Venture Center

NCL Innovation Park
Pashan road, Pune-08

BIOPUNE SEMINAR SERIES

Bio Pune Seminar Series presents talks in the area of Bio Technology, Biomedical Engineering, Bioinformatics, Biomass value addition and related areas which are of interest and relevance to the bio sciences based technology and entrepreneurship community in Pune.

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BioPune Seminar # 6

on

20 years of Cancer Stem Cells: Translating achievements to drug development and evaluation

by

Sharmila Bapat,
Ph.D, F.N.A.Sc
National Centre for Cell Science

on

30 June 2014
4pm – 5pm*
Training Room, Venture Center
100 NCL Innovation Park
Dr. Homi Bhabha (Pashan) Road,
Pune – 411008

Register here:
http://biopune6.eventbrite.com

This is a free event, but registration is required

*Tea shall be served at 3.45pm at the venue.

Dr. Sharmila Bapat

Scientist 'F', National Centre for Cell Science

Abstract:

The primary characteristics of adult stem cells are maintaining prolonged quiescence, ability to self-renew and plasticity to differentiate into multiple cell types. These properties are evolutionarily conserved from fruit fly to humans. Similar to normal tissue repair in organs, the stem cell concept is inherently impregnated in the etiology of cancer. The last two decades have witnessed extensive research in the prospective identification, isolation and research in these rare cell populations in tumors called "cancer stem cells (CSCs)". These cells maintain some similarities with normal adult stem cells including those of self-renewal, differentiation and regenerative potential being established through formation of a hierarchy, gene expression through similar genetic and epigenetic mechanisms, etc. The presence of CSCs in tumors is considered as being an adverse indication for most patients since these cells can evade conventional therapy and give rise to drug-resistant recurrent disease. Thereby, CSC research was welcomed by both researchers as well as clinicians, since it was hoped to guide in better disease management and effective therapies.

Unfortunately, tumors are complex tissues consisting of a multitude of cell types and cannot be viewed in a single channel of tissue regeneration. This became one of the important limitations of CSC research and its translation. Understanding tumor progression and responses to drugs necessitates the resolution and behavioral patterns of the different cell types and their interactions with each other. Towards such an aim, we put forth and tested a set of principles that can be applied in a tumor - and marker-independent manner, to identify broad categories of cell groups using flow cytometry that are common and integral to any tumor type. These include –

1. Individual components of the regenerative (cancer stem cell) hierarchies,
2. Evolving tumor cell populations as derivatives of micro environmental and/or intrinsic genetic instability, and
3. Differential cycling tumor populations cells within a tumor.

This real-time resolution of CSCs and their cross-talk with other tumor cell populations opens up several possibilities in basic and applied research. One such outlines a convenient, incisive, analytical tool for predicting drug efficacies by profiling perturbations within discrete tumor cell subsets in response to different drugs and candidates which I will present in my talk. The same possibility can be a 'paradigm shift' in the current drug design, screening and development pipeline

About the speaker:

Dr Sharmila Bapat is currently Group Leader (Scientist "F") at NCCS, Pune. The research interest in her lab relates to ovarian cancer biology. Her group has carried out pioneering work in ovarian cancer stem cell identification and characterization, and recently over the last few years in elucidation of tumor heterogeneity. She did her doctoral studies from NCL, Pune in Biochemistry. Dr. Bapat is on the board of various committees including DBT and ICMR Task Forces, IACR Executive Committee among others. Dr. Bapat has reveived several awards including Prem Nath Wahi Award (ICMR), National Women Bioscience (DBT) and is a Fellow of the National Academy of Sciences (NASI, Allahabad). She is a Elected member of the Guha Research Council and of several international organizations including American Association of Cancer Research, International Society of Stem Cell Research, International Federation of Head & Neck Oncology, etc. She has over 25 research publication inpeer-reviewed international journals and has edited a book titled "Cancer Stem Cells" on invitation from the publishers John Wiley & Sons (Hoboken, USA). At present she has several Indian and International collaborations (USA, Finland, Japan and Australia).