Herrenhausen Palace | Hannover, Germany | April 8–11, 2019

Scientific Organizers:
Michel Gilliet, University Hospital of Lausanne, Switzerland
Emma Guttman, Mount Sinai Hospital, USA
Anthony Oro, Stanford University, USA
Manolis Pasparakis, University of Cologne, Germany

Organized in collaboration with Volkswagen Foundation

The skin is the largest human organ and the primary interface between the body and the environment. It provides the first line of defense against invading pathogens and trauma via its physical barrier properties but also via active defense mechanisms orchestrated by a coordinated interplay between epithelial and immune cells. Recently, the skin microbiota has emerged as an important third player that critically influences skin homeostasis and inflammation by interacting with epithelial and immune cells. This conference aims to illustrate these reciprocal interactions and describe their impact on skin physiology and pathophysiology. A central focus will be to discuss how the composition of the skin microbiota regulates homeostasis and determines susceptibility to inflammatory, allergic and neoplastic diseases of the skin and other epithelial tissues. Emerging concepts concerning the mechanisms influencing epithelial-immune-microbiota crosstalk and opportunities for therapeutic interventions will be discussed. The symposium will also provide a unique setting for in-depth, cross-disciplinary discussions between basic skin scientists and biologists studying immune responses in other barrier organs, dermatologists, cancer biologists, immunologists and many researchers from disparate fields who normally do not have opportunities to meet. Finally, the conference will also foster interaction with potential industry partners, who increasingly see the skin as a major focus for gaining insights into immune mechanisms and for development of targeted therapies for patients with chronic inflammatory diseases, allergic diseases and cancer.

Session Topics:
- Epithelial-Microbiome Interactions in the Skin
- Epithelial-Immune Interactions in the Skin
- Microbiota-Immune Interactions in Skin and other Epithelial Surfaces
- Workshop: Therapeutic Innovation for Skin Diseases
- Skin Dysbiosis and Allergic Inflammation
- Epithelial-Microbiota-Immune Interactions in Tumorigenesis and Systemic Diseases
- Emerging Therapeutic Concepts Treatment plus one additional workshop

Discounted Registration Deadline: Feb 7, 2019
Visit www.keystonesymposia.org/19D4 for more details.
MONDAY, APRIL 8
Arrival and Registration

TUESDAY, APRIL 9
Welcome and Keynote Address
*Michel Gilliet, University Hospital of Lausanne, Switzerland
Richard L. Gallo, University of California, San Diego, USA
Skin Microbiome in Health and Disease – The Holobiome Perspective

Epithelial-Microbiome Interactions in the Skin
*Julie A. Segre, National Institutes of Health, USA
Human Skin Microbiome: Trans-Kingdom, Host-Immune Interactions
Yasmine Belkaid, NIAID, National Institutes of Health, USA
The Skin Microbiota in the Control of Skin Immunity
Elizabeth A. Grice, University of Pennsylvania, USA
Microbial Roles in Skin Barrier Function and Repair
Jan Claesen, Cleveland Clinic, USA
Short Talk: Cutibacterium Acnes Antibiotic Production Shapes Niche Competition in the Human Skin Microbiome at the Level of Individual Follicles
Mercedes Gomez de Aguero, University of Bern, Switzerland
Short Talk: Neonatal Skin Barrier Is Shaped by Embryonic Exposure to Maternal Microbiota

Workshop 1
*Angela M. Christiano, Columbia University, USA
Jacob S. Baker, Massachusetts Institute of Technology, USA
Transmission and Evolution of Cutibacterium Acnes during Human Development
Roland Jourdain, L'Oreal, France
Malassezia restricta-Mediated Lipid Peroxidation: A New Player in Dandruff Origin
Emmi Wachsmuth, University Hospital Cologne, Germany
Cell Autonomously Activating Functions of Insulin/IGF-1 Signaling in Skin Barrier Function and Diabetes-Induced Skin Disease
Snehlata Kumari, CECAD Research Center, University of Cologne, Germany
Immunomodulatory Role of Epithelial IKK/NF-κB Signaling in Necroptosis -Mediated Skin Inflammation
Stephen Murtough, Queen Mary University of London, UK
iRhom2-mediated Immune Dysregulation: Impact on the Skin and Oesophagus
Edgar A.E. Serfling, Institute of Pathology, Germany
The Osmosensitive Transcription Factor NFAT5 Controls the Integrity of Skin
Zsolt Dajnoki, University of Debrecen, Hungary
Prominent Permeability Barrier Alterations in Rosacea Skin
Gudrun F. Debes, Thomas Jefferson University, USA
IgM Plasma Cells Reside in Healthy Skin and Accumulate with Chronic Inflammation

Epithelial-Immune Interactions in the Skin
*Amy S. Paller, Northwestern University, USA
Genetic Barrier Disorders with Inflammation and Microbiome Abnormalities
Angela M. Christiano, Columbia University, USA
Immune Control of Hair Follicles
Sabine Eming, University of Cologne, Germany
Metabolic Control of Skin Inflammation
Anand Kumar Andiappan, Singapore Immunology Network, Singapore
Short Talk: Genome-Wide Gene Expression Identifies Strong Proinflammatory Signatures Associated with Skin-Relevant FLG Mutants with Potential as Non-Invasive Biomarkers for Skin Disease
Tom Hayday, King's College London, UK
Short Talk: EGFR Regulates Cell Autonomic Pro-Inflammatory Signaling in Keratinocytes

Poster Session 1

WEDNESDAY, APRIL 10
Microbiota-Immune Interactions in Skin and other Epithelial Surfaces
*Michel Gilliet, University Hospital of Lausanne, Switzerland
Role of Microbiota in Innate Immune Responses of the Skin
Daniel H. Kaplan, University of Pittsburgh, USA
Cutaneous Nociceptors Trigger Protective Innate Type-17 Anticipatory Immunity
*Manolis Pasparakis, University of Cologne, Germany
Microbiota-Immune Interactions in Intestinal Inflammation
John Common, Skin Research Institute of Singapore, Singapore
Skin Microbiome Signatures in Atopic Dermatitis Are Linked to Host Immunity and Microbial Virulence
Yiyin Erin Chen, Stanford University, USA
Short Talk: Understanding Commensal-Host Communication through Genetic Engineering of Staphylococcus epidermidis
Annika Krueger, University of Queensland, Diamantina Institute, Australia
Short Talk: Secreted Bacterial Proteins from Staphylococcus aureus as Local Regulators of Epithelial Inflammation in Photo-Damaged Skin

Workshop 2
*Yasmine Belkaid, NIAID, National Institutes of Health, USA
Karmella Naidoo, Malaghan Institute of Medical Research, New Zealand
Mucosal-Associated Invariant T (MAIT) Cells as A Novel Therapeutic Target against Atopic Dermatitis
Lennart M. Rösner, Dpt of Dermatology and Allergy, Hannover Medical School, Germany
T Cell Receptor Sequencing Underlines the Pivotal Role of Skin-Homing T Cells in Atopic Dermatitis
Travis M. Whitfill, Azitral Inc., USA
Engineering the Microbiome to Treat Netherton Syndrome, a Rare Skin Disease

* Session Chair † Invited but not yet accepted Program current as of December 14, 2019. Program subject to change. Meal formats are based on meeting venue. For the most up-to-date details, visit https://www.keystonesymposia.org.
David Isaac Weiss, University of California, Los Angeles, USA
*IL-1β Stimulates Rapid Release of the Antimicrobial Protein IL-26 from Th17 Cells*

Anissa Fries, University Hospital of Lausanne, Switzerland
Pathogenic Role of Interleukin (IL)-26-Producing Th17 Cells in the Acute Forms of Psoriasis

Lucie Loyal, BCRT/Charite, Germany
Circulating CD8+ Helper-Type T Cell Memory Subsets Represent CD4+ Helper-Alike Cells with a Skin-Resident Memory T Cell Signature

Franziska Herster, University of Tubingen, Germany
Platelet-Neutrophil Aggregates Promote Skin Pathology in Psoriasis

Anne Muller, University of Tuebingen, Germany
IkBζ is a Key Mediator of IL-36 Signaling in Psoriasis

**Skin Dysbiosis and Allergic Inflammation**

*Emma Guttman, Mount Sinai Hospital, USA
Atopic Dermatitis: A Th2 and Th22 Driven Disease & Therapeutic Implications*

Heidi H. Kong, National Institutes of Health, USA
Skin Microbiota and Development of Atopic Dermatitis

Brian Kim, Washington University School of Medicine, USA
The Skin Neuro-Immune Axis, Dysbiosis and Itch

Bernhard Homey, University of Duesseldorf, Germany
Short Talk: Microbe-Host Interplay in Atopic Dermatitis and Psoriasis

Jennifer Wing-Ki Yau, Chinese University of Hong Kong, Hong Kong
Short Talk: Taxonomic and Functional Profiling of Skin Metagenomes Associated with Childhood Atopic Dermatitis

Niki Ubags, University of Lausanne, Switzerland
Short Talk: The Skin Microbiome Drives Immune Maturation and Exacerbation of Both Skin and Airway Inflammation

**Emerging Therapeutic Concepts**

Kari Nadeau, Stanford University, USA
Novel Therapies and Immune Regulation of Food Allergies

*James G. Krueger, Rockefeller University, USA
Therapeutic Targeting Epithelial/Immune Pathways in Inflammatory Skin Diseases*

George D. Yancopoulos, Regeneron Pharmaceuticals, Inc., USA
Regeneron's Efforts in Atopic and Allergic Conditions: From Dupilumab...to "BiSpecs" that Kill Long-Lived IgE Plasma Cells

Bernhard Paetzold, S-Biomedic, Belgium
Short Talk: Direct Modulation of the Skin Microbiome as Potential Therapy for Acne Vulgaris: A Pilot Study

Miao-Tzu Huang, National Taiwan University Hospital, Taiwan
Short Talk: Short-Chain Fatty Acids Ameliorate Allergic Inflammation via Induction of Immune-Regulatory Microbiome and Metabolic Pathways

Aisleen Diaz, Icahn School of Medicine at Mount Sinai, USA
Short Talk: Changes in Skin Biomarkers Following Crisaborole Treatment Correlate With Clinical Improvement in Atopic Dermatitis

**Meeting Wrap-Up: Outcomes and Future Directions (Organizers)**

FRIDAY, APRIL 12
Departure