeutic approaches for an inflammatory disease of high morbidity.

Both projects will offer the students the challenging field of cutting edge translational research by learning how to think and how to work scientifically.

Selected publications

Sary, G., Bangert C., Tauber M., Strohal R., Kopp T., **Stingl G.** "Tumoricidal activity of TLR 7/8- activated inflammatory dendritic cells". *J Exp Med.* 204: 1441-1451 (2007).

Altrichter, S., Kriehuber E., Moser J., Valenta R., Kopp T., **Stingl G.** "Serum IgE Autoantibodies Target Keratinocytes in Patients with Atopic Dermatitis". *J Invest Derm.* 128: 2232-2239, (2008).

Schuster, Ch., Vaculik Ch., Fiala S., Meindl S., Brandt O., Imhof M., **Stingl G.**, Eppel W., Elbe-Bürger A. "HLA-DR leukocytes acquire CD1 antigens in embryonic and fetal human skin and contain functional antigen-presenting cells". *J Exp Med.* 206: 169-181, (2009).

Sary, G., Klein I., Kohlhofer S, Koszik F., Scherzer N., Müllauer L., Quendler H., Kohrgruber N., **Stingl G.** "Plasmacytoid dendritic cells express TRAIL and induce CD4⁺ T cell apoptosis in HIV-1 viremic patients". *Blood* 114: 3854-3863, (2009).