GEORC Dr. Cots Departm

GEORGE COTSARELIS

Dr. Cotsarelis if the Milton B. Hartzell Professor of Dermatology and Chairman of the Department of Dermatology at the University of Pennsylvania Perelman School of Medicine. Dr. Cotsarelis was the first to identify the stem cells of the hair follicle and cornea. His research focuses on using stem cells in adult tissues to develop new treatments for hair loss, skin fragility, poor wound healing and skin aging. He has made seminal discoveries in our understanding of how stem cells contribute to hair growth and what goes wrong to cause hair

loss. He is working with biotech companies to develop new drugs for skin disorders and with bioengineers to make replacement skin and hair.



YA-CHIEH HSU

Dr. Hsu is an Assistant Professor of Stem Cell and Regenerative Biology at Harvard University's Department of Stem Cell and Regenerative Biology and a Principal Faculty member of the Harvard Stem Cell Institute. Her lab studies how growth and differentiation are controlled, and how different cell types coordinate with one another to maintain tissue function during development, regeneration, and repair. Skin the lab's primary model system,

but we are also exploring other epithelial tissues to determine the extent to which these mechanisms are shared or separate.



MARKUS FRANK

Dr. Frank is an Associate Physician at Brigham and Women's Hospital and an Assistant Professor, Dermatology and Associate Professor, Pediatrics, at Harvard Medical School. He is also a Principal Faculty member of the Harvard Stem Cell Institute and co-leader of the Institute's Skin Program. Dr. Frank's laboratory research focuses on the physiological and pathological roles of the human P-glycoprotein family of ATP-binding cassette (ABC)

transporters. His laboratory has cloned and characterized a novel human ABC transporter, ABCB5. His laboratory has also recently discovered PD-1-dependent immunoregulatory functions of this unique cell subset in vitro and in vivo; as a result, research efforts are currently underway to further develop adult skin-derived ABCB5+ stem cells as a transplantable cell source for novel therapeutic applications in tissue engineering and regeneration, and for stem cell-based modulation of transplant allograft rejection and autoimmune disorders.



GEORGE MURPHY

Dr. Murphy is Professor of Pathology at Harvard Medical School and Director of the Brigham and Women's Program in Dermatopathology. His lab was the first to elucidate apoptosisinducing pathways that involve skin stem cell targets of alloreactivity in experimental graft-versus-host disease. He has also played a supporting role in a number of recent studies where specialized pathology has been integral to our understanding of tissue and cancer stem

cell biology. A Principal Faculty member of the Harvard Stem Cell Institute, he also serves as co-leader of the Institute's Skin Program.

HSCI Skin Program Inaugural Symposium

Thursday, November 12, 2015

Joseph B. Martin Conference Center

at Harvard Medical School | Rotunda Room

8:00 a.m.—5:00 p.m.

ORGANIZERS

Markus Frank | Boston Children's Hospital

George F. Murphy | Brigham and Women's Hospital

Co-leaders, HSCI Skin Program



- 7:30-8:00 Registration and Coffee
- 8:00-8:15 Welcome | GEORGE F. MURPHY | Brigham and Women's Hospital

STEM CELL PLASTICITY

- 8:15-9:15 **RUDOLF JAENISCH** | MIT "Human ES and iPS cells: Pluripotency and plasticity"
- 9:15-10:00 NATASHA FRANK | Brigham and Women's Hospital "ABCB5-Positive stem cells in organ development and regeneration"
- 10:00-10:15 **BREAK**

REGULATION OF STEM CELL SPECIFICATION

- 10:15-11:15
 ROBERT LAVKER | Northwestern

 "How microRNA's help to maintain epithelial stem cell homeostasis"
- 11:15-12:15
 CEDRIC BLANPAIN | Université Libre de Bruxelles

 "Mechanism regulating tumor heterogeneity"
- 12:15-1:15 **LUNCH (provided)**

HAIR FOLLICLE AS A STEM CELL PARADIGM

- I:15-2:15
 GEORGE COTSARELIS | University of Pennsylvania

 "Hair Follicle Stem Cells in Androgenetic Alopecia"
- 2:15-3:00 YA-CHIEH HSU | Harvard University "Stem Cells and Their Progeny in the Hair Follicle Niche"
- 3:00-3:15 **BREAK**

SKIN CANCER AND THE STEM CELL NICHE

3:15-4:15 MARKUS FRANK | Boston Children's Hospital/Brigham and Women's Hospital "Immunoregulatory stem cells in skin and skin-associated malignancy"

PANEL DISCUSSION

- 4:15-5:00 Setting Sail for the Future of Skin Stem Cell Research
- 5:00 Wrap-up and adjourn | GEORGE F. MURPHY



Dr. Rudolf Jaenisch is Professor of Biology at the Whitehead Institute and the Department of Biology, Massachusetts Institute of Technology. He has generated the first transgenic mice carrying exogenous DNA in the germ line and was the first to use insertional mutagenesis for identifying genes crucial for embryonic development. Key

contributions have been the study of epigenetic processes in gene expression, imprinting and X-inactivation and in diseases such as cancer and mental retardation. More recently he has focused on mammalian cloning and on reprogramming somatic cells by defined factors. The possibility to generate patient specific induced pluripotent stem cells has great potential for studying complex human diseases such as Alzheimer, Parkinson's and various forms of Autism and may offer novel strategies for treatment of disease.

NATASHA FRANK



Dr. Natasha Frank is an Associate Physician at Brigham and Women's Hospital and an Assistant Professor of Medicine, Harvard Medical School. Current endeavors in Dr. Frank's research laboratory at the VA Boston Healthcare System and Children's Hospital Boston are focused on dissecting the relationship of multipotent stem cells residing in diverse human tissues to genetic diseases and cancer, with a special emphasis on the relevant role of the ATP-binding cassette transporter and chemoresistance gene ABCB5. Dr. Frank directs the Genetics Clinic at the VA

Boston Medical Center where she attends to patients with hereditary cancer syndromes. Additionally, she serves as an Associate Physician in the Division of Genetics at Brigham and Women's Hospital and is a member of the Harvard Center for Neurofibromatosis and Allied Disorders.

ROBERT LAVKER



Robert M. Lavker, Ph.D., is the Jack W. Graffin, M.D. Professor of Dermatology at the Northwestern University Feinberg School of Medicine. Dr. Lavker has spent the last 47 years studying various aspects of epithelial biology. His major research endeavors focus on the biology of epithelial stem cells and how microRNAs (miRNAs) help maintain epithelial

homeostasis. Dr. Lavker has identified stem cells in several epithelia: human and non-human primate epidermis, the limbal region of the cornea, and the bulge region of the hair follicle. These studies have been of major importance for their implications regarding hair follicle growth, wound repair, carcinogenesis, and corneal regeneration. With respect to the latter, his work on the limbal epithelium has had a major impact on the conduct of corneal epithelial transplant surgery. Most recently, the laboratory has defined a miRNA family that contributes to the maintenance of epithelial stem cell-enriched epithelia.

CEDRIC BLANPAIN



Cedric Blanpain is full professor of Stem Cell and Development Biology and investigator of the WELBIO (Walloon Excellence in Life science and Biotechnology) at the IRIBHM, Université Libre de Bruxelles (ULB). His research group is studying the mechanism regulating stem cell fate decision during embryonic development, tissue homeostasis and repair as well as the implication of stem cells during cancer initiation and growth.