Department of Biomedical Sciences

Departmental Seminar

"Stem cells and ovarian cancer"

By

Prof. Alexander Nikitin

Professor of Pathology
Leader, Cornell Stem Cell Program
Department of Biomedical Sciences
Cornell University

Date: **10 March 2015 (Tuesday)**

Time: **2:30pm – 4:00pm**

Venue: **G5-314, 5/F, Green Zone,**
Academic 1
City University of Hong Kong
Tat Chee Avenue, Kowloon Tong

For abstract, please refer to the attachment.

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~ All are Welcome ~

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About the speaker

Alexander Nikitin, M.D., Ph.D. is Professor of Pathology in the Department of Biomedical Sciences and Leader of the Cornell Stem Cell Program at the Cornell University. He is also Director of the Cornell Stem Cell Pathology Unit and is Co-Director of the Cornell Stem Cell Modeling and Phenotyping Core. Dr. Nikitin earned his M.D. (with Distinction) from the Pavlov First Medical Institute and Ph.D. in Pathology from the Petrov Research Institute of Oncology, both in St. Petersburg, Russia. After work as a diagnostic pathologist in the Petrov Research Institute of Oncology, St. Petersburg Russia, he performed postdoctoral and junior faculty research at the University of Essen Medical School in Germany and at the University of Texas Health Science Center at San Antonio in Texas. Dr. Nikitin joined the Cornell University faculty in 2000 and was promoted to Associate Professor of Pathology with indefinite tenure in 2007, followed by promotion to the full Professor of Pathology in 2013. He initiated the formation of the Cornell Stem Cell Program in 2008. Dr. Nikitin's research aims to understand how aberrations in molecular and cellular mechanisms governing the tissue homeostasis may lead to cancer initiation and progression. His laboratory established the first autochthonous mouse model of high-grade serous ovarian carcinoma, identified transcriptional regulation of genes encoding miR-34 family by p53, reported common downregulation of *mir-34* genes in ovarian cancer, showed importance of p53/miR-34/MET feed-forward loop for the control of cell motility and invasion, revealed critical cooperation of p53 and miR-34 in the regulation of adult stem cell compartment, and discovered a novel cancer-prone niche in the ovarian surface epithelium. Dr. Nikitin's laboratory also developed new mouse models of metastatic prostate cancer, luminal subtype B mammary carcinoma and undifferentiated high-grade pleomorphic sarcoma. Work on those models offered important conceptual insights into the roles of stem cells in cancer pathogenesis. As a part of Dr. Nikitin's interests in pathology, he is also working on development of a concept of "stem cell pathology". Dr. Nikitin's research is complemented by cross-disciplinary collaborations in technology-oriented areas, such as nonlinear microscopy, intravital imaging and nanotechnology. Dr. Nikitin is author of over 90 manuscripts and 7 book chapters, and, together with Drs. M. H. Kaufman and J. P. Sundberg, has written a book "Histologic Basis of Mouse Endocrine System Development: A Comparative Analysis". CRC Press, 2010. Dr. Nikitin is former Vice Chair of Pathology and Laboratory Medicine Standing Committee of the NIH Mouse Models of Human Cancers Consortium, and a recipient of the NCRR, NIH Midcareer Award in Mouse Pathobiology. He is co-founder and co-organizer of the NIH-funded Annual Practical Workshop on the Pathology of Mouse Models for Human Disease and Member of the Academy of Genomic Pathology.

Abstract

It is well established that some types of cancers arise from stem cells, while others may originate from more differentiated cells. However, little is known about stem cell niches for the ovarian surface epithelium (OSE) and tubal epithelium, two main presumptive tissues of origin of ovarian carcinoma. Recently, we have identified a population of slowly cycling ovarian surface epithelium stem cells (OSE-SC), which mainly reside in the hilum region, the transitional/junction area between the OSE, mesothelium and tubal epithelium, of the mouse ovary. Deletion of tumor suppressor genes *p53* and *Rb* in OSE-SC leads to formation of high-grade serous carcinoma, consistent with frequent alterations in p53 and RB pathways in this most common and aggressive type of human ovarian cancer. Our comparative evaluation of mouse and human ovaries and uterine (fallopian) tubes supports existence of cancer-prone stem cell niches in human oophoro-salpingeal epithelia. These findings open new directions for studies of ovarian carcinoma pathogenesis and development of more effective clinical approaches.