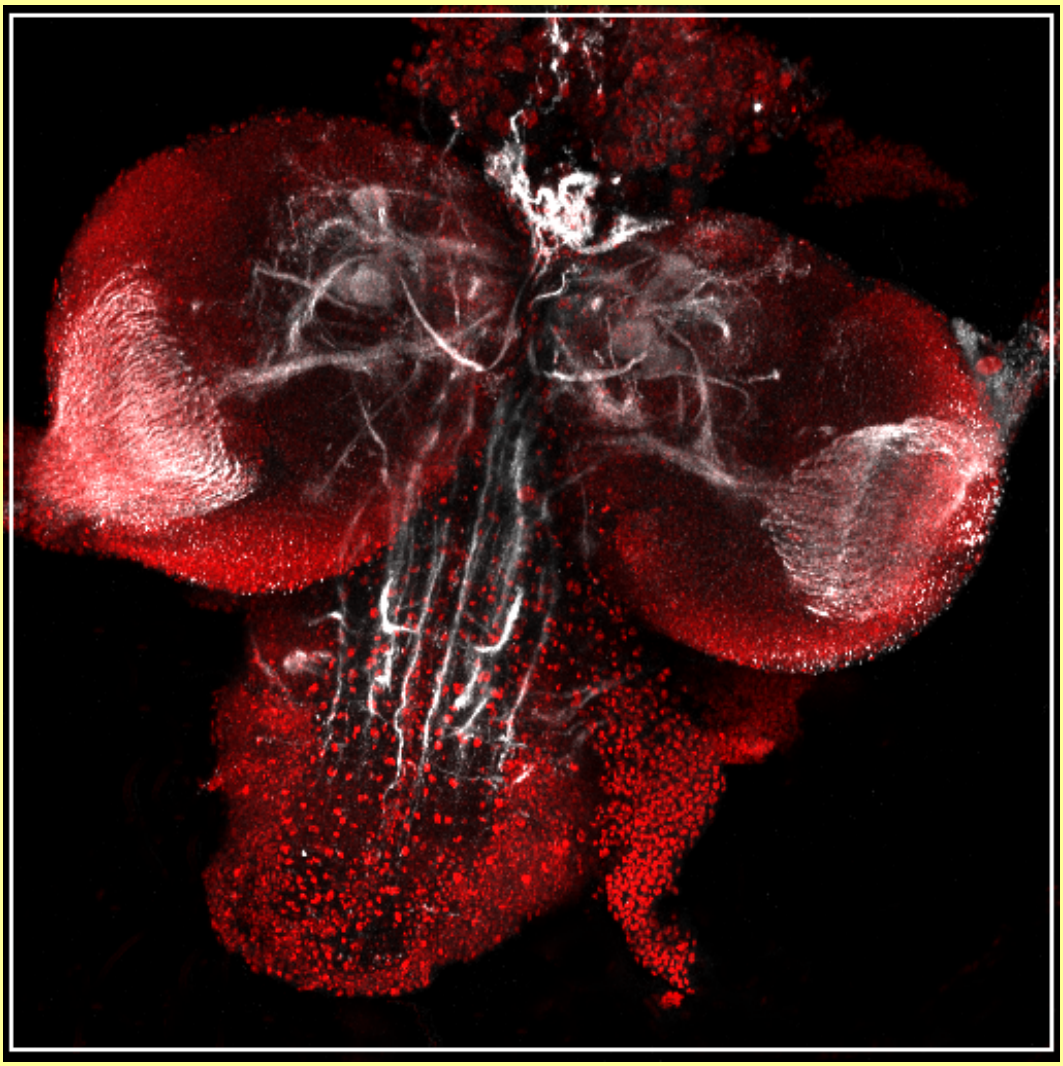
♦Volume 29 ♦Number 2 ♦ March 2010

CELL BIOLOGY

NEWSLETTER



INDIAN SOCIETY OF CELL BIOLOGY (Regd.)

Dear Members,

It gives us great pleasure in bringing out this edition of Cell Biology Newsletter which serves as a medium of communication between the Indian Cell Biologists and provides a platform for amalgamation of old and young minds.

Last Cell Biology meeting was held at DST Auditorium of University of Hyderabad, a lovely place to discuss science. A detailed report of the Conference can be seen in the following pages of this Newsletter. The abstracts of the Prof J Das Memorial Lecture by Dr A Surolia, Director, National Institute of Immunology, Hyderabad and award wining presentations by student members are also appended to give a glimpse of the research activities going on in the leading areas of cell biology.

Since last several years Indian Society of Cell Biology felt the need to compile the Cell Biology protocols to serve as a guide to the teachers teaching Cell Biology in Schools, Colleges and Universities. Next Cell Biology Newsletter will be the special issue containing the protocols.

The XXXIV All India Cell Biology Conference will be hosted by Bose Institute, Kolkata, from 4th to 6th December 2010. All the members will shortly have the first circular of the Conference from Dr Joyoti Basu (joyotobasu@gmail.com) and Dr Manikuntala Kundu (manikuntala.kundu@gmail.com), Department of Chemistry, Bose Institute, 93/1 Acharya Prafulla Chandra Road, Kolkata 700 009.

Last year the society organized a three-day hands on workshop on Cell Biology Experiments for School and College Teachers of Varanasi and adjoining areas at Banaras Hindu University. A report of the same is presented in this Newsletter. This year we again plan to organize the workshop of the same kind for teachers from different parts of the country. An announcement of the workshop is given on the inner back cover of this Newsletter.

The society has decided to conduct lectures by eminent Cell Biologists in remote areas. We plan to conduct one day lectures in a college at Puttaparthi on 26th September 2010.

Nominations for the Prof S P Ray Chaudhuri Seventy fifth Birthday Endowment Lecture for 2010 are invited in the format given in this edition. The prestigious lecture will be delivered in the XXXIV All India Cell Biology Conference at Kolkata in December 2010.

Election of the office bearers of the Society is due this year. Communication inviting nominations for the election of office bearers from the returning officer will be sent in due course of time to all the members of the society.

Proposals for organizing XXXV All India Cell Biology Conference to be held in December 2011 are invited. The proposals will be placed before the Executive Committee during its meeting in XXXIV All India Cell Biology Conference in December to finalize the venue.

Indian Society of Cell Biology has grown over the years and now has its own website (www.iscb.org.in) which includes the list of all the members, however, many addresses and E-mail IDs are incorrect. We request all the members to kindly go through the entire list and to please let us know if you can update any of them.

We look forward to meeting you all during the conference at Kolkata.

With best regards,

Yours sincerely,

Madhu G Tapadia
(Executive Secretary)

J K Roy
(Secretary)

CONTENTS

XXXIII ALL INDIA CELL BIOLOGY CONFERENCE, HYDERABAD

(December 10 to 13, 2009) : A REPORT

The annual meeting of the Indian Society of Cell Biology, the "XXXIII All India Cell Biology Conference & International workshop on Cell Cycle Regulation" was organized by School of Life Sciences, University of Hyderabad, Hyderabad, from 10^{h} to 13th of December, 2009. Dr D Siddavattam was the Covenor of the conference.

The conference was inaugurated on the afternoon of the first day by Dr S Hasnain, the Vice Chancellor of University of Hyderbad. Dr Rita Mulherkar, President, Indian Society of Cell Biology welcomed the guests on the behalf of the society. The conference included Prof J Das Memorial Lecture by Dr A Surolia, National Institute of Immunology, New Delhi; University of Hyderabad Distinguished Lecture by Dr J Hacker, Robert Koch Institute, Germany, 20 plenary talks, 15 key note lectures, 10 proffered oral presentations by students and by some of the senior members, nearly 125 poster presentations and the meeting of Executive Committee and General Body of Indian Society of Cell Biology.

FOURTH PROF J DAS MEMORIAL LECTURE

The Prof J Das Memorial Lecture, a prestigious award lecture, was delivered by the distinguished scientist, Dr A Surolia, NII, New Delhi. The session was chaired by Dr Rita Mulherkar (President of ISCB,). In his lucid talk, Dr Surolia demonstrated the interaction of Danish dementia associated peptides with the lens alpha-crystalin which gives a clue towards understanding high incidence of cataract in Danish dementia cases.

UNIVERSITY OF HYDERABAD DISTINGUISHED LECTURE

The University of Hyderabad Distinguished lecture, was delivered by the noted scientist from Robert Koch Institute, Wuerzburg, Germany, Dr J Hacker. The session was chaired by Dr S E Hasnain, Vice Chancellor, University of Hyderabad. Dr Hacker lucidly discussed on a newly identified gene product of *E coli* which affects host cell cycle and plays important role in host-pathogen relationship.

SESSION I

The first evening session of the conference on Chromosome structure and dynamics had three plenary and two keynote lectures.chaired by Dr K Subba Rao, UH and Dr Rita Mulherkar, ACTREC. Through the first lecture Dr U Surana, National University of Singapore, described a new regulatory network which prevents segregation of damaged chromosomes by preventing spindle fibre elongation and inhibiting cohesion cleavage and also focused on cells escaping the arrest if damage is not repaired. Dr S Grewal NIH, Bethesda, highlighted an emerging theme that transcription and non-coding RNAs provide initial scaffold for formation of heterochromatin which serves as a recruiting platform for diverse factors involved in many cellular processes. Dr S Mayor, NCBS, discussed about the organization of the surface of active membrane where the GPI-anchored and Ras family of proteins are organized as nano-clusters. On the other hand through keynote addresses Dr S Galande, NCCS, described that the chromatin organizer, SATB1, interacts with the components of Wnt signaling pathway and regulates various gene activity after getting acetylated. Dr T Kundu of JNCASR discussed about the role of nucleoplasmin NPM1 in oral cancer manifestation.

SESSION II

The morning session of the second day was on Protein Trafficking and Cell Cycle Regulation, chaired by Dr P S Shastry, Hyderabad and Dr R Sharma, IISc, had four plenary, two keynote lectures and two presentations by student members. Through plenary talk Dr Jayashree Pain, University of Medicine and Dentistry of New Jersy, demonstrated a functional link between

nucleotide homeostasis and iron metabolism. Dr A Dancis of University of Pennsylvania discussed on the studies which has implication for the linked processes of extramitochondrial Fe-S cluster synthesis and mitochondrial intermenbrane space disulphide formation. Dr Anuradha Lohia, Bose Institute, demonstrated erratic cell division so that each daughter cell contains one, more or no nucleus but this does not affect cell survival and yet preserve it genetic composition. Dr S Bhattacharya, Visva-Bharati talked on insulin resistance in skeletal muscle cells orchestered by lipid induced molecule pPKC€-F-actin complex and C901, a purified product from plant opposes this inhibitory effect. Through keynote address Dr S Mahalingam, IIT-Chennai talked on a Ras effector, RASSF5, known to be involved in growth suppression. The invited taks were followed by two students' presentations. Ms Kanika Bajaj,University of California, Berkeley lucidly presented the trafficking of Type I Procollagen as giant cargo from endoplasmic reticulum. Imperfect folding of this protein causes the disorder Osteogenesis imperfecta. On the other hand Mr S Parthasarathy, UH, described the role of Tat specific signal peptidase in membrane targeting of the organophosphorus hydrolase interactome.

SESSION III

The pre-lunch session of the second day was on Stem Cell Biology, chaired by Dr C M Habibullah, Deccan College of Medical Sciences & Allied Hospitals. This session included three keynote and one plenary lectures. Regulation of cell division cycle is well understood, however quiescence is poorly understood. Dr Jyotsna Dhawan, Institute for Stem Cell Biology and Regenerative Medicine, lucidly discussed active regulation of quiescence of the myoblasts and its returning to active proliferation if DNA is damaged to repair the damage. Only a small sub-population (cancer stem cells) within cancer has the potentiality to initiate new tumous, while the bulk of cancer cells are non-tumorigenic and identification of these cells may help in cancer therapy. Dr Annapoorni Rangarajan, IISc, discussed about generation of a breast cancer model system and understanding the self renewal mechanism that operate in cancer stem cells. In another lucid talk Dr Geeta K Vemuganti, L V Prasad Eye Institute, showed a simple, cost effective method of culturing corneal epithelium from limbal tissue and its application to cure patients with severe unilateral and bilateral Limbal Stem Cell Deficiency. She also highlighted the use of other stem cells in such therapy. Through a plenary talk Dr A Sachinidis, Universiy of Koeln, discussed generation of a new embryonic stem cell-derived model of smooth muscle cells towards understanding the function and physiological processes involved in smooth muscle cell development.

SESSION IV

The post lunch session of the second day on Systems approach to Biology, had two plenary and three keynote lectures chaired by Dr J Gowrishankar, CDFD. Dr A Ray, Kech Graduate Institute, California, discussed about a highly interconnected network of nearly 450 genes in yeast which affect cell cycle control/RNA processing. Dr S Das, Thomas Jefferson University & Hospitals, Philadelphia, described the molecular mechanism of mitochondrial motility with the help of Kinesin, Milton and Miro proteins. On the other hand through keynote address, Dr P Dhar, Riken Yokohama Institute, gave an interesting presentation of making sense from junk DNA and reported structural and phenotypic correlations from the synthesized proteins of so-called junk DNA. Dr U Tatu, IISc, showed that malarial parasite coded heat shock protein, PfHsp90 can be a potential drug target against malaria. Using cell biological, bioinformatics and proteomic analysis methods it was shown that parasite chaparones are the best suitable molecules for drug targeting. Dr S H Chalsani, Salk Institute for Biological Studies, San Diego, discussed the dissection of a neural circuit regulating food seeking behaviour in *Caenorhabditis elegans*.

SESSION V : CELLULAR RESPONSE TO HUMAN DISEASES

The morning session of the third day was on the theme, Cellular response to human diseases chaired by J K Roy, BHU and Dr U Surana, NUH, Singapore. The session included four plenary, one keynote lectures and three short talks. p21-activated kinase-1 (PAK) is one of the main

cytoskeletal kinases. Dr Rakesh Sharma, George Washington University, demonstrated the involvement of PAK in human cancers and PAK inhibitors as potential drug in cancer therapies. Dr V V S M Murthy, University of Texas Health Science Centre at Tyler, showed that lysinylated phosphatidyl glycerol – a constituent of membrane of *M tuberculosis*, is critical for maintaining optimal membrane potential for its proliferation in host. Dr K Somasundaram, IISc, showed that PI3 kinase pathway acting via Akt and mTOR in human cancers and blocking this pathway inhibits p53 function. Thus in order to keep p53 (repair pathway) ON, a combinatorial therapy having PI3 kinase pathway inhibitor and other chemotherapeutic drug is effective. Dr Joyoti Basu, Bose Institue showed Mycobacterial mediated macrophage apoptosis and release of TNF involving activation of p38 MAP Kinase and tyrosine kinase to trigger deregulation of one of the apoptotic molecule. On the other hand through key note lecture Dr Naresh Babu of Hyderabad University demonstrated that Stat 3 phosphorylation by JAK protein tyrosine kinase is essential for normal function of electron transport chain in motochondria. Through the short shtudent's talk Sravanth H Kumar, IISc, beautifully narrated that SV40 small T-antigen activates AMP-activated protein kinase and triggers autophagy to protect cancer cells from nutrient deprivation. Funds and opportunities become an integral part of research, especially for young scientists. Dr Megha S Sharma, Welcome Trust-DBT India Alliance talked about new funding opportunities for biomedical researchers.

SESSION VI : CELL-CELL COMMUNICATION

The evening session of the third day had one plenary, four keynote lectures and two student presentations. The session was chaired by Dr Ch Mohan Rao, CCMB and Dr Rakesh Kumar, George Washington University, USA. Formation of seeds in plant avoiding nomal process of meiosis and fertilization is called apomixis. Dr I Siddiqui, CCMB, discussed in his plenary talk about the genes involved in apomixes and its potential in food crops. On the other hand through an exciting keynote lecture Dr U Nath, IISc, demonstrated control of cell proliferation and cell expansion in generating organ shape in plants. Dr B C Tripathy, JNU, discussed about the components of protein import apparatus in chloroplasts. TB is a chronic inflammatory disease caused by *Mycobacterium tuberculosis.* Dr Nasreen Z Ehtesham, NII, discussed about the evaluation of several TB antigens as potential immunogenic marker for TB diagnosis and for its potentiality in therapy, while Dr S K Dhar, Special Centre for Molecular Medicine, illustrated initiation of DNA replication and cell cycle regulation in in malarial parasite. Through short talks by students, S Kallakuri, German Cancer Research Centre, Heidelberg, demonstrated that Importin-α2, Importin-ß and Kelch regulate microtubule dynamics during oogenesis and early embryogenesis, while P K Bhaskar, BHU, discussed about dlin-52 expression in *Drosophila* eye and its targeted knock-out resulting in rough eye phenotype.

SESSION VII : MOLECULAR INFECTION BIOLOGY

The morning session of the fourth day had four plenary lectures and four short students' talks. The session was chaired by Dr Reinhard Kurth, Robert Koch Institute Germany and Dr K Muniyappa, IISc. In the plenary talk Dr Reinhard Kurth brought forward an interesting study on the human endogenous retroviruses-K13 seeking answer to the question why retroviral ORFs are maintained over millions of years and what are beneficial and detrimental effects they have on the host? Dr S E Hasnain, Hyderabad University, focused on host parasite interactions aimed at crippling the host immune response by the parasite taking example of *M tuberculosis*. Dr K Muniyappa, IISc, lucidly discussed homologous recombination mechanism in mycobacterium, which may have an implication on TB vaccination and use of inhibitors for therapeutic intervention of the disease, while Dr V Nagraja, IISc, illustrated the exploitation of the differences in the properties of DNA gyrases as well as topoisomerase I of mycobacteria to design mycobacterial gyrase/topoisomerase I specific inhibitors. Through short students' talks P Murawala, NCCS, showed that Adenomatous polyposis coli protein interacts with Nup358 (a microtubule binding nucloporin) to recruit it to the plus ends of microtubule and helps in polarized cell migration. P Nagesh, Hyderabad University, described the role of SUMOylation in yeast heterochromatin establishment. S Srivastava, CCMB,

demonstrated the effect of metabolic cholesterol depletion on the function of human serotonin$_{1A}$ receptor. While Mamta Jain, JNCASR, demonstrated that Rudhira is an important regulator of cytoskeletal organization and affects cell migration.

POSTER SESSIONS :

A total of nearly 125 posters were presented on the diverse areas of Cell Biology during the poster sessions on second and third day of the conference. A large number of posters were from student members of the society. Most of the posters, especially the students' posters, were of high quality. Since these sessions gave an opportunity to all the interested participants to search the posters of their interest and to discuss the work at length, good interactions between the presenting author and the participants were seen. As large number posters were presented, the highlights of them are not being presented here.

AWARDS TO STUDENT MEMBERS

On the whole the deliberations through platform and poster were stimulating and highly educating. Out of nine oral presentations by student members, the paper entitled "SV40 small T-antigen activates AMPK and triggers autophagy to protect cancer cells from nutrient deprivation" by Mr Sravant Hindupur Kumar, Indian Institute of Science, Bangalore, was selected for Prof V C Shah Award.

Out of nearly 110 posters presented by student members, the poster entitled "Identification and isolation of tapetum specific promotem cotton (*G hirsutum*)" by Mr Paritosh Kumar, Delhi University South Campus, New Delhi, was adjudged Prof V C Shah Award; the poster entitled "Ecdysone regulates development and fluid secretion of Malpighian tubules of *Drosophila melanogaster*" by Mr Naveen Kumar Gautam, Banaras Hindu University, Varanasi, was given Prof B R Seshachar Memorial Award; the poster entitled "Role of non-visual β-arrestin as a node of cross-talk between Notch and other signaling pathways" by Ms Nalani Sachan, Banaras Hindu University, Varanasi, received Prof A S Mukherjee Memorial Award; the poster entitled "Role of laforin, a protein phosphatase defective in Lafora disease, in glucose transport and metabolism" by Mr Pankaj Kumar Singh, Indian Institute of Technology, Kanpur; while the paper entitled "Cytoskeletal remodeling by C3G to induce nuerite like extensions in invasive breast carcinoma cells" by Mr Kunal Dayma, Centre for Cellular and Molecualr Biology, Hyderabad, received the Conference Award.

Report prepared by
J K Roy
Cytogenetics Laboratory, Department of Zoology
Banaras Hindu University, Varanasi 221 005

FROM TREASURER'S DESK

All ordinary and student members of the society are requested to renew their membership, if it has not already been done. Demand drafts may be drawn in favour of "Indian Society of Cell Biology" payable at `Varanasi' and may be sent to Dr A Mukherjee, Treasurer ISCB, Department of Molecular & Human Genetics, Banaras Hindu University, Varanasi 221 005.

WORKSHOP ON
CELL BIOLOGY EXPERIMENTS FOR SCHOOL AND COLLEGE TEACHERS
(October 2 to 4, 2009) : A REPORT

The three days hands-on workshop on Cell Biology Experiments for School and College Teachers was organized under the auspices of Indian Society of Cell Biology in Cytogenetics Laboratory, Department of Zoology, Banaras Hindu University, Varanasi from 2nd to 4th October, 2009. Following the announcement, the Principals and several teachers of local schools and colleges responded and sent applications. Twelve of them were selected to participate in the workshop. The workshop included one lecture of 1.5 hours daily followed by the experiments on Cell Biology which can be easily done in class rooms and also some of the experiments to give a flavour of modern cell biology.

Day 1

The workshop began with the lecture of Prof S C Lakhotia, BHU on `Cell Biology – bridging molecular and organismic biology'. Through his lucid talk he introduced the present day Cell Biology before the teachers and how it developed over the years with the advent of newer technologies. He also emphasized how to make the subject interesting to the beginners. After the lecture, in the pre-lunch session the following experiments were conducted : Staining and observation of cheek epithelial cells, staining and observing Mitochondria in the cheek epithelial cells and differential staining for DNA and RNA in the same cell type. In the post-lunch session the teachers learned quick isolation of DNA from rat liver cells, polytene chromosome preparation from *Drosophila* larvae and carrying out polymerase chain reaction.

Day 2

The second day started with an interesting lecture on `Importance of model organisms in the study of cell biology' by Dr Madhu G Tapadia, BHU. She introduced the organisms like *Drosophila*, frog, chick and mouse which are used as model organisms. The experiments conducted in the pre-lunch session were : study of different stages of mitosis in onion root tip cells, observation of bacterial cells and their plating technique. In the post lunch session the teachers learned different stages of meiosis from grasshopper testis cells, identified different cell types in their blood and did agarose gel electrophoresis for DNA prepared by them on the previous day.

Day 3

The last day had a very informative lecture on `Genes and diseases' by Prof R Raman, BHU. He narrated about those genes which when mutated cause diseases. He also emphasized on the tests available for the diagnosis, their treatments and prevention. In the pre-lunch practical session the participants observed bacterial plates prepared by them and also observed various mutants of *Drosophila*. In the post lunch session they were given an exposure on Confocal Microscopy and then they had a general discussion with the teachers and students of the laboratory. The workshop ended with the note from the hosts that the participants are always welcome to the Cytogenetics Laboratory, Zoology, BHU, in case any of them need any help in training or conducting experiments in their schools or colleges. Encouraging enthusiasm was seen in the participants.

Report prepared by
J K Roy
Cytogenetics Laboratory, Department of Zoology
Banaras Hindu University, Varanasi 221 005

Abstract : Prof J Das Memorial Lecture

The link between Dementia and Cataract

With the rise in the average age of population, neurodegenerative diseases are becoming increasingly common. Many of these perplexing disorders are known to arise from the conformational instability resulting in misfolding of an underlying protein.

Two familial amyloidoses, viz familial British and Danish dementias (FBD and FDD), are the two neurodegenerative disorders which are linked to different genetic defects in the same gene, BRI. The amyloid precursor proteins in the British family (ABriPP) and in the Danish family (ADanPP) have the same length of 277 amino acids, have a very similar sequence and share identical N-terminal amino acid sequence (the first 22 residues), which suggests that these molecules are generated by the same proteolytic mechanism.

FDD, also known as heredo-oto ophthalmo-encephlopathy (HOOE) is a dominantly inherited syndrome. It is clinically characterized by a gradual loss of vision, deafness, progressive ataxia and dementia. Cataract is the earliest manifestation of this disease, starting at the age of 20 followed by hearing impairment developing around the age of 40. Cerebellar ataxia then follows leading to symptoms of paranoid psychosis and dementia. Alzheimer's and Down syndrome patients also exhibit cataract fairly early in their lives.

Crystallins are the major structural proteins in the lens accounting for up to 90% of total soluble protein. There are three distinct families of crystallins: α-, β- and γ-crystallins, whose structure, stability and short-range interactions are known to contribute to the lens transparency. Up to 50% of the total protein in human lens is contributed by α-Crystallin. αA and αB, which occur in a stoichiometry of 3:1, are known for their chaperone activity. It is widely acknowledged that eye lens proteins undergo various posttranslational modifications, most of which lead to aggregation and this process is further accelerated due to various physiological, environmental and genetic factors predisposing lens to cataract formation. Thus, α-crystallins are instrumental in maintaining transparency of the lens with their chaperone-like activity.

We have probed the interaction of the Danish dementia and some other dementia associated peptides with the lens α-crystallin *in vitro* and *ex vivo*. Our studies demonstrate that ADan reduced peptide (redADan) has both exquisite specificity and ability among several amyloidogenic peptides to compromise the chaperonic function of α-crystallin as well disposing lens in organ culture to cataractogenesis all of which together help explain the high incidence of the occurrence of cataract in Danish dementia.

Avadhesha Surolia
National Institute of Immunology
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New Delhi 110 067

Abstract : Prof V C Shah Award wining Best Platform Presentation

SV40 small T-antigen activates AMPk and triggers autophagy to protect cancer cells from nutrient deprivation

As tumors grow larger, they often experience an insufficient supply of oxygen and nutrients. Hence, cancer cells must develop mechanisms to overcome these stresses. Using an *in vitro* transformation model where the presence of the simian virus 40 (SV40) small T (ST) antigen has been shown to be critical for tumorigenic transformation, we investigated whether the ST antigen has a role to play in regulating the energy homeostasis of cancer cells. We find that cells expressing the SV40ST antigen (+ST cells) are more resistant to glucose deprivation-induced cell death than cells lacking the SV40ST antigen (-ST cell). Mechanistically, we find that the ST antigen mediates this effect by activating a nutrient-sensing kinase, AMP-activated protein kinase (AMPK). The basal level of active, phosphorylated AMPK was higher in +ST cells than in –ST cells, and these levels increased further n response to glucose deprivation. We further show that AMPK mediates its effects, at least in part, by inhibitng mTOR (mammalian target of rapamycin), thereby shutting down protein translation. Finally, we show that +ST cells exhibit a higher percentage of autophagy that –ST cells upon glucose deprivation. Replenishing the supply of glucose to +ST cells that had been starved for 24 h resulted in the downregulation of autophagy, followed by the restoration of cell proliferation, while prolonged autophagy resulted in massive cell death. Thus, we demonstrate a noval role for SV40 ST antigen in cancer, where it functions to maintain energy demeostasis during glucose deprivation by activating AMPK, inhibition mTOR, and inducing autophagy as an alternate energy source.

Sravanth Hindupur Kumar
Department of Molecular Reproduction, Development & Genetics
Indian Institute of Science
Bangalore 560 012

Abstract : Prof V C Shah Award wining best Poster

Identification and isolation of tapetum specific promoters from cotton (*G hirsutum*)

Tapetam specific promoters are used in barnase-barstar based transgenic technology to develop hybrid seeds. Our laboratory has developed this technology for hybrid seed production in Indian oil seed mustard (*Brassica juncea*)[1-4]and currently extending to cotton. The first step in this is to isolate tapetum specific promoters form cotton which are not reported till date. We initiated this work firstly by establishing a correlation between the sizes of the cotton bud to that of the stage in development of the tapetum. We the identified anther specific transcripts based on the comparison of the transcriptone profile of buds at different stages of tapetal cell development (bud size of 5mm, 7mm and 8mm) in antherts, to that of buds wherein anthers have been removed (rest of buds), leaf and seedling. Transcriptone profiling was carried out by microarray analysis using Affymetrix GeneChip® Cotton Genome Array, which can identify 21,854 transcripts from cotton. Three biological replicates were used in each case. Based on the analysis of the hybridization, we identified a set of 117 transcripts which were differentially expressed in the anthers as compared to other tissues. On validation of a subset of these transcripts by semi-quantitative RT-PCR, we identified three transcripts (called 1, 2 and 3) which were found to be anther specific. For transcript 1, based on the available sequences of the ESTs we isolated the partial genome sequence. On sequence comparison , we observed two copies of the gene, one copy each from the diploid genome of G. *herbaceum* and G. *raimomdii* constituting the tetraploid genome G. *hirsutum* . Procmoters for both the genes have been isolated and can be used to drive the expression of the barnase gene. For the transcript2, similar analysis has been carried out and the isolated promoters can be used to drive barstar expression. Our strategy to isolate tapetum specifi promoters and the structural organization of the isolated promoters would be discussed.

Kumar Paritosh
Department of Genetics
Delhi University South Campus
New Delhi 110 021

Abstract : Prof B R Sheshachar Memorial Award wining best Poster

Ecdysone regulates development and fluid secretion of Malpighian tubules of *Drosophila melanogaster*

20-hydroxyecdysone direct insect development from embryogenesis to larva-larva molting, pupation and during oogenesis in the adult. In this paper we show that disruption of ecdsone signaling during development leads to major disruption in the organization and function of Malpighan tubules. The distinctive arrangement of two essential cell types, principal celll (PCs) and stellate cells (SCs) disappearas, and they are irregularly arranged and present in clusters. The cytoskeletal protens, actin and β-tubulin, that play an important role in the organization of Malpighian tubules are also under the regulation of ecdysone signaling. We also show that ecdysone may modulate the secretion of ions and water by regulating the NA^+/ K^+- ATPase and aquaporin, DRIP thus playing an important role in the physiology of Malpighian tubules.

Naveen Kumar Gautam
Department of Zoology
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Varanasi 221 005

Abstract : Prof A S Mukherjee Memorial Award wining best Poster

Role of non-visual β-arrestin as a node of cross-talk between Notch and other signalling pathways

Notch signaling is an evolutionarily conserved mechanism which plays a fundamental role in metazoan cell fate determination. Signaling activity of the notch receptor is controlled at multiple levels. Earlier we uncovered a Notch signal controlling mechanism that depends on the ability of the non-visual β-arrestin, Kurtz (Krz), to influence the degradation and consequently the function of the Notch receptor. We identified Krz as a binding partner of a known Notch pathway modulator, Deltex(Dx), and demonstrated the existence of a trimetric Notch-Dx-Krz protein complex. This complex mediates the degradation of the Notch receptor through an ubiquitination-dependent pathway. Loss of k*rz* function results in elevated levels of the Notch protein and an upregulation of downstream effectors of Notch signaling in a context-dependent manner. Our results establish that upregulation of Notch signaling activity in *krz* mutant cells is dependent on the levels of the Notch ligand, Delta. To establish the spectrum of receptor activities that require Krz as a signaling adaptor, the activity of several signaling pathways in *krz* mutant somatic clones in drosophila larval imaginal discs is being studied. Functional characterization of a few novel interacting partners involved in Notch signaling is also in progress.

Nalani Sachan
Department of Molecular & Human Genetics
Banaras Hindu University
Varanasi 221 005

Abstract : Dr Mansi Ram Memorial Award wining best Poster

Role of laforin, a protein phosphatase defective in Lafora disease, in glucose transport and metabolism

Glucose homeostasis is vital for normal cellular functions and therefore disturbances in it uptake or metabolism affect several cellular processes that are dependent on glucose. Indeed abnormalities in glucose metabolism underlie the pathogenesis of various disorders but the molecular basis of these impairments is poorly understood. Intriguingly, growing evidences suggest that defects in the glucose utilization as the primary cayse of the neuronal death in a few neurodegenerative disorders. Lafora disease (LD) is one such disorder wherein the affected neurons are loaded abnormal forms of glycogen inclusions, known as Lafora bodies , suggesting that defects in glycogen metabolic pathway might underlie the neuropathology in LD as well. LD is caused by mutations in the protein phasphatase laforin or the malin E3 ubiquitin ligase. Towards understanding the role of these protein s in glycogen metabolic pathway, we first explored the possibility whether the laforin and malin function as glucose sensing proteins or not. We found that the changes in the cellular levels of glucose alter the subcellular localization and stability of laforin, and that these two properties are mediated by glycosylation of laforin. We further show that laforin and malin, as a functional complex, regulate the cellular glucose uptake. Thus, loss of malin or laforin mght results in the impairment in neuronal processes that are regulated by intracellular glucose level. In the presentation, we would provide fyrther evidences to suggest that one of such critical processes could be glycosylation – a glucose dependent post-translational modification of proteins, and discuss its implications in the pathophysiology of LD.

Pankaj Kumar Singh
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Indian Institute of Technology
Kanpur 208 016

Abstract : Conference Award winning best Poster

Cytoskeletal remodelling by C3G to induce neurite like extensions in invasive breast carcinoma cells

Cytoskeletal remodeling is responsible for cell plasticity and facilitates differentiation, motility and adherence related functions. The signaling components responsible for this phenomenon are still poorly understood. C3G (Rap GEF1) a GTP exchange factor for Ras family of small GTPases has been implicated n cell migration, adhesion, vascular maturation and neuronal differentiation. We have earlier shown that C3G regulates cytoskeletal reorganization to induce filopodia in epithelial cells and neurite growth in neuroblastoma cells (ECR 2007; 313(11):2476-92, JNC 2008;107(5):1424-35). Here we show that C3Gover expression includes neurite like expressions (NLE) in MDA MB 231 breast carcinoma cells which have adopted mesenchylamal characteristics. These phenotype changes are not seen in MCF-7 cells, which are non-metastatic breast cancer cells. These processes were often branch and rich in f-actin and acetylated tubulin. NLE formation was dependent on integrity of actin and microtubule elements. This property was dependent on catalytic and protein interaction domains of C3G. Process formation was independent of MAPK pathway but dependent on GSK3β activity. C3G over expression altered β-catenin protein levels and AKT activity, molecules associated with regulation of morphological changes during neurite extension. Hence, our results suggest that C3G overexpression can induce phenotype characteristics of neuronal cells in MDA MB 231 cells and Wnt signaling pathway is involved in this phenomenon.

Kunal Dayma
Centre for Cellular & Molecular Biologyndu University
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RabGTPases: The new flavour in trafficking

Divya Singh
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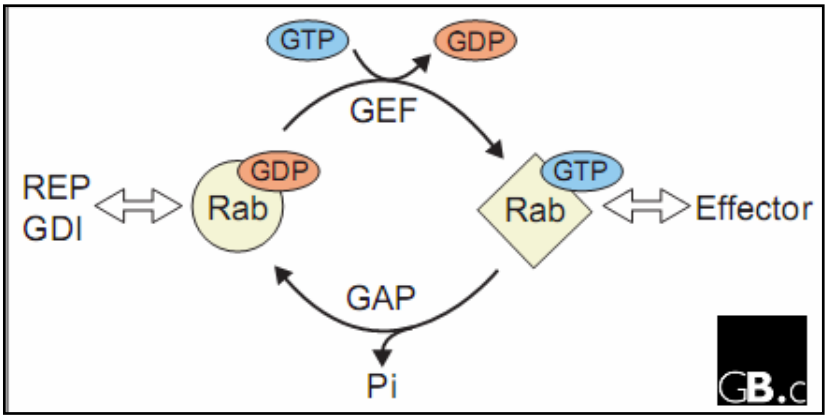
The compartmentalisation of eukaryotic cell requires a complex pool of lipids and proteins to be continuously transported between different membrane bound compartment. Constant communication between these compartments is maintained by means of vesicles that bud of from the donor compartment and fuse with the acceptor compartment resulting in mixing of the vesicular content with that of the acceptor compartment. Rab GTPases have recently emerged as the master regulators of the mechanism of vesicular budding, transport, tethering and fusion.

Rab GTPases constitute the largest family of small GTPases, which function as molecular switches that alternate between the 'active' GTP bound form and an 'inactive' GDP bound form. In humans sixty different members of the Rab family are localized to distinct membrane bound compartments [1, 2], eleven in *Saccharomyces cerevisiae* [3], twenty-nine in *Caenorhabditis elegans* [4] and twenty- six in *Drosophila melanogaster* [5].

The Rab cycle

The RabGTPases cycle between GDP-bound inactive and GTP-bound active forms between cytosol and membranes. Shortly after synthesis, newly synthesized Rab Proteins associate with the Rab escort protein (REP) in the cytosol which serves to deliver Rab-GDP to geranylgeranyltransferase type II [6]. Upon prenylation, geranylgeranyl groups make the Rab protein hydrophobic and are essential for reversible membrane association [7]. The Rab-GDP-REP complex is targeted to a membrane receptor on the donor organelle or transport vesicle and REP are displaced by a membrane bound displacement protein. Subsequently, Rab-GDP is activated to Rab-GTP by a Guanine nucleotide exchange factor (GEF) which prevents association with REP and GDP dissociation inhibitor (GDI). The transport vesicle buds off the donor compartment and is transported to the target organelle. Docking of the transport vesicle to the target site requires Rab-GTP and recruited effector proteins that stabilize this interaction. Catalyzed GTP hydrolysis by a GTPase activating protein (GAP) converts active Rab-GTP into inactive Rab-GDP that is subsequently extracted from the membrane by a GDI. GDI serves to maintain Rab-GDP soluble in the cytoplasm and delivers it for the next cycle to the donor organelle [8].



Subcellular localization and functions of Rabs:

The subcellular localization [9] and functions of Rab proteins are presented below in a tabular form :

Rab	Localization	Function
Rab 1	ER exit sites and the pre-Golgi Intermediate Compartment(IC)	ER-Golgi trafficking
Rab 2	Golgi Intermediate compartment	ER-Golgi trafficking
Rab 3	Synaptic vesicle	Mediate various types of exocytic events
Rab4	Early recycling endosome	Mediates fast endocytic recycling directly from endosomes
Rab5	Early endosomes, phagosomes, caveosomes and the plasma membrane	Mediates endocytosis and endosome fusion of clathrin-coated vesicles (CCVs), macropinocytosis (with Rab34) and maturation of early phagosomes (with Rab14 and RAB22)
Rab 6	Golgi body	Mediate intra-Golgi trafficking.
Rab 7	Late endosome-associated	Mediates maturation of late endosomes and phagosomes
Rab 8	Trans golgi network	Mediates constitutive biosynthetic trafficking from the *trans*-Golgi network (TGN) to the plasma membrane with Rab10 and Rab14
Rab 11	Recycling endosomes	Mediate slow endocytic recycling along with Rab35
Rab 13	Tight junctions	Regulates the assembly of tight junctions between epithelial cells.
Rab15	Early endosomes	Trafficking from early endosomes to recycling endosomes and in the trafficking from apical recycling endosomes to the basolateral plasma membrane.
Rab17	Recycling endosome	Control trafficking along with Rab25through the apical recycling endosomes to the apical plasma membrane
Rab21	Early endosomes	Mediates integrin endocytosis
Rab22	Phagosomes	mediates trafficking between the TGN and early endosomes
Rab26,Rab27 and Rab37	Early endosome and melanosome	Mediate various types of regulated exocytic events

Rab32 and Rab38	Mitochondrial membrane	Involved in the biogenesis of melanosomes. Rab32 also controlling the mitochondrial fission

RabGTPases and Diseases:

A rare autosomal recessive disorder **Griscelli syndrome** that results in pigmentary dilution of the skin and the hair and a condition similar to partial albinism is associated with Rab27 and its effectors. Three different forms of GS are associated with mutations in different proteins myosin Va in GS1, Rab27a in GS2 and melanophilin in GS3 [10]. Another X-linked disorder **Choroideremia** which is a form of retinal generation characterized by degeneration of the retinal pigment epithelium and the two underlying cell layers is attributed to malfunctioning of Rab27A. The CHM gene affected in choroideremia encodes REP [11]. Rab27a, which is expressed in the retinal pigment epithelium, is poorly geranylgeranylated in choroideremia cells and thus results in degeneration of the two retinal cell layers. A form of X-linked non-specific mental retardation has been attributed to mutations in the GDI1 gene. These mutations cause a reduced GDI binding and recycling of Rab3a. Mutations in the catalytic and regulatory subunits of a RAB3 GAP cause inherited neurological diseases: **Warburg Microsyndrome** and **Martsolf syndrome**, respectively [12]. In muscle and fat cells the glucose uptake is regulated by the insulin stimulated fusion of intracellular vesicles containing glucose transporter, GLUT4, with the plasma membrane. Impairment of GLUT4 translocation which is regulated by RabGTPases and their regulators is known to result in **Type II diabetes** [13]. Malfunctions of RabGTPases have also been associated with development of cancers. Rab25 which is involved in trafficking through recycling endosomes has an increased expression in ovarian, breast and also in prostate cancers. Another member of Rab family, Rab11a, which is a tumour associated c-Fos/AP-1 target, may be associated with development of skin cancers [14].

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INDIAN INDIAN SOCIETY OF CELL BIOLOGY (Regd.)

Dear Members,

The Indian Society of Cell Biology has instituted "Prof S P Ray-Chaudhuri 75th Birthday Endowment Lecture" as a mark of its respect to Prof S P Ray-Chaudhuri and in recongnition of his immense contribution to the development of Cell Biology in India. Nominations are invited from all Life and Ordinary members of at least three years standing for Prof S P Ray-Chaudhuri 75th Birthday Endowment Lecture to be delivered at XXXIV All India Cell Biology Conference at Kolkata from 4th to 6th December 2010.

The person to be nominated need not be a member of the Society when nominated but may be requested to become a member in due course of time. The person to be nominated will ordinarily be an Indian citizen at the time of nomination/selection and should be an eminent scientist who would have made outstanding original contributions to Cell Biology or contributed substantially to growth of the subject in India. A list of previous speakers are given below :

1. Dr O Siddiqui (TIFR)
2. Dr A T Natarajan
3. Dr G Padmanaban (IISc)
4. Dr H Sarat Chandra (IISc)
5. Dr Lalji Singh (CCMB)
6. Dr K P Gopinathan (IISc)
7. Dr A N Bhaduri (IICB)
8. Dr A N Bhisey (CRI)
9. Dr S C Lakhotia (BHU)
10. Dr R Raman (BHU)
11. Dr K VijayRaghavan (NCBS)
12. Dr S K Sopory (ICGEB)

Please send nomination in the enclosed proforma so as to reach us by 14th August 2010. The bio-data of the nominee may be sent to J K Roy by E-mail (jkroy@bhu.ac.in).

With best regards,

Yours sincerely,

J K Roy
Secretary, ISCB
Department of Zoology
Banaras Hindu University
Varanasi 221 005

NOMINATION FORM FOR THE PROF S P RAY-CHAUDHURI 75th BIRTHDAY ENDOWMENT LECTURE

Name & Address of the member making the nomination:

Nomination:

I wish to nominate ..... (address ....) for the PROF S P RAY-CHAUDHURI 75th BIRTHDAY ENDOWMENT LECTURE. I have obtained consent of the nominee for the purpose. The biodata of the nominee is enclosed herewith.

Date Signature of the nominating member

MOHIT K. SAIGAL & CO.
CHARTERED ACCOUNTANTS

"SAIGAL HOUSE"
B 37/122, MAHMOORGANJ
VARANASI - 221010

INDIAN SOCIETY OF CELL BIOLOGY

BALANCE SHEET AS ON 31 MARCH,2010

LIABILITIES	AMOUNT	AMOUNT	ASSETS	AMOUNT	AMOUNT
CAPITAL FUND ACCOUNT:			INVESTMENTS		1859962.17
Opening Balance	1579677.11				
Add: Excess of Income over			CURRENT ASSETS & LOANS &		
Expenditure	124929.34	1704606.45	ADVANCES :		
LIFE MEMBERSHIP FEES:			CASH & BANK BALANCES:		
Opening Balance	223870.00		Cash in hand	2,362.50	
Add: during the year	61910.00	285780.00	SBI, Varanasi	82,515.78	
			Bank of Baroda, Pune	-	
			Bank of Baroda, Vns	45,546.00	130,424.28
TOTAL		1990386.45	TOTAL		1990386.45

For INDIAN SOCIETY OF CELL BIOLOGY

As Per Audit Report of Even Date

For MOHIT K SAIGAL & CO.
(Chartered Accountants)

MOHIT K. SAIGAL & Co. VARANASI CHARTERED ACCOUNTANTS

Mohit K. Saigal
FCA

MOHIT K. SAIGAL & CO.
CHARTERED ACCOUNTANTS

"SAIGAL HOUSE"
B 37/122, MAHMOORGANJ
VARANASI - 221010

INDIAN SOCIETY OF CELL BIOLOGY

Receipts & Payment A/c for the period 1.4.09 to 31.3.10

RECEIPTS		AMOUNT	PAYMENT		AMOUNT
To Opening Balances:			By Audit Fees		2,500.00
Cash in Hand	2068.50		By Award Exp.		5,000.00
SBI, Kolkata	36489.44		By Bank Charges		168.00
BOB, Pune	5007.00	43584.94	By Prof. J Das Memorial Lect.		33,896.00
			By Newsletter Printing		14,065.00
To Membership Fees :			By Postage & Courier		3,200.00
Student	11750.00		By xxxiii AICBC, Hedarabad		25,000.00
Life	61910.00		By Misc. Exp.		1,200.00
[illegible]tinery	2720.00	76380.00	By Web Site Exp.		2,245.00
			By Registration of a teacher in		
To Intt. On GOI		45033.34	conference		3,000.00
To Interest from IDBI		6500.00	By Investment in FDR (HDFC)		350,000.00
To Interest on SB A/c		2182.00	By Workshop Exp.		10000.00
To Interest From HDFC		93018.00			
To xxx AICBC, Delhi		50000.00			
To Sponsorship Fees		14000.00			
			By Closing Balances:		
To Investment Matured		250000.00	Cash in Hand	2,362.50	
			SBI, Varanasi	82,515.78	
			Bank of Baroda, Pune	-	
			Bank of Baroda, Vns	45,546.00	130,424.28
Total		580,698.28		Total	580,698.28

For INDIAN SOCIETY OF CELL BIOLOGY

As Per Audit Report of Even Date

For MOHIT K SAIGAL & CO.

MOHIT K. SAIGAL & Co. VARANASI CHARTERED ACCOUNTANTS

Mohit K. Saigal
FCA

A three days hands-on Workshop on Cell Biology Experiments for school and College teachers

22nd to 24th October 2010

Desirous Teachers are requested to send applications on plain paper forwarded by the Principal/Head of the Department, giving a brief CV and stating what kind of Cell Biology practical are conducted in their schools/colleges and how the training will be utilized. 15 teachers will be selected and they will be provided local hospitality. No TA/DA will be given. Applications may be sent to :

Dr Madhu G Tapadia
Cytogenetics Laboratory, Department of Zoology
Banaras Hindu University, Varanasi 221 005
(madhutapadia@hotmail.com)

6th Asian Pacific Organization for Cell Biology Congress
25 – 28 February 2011 Metro Manila, Philippines

APRIL 2010 : CALL FOR ABSTRACTS

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Filipinas F. Natividad, PhD
Chair, Organizing Committee

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E-mail: ffnatividad@stluke.com.ph
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Organized by :
Philippine Society for Cell Biology
Philippine Society for Biochemistry and Molecular Biology

On behalf of :
The Asian Pacific Organization for Cell Biology