

Theme: Skin Immunology

Time: Wednesday 2 May 2018

Location: Auditorium Nielsine Nielsen, Blegdamsvej 3, 2200 Copenhagen N

Organizer: Graduate School of Immunology and Infectious Diseases

Chairman: Charlotte Menne Bonefeld

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| 13.00 | Welcome Charlotte Menne Bonefeld |
| 13.15 | Johanna Brandner, Department of Dermatology and Venereology, University of Hamburg: The skin barrier |
| 14.00 | Martin Kongsbak-Wismann, University of Copenhagen: Vitamin D and <i>Mycobacterium Tuberculosis</i> |
| 14.45 | Beatrice Dyring-Andersen, University of Copenhagen: Innate immune response of the skin focusing on the role of ILC |
| 15.30 | Coffee Break |
| 16.00 | Deborah Witherden, The Scripps Research Institute, San Diego: Activation of DETC |
| 16.45 | Wendy Havran, The Scripps Research Institute, San Diego: Role of DETC in the skin immunology |
| 17.30 | Closing remarks |

Abstracts

Skin Immunology

The skin barrier

Johanna Brandner

Department of Dermatology and Venereology, University of Hamburg

The skin is an indispensable barrier to protect the body from the uptake of pathogens, allergens and harmful substances and from the loss of water and solutes. To perform this barrier function, several kinds of barriers, i.e. the mechanical barriers stratum corneum and tight junctions, the microbiome barrier, the chemical barrier and the immunological barrier interacts. In this talk I will give an overview of these various barriers and their interactions with a focus on tight junctions.

Vitamin D and *Mycobacterium Tuberculosis*

Martin Kongsbak-Wismann

University of Copenhagen

In 2016 approximately 10 mio new cases of were diagnosed with *Mycobacterium tuberculosis* (*Mt*) infection, and almost two mio deaths were ascribed to this infection. *Mt* primarily affects alveolar macrophages and the disease manifests with granulomas in the lungs consisting of activated immune cells trying to contain and fight of the infection. Central for macrophages' ability to kill *Mt* is the cytokine, Interferon gamma (IFN γ). Furthermore, epidemiological studies have shown that vitamin D deficiency is linked to poor disease prognosis. Paradoxically, vitamin D is known to inhibit the immune systems' ability to secrete IFN γ . This talk therefore looks into the actions of vitamin D, and how this vitamin supposedly is inhibiting IFN γ production and concomitantly seems to be important for disease management.

Innate lymphoid cells – getting under the skin

Beatrice Dyring-Andersen,

University of Copenhagen

Innate lymphoid cells (ILCs) are the most recently discovered group of immune cells. They are characterized by a classic lymphoid cell morphology, lack of antigen specificity (antigen receptors encoded by rearranged genes) and lack the expression of cell-surface molecules that identify other immune cell types.

This talk will review the basic concepts of innate immunology in the context of innate lymphoid cells, define the group of cells and subsets and present current data regarding the role of ILC in disease.

Molecular interactions driving epidermal $\gamma\delta$ T cell activation

Deborah A. Witherden

The Scripps Research Institute, La Jolla CA USA

$\gamma\delta$ T cells resident in the epidermal layer of mouse skin, termed DETC, are rapidly activated following epidermal damage and are an essential component of the wound healing process. DETC undergo numerous changes in phenotype, morphology and effector function in response to epidermal wounding and our focus has been to identify the molecular interactions driving these changes. We have identified pivotal signals regulating the DETC response to keratinocyte damage and have determined the roles of distinct receptor-ligand pairs in an effective $\gamma\delta$ T cell response. These findings provide insight into the molecular mechanisms initiating DETC activation and may provide therapeutic targets for improving the wound healing process.

$\gamma\delta$ T Cells and the Regulation of Immune Responses at Epithelial Surfaces

Wendy L. Havran

The Scripps Research Institute, La Jolla, CA USA

Intraepithelial $\gamma\delta$ T cells play unique roles in homeostasis, tissue repair, inflammation and protection from malignancy in mice and man. We have identified JAML-CAR costimulatory molecules as key regulators of intraepithelial $\gamma\delta$ T cell functions in wound healing and antitumor immunity. Expression of these molecules is dysregulated in chronic wounds and skin tumors. This raises the possibility that JAML-CAR molecules may be novel targets for therapeutic intervention to accelerate tissue repair and kill skin tumors. Novel degradable hydrogels will be tested to deliver activating molecules into wounds or tumors as a new therapeutic strategy to treat chronic wounds, tumors, and other epithelial disorders.