

Seminar Announcement
- All Are Welcome -

Speaker : **Dr Mary Helen Barcellos-Hoff**

*Professor, Department of Radiation Oncology and Cell
Biology, Director of Radiation Biology
New York University School of Medicine*



Title : ***“From cradle to grave: The tumor
microenvironment from carcinogenesis
to therapy”***

Date : **22 May 2013 (Wednesday)**

Time : **11:00am – 12:00pm**

Venue : **Breakthrough Theatrette, Matrix Level 4**

Host : **Prof Birgit Lane**
(Tel: 64070152, e-mail: birgit.lane@imb.a-star.edu.sg)

Abstract:

Although cancer biology and therapy tends to focus on changes in malignant cells, cancer is fundamentally a disease of tissues. By identifying microenvironments that promote early cancer, we have an opportunity to find nascent lesions, and possibly return the microenvironment to its native cancer suppressive state. Here I discuss how ionizing radiation affects systemic processes that alter the course of carcinogenesis, and how aspects of this biology can be exploited in radiation therapy. Transforming growth factor β (TGF β) is a key signal by which radiation alters tissues and tumors. Radiation-induced TGF β regulates innate immune cells and cooperates with Notch to deregulate adult tissue stem cells. When mice are irradiated with low doses (10-100 cGy) prior to transplantation with oncogenically primed mammary epithelium, carcinogenesis is significantly accelerated in a TGF β dependent manner. Remarkably, similar biology is evident in radiation-preceded human cancer. TGF β is also central to the response to radiotherapy, where it unexpectedly mediates the DNA damage response, as well as the tumor microenvironment, both of which contribute to significantly to tumor control. Inhibiting TGF β in the context of early cancer or cancer therapy provides a novel means to activate an anti-tumor microenvironment.

About the Speaker:

After 20 years at Lawrence Berkeley National Laboratory in California, Dr. Barcellos-Hoff joined NYU in 2008 where she is Professor and Director of Radiation Biology in the Department of Radiation Oncology. She is Principal or Co-Investigator of seven currently funded research projects from NIH, DOD, DOE, NASA and industry. Dr. Barcellos-Hoff has published more than 65 primary research publications, most recently in Cancer Cell, as well as more than 70 book chapters, invited reviews and editorials. Her lab investigates radiation effects mediated by the microenvironment. In carcinogenesis, they study how radiation affects tissue composition, cytokine signaling stem cell biology, genomic instability, inflammation, and epithelial-mesenchymal transition. This research has led the field in defining the complexity of radiation effects on biological systems and the mechanisms underlying radiation carcinogenesis. The translational potential of this work has been extended to radiotherapy to test the use of TGF β inhibitors to improve tumor control in breast, lung and brain cancer during radiotherapy via molecular control of the DNA damage response and modulation of the tumor microenvironment.