OMICS Group Conferences
Accelerating Scientific Discovery

2nd International Conference and Exhibition on
Cell & Gene Therapy

October 23-25, 2013 Holiday Inn Orlando International Airport, Orlando, FL, USA

Comparative expression profiling reveals critical temporal requirement of *CKI* and *hDlg* in developing colorectal carcinomas

Jyoti Bhojwani
Indore University, India

Spatio-temporal cues defined for certain critical components in a particular developmental pathway provide a firm basis for detecting the order, hierarchy and "switching-off or on" of genes that regulate it. The various time-points at which genes are switched "on/off" determines the fate of how a cell behaves in terms of being functional or non-functional, due to disruption of that specific pathway. This piece of work reports a strong evidence, toward identifying such components (associated with *Wnt*-signaling) which indeed determine the transformation of a "blank-slate" ("cells of origin" and/or putative "cancer stem cells") or "primitive-state" epithelial cells to an intermediate adenoma/polyp (*dyspastic*), and later to a proliferative (*hyperplastic*) or cancerous (*neoplastic*) state/s. The report discusses a critical temporal requirement of *Caesin-Kinase I* (*CKI*) and *Human-Discs-large* (*hDlg*), which have been identified as "early" and "late" acting molecules respectively, in a very crucial developmental event, that basically transforms "polyps" to full-fledged "carcinomas" (epithelial cancers) in COLORECTAL(CRC) tumors. A concomitant loss of CKI protein, in cells mutant for *APC*, a tumor suppressor gene, basically initiates the process of early-late polyposis, which furthers the progression of tumorigenesis, to finally give rise to confluent malignant cancers. The disturbance of architectural properties during metastasis, owing to the loss of apico-basal polarity of cells, consequently perturbs the hDlg protein expression, since it is basically a membrane associated protein, belonging to the MAGUK (*Membrane-Associated-Guanylate-Kinase*) family. The loss of a critical cytoplasmic-component of APC protein, which most prominently disappears in cells mutant for APC, actually governs the early loss of expression of CKI during polyposis and consequently hDlg in later stages of colorectal carcinoma development. The detection of this vital parameter, served as a focal-point and the most striking diagnostic feature, for detection of effects, ie. gain/ loss of other downstream components of *Wnt*-pathway, involved during the progression of CRC disease. The results presented here, prove that apart from being associated with each other as binding-partners during *Wnt*-signaling, the loss of *CKI* and *APC*, together, is indeed responsible for triggering the normal epithelial cells of intestinal lining, to polyps followed by an awry late/confluent cancerous state, where *hDlg* expression also gets aberrant, due to subsequent loss of architectural properties in these abnormal cancer cells. Coincidentally, the chromosomes on which these genes reside have been found to be dense and rich in SNPs (hot-spots), the details of which have been recently discussed in a separate report (*Patidar & Bhojwani, 2013*)

Biography

Jyoti Bhojwani is presently a Faculty of Genetics/Bioinformatics, Principal Investigator of the M.Tech Research Programs (Bio-Informatics) and is engaged in teaching the curriculum in M.Sc Life-Sciences/Bio-Technology at University of Indore, India. She obtained her B.Sc. degree in Biological Sciences/Chemistry/Physics, M.Sc degree in Life-Sciences, and Doctoral degree (Ph.D.) at School of Life-Sciences, University of Indore. Thereafter, Dr. Jyoti Bhojwani pursued her post-doctoral ventures at Max-Planck Institute for Biophysical Chemistry (FRG), University Of California-Irvine and Univeristy of Pittsburgh (USA). Currently, Dr. Jyoti Bhojwani's projects mainly focus on translational-research and extrapolation of basic developmental mechanisms from model-systems like fruitfly (*Drosophila*) to human. Apart from this, her major thrust areas of research interest have been Cancer Biology, Stem-Cell Biology and Homeotic-Gene Regulation. She is really keen on studying in details the genetic factors, which presumably aid in understanding of mechanism by which "cancer stem cells" function in transforming a tissue from normal to neoplastic or hyperplastic states. Especially, the members of genetic pathways, which bear special relevance and convergence to both tumorigenesis and stem cell renewal/differentiation/lineage progression, are of prime interest, in her research-regimen. Her research has a motive to further facilitate the perception of stem cell potential/mechanistic in areas of regenerative medicine and anti-cancer therapy. Currently, being involved in Clinical informatics, her students are also training a Cancer model and a Stem cell model, deploying Systems Biology approach and other Gene Networking Bioinformatics tools. This novel area of research will hopefully lead to further understanding the tipping of balance from a stem cell/normal cell to a transformed cancer cell.

Besides being involved with research and teaching, Dr. Jyoti Bhojwani is also deeply inclined towards Science Journalism. Owing to her publications and useful insights in scientific field, she is now on the editorial-board of an international journal (IJUDH). Her Specialties Include: Research/ Teaching/Mentoring/Science-Journalism

jbhojwani2005@gmail.com