NCBS Annual Talks 2017

Futures in Biology

Index

Annual Talks 2017 – Futures in Biology

Venue: Dasheri Auditorium, Southern Laboratory Complex (SLC)

	Time	Session	Speaker
11th Jan 2017	09h00	**Proteins: Structure and dynamics** (Chair: MK Mathew)	Jayant Udgaonkar *How does the prion protein begin to misfold?*
	09h30		Vinothkumar *Protein structures by single particle electron cryo microscopy*
	10h00		Ranabir Das *Studying the role of post-translational modifications observed during the Herpes infection*
	10h30	**Coffee**	
	11h00	**Plenary** (Intro: Minhaj Sirajuddin)	Jim Spudich *Genetic cardiomyopathy: One model embodying one prime future direction of biology and medicine, and modern therapeutic approaches*
	12h00	**RNA/DNA and interactions** (Chair: Das Palakodeti)	Dimple Notani *Role of transcriptional enhancers in gene regulation*
	12h30		Shivaprasad PV *Insights into micro RNA biogenesis and their functions in plants*
	13h00	**Lunch**	
	13h30	**Posters**	
	16h00	**RNA/DNA and interactions** (Chair: Mukund Thattai)	Arati Ramesh *Structure to signaling: Understanding biological roles and mechanisms of non-coding RNAs in bacteria.*
	16h30		Anjana Badarinarayan *Regulation of DNA double-strand break repair in bacteria*
	17h00		Aswin Seshasayee *The genetic landscape of bacteria in prolonged stationary phase*
	17h30	**Coffee**	
	18h00	**Plenary** (Intro: Apurva Sarin)	Anjana Rao *TET methylcytosine oxidases, immune responses and cancer*
	19h00	**Dinner**	

12th Jan 2017	09h00	**Neuroscience** (Chair: Raghu Padinjat)	Axel Brockmann *Honey Bee Daily Foraging – Molecular Biology of Animal Behavior under Natural Conditions*
	09h30		Sumantra Chatterjee *Trumping fear: What goes up must come down*
	10h00		Gaiti Hasan *Altered neural function as a consequence of Inositol 1,4,5-trisphosphate signaling and SOCE in neurons*
	10h30	**Coffee**	
	11h00	**Plenary** (Intro: Mani Ramaswami)	Utpal Bannerjee *TBA*
	12h00	**Developmental Biology** (Chair: Mani Ramaswami)	Benny Shilo *The roles of actomyosin in secretion*
	12h30		Vatsala Thirumalai *Gap junctions instruct chemical synapse formation and dendritic growth*
	13h00		Suzanne Eaton *A temperature-dependent shift in dietary preference alters the viable temperature range of Drosophila*
	13h30	**Lunch**	
	14h00	**Posters**	
	16h00	**Health: better and worse** (Chair: Sanjeev Jain)	Patrick Hogan *Calcium signaling: a microcosm of the new cell biology*
	16h30		Varadharajan Sundaramurthy *Extensive interactions of Plasmodium with host cell organelles during liver stage malarial infections*
	17h00		Sudhir Krishna *Challenges, lessons and opportunities at the interface of research niches with the health ecosystem*
	17h30	**Coffee**	
	18h00	**Plenary** (Intro: Jitu Mayor)	Randy Schekman *Biogenesis and function of the autophagosome membrane*
	19h00	**Dinner**	

13th Jan 2017	09h00	**Ecology and Evolution** (Chair: Jayasree Ratnam)	Uma Ramakrishnan *A decade of tiger population genetics suggests conservation priorities*
	09h30		Mahesh Sankaran *Forest-grassland mosaics: history, dynamics and an uncertain future*
	10h00		Deepa Agashe *How to make a bacterium: A recipe of genes*
	10h30	**Coffee**	
	11h00	**Plenary** (Intro: Ullas Karanth)	Kamal Bawa *Biology for meeting the environmental challenges of the 21st century*
	12h00		Sanjay Sane *How flies determine the location of an odor source*
	12h30		Shannon Olsson *From Insect Dreams to Virtual Reality*
	13h00	**Lunch**	
	14h30	**Special Lecture**	Randy Schekman *Sorting of small RNAs into extracellular vesicles secreted by human cells*
	15h30	**Science, Society and NCBS** (Chair: Jitu Mayor)	VijayRaghavan *Institution building in India*
	16h00		Anna Spudich *Seeds of Culture*
	16h30	**Coffee + Exhibit**	
	17h00	**Science, Society and NCBS** (Chair: Jitu Mayor)	Indira Chowdhury *The predicaments of institutional legacy: The archives of TIFR and what they tell us about molecular biology*
	17h30		Vikram Patel *Can neuroscience address India's public health needs: from myths to reality*
	18h00		Kris Gopalakrishnan *Research and the endless frontier*
	18h30	**Panel Discussion**	Moderated by Janaki Nair
	19h30	**Banquet**	

14th Jan 2017	09h00	**Theory and Biology** (Chair: Madan Rao**)**	Upinder Singh Bhalla *A cell for every song*
	09h30		Sriram Ramaswamy *What can active matter do for biology?*
	10h00	**Plenary** (Intro: Madan Rao)	Albert Libchaber *Subsurface microbial ecosystems: a photon flux and a metabolic cascade*
	11h00	**Coffee**	
	11h30	**Posters**	
	13h00	**Lunch**	
	13h30	**Posters**	
	16h00	**Board Meeting**	Postdoc/Student Panel Discussion "Preparing for a future in biology"
	17h30	**Poster awards**	
	17h45	**Coffee**	

Wednesday, January 11, 2016

Proteins: Structure and dynamics

9.00 AM – 9.30 AM

How does the prion protein begin to misfold?

Jayant Udgaonkar
National Centre for Biological Sciences-TIFR, Bengaluru

The prion protein can spontaneously misfold to form beta-sheet rich oligomeric structures that have been correlated with the propensity to get prion disease. We have examined the structural changes that happen in the monomeric mouse prion protein upon initiation of misfolding by real time NMR (in collaboration with Ranabir Das), hydrogen exchange mass spectrometry and other methods. In my talk, I will discuss the sequence of structural changes that have to occur in the prion protein before the misfolding reaction can commence.

9.30 AM – 10.00 AM

Protein structures by single particle electron cryo microscopy

Vinothkumar
MRC-LMB, Cambridge, UK

Electrons and electron microscopy have the power to image individual atoms. In the study of inorganic materials, resolutions better than 1 Ångstrom are routinely achieved. However, this requires high electron dose and radiation damage by the electron beam, which means that structure determination of biological molecules requires averaging multiple molecular images. Together with radiation damage, electron beam-induced movement and the need for higher signal to noise are limiting factors for biological specimens and the resolutions that was achieved by CryoEM until recently has remained low.

During the last few years, there has been enormous progress in the determination of three-dimensional biological structures by CryoEM, allowing maps to be obtained with higher resolution and from fewer images than required previously. This is due principally to the introduction of a new type of direct electron detector that has 2- to 3-fold higher detective quantum efficiency (DQE) than available previously, and to the improvement of the computational algorithms for image processing. Using selected biological molecules as examples, I will describe how these advances result in high-resolution structures of proteins and computationally separate different conformational states of biological macromolecules.

10.00 AM – 10.30 AM

Studying the role of post-translational modifications observed during the Herpes infection

Ranabir Das
National Centre for Biological Sciences-TIFR, Bengaluru

Post-translational modification of proteins by chains of ubiquitin (Ub) molecules has long been known to play several functions in the inducible and reversible control of signaling pathways. Ubiquitylation is a multistep process where several classes of enzymes function in a sequential regulated manner. First, Ub is activated by an activating enzyme (E1). The activated ubiquitin is then conjugated to the conjugating enzymes (E2s). The E2s interacts with another class of proteins known as ubiquitin ligase (E3s), which function to transfer ubiquitin to the targeted protein. Repeated cycles of ubiquitylation can assemble a poly-ubiquitin chain on a substrate protein. A substrate tagged with a particular form of poly-ubiquitin chains (K48-linked chains) are destined to be degraded by the macro-molecular machinery known as the 26S proteasome. It has been reported earlier that viruses can hijack the Ubiquitin-26S proteasome pathway to suppress anti-viral responses. In this talk, we will report recent results that provide molecular mechanism of how the herpes simplex virus may modulate this pathway and other post-translational modifications for an effective infection.

RNA, DNA and their interactions

12.00 PM – 1.00 PM

Genetic cardiomyopathy: One model embodying one prime future direction of biology and medicine, and modern therapeutic approaches

James A. Spudich
Department of Biochemistry, Stanford University School of Medicine, Stanford, California

With the advent of technologies for sequencing the entire human genome in a cost-effective manner, this decade and those to come will see an exponential increase in our understanding of the genetics that underlies human diseases. And where we have a deep understanding of the biochemical and biophysical basis of the machineries and pathways involved in those genetic changes, there will be opportunities to develop modern therapeutics that specifically target the actual machinery and pathways altered by individual mutations. Prime examples of such genetic disease, are classes of hypertrophic and dilated cardiomyopathies that result from single amino-acid substitutions in one of several proteins that make up the cardiac sarcomere. Hypertrophic cardiomyopathy alone affects ~1 in 500 individuals worldwide, and it is the leading cause of sudden cardiac death in young adults. I will describe approaches we are taking to understand the molecular basis of the changes in power output that result from these mutations, which have yielded major surprises along the way. Small molecules binding to the mutant sarcomeric protein complex, now in clinical trials, should be able to mitigate the effects of hypertrophic and dilated cardiomyopathy mutations at their sources, leading to possible new therapeutic approaches for these genetic diseases.

12.00 PM – 12.30 PM

Role of transcriptional enhancers in gene regulation

Dimple Notani
National Centre for Biological Sciences-TIFR, Bengaluru

Genes are regulated by distal regulatory elements known as enhancers that exert their function on target genes by establishing looping with the promoter. ENCODE (ENCyclopedia of DNA Elements) has revealed thousands of enhancers populate mammalians genomes where they act in cell-type specific manner. Although discovered over thirty-five years ago, the molecular mechanisms underlying enhancer functions still remain poorly understood. Recently, another layer of complexity has been uncovered by the discovery that in addition to widespread transcription of long non-coding RNAs (lncRNAs) in mammalian cells, bidirectional ncRNAs are transcribed on enhancers, and are thus referred to as enhancer RNAs (eRNAs). However, it has remained unclear whether these eRNAs are functional or merely a reflection of enhancer activation. Different roles of eRNAs in gene regulation are just emerging.

Using genomic techniques that quantify the alterations in nascent transcription and three-dimensional architecture we have shown that these eRNAs are required for gene activation and establishing looping with the promoter. Further, they mostly are involved in cis-gene regulation and act in a sequence specific manner. Interestingly, high resolution chromatin structures reveal a complex pre-existing network of multiple enhancers, which mediate their effects on target genes in a hierarchical order. This phenomenon warrants a new model of enhancer function that depends on the strength of other enhancers where eRNA-mediated recruitment of protein cargo ultimately determines the strength and position of target loci in three-dimensional space of nucleus.

12.30 PM – 1.00 PM

Insights into micro RNA biogenesis and their functions in plants

P.V. Shivaprasad
National Centre for Biological Sciences-TIFR, Bengaluru

Micro (mi)RNAs are a class of small RNA molecules resulting from RNA silencing pathways across eukaryotes. These 21-22 nt RNAs associate with protein partners called Argonautes to target nucleic acids having high base-pair complementarity. miRNAs regulate various aspects of plant development, typically acting as second-generation gene switches controlling expression of primary gene switches, the transcription factors and their co-factors. Intriguingly, miRNAs are also capable of arresting invading viruses and promote resistance to bacterial and fungal infections. Our lab focuses on various aspects of small RNA biogenesis and their functions, using genetic, molecular, bioinformatic and biochemical approaches. We have identified at least two novel mechanisms that regulate miRNA biogenesis in plants. We have previously shown that miRNA:miRNA* loop length plays a prominent role in miRNA biogenesis. In addition, we find that specific GC signature along the primary miRNA transcript is required for proper processing of these precursors. I will also discuss functions of few miRNAs that regulate phenotypes such as leaf development and secondary metabolism, taking examples from less conserved miRNAs that contribute towards clade/family specific phenotypes.

4.00 PM – 4.30 PM

Structure to signaling: Understanding biological roles and mechanisms of non-coding RNAs in bacteria

Arati Ramesh
National Centre for Biological Sciences-TIFR, Bengaluru

To sense and respond to their environment is a fundamental requirement for all organisms. A major mode of signal sensing in response to changing environments is via non-coding RNAs. This is especially evident in bacteria, where ligand-sensing riboswitches and RNA-protein complexes control important processes such as growth, metabolism, adaptations and stress response. We are interested in understanding mechanisms of RNA-mediated response to environmental cues. We have discovered a class of small RNAs that specifically recruit proteins containing the RNA-binding ANTAR domain, in response to metabolic cues in many gut bacteria. Metabolite induced phospho- cascades activate the ANTAR protein for RNA recognition. Using a combination of RNA-protein biochemistry, biophysics and genetics we uncover the mechanism by which these small RNAs function. Our broad bioinformatic analyses suggest that the ANTAR protein-RNA regulatory network is widely prevalent across bacteria, and that the central tenets for gene regulation by ANTAR may be conserved in nature. These findings open new avenues to address RNA-mediated mechanisms of signaling in pathogenic bacteria such as mycobacteria and pseudomonas where the biological roles of non-coding RNAs are poorly understood. In addition, we are currently investigating the presence of these small RNAs and their possible function in eukaryotes.

4.30 PM – 5.00 PM

Regulation of DNA double-strand break repair in bacteria

Anjana Badrinarayanan
National Centre for Biological Sciences-TIFR, Bengaluru

DNA damage is a threat to genome stability and unrepaired damage, including double-strand breaks (DSBs), can lead to loss of genetic information as well as cell death. Cells in all domains of life can faithfully repair DSBs via homologous recombination. While recombination has been well-characterized biochemically, the spatial organization and regulation of this process inside cells is less understood. To study recombination in the context of living cells, I developed a system to introduce site-specific DSBs at various locations across the chromosome of the bacterium, Caulobacter, and probed DSB processing and repair using a combination time-lapse microscopy and deep-sequencing techniques. In this talk, I will first describe the spatial organization of the repair process and how it is coordinated with chromosome replication, organization and segregation. I will then discuss a novel assay to measure DSB processing in vivo and the mechanism by which this is regulated. Together, these studies provide important insight into the effect of DSBs on chromosome organization and segregation as well as the mechanisms used by cells to ensure that genomic integrity is maintained during the repair process.

5.00 PM – 5.30 PM

The genetic landscape of bacteria in prolonged stationary phase

Aswin Seshasayee
National Centre for Biological Sciences-TIFR, Bengaluru

Prolonged stationary-phase is an approximation of natural environments presenting a range of stresses and require alternative metabolic pathways for survival. This study describes the repertoire of mutations accumulating in starving E. coli populations in lysogeny broth. A wide range of mutations accumulate over the course of one month in stationary-phase. SNPs constitute 64% of all mutations. Majority of these mutations are non- synonymous and are located at conserved loci. There is an increase in genetic diversity in the evolving populations over time. Simulations of stationary-phase evolution suggest that the maximum frequency obtained by mutations in our experimental populations can not be explained by neutral drift. Moreover there is frequent genetic parallelism across populations suggesting that these mutations are under positive selection. Finally functional analysis of mutations suggests that regulatory mutations are frequent targets of selection.

6.00 PM – 7.00 PM

TET methylcytosine oxidases, immune responses and cancer

Anjana Rao

La Jolla Institute for Allergy and Immunology, La Jolla, California USA
Department of Pharmacology, University of California at San Diego, La Jolla, California, USA
Moores Cancer Center, University of California at San Diego, La Jolla, California, USA
Sanford Consortium for Regenerative Medicine, La Jolla, California, USA

Some years ago, our lab discovered that enzymes of the TET (Ten-Eleven Translocation) family were a new class of epigenetic regulators that altered the modification status of cytosine bases in DNA. The three mammalian TET enzymes – TET1, TET2 and TET3 – successively oxidize the methyl group of 5-methylcytosine (5mC) to yield 5-hydroxymethylcytosine (5hmC), 5-formylcytosine (5fC) and 5-carboxyl-cytosine (5caC). These modified cytosine bases (together termed oxidized methylcytosines, oxi-mC) facilitate DNA demethylation and are also novel epigenetic marks. DNA methylation has long been linked to develop-mental processes and to oncogenesis; similarly TET proteins, which alter DNA modification status, are implicated in numerous biological processes, including cell lineage specification, embryonic development, neuronal function, somatic cell reprogramming and cancer.

Thursday,January 12, 2017

Neuroscience

9.00 AM – 9.30 AM

Honey Bee Daily Foraging – Molecular Biology of Animal Behavior under Natural Conditions

Axel Brockmann
National Centre for Biological Sciences-TIFR, Bengaluru, India

My lab is interested in the organization and mechanisms of animal behavior. How do animals do what they do and what are the underlying neural and molecular mechanisms? Our primary experimental paradigm is daily foraging activity of honey bees. Honeybee foragers continuously fly back and forth between the nest and a food source over the whole day and they do this as long as the food source is rewarding. Most, if not all, of the famous sensory and behavioral capabilities of honey bees, e.g. color perception, time-memory, concept formation, have been demonstrated using this natural behavior. My lab started using this behavioral paradigm to study molecular mechanisms underlying animal behavior under natural conditions.

We started our exploration using two different approaches: (1.) time-training and clock gene expression, and (2.) foraging activity induced immediate early gene (IEG) expression. First results indicate that time training of honey bees leads to changes in clock gene expression and continuous foraging behavior is associated with up-regulation of different IEGs and candidate downstream genes. We think both findings open the possibility to identify molecular processes involved in specific behavioral responses during daily foraging.

9.30 AM – 10.00 AM

Trumping fear: What goes up must come down

Sumantra Chaterjee
National Centre for Biological Sciences-TIFR, Bengaluru, India

"What is mind? Doesn't matter!
What is matter? Never mind!"

10.00 AM – 10.30 AM

Altered neural function as a consequence of Inositol 1,4,5-trisphosphate signaling and SOCE in neurons

Gaiti Hasan
National Centre for Biological Sciences-TIFR, Bengaluru, India

Inositol-1,4,5 trisphosphate (IP_3) is a key cellular signaling molecule that functions downstream of specific G-protein coupled receptors and links GPCR activation to changes in intracellular Ca^{2+}. The primary cellular target of IP_3 is the endoplasmic reticulum localized ligand-gated calcium channel, the IP_3 receptor (IP_3R). We also study the consequences of store-operated calcium entry (SOCE), which is stimulated upon IP_3-mediated Ca^{2+} release from the ER-store. My group's interest is to understand the developmental and physiological consequences of IP_3 signaling and SOCE in neurons in the context of the whole organism. This requires that we perturb IP_3R function and SOCE specifically in neurons and not in other cell types. The ubiquitous expression of the IP_3R as well as STIM and Orai in multiple cell types in all multicellular organisms is a challenge for achieving this aim. Traditionally, cellular functions of ubiquitous proteins have been addressed using pharmacological methods on cells in culture. However, this approach does not allow an understanding of the physiological and/or developmental function of the targeted protein in the context of the whole organism. Sophisticated genetic tools, either available or developed by us in the fruit fly Drosophila melanogaster, have helped in understanding the consequences of cell and tissue specific abrogation of IP_3R function as well as SOCE. I will discuss our recent findings in this area.

Developmental Biology

11.00 AM – 12.00 PM

TBA

Utpal Banerjee
University of California, Los Angeles, USA

TBA

12.00 AM – 12.30 PM

The roles of actomyosin in secretion

Benny Shilo
Weizmann Institute of Science, Israel

Releasing content from large vesicles measuring several micrometers in diameter poses exceptional challenges to the secretory system. An actomyosin network commonly coats these vesicles, and is thought to provide the necessary force mediating efficient cargo release. We follow the spatial and temporal dynamics of the formation of this actomyosin coat around large vesicles and the resulting vesicle collapse, in live *Drosophila melanogaster* salivary glands. We identify the Formin family protein Diaphanous (Dia) as the main actin nucleator involved in generating this structure, and uncover Rho as an integrator of actin assembly and contractile machinery activation comprising this actomyosin network. High-resolution imaging reveals a unique cage-like organization of myosin II on the actin coat. This myosin arrangement requires branched-actin polymerization, and is critical for exerting a non-isotropic force, mediating efficient vesicle contraction. I will discuss an activity-driven instability that leads to the clustering of myosin II and branched actin. I will also present a negative-feedback loop whereby branched actin leads to inactivation of Rho, as content release of the vesicle is competed, to promote actin disassembly by blocking actin nucleation.

12.30 PM – 1.00 PM

Gap junctions instruct chemical synapse formation and dendritic growth

VatsalaThirumalai
National Centre for Biological Sciences-TIFR, Bengaluru, India

The formation of chemical synapses between neurons is a carefully orchestrated process. Molecular signals and electrical activity play critical roles in chemical synaptogenesis. During development, gap junctions between neurons (electrical synapses) are upregulated in a time window that precedes chemical synapse formation. It has been suggested that electrical synapses could instruct chemical synapse formation by enhancing correlated firing between connected pairs. I will present evidence that, indeed, electrical synapses are required for normal wiring of the cerebellum in zebrafish.

Using TALEN-mediated genome editing, we generated zebrafish lacking a key neural gap junction protein, connexin 35 (Cx35). Electrophysiological and ultrastructural analysis revealed reduced chemical synapse density in Purkinje neurons of mutant fish at 7 days post fertilization (dpf). Time lapse imaging of Purkinje neurons upto 7 dpf showed that dendritic arbors grew less between 6 and 7dpf in mutants compared to wild type. Taking these results together, we propose a model in which Cx35-mediated gap junctions regulate chemical synaptogenesis by providing growth cues for dendrites.

1.00 PM – 1.30 PM

A temperature-dependent shift in dietary preference alters the viable temperature range of *Drosophila*

Suzanne Eaton
Max Planck Institute of Molecular Cell Biology and Genetics, Germany

How cold-blooded animals adapt their behaviour and physiology to survive seasonal changes in temperature is not completely_understood - even for well-studied model organisms like *Drosophila melanogaster*. Here, we show that *Drosophila* respond to high and low temperature extremes by modifying their feeding behaviour. Above 15˚C, *Drosophila* feed and lay eggs on yeast. In contrast, below 15˚C, *Drosophila* prefer to feed and lay eggs on plant material. The different lipids present in yeast and plants improve survival at high and low temperatures, respectively. Yeast lipids promote high temperature survival by increasing systemic insulin signalling. This expands the range over which developmental rate increases with temperature, suggesting that faster nutrient utilization is required to fuel biochemical reactions driven faster by kinetic energy. In addition to speeding development, yeast lipids increase fertility. Thus, yeast provide cues that could help Drosophila to exploit a transient summer food resource. Plant lipids, on the other hand, are required to maintain membrane lipid fluidity at low temperature, and increase cold-resistance of larvae and adults. The cold-resistance and lowered insulin signalling conferred by feeding on plants allows adults to survive for many months at temperatures consistent with overwintering in temperate climates. Thus, temperature-dependent changes in feeding behaviour produce physiological changes that could promote seasonal adaption.

Health: Better or worse

4.00 PM – 4.30 PM

Calcium signaling: a microcosm of the new cell biology

Patrick Hogan
La Jolla Institute for Allergy and Immunology, California, USA

The STIM-ORAI pathway is one of the cornerstones of cellular calcium signalling. Its core mechanism is that the ER-resident regulatory protein STIM1 detects reduced ER-luminal calcium during physiological signalling and triggers a calcium current through the plasma membrane calcium channel ORAI1. We have been examining the subtle choreography of STIM and ORAI, their modulators, and their downstream effectors in living cells, focusing on three general areas. First, we have undertaken parallel studies of STIM and ORAI as isolated proteins and in their native cellular context to dissect the protein conformational changes in STIM and ORAI themselves that underlie their biological function. Second, we have applied single-molecule tracking and other subdiffraction imaging techniques in living cells to locate ORAI channels in relation to modulatory proteins and membrane lipid nanodomains and, more broadly, to examine the dynamic reorganization of the ER-plasma membrane junctions where STIM engages ORAI during signalling. Third, we have paired protein-biochemical approaches with genome-wide monitoring of mRNA transcription to investigate the role of calcium signals in the balance between T cell activation and T cell unresponsiveness. Each line of experimentation addresses questions specific to cellular calcium signalling. However, the analysis of STIM-ORAI signalling also serves as a case study in applying newly available tools that are driving advances in all areas of cell biology.

4.30 PM – 5.00 PM

Extensive interactions of Plasmodium with host cell organelles during liver stage malarial infections

Varadharajan Sundaramurthy
National Centre for Biological Sciences-TIFR, Bengaluru, India

Plasmodium parasites undergo dramatic growth during the liver stage malarial infection, multiplying from a single parasite to tens of thousands of merozoites in couple of days while remaining within a vacuole inside a single infected hepatocyte. This rapid growth necessitates extensive interactions of the parasite with the host cellular machinery. While several studies have explored these interactions using in vitro experimental systems, relatively little is known about the contours of these interactions in vivo. We have embarked on an approach to understand these interactions using unbiased ultrastructure studies and quantitative image analysis in 3d. Our results have uncovered several previously unappreciated facets of liver stage pathogenesis and reveal extensive membrane contact sites of Plasmodium vacuole membrane (PVM) with diverse host cell organelles. Most interestingly, our results reveal an unexpected link between liver stage Plasmodium development and the hepatic polarity machinery. These results will lead to better understanding of pathogenesis mechanisms during the enigmatic liver stage of malaria.

5.00 PM – 5.50 PM

Challenges, lessons and opportunities at the interface of research niches with the health ecosystem

Sudhir Krishna
National Centre for Biological Sciences-TIFR, Bengaluru, India

I will trace our journey of engaging St. John's medical college with a program in haematology genomics and the evolution of an infectious disease ecosystem. I will also update with our work on CD66/Notch high cells in human cervical cancers and focus on cellular migration.

6.00 PM – 7.00 PM

Biogenesis and function of the autophagosome membrane

Randy Schekman
University of California, Berkeley, USA

Friday, January 13, 2017

Ecology and Evolution

9.00 AM – 9.30 AM
A decade of tiger population genetics suggests conservation priorities

Uma Ramakrishnan
National Centre for Biological Sciences-TIFR, Bengaluru

Tigers are emblematic of conservation, and India harboring around 60% of the world's wild tigers. While the total numbers of tigers in India has increased due to focused conservation efforts, only 10 populations have more than 50 individuals, and the median population size is 19. The key issues that face tiger populations today are genetic isolation, and subsequent extinction due to stochastic effects. Genetic data from contemporary and extinct populations have allowed us to quantify the (a) extent and timing of a historical, human-induced demographic bottleneck and (b) loss of connectivity between populations over the last 150 years. Genome-level data from 10,000 SNPs helps identify 'tiger landscapes' and potentially 'at risk' populations that could be targets of conservation action.

The future survival of tigers is critically dependent on exchange between these fragmented populations. But is such connectivity possible given current models of economic development in India? Genetic data from 116 individuals from the Central Indian tiger landscape reveals how human footprints, agriculture and forests impact connectivity. Modeling future landscapes under different development scenarios allows us to assess how tiger connectivity, extinction and genetic variation will change. Our results suggest that connectivity between populations will decrease with high risk of local extinction in many small and/or isolated populations. Decreasing extinction will require stepping-stone populations that act as corridors between larger populations. Our results can prioritize mitigation efforts associated with development activities, providing a link between science and policy.

9.30 AM – 10.00 AM

Forest-grassland mosaics: history, dynamics and an uncertain future

Mahesh Sankaran
National Centre for Biological Sciences-TIFR, Bengaluru

Forest-grassland mosaics, characterized by abrupt boundaries between the two contrasting vegetation types, are an enigmatic and puzzling feature of many landscapes. Although traditionally believed to be artifacts of human activity, paleo-ecological evidence has revealed that many of these mosaics are in fact ancient ecosystems that predate human presence, often supporting unique biodiversity. They have been documented from diverse array of sites across the globe, ranging from the tropics to temperate regions. Their occurrence under these diverse climatic and biotic conditions has made it challenging to derive general theories for the mechanisms creating, structuring and maintaining these mosaics. Here, I discuss some of our ongoing work in one such forest-grassland mosaic, the iconic montane shola-grasslands of the Western Ghats: from their history, to the factors maintaining these mosaics, the conservation challenges they face, both currently and in the face of future climate change, and the implications of our results for a broader understanding of what structures these mosaics globally.

10.00 AM – 10.30 AM

How to make a bacterium: A recipe of genes

Deepa Agashe
National Centre for Biological Sciences-TIFR, Bengaluru

Bacteria encompass an enormous diversity of phenotypes, encoded by an equally diverse set of genomes. We aim to understand the evolutionary processes that lead to this genomic diversity, focusing on genomic GC content, codon use, tRNA genes. We test various recipes for bacterial success, answering key questions such as: which genes should be retained, and in how many copies? Which codons should be used, and how best to translate them? Our results indicate multiple, dynamic blueprints for bacterial genome evolution that emerge via both stochastic and deterministic processes.

11.00 AM – 12.00 PM

Biology for meeting the environmental challenges of the 21st century

Kamal Bawa
University of Massachusetts, Boston, and
Ashoka Trust for Research in Ecology and the Environment, Bengaluru

The major challenges for conservation biology remain: a) curtailment of biodiversity loss, b) better understanding of land use transitions, and the impact of such transitions on biodiversity c) enhancing sustainable use of biodiversity and ecosystems services, d) mitigation of climate change through green pathways, and e) highlighting the role of biodiversity in meeting sustainable development goals. For each of these areas I address major issues, approaches to address these issues, and potential new areas of inquiry. I will largely draw upon examples from the work of my group and the work of my colleagues at ATREE. I will conclude with comments on the opportunities conservation biology offers to address significant scientific issues and the interactions between society and nature.

12.00 AM – 12.30 PM

How flies determine the location of an odor source

Sanjay Sane
National Centre for Biological Sciences-TIFR, Bengaluru

Insects routinely forage in complex sensory environments. Typically, the search for a food or pheromone source begins with a whiff of odor, which triggers a flight response. Insects then track turbulent plumes of odor until they approach the vicinity of the odor source. However, pinpointing the precise location of the odor source requires the use of both visual and olfactory modalities. We have investigated the basic rules of this process in the fruit fly, Drosophila melanogaster specifically asking how these flies are able to determine the precise location of an odor source amidst a visually cluttered environment. Our experiments show that the decision of flies to land on a putative odor source is biased by the presence of other visual objects in its vicinity. Flies are more likely to land on visually distinct objects that are close to the odor source, if they are of a higher visual contrast. There are significant quantifiable alterations in their search trajectories based on the presence or absence of one or more visually-distinct objects in the vicinity of the odor source. Our experiments also indicate the possibility of olfactory "working memory" that enables them to continue their search even when the olfactory feedback is reduced or absent. Together, these results allow us to gain insight into some basic rules that the flies may use to determine where the source of odor is located.

12.30 PM – 1.00 PM

From Insect Dreams to Virtual Reality

Shannon Olsson
National Centre for Biological Sciences-TIFR, Bengaluru

One of the most important tasks for any organism is to identify objects in the world around them. All organisms must, for example, discriminate what to eat from what might eat them. Identifying complex objects in an even more complex world is a difficult task. Most insects are solitary, which means they must initially identify some objects, such as food or enemies, innately. Our group is interested in how insects identify objects across different environments, and how they can detect new introduced objects in an environment, such as invasive species. Using field assays, multivariate analysis, and physiological analyses, we have found that cosmopolitan species of hoverflies use unique combinations of visual and olfactory cues to identify flowers in tropical South India, the alpine Himalayas, or cold temperate Sweden. For the latter question, we have compared olfactory processing of host odors for different fruit-specific populations of Tephritid flies that have recently diverged in preference for various fruit within the past 300 years. Finally, we are quantitatively characterizing object identification itself using a novel chemo-visual virtual reality arena. We hope to offer a comparative approach to understand how animals parse the environment to identify objects in nature.

Special Lecture

2.30 PM – 3.30 PM

Sorting of small RNAs into extracellular vesicles secreted by human cells

Randy Schekman
University of California, Berkeley, USA

Science and Society

3.30 PM – 4.00 PM

Institution building in India

K. VijayRaghavan
National Centre for Biological Sciences-TIFR, Bengaluru

4.00 PM – 4.30 PM

Seeds of Culture

Annamma Spudich
National Centre for Biological Sciences-TIFR, Bengaluru

Natural products, medicines and spices from India were high value commodities of India Trade, the major commercial activity of the pre-modern world. Contemporary historical, political and economic documents giveglimpses of the complex knowledge systems in botany and medicine that were the underpinnings of India Trade in the beginning of the 1st Millennium. In ancient India the *"healer (bhisaj), a demon-killer, the plague-dispeller" with* knowledge of *"those herbs, the firstborn of the gods"* was a revered individual and represented all levels of Indian society.

Documents on Indian botanical medical uses found across Asia, the middle East and Greco-Roman world, attest that Indian plant medicines were available all across Asia, in the Middle East and Europe. By the Middle Ages *"India trade was the backbone of the international economy"* and "*medicinal substances and spices of India were primary commodities*." At the end of the 15th century, Spain and Portugal, at the farthest end of the European export market, decided to enter India trade directly. The search for shorter and direct sea routes to India, to acquire spices and medicines, was the driving force behind the voyages of discovery that profoundly changed the map and history of the world.

Soon after their arrival Europeans found that their medicines were inadequate for the tropics, and that Indian traditional medical systems had powerful therapies, and Indian physicians were *"very well acquainted with medicine."* So an important commodity Europeans collected in India was the rich legacy of regional botanical medical knowledge systems for their use in India, and tropical colonies in Asia and the Americas. And for the next 250 years, physicians and scholars and civil servants in the

employ of the Portuguese, Dutch and the British, documented regional medicinal, agricultural and horticultural knowledge systems of India from scholars and practitioners in India, who largely remain unidentified.

These European works on Indian medical botany and therapeutics, highlighted in the exhibition *Seeds of Culture,* are vital sources of regional folk medical knowledge of India not found in classical Indian medical texts. These works document uses of individual medicinal plants, not formulations, and refer to diseases more in contemporary medical terminology. With the critical need for new medicines, especially for chronic diseases, *"natural compounds for which innocuous long-term use in human populations has already been documented might be more tolerable and acceptable in disease prevention*…"(Commentary, Dries et al., PNAS, 2012). One challenge for biomedical institutions in India is how to integrate the sophisticated technologies of modern sciences with the age-old therapeutic knowledge unique to India, to discover their underlying chemistry, and develop medicines to treat intractable diseases.

5.00 PM – 5.30 PM

The predicaments of institutional legacy: The archives of TIFR and what they tell us about molecular biology

Indira Chowdhury
Srishti Institute of Art, Design and Technology, Bengaluru

Institutions recall their past for a purpose — a purpose that is often embedded in the present. Institutions and the people who work within them do not mechanically reproduce the past, as the sociolinguist, Charlotte Linde tells us, rather, they work the past, representing it each time in new but related ways for a particular purpose, in a particular form to create a particular desired present and future.

This presentation focuses on the history of the Tata Institute of Fundamental Research, a premier scientific institution that was founded by Homi Bhabha in 1945 and analyses the nature of Bhabha's legacy. Reflecting on the nature of the Nehruvian scientific vision as well as the nature of institutional practices that Bhabha put in place, this presentation will focus on the ways in which legacies are put in place within institutions. What elements of Bhabha's legacy defined TIFR as an institution? What enables legacies to remain alive in new institutions that the parent institution might create? Looking specifically at Molecular Biology which had a rather late start within TIFR, this presentation will analyze the detours that that this discipline took by examining archival records and oral history interviews.

5.30 PM – 6.00 PM

Can neuroscience address India's public health needs: from myths to reality

Vikram Patel
Department of Population Health, London School of Hygiene and Tropical Medicine

The government of India has recently published a national survey showing that about70 million adult Indians suffer from a mental disorder and nearly 90% of them have never received any treatment. Such massive treatment gaps are also true for many other developing countries. Despite billions of dollars invested in neuroscience, there appears to be little impact on influencing population health more generally, and the lives of those who are affected by mental disorders more specifically. This lecture will make the case that translational research is an essential component of the menu of neuroscience in India. Using examples of ongoing research, the lecture will highlight tangible opportunities for neuroscientific approaches to inform the mechanisms of how social determinants affect brain development and behaviour, enable the assessment of normal and deviant development, and influence the design of tailored interventions which can be scaled up through the public health system.

6.00 PM – 6.30 PM

Research and the endless frontier

Kris Gopalakrishnan

6.30 PM – 7.30 PM

Panel Discussion

Moderated by Janaki Nair

Saturday, January 14, 2016

Theory and Biology

9.00 AM – 9.30 AM

A cell for every song

U.S. Bhalla
National Centre for Biological Sciences-TIFR, Bengaluru

Sequences of events are ubiquitous in sensory, motor, and cognitive function.Typically, a correctly ordered sequence (such as a tune) has much greater salience than scrambled input. We employ experiments and computer models to study sequences in brain computation and memory. Using models that span the range from highly abstract 2 variable systems to complex multiscale electrical and chemical signaling, we show how chemical networks can recognize sequential synaptic input on dendrites. Specifically, successive and ordered inputs on nearby synapses over ~20 microns elicit strong responses, whereas scrambled inputs on the same synapses give weak responses. We suggest that this is an extremely powerful computational operation. We show that even in a random network such sequence recognition has combinatorial properties that potentially scale to match the combinatorics of possible sequential input representations. In other words, for every possible tune (or dance, or poem) there are many cells that can learn to recognize it.

9.30 AM – 10.00 AM

What Active Matter can do for biology

Sriram Ramaswamy
National Centre for Biological Sciences-TIFR, Bengaluru

The physics tradition of modelling collective phenomena in biology is not new. Why then the excitement about "Active Matter" as a way of looking at cells, tissue and organisms as living materials, and why should biologists care? My talk will offer some answers with examples from recent and current work as well as directions for the future.

10.00 AM – 11.00 AM

Subsurface microbial ecosystems: a photon flux and a metabolic cascade

Albert Libchaber
The Rockefeller University, New York

Mud is a porous medium containing a high density of diverse microorganisms. It is out of equilibrium as the energy from a photon flux is dissipated by a cascade of biochemical reactions, mediated by the metabolisms of the constituent organisms. Despite its complexity, microbes in nature self-organize into simple reproducible patterns. We present two experiments in which the dynamics of natural mud coming to steady state are observed and modelled. In the first, the oxygen gradient produced by cyanobacteria in an imposed light gradient is measured. In the second, a thin front of oxygen-consuming microbes forms at the penetration depth of oxygen and moves with the changing oxygen gradient.

Posters

Day 1: 11th January 2016

1. ***Understanding the role of Actomyosin machinery in the organization of Plasma membrane proteins***
Parijat Sil, Satyajit Mayor
National Centre for Biological Sciences, Bengaluru, India

3. ***Elucidating the role of Regulatory T cells in skin homeostasis***
Edries Yousaf Hajam, **Rupali Gund**, Abhik Dutta, Husain Miyajiwala, Apurva Sarin, Colin Jamora
Institute for Stem Cell Biology and Regenerative Medicine, Bengaluru, India

5. ***Hippocampal neurons control gain by precisely balanced inhibition***
Aanchal Bhatia, Sahil Moza
National Centre for Biological Sciences, Bengaluru, India

7. ***Regulation of PI(4,5)P2 cycle during Drosophila melanogaster phototransduction***
Rohit Suratekar, Raghu Padinjat, Sandeep Krishna
National Centre for Biological Sciences, Bengaluru, India

9. ***Programs for Glycan assembly***
Anjali Jaiman, Mukund Thattai
National Centre for Biological Sciences, Bengaluru, India

11. ***Role of folding intermediates in initiating misfolding and aggregation of the prion protein***
Roumita Moulick, Rama Reddy Goluguri, Jayant B. Udgaonkar
National Centre for Biological Sciences, Bengaluru, India

13. ***Understanding the unusual fluorescence change in hyperthermophilic protein Ctd-MK0293***
Hitesh Rafalia, Shachi Gosavi
National Centre for Biological Sciences, Bengaluru, India

17. ***Structural biology of sugar processing in Biology***
Sucharita Bose[1], Thanuja Gangisetty[2], Sathya Srinivisachari[1], Lavanyaa M[7], Swagatha Ghosh[3], Sai Rohit G[3], Jay Prakash Kumar[1], Nitish Sathyanarayanan[2], Vinod Nayak[1], Sai Sudha[1], Subhadra Dalwani[1], Keerthi Joshi[8], Avni Goswami[8], Deepthi Joseph[1], Debayan

Purkait[1], Arunabha Sarkar[3], Kanaga Vijayan[1], Elin Johansson[4], Elin Claesson[4], Weixiao Yuang[4], Wahlgren Parveen Goyal[4], Rachel North[5], Ren Dobson[5], Rosmarie Friemann[4], Aviv Paaz[6], Jeff Abramson[6], Ramaswamy S[1]
[1]Institute for Stem Cell Biology and Regenerative Medicine, Bengaluru, India
[2]Transdisciplinary University
[3]National Centre for Biological Sciences, Bengaluru, India
[4]University of Gothenburg
[5]University of Canterbury
[6]University of California, Los Angeles
[7]Manipal University, Manipal, Karnataka, India
[8]M.S.University of Baroda, Vadodara, India

21. ***The forgotten world of plant defense***
Rohit Sasidharan, **Shiksha Ajmera**, and Radhika Venkatesan
National Centre for Biological Sciences, Bengaluru, India

25. ***m^faking reality : A game that means the world to a fly***
Pavan Kumar Kaushik[1], Marian Renz[2], Shannon Olsson[1]
[1]National Centre for Biological Sciences, Bengaluru, India
[2]Hochschule Bremen Bremen, Bremen, Germany

29. ***Nucleophilic dermal cream-mediated deactivation of pesticides on the skin to prevent pesticide-induced toxicity***
Ketan T[1,2], **Subhashini P**[1], Sandeep C[1], Purna S*[1], Shubhangi U*[1], Sneha S*[1] and Praveen K. Vemula[#1]
*equal contribution,[#]Corresponding author
[1]Institute for Stem Cell Biology and Regenerative Medicine, Bengaluru, India
[2]Manipal University, Manipal, India

33. ***GPI-anchored protein organization and dynamics at the cell surface revealed by single molecule microscopy.***
Sangeeta Nath[1], Satyajit Mayor[2], Kenichi Suzuki[1]
[1]Institute for Stem Cell Biology and Regenerative Medicine, Bengaluru, India
[2]National Centre for Biological Sciences, Bengaluru, India

37. ***Dynamics of bacterial communities associated with developmental stages of butterflies and their impact on butterfly fitness***
Kruttika Phalnikar, Krushnamegh Kunte and Deepa Agashe
National Centre for Biological Sciences, Bengaluru, India

41. ***Role of E-protein transcription factor in neuronal function***
Mohammad Shariq, Rajit Cheramangalam, Dipannita Sarkar, Hiyaa Ghosh
National Centre for Biological Sciences, Bengaluru, India

45. ***Uncovering the role of small RNAs and their protein partners in bacterial pathogenesis***

Anjali K[1], Dolly Mehta[1,2], Arati Ramesh[1]
[1]National Centre for Biological Sciences, Bengaluru, India
[2]SASTRA University, Thanjavur, Tamil Nadu, India

47. ***Understanding phylogenetic, spatial and intraspecific variation in wood density of tree species***

Karthik Teegalapalli, Chandan Pandey, Mahesh Sankaran
National Centre for Biological Sciences, Bengaluru, India

49. ***Sequence and structural studies of gene products containing tyrosine phosphatase domain***

Teerna Bhattacharya, R. Sowdhamini
National Centre for Biological Sciences, Bengaluru, India

51. ***Gene mutations in families segregating neuropsychiatric illness***

Soham Jagtap, The ADBS Consortium
National Centre for Biological Sciences, Bengaluru, India
Institute for Stem Cell Biology and Regenerative Medicine, Bengaluru, India
National Institute for Mental Health and Neurosciences, Bengaluru, India

53. ***Genomic insights into the Indian reference exome***

Dr. Ravi More, The ADBS Consortium
National Centre for Biological Sciences, Bengaluru, India
Institute for Stem Cell Biology and Regenerative Medicine, Bengaluru, India
National Institute for Mental Health and Neurosciences, Bengaluru, India

55. ***Elucidating the role of Transmembrane helix of STIM1 from EM to PM***

Sahil Lall, M K Mathew
National Centre for Biological Sciences, Bengaluru, India

57. ***Integrating molecular approaches to understand planktonic assemblages in marine environment***

Shruti Malviya, Mukund Thattai
National Centre for Biological Sciences, Bengaluru, India

59. ***Exploring the effects of sparse restraints on protein structure prediction***

Varun Mandalaparthy, Venkat Ramana, Shachi Gosavi
National Centre for Biological Sciences, Bengaluru, India

61. ***A cluster of microRNAs regulate anthocyanin development in Vitis vinifera by targeting MYB transcription factors***

Varsha Tirumalai, Chenna Swetha, Ashwin K. Nair and P. V. Shivaprasad
National Centre for Biological Sciences, Bengaluru, India

63. ***Store Operated Calcium Entry in Human Embryonic Stem Cell Derived Neural Progenitors***

Renjitha Gopurappilly, Bipan Kumar Deb, Gaiti Hasan
National Centre for Biological Sciences, Bengaluru, India

65. ***Role of Methyltransferases in Plant Interactions***

Karan Malhotra**,** and Radhika Venkatesan
National Centre for Biological Sciences, Bengaluru, India

69. ***Membrane contact sites as signaling microdomains: Regulation of PLC signalling in trans***

Shweta Yadav[1], **Bishal Basak[1],** Rajan Thakur[1,4], Georgiev Plamen [2], Deivasigamani S[3], Girish Ratnaparkhi[3], Shirish Mishra[1], Raghu Padinjat [1,4]
[1]National Centre for Biological Sciences, Bengaluru, India
[2]Inositide Laboratory, Babraham Institute, Cambridge CB22 3AT, United Kingdom
[3]Indian Institute of Science Education and Research, Pune, India
[4]SASTRA, Thanjavur, India

73. ***A novel genetic tool for in vivo tagging of synaptic plasticity associated with memory***

Daniel B. Weatherill[1,3], Kelsey C. Martin[2], Sumantra Chattarji[3], and Michael S. Fanselow[1]
[1]Department of Psychology, University of California Los Angeles, Los Angeles, California
[2]Department of Biological Chemistry, University of California Los Angeles
[3]National Centre for Biological Sciences, Bengaluru, India

77. ***Transcriptional regulation of microglial homeostasis and function***

Vinaya Sahasrabuddhe, Athira D.P, Hiyaa Ghosh
National Centre for Biological Sciences, Bengaluru, India

81. ***Genome-wide survey and phylogeny of few insect odorant binding proteins***

Bhavika Mam, R. Sowdhamini
National Centre for Biological Sciences, Bengaluru, India

85. ***Detecting cooperatively bound transcription factors from high-throughput data***

Vishaka Datta S, Sandeep Krishna,
National Centre for Biological Sciences, Bengaluru, India

89. ***Unraveling the sequence of structural events associated with the folding of a small globular protein***
Sandhya Bhatia[1], G. Krishnamoorthy[2], Jayant B. Udgaonkar[1]
[1]National Centre for Biological Sciences, Bengaluru, India
[2]Department of Biotechnology, Anna University, Chennai, India

93. ***The impact of chromosome organisation on global gene expression and evolution of Escherichia coli***
Terence Christie[1], Reshma T V[1], Malikmohamed Yousuf[1,2,3], Awadhesh Pandit[1], Bianca Sclavi[3], Marco Cosentino Lagomarsino[2], Aswin SaiNarain Seshasayee[1]
[1]National Centre for Biological Sciences, Bengaluru, India
[2]Computational and Quantitative Biology, Sorbonne University, UPMC Univ Paris
[3]Centre National de la Recherche Scientifique, LBPA

97. ***Cerebellar network dynamics during motor adaptation***
Sriram Narayanan, Mohini Sengupta, Kshitij Dwivedi, Vatsala Thirumalai
National Centre for Biological Sciences, Bengaluru, India

101. ***Experience-Mediated Shifts in the Food Choice of a Generalist Beetle***
Vrinda Ravi Kumar, Swastika Issar and Deepa Agashe
National Centre for Biological Sciences, Bengaluru, India

105. ***From unruly agrarian landscape to production forests: A story of 'Scientific Forestry' in the shola-grassland ecosystems of the Western Ghats***
Atul Joshi, Jayashree Ratnam, Mahesh Sankaran
National Centre for Biological Sciences, Bengaluru, India

107. ***The smelly world of blackbuck leks***
Jyothi V Nair, VS Pragadheesh, Shannon Olsson*, Uma Ramakrishnan*
National Centre for Biological Sciences, Bengaluru, India
*equal contribution

109. ***Probing misfolding kinetics at the monomeric level during prion oligomerization***
Ishita Sengupta, Jayant Udgaonkar
National Centre for Biological Sciences, Bangalore

111. ***Characterization of membrane organization of DE-cadherin and its dynamic interaction with actomyosin machinery***

Rumamol C[1,2], Thomas Lecuit[3], Satyajit Mayor[1]
[1]National Centre for Biological Sciences, Bengaluru, India
[2]Manipal University, Manipal, India
[3]IBDM, Aix-Marseille Université, Campus de Luminy, Marseille, France

127. ***Mass Spectrometry Applications in Life sciences***

Kannan R, Babu P, Vikas K, **Dhananjay DS**
National Centre for Biological Sciences, Bengaluru, India

113. ***A Fishy business*: *Response of stream fish assemblages to small hydro-power induced flow alteration in the Western Ghats, Karnataka***

Shishir Rao[1, 2], Dr. Jagdish Krishnaswamy[3], Dr. R.S Bhalla[4]
[1]Post-Graduate Program in Wildlife Biology and Conservation, National Centre for Biological Sciences, Bengaluru, India
[2]Wildlife Conservation Society - India Program, Center for Wildlife Studies, Bengaluru, India
[3]Convenor and Senior Fellow, Suri Sehgal Centre for Biodiversity and Conservation, Ashoka Trust for Research in Ecology and the Environment (ATREE), Bengaluru, India
[4]Senior doctoral fellow, FERAL, Pondicherry, India

115. ***Glycomics and Glycoproteomics Facility***

RaviKrishan P. and P. Babu
Glycomics and Glycoproteomics Facility, National Centre for Biological Sciences, Bengaluru, India

117. ***Central Imaging and Flow Cytometry Facility***

Divya A, Raksha K, Jain N, Emanuel N, Kumar S, Kumar A, Mathew M, Sarin A, Mayor S and Krishnamurthy H
Central Imaging and Flow Cytometry Facility, National Centre for Biological Sciences, Bengaluru, India

119. ***High Throughput and High Content Screening***

Chandan Mithra, Shahab Uddin MS
Screening Facility, National Centre for Biological Sciences, Bengaluru, India

121. ***Fly Facility: Platform for gene editing technologies***

Deepti Trivedi
Fly Facility, National Centre for Biological Sciences, Bengaluru, India

123. ***The NCBS Animal Care and Resource Center***

Kaveri, Reena V, Sreenivasulu T, Kamlesh KV, Chethna SB, Vinod Kumar D, Latha Chukki, Aurélie Jory, Mohan GH
The NCBS Animal Care and Resource Center, National Centre for Biological Sciences, Bengaluru, India

125. ***High Field NMR Facility@NCBS***

P Purushotham Reddy
NMR Facility, National Centre for Biological Sciences, Bengaluru, India

Day 2: 12th January 2016

2. ***Labeling of mouse prion protein for single molecule fluorescence experiments***
Rama Reddy Goluguri, Jayant B.Udgaonkar
National Centre for Biological Sciences, Bengaluru, India

6. ***Primary cues patterning body axis specify vertebrate head mesoderm***
Nitya Nandkishore[1,4], Bhakti Vyas[2,4], Alok Javali[3,4], Ramkumar Sambasivan[4]
[1]SASTRA University, Thanjavur
[2]Manipal University, Manipal
[3]National Centre for Biological Sciences, Bengaluru, India
[4]Institute for Stem Cell Biology and Regenerative Medicine, Bengaluru, India

10. ***Individual Dance Activity Variation in Honeybee Foraging Groups***
Ebi Antony George, Axel Brockmann
National Centre for Biological Sciences, Bengaluru, India

14. ***A silencing suppressor protein Beta C1 from Synedrella yellow vein begomovirus is an endonuclease with atypical DNA-binding properties***
Ashwin K. Nair, Vikram Jha, Kiran SC, Ranabir Das, P. V. Shivaprasad
National Centre for Biological Sciences, Bengaluru, India

18. ***Exploring cross talks between endocytosis and phagocytosis***
Kuldeep Sachdeva, Varadharajan Sundaramurthy
National Centre for Biological Sciences, Bengaluru, India

22. ***Elucidating the functions of an autism-related gene in nervous system development***
Igor Kondrychyn, Urvashi Jha, Aalok Varma, Vatsala Thirumalai
National Centre for Biological Sciences, Bengaluru, India

26. ***FMRP affects rRNA methylation in ESCs: A novel role of FMRP in the nucleus***
Vishal Tiwari[1], Michelle D'Souza[2], Praveen Anand[2], Rakhi Pal[2], Bhuvaneish Selaraj[3], Siddharthan Chandran[3], Sumantra Chatterje[2], Ravi S Muddashetty[2]
[1]National Centre for Biological Sciences, Bengaluru, India
[2]Institute for Stem Cell Biology and Regenerative Medicine, Bengaluru, India
[3]University of Edinburg, Scotland

30. ***Studying the role of sumoylation during the human cytomegalovirus infection***

Vasvi Tripathi, Kiran S Chatterjee, Ranabir Das
National Centre for Biological Sciences, Bengaluru, India

31. ***Flies without halteres: Effects of unilateral haltere ablation on free flight in Diptera***

Vardhanam Daga, Sanjay P Sane
National Centre for Biological Sciences, Bengaluru, India

34. ***A "socialist" model of stress and emotion: the good, the bad, and the ugly***

Deepika Patel[1], Shobha Anilkumar[2], Ashutosh Shukla[3], Bauke Buwalda[1], Sumantra Chattarji[3]
[1]University of Groningen, Netherlands
[2]Manipal University, Manipal, India
[3]National Centre for Biological Sciences, Bengaluru, India

35. ***Regulation of tumor progression,metastasis and therapy resistance in cervical carcinomas***

Calvin Rodrigues[1], Aswathy Ammothumkandy[1], **Annapurna Pranatharthi**[1, 2], Leanna Rose Joy[1], Cecil Ross [2], Sweta Srivasatva [2], and Sudhir Krishna[1]
[1]National Centre for Biological Sciences, Bengaluru, India
[2]St. Johns Medical College and Hospital, Bengaluru, India

38. ***Dynamic Expression of transfer RNA-derived small RNAs define cellular states***

Daniel GR Yim[1], **Srikar Krishna[2]**, Vairavan Lakshmanan[2], Judice LY Koh, Jung Eun Park, Jit Kong Cheong, Joo Leng Low, Michelle JS Lim, Junyu IP, Jie Min Nah, Iain BH Tan, N Gopalakrishna Iyer, Huili Guo, Siu Kwan Sze, Srikala Raghavan[2], Dasaradhi Palakodeti[2], Ramanuj DasGupta[1]
[1]Genome Institute of Singapore, A-Star, Singapore
[2] Institute for Stem Cell Biology and Regenerative Medicine, Bengaluru, India

39. ***Epidermal integrity critically regulated by poly (A) binding protein cytoplasmic (PABPC2) provides instructive cues for neoblast function during planaria regeneration.***

Dhiru Bansal[1], Jahnavi Kulkarni[1], Kavana Nadahalli[1], Vairavan Lakshmanan[1], Srikar Krishna[1], Vidyanand Sasidharan[1], Jini Geo[2], Shilpa Dilipkumar[1], Renu Pasricha[2], Akash Gulyani[1], Srikala Raghavan[1], Dasaradhi Palakodeti[1]
[1]Institute for Stem Cell Biology and Regenerative Medicine, Bengaluru, India
[2] National Centre for Biological Sciences, Bengaluru, India

42. ***Investigating a requirement for Notch1 signalling in the regulation of calcium homeostasis in mitochondria***

Neetu Saini[1], Sowmya Lakshminarayan[2], Apurva Sarin[1]
[1]Institute for Stem Cell Biology and Regenerative Medicine, Bengaluru, India
[2]National Centre for Biological Sciences, Bengaluru, India

43. ***Chemistry, genetics and development of polymorphic butterfly wing patterns***

Saurav Baral, **Riddhi Deshmukh**, Bhavya Dharmaraaj, Krushnamegh Kunte
National Centre for Biological Sciences, Bengaluru, India

46. ***Interrupting intracellular signalling by inhibiting the molecular recognition of post-translational modifications***

Bais VS, **Boggaram S**, **Chunchagatta Lakshman PK**, **Hurakadli MA**, **Jasti SR**, **Kurdekar V**, **Kurup L**, **Kurupi R**, **Manjunath K**, **Nijaguna MB**, **Periyasamy J**, **Thakur R**, Bharatham K, Goyal A, Padigaru M, Potluri V, Sadasivam G, Venkitaraman AR
Centre for Chemical Biology and Therapeutics, National Centre for Biological Sciences, Bengaluru, India

50. ***Neural correlates of general cognitive ability***

Abhinav Yadav[1], Poortata Lalwani[2], Rashmi Jejurikar[1], Harini Suri[2], Archana Purushotham[1]
[1]Institute for Stem Cell Biology and Regenerative Medicine, Bengaluru, India
[2]Indian Institute of Science Education and Research, Pune, India

54. ***Using games and simulated evolution to explain bacteriophage infection strategies***

Vaibhhav Sinha[1,2], Sandeep Krishna[1]
[1]Manipal University, Manipal, Karnataka, India
[2]National Centre for Biological Sciences, Bengaluru, India

58. ***Elongation of tau fibrils follows Michaelis-Menten like enzyme kinetics***

Harish Kumar, Jayant B. Udgaonkar
National Centre for Biological Sciences, Bengaluru, India

62. ***Chemical modulators to understand Host pathways controlling intracellular Mycobacterial growth***

Manisha Goel, Varadharajan Sundaramurthy
National Centre for Biological Sciences, Bengaluru, India

66. ***DARPP32 Expression in the Zebrafish***

Lena Robra, Vatsala Thirumalai
National Centre for Biological Sciences, Bengaluru, India

70. ***Tunable feedback loop enables airflow mediated antennal positioning in hawkmoths***

Dinesh Natesan[1,2,3], Nitesh Saxena[1], Örjan Ekeberg[2], Sanjay P Sane[1,3]
[1]National Centre for Biological Sciences, Bengaluru, India
[2]Department of Computational Biology, KTH Royal Institute of Technology, Stockholm, Sweden
[3]Manipal University, Manipal, India

74. ***Suppression of pre-motor GABAergic input to leg motor neurons decreases the speed of freely walking Drosophila***

Swetha B.M. Gowda[1,2], Pushkar D. Paranjpe[1], Sudhir Palliyil[3], Heinrich Reichert[4], K. VijayRaghavan[1]
[1]National Centre for Biological Sciences, Bengaluru, India
[2]Manipal University, Manipal, India
[3]Konsturi, Bangalore; [4]Biozentrum, University of Basel, Basel, Switzerland

78. ***Nutrient addition and lack of grazing reduces establishment of leguminous savanna tree seedling***

Chandan Pandey, Mahesh Sankaran
National Centre for Biological Sciences, Bengaluru, India

82. ***Temporal coding in diseased and healthy hippocampus***

Deepanjali Dwivedi, Aditya Asopa
National Centre for Biological Sciences, Bengaluru, India

86. ***How do Individual Honey bees Communicate New Food Source Information?***

Arumoy Chatterjee[2], Axel Brockmann[1]
[1]National Centre for Biological Sciences, Bengaluru, India
[2]SASTRA University, Thanjavur, Tamil Nadu, India

87. ***Engineering Domain Swapping in single chain Monellin***

Neha Nandwani[1], Parag Surana[1], Nahren M Mascarenhas[2], Ranabir Das[1], Jayant B. Udgaonkar[1], Shachi Gosavi[1]
[1]National Centre for Biological Sciences, Bengaluru, India
[2]Sacred Heart College, Tirupattur, India

90. ***Mechanism of generation of functional nanodomains at the plasma membrane of living cells***

Joseph Mathew K, Anupama Ambika Anilkumar, Chandrima Patra, Satyajit Mayor
National Centre for Biological Sciences, Bengaluru, India

[3]The Accelerator program for Discovery in Brain disorders using Stem cells (ADBS) Program, National Centre for Biological Sciences, Bengaluru, India

91. ***Octopamine receptors on central brain dopaminergic neurons regulate flight durations in Drosophila***

Steffy B Manjila, Maria Kuruvilla, Sanjay Sane, Gaiti Hasan
National Centre for Biological Sciences, Bengaluru, India

94. ***Understanding phosphoinsoitide signalling in the brain: Insights from human disease models***

Pramod K Singh[1], Anil Vasudevan[2], ADBS investigators[3], Padinjat Raghu[1]
[1]National Centre for Biological Sciences, Bengaluru, India
[2]Department of Pediatric Nephrology, St. John's Medical College Hospital, Bengaluru, India

95. ***Understanding Xylotrechus quadripes: How beetles wake up and smell the coffee***

Santosh Rajus, Sriraksha Bhagavan, Hinal Kharva, Shannon B Olsson
National Centre for Biological Sciences, Bengaluru, India

98. ***Collective behaviour in mound building termites***

Sree Krishna Varma Raja P C, Sanjay P Sane
National Centre for Biological Sciences, Bengaluru, India

99. ***What happens after a single episode of stress? Changes in neuronal structure and function over time***

Jesvin Singh*[1], Prabahan Chakraborty*[1], Kanika Gupta*[1], Aditi Bhattacharya[2], Sumantra Chattarji[1]
[1]National Centre for Biological Sciences, Bengaluru, India
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*equal contribution

102. ***Second order neurons for bitter taste processing in Drosophila***

Ali Asgar Bohra[1], Heinrich Reichert[2], K. VijayRaghavan[1]
[1]National Centre for Biological Sciences, Bengaluru, India
[2]Biozentrum, University of Basel, Basel, Switzerland

103. ***The Population Biology and Genetics of Butterfly Migration***

Vaishali Bhaumik, Krushnamegh Kunte
National Centre for Biological Sciences, Bengaluru, India

106. ***Structure Determination and Biochemical studies of Cyclotides from the medicinal plant, Clitoriaternatea***

Neha V. Kalmankar[1,2], P. Balaram[3], R. Sowdhamini[1], Radhika Venkatesan[1]
[1]TransDisciplinary University, Bengaluru, India
[2]National Centre for Biological Sciences, Bengaluru, India

[3]Indian Institute of Science, Bengaluru, India

110. ***Role of Cx35 containing gap junctions in recruiting chemical synapses***

Shaista Jabeen, Vandana Agarwal, Sahana Sitaraman, Gnaneshwar Yadav, Vatsala Thirumalai.
National Centre for Biological Sciences, Bengaluru, India

114. ***Changing ecologies, shifting behaviors: Behavioral responses of lion-tailed macaques Macacasilenus to a matrix of anthropogenic habitats in southern India***

Ashni Kumar Dhawale[1,2], Anindya Sinha[3], M Ananda Kumar[4]
[1]Post-Graduate Program in Wildlife Biology and Conservation, National Centre for Biological Sciences, Bengaluru, India
[2]Wildlife Conservation Society - India Program, Center for Wildlife Studies, Bengaluru, India
[3]National Institute of Advanced Sciences, Bengaluru, India
[4]Nature Conservation Foundation

118. ***Soft lithography and microfluidics for biological sciences***

Feroz M.H. Musthafa
Microfluidics and Microfabrication Facility, National Centre for Biological Sciences, Bengaluru, India

122. ***The NCBS Mouse Geome Engineering Facility: Services, Resources and Year-1 of Operational Results***

Jaya Purushotham, Manjunath J, ShilpaKumari B A, Latha Chukki, Aurélie Jory
The NCBS Mouse Geome Engineering Facility, National Centre for Biological Sciences, Bengaluru, India

126. ***Campus Wide Stem Cell Facility***

Mohanapriya R, Dr.Maki Murata-Hori
Institute for Stem Cell Biology and Regenerative Medicine, Bengaluru, India

Day 4: 14th January 2016

4. ***Cooperativity of processive Vs. non-processive motor proteins***
Prakash Iama, Minhaj Sirajuddin
Institute for Stem Cell Biology and Regenerative Medicine, Bengaluru, India

8. ***Role of SORTING NEXIN1–Dependent Endosomal Trafficking Pathway in regulating halotropism during salt stress in Arabidopsis thailiana***
Snigdha M, M K Mathew
National Centre for Biological Sciences, Bengaluru, India

12. ***Characterization of a GCTM-5 Positive Population in Pancreatic Adenocarcinoma and Cholangiocarcinoma***
B. Nayer[1], S. Sarkar[1], T. Ikeda[2], N. Yoshida[2], P. S. Sabarinath[1], N. Vartak-Sharma[1], S. Dakhore[1], P. Mishra[1], A. Farley[3], M. F. Pera[3], K. Hasegawa[1,2]
[1]Institute for Stem Cell Biology and Regenerative Medicine (inStem), Bangalore, India
[2]Institute for Integrated Cell-Material Sciences (iCeMS), Kyoto University, Japan
[3]University of Melbourne

15. ***Probing the genetic and phenotypic characteristics of evolving populations of Escherichia coli under prolonged stationary phase***
Pabitra Nandy, Savita Chib, Aswin Sai Narain Seshasayee
National Centre for Biological Sciences, Bengaluru, India

16. ***Spatio-temporal regulation of Notch activity in T regulatory cells (Tregs)***
Nimi Marcel[1], Chaitrali Saha[1], Lakshmi R Perumalsamy[2], Nandini P Basak[1], Sanjay K Shukla[2,3], Apurva Sarin[1]
[1]National Centre for Biological Sciences, Bengaluru, India
[2]Institute for Stem Cell Biology and Regenerative Medicine, Bengaluru, India
[3]Manipal University, Manipal, Karnataka, India

19. ***Drosophila development under nutritional stress: A role for neuropeptides and intracellular Ca2+ signaling***
Megha[1], Christian Wegener[2], Gaiti Hasan[1]
[1]National Centre for Biological Sciences, Bengaluru, India
[2]University of Wurzburg, Germany

20. ***How do the physical properties of the cytoplasm affect cell functioning?***

Charuhansini Kulkarni, Shashi Thutupalli
National Centre for Biological Sciences, Bengaluru, India

23. ***Understanding the role of Clathrin-independent endocytosis in Wingless signalling***

Chaitra Prabhakara, Anupama Hemalatha, Satyajit Mayor
National Centre for Biological Sciences, Bengaluru, India

24. ***Drosophila PIP4K activity regulates Insulin/PI3K signalling in cellular growth***

Sanjeev Sharma[1], Swarna Mathre[1,2], Avishek Ghosh[1] and Padinjat Raghu[1]
[1]National Centre for Biological Sciences, Bengaluru, India
[2]Manipal University, Manipal, Karnataka, India

27. ***Quietly changing partners: Smad3 replaces beta-catenin in Tcf/Lef transcriptional activation in quiescent muscle stem cells***

Ajoy Aloysius[1], Prethish Sreenivas[2], Ramanuj Das Gupta[3, 4],Jyotsna Dhawan[3,2]
[1]National Centre for Biological Sciences, Bengaluru, India.
[2]Centre for Cellular and Molecular Biology, Hyderabad, India.
[3]Institute for Stem Cell Biology and Regenerative Medicine, Bengaluru, India.
[4]Genome Institute of Singapore, Singapore.

28. ***The Sweet Lab***

Sucharita Bose, The Sweet Lab
National Centre for Biological Sciences, Bengaluru, India
Institute for Stem Cell Biology and Regenerative Medicine, Bengaluru, India
UCLA school of Medicine,
University of Gothenburg,
Center for Cellular and Molecular Platforms

32. ***Investigating the genetic control of tissue and cell morphogenesis in the development of the inner ear***

Arockia Catherin, **Nishant Singh**, **Varsha NT**, **ShriVidhya Seshadri**, Raj K. Ladher
National Centre for Biological Sciences, Bengaluru, India

36. ***Autophagy in flight Muscle development in Drosophila***

Dhananjay Chaturvedi[1], Spriha Keshri[1, 2] ,Nagaraju Dhanyasi[1,3] , K Vijay Raghavan[1]
[1]National Centre for Biological Sciences, Bengaluru, India
[2]MSU Baroda, Gujarat, India
[3]Harvard Medical School, USA

40. ***Probing Mechanisms of Airway Injury Repair***

Aditya D[1], Amrutha K[2], Aradhya J[2], **Archit V B**[1], Rital B[1], Guha A[1]
[1]Institute for Stem Cell Biology and Regenerative Medicine, Bengaluru, India
[2]SASTRA University, Thanjavur, Tamil Nadu, India

44. ***Inhibitory Potentiation: A general circuit mechanism for masking behavior?***
Madhumala K Sadanandappa[1], Balint Z. Kacsoh[2], Giovanni Bosco[2], K. VijayRaghavan[1] Mani Ramaswami[1,3]
[1]National Centre for Biological Sciences, Bengaluru, India
[2]Department of Genetics, Geisel School of Medicine at Dartmouth, Hanover, New Hampshire
[3] Trinity College Institute of Neuroscience, School of Genetics and Microbiology and School of Natural Sciences, Trinity College Dublin, Dublin-2, Ireland.

48. ***Understanding biogeographic patterns on the Indian plate: insights from mammals, birds and lizards***
Vivek Ramachandran[1], VV Robin[2], Krishnapriya Tamma[3], Ishan Agarwal[4], Uma Ramakrishnan[1]
[1]National Centre for Biological Sciences, Bengaluru, India
[2]Indian Institute of Science Education and Research, Tirupati, India
[3]Indian Institute of Sciences, Bengaluru, India
[4]Villanova University, Philadelphia, USA

52. ***Molecular synaptic switches and protein synthesis in plasticity and Fragile X***
Dilawar Singh, Nisha Ann Vishwan, Upinder Singh Bhalla
National Centre for Biological Sciences, Bengaluru, India

56. ***Time restricted feeder training and clock entrainment in bees***
Rikesh Jain, Abhishek Anand, Axel Brockmann
National Centre for Biological Sciences, Bengaluru, India

60. ***Is DNA cytosine methylation a deliberate bacterial strategy to introduce consequential mutations?***
Mohak Sharda, Supriya Khedkar, Aswin Sai Narain Seshasayee
National Centre for Biological Sciences, Bengaluru, India

64. ***Molecular characterisation of crabs claw gene (crc) involved in the development of extra floral nectary in the Ricinus communis plant***
Jyothsna Yasur, Radhika Venkatesan
National Centre for Biological Sciences, Bengaluru, India

67. ***Tracking wild pollinator preference across climates and continents***
VS Pragadheesh[1], Suhrid Ghosh[1], S Josefin Dahlbom[2], Karin Nordström[2], Shannon Olsson[1]
[1]National Centre for Biological Sciences, Bengaluru, India
[2]Uppsala University, Uppsala, Sweden
Flinders University, Adelaide, Australia

68. ***Stability in SUMO induced by the Sumo Interacting Motifs***
Kiran S Chatterjee, DSS Hembram, Ranabir Das
National Centre for Biological Sciences, Bengaluru, India

71. ***Merkel cell polyomavirus : understanding cellular context dependent tumorigenesis***
Arushi Vats, Shruti Dhar, Reety Arora and Sudhir Krishna
National Centre for Biological Sciences, Bengaluru, India

72. ***Evolution of bacterial tRNA genes : little translational selection and a lot of noise***
Saurabh Mahajan, Deepa Agashe
National Centre for Biological Sciences, Bengaluru, India

75. ***Mimicry in butterflies: a bag of magnificent developmental genetic tricks and co-option***
Riddhi Deshmukh, Saurav Baral, Gandhimati A., Muktai Kuwalekar, Krushnamegh Kunte
National Centre for Biological Sciences, Bengaluru, India

76. ***Structural and functional insights into ANTAR and ANTAR-like RNA binding domains***
Anirudh KN, Arati Ramesh
National Centre for Biological Sciences, Bengaluru, India

79. ***Genotyping SNPs from non-invasive samples: Application of new technology for tiger conservation***
Meghana Natesh[1,2], Ryan Taylor[3], Dmitri Petrov[3], Elizabeth Hadly[3], Uma Ramakrishnan[1]
[1]National Center for Biological Sciences, Bengaluru, India
[2]SASTRA University, Thanjavur, Tamil Nadu
[3]Stanford University, California, USA

80. ***An in-vitro approach to understand dynamic actin driven molecular patterning of plasma membrane components***
Abrar Bhat[1], Darius V. Köster[1], Kabir Husain[1], Madan Rao[1,2], Satyajit Mayor[1]
[1]National Centre for Biological Sciences, Bengaluru, India [2]Raman Research Institute, C. V. Raman Avenue, Bengaluru, India

83. ***Fluid Flow Modulates Electrical Activity in Cardiac hERG Channels***

Samrat Roy[1,2,3], M.K Mathew[1]
[1]National Centre for Biological Sciences, Bengaluru, India
[2]Biocon Bristol Myers Squibb Research Centre, Bengaluru, India
[3]Kalinga Institute of Industrial Technology (KIIT) University, Bhubaneswar, India

84. ***Constraints on the topology of the vesicle traffic network due to mechanisms of SNARE recycle***
Somya Mani, Mukund Thattai
National Centre for Biological Sciences, Bengaluru, India

88. ***Natural variation in microRNA 397 expression among wild and cultivated rice species induces differential cascade silencing of laccases***
Chenna Swetha, Varsha Tirumalai, Ashwin K. Nair, P. V. Shivaprasad
National Centre for Biological Sciences, Bengaluru, India

92. ***Role of Compartments and Their Interactions in Intracellular Traffic***
Anupam Singh, Madan Rao, Shashi Thutupalli
National Centre for Biological Sciences, Bengaluru, India

96. ***Effect of salt on local dynamics of the mouse prion protein***
Suhas H Bhate, Jayant Udgaonkar, Ranabir Das
National Centre for Biological Sciences, Bengaluru, India

100. ***Sequencing 1000 dengue genomes: Understanding dengue virus evolution in India***
Anuj Kumar[1], Amul Nisheeta[1], Awadhesh Pandit[1], Satish Ramachandra Rao[2], Mary Dias[3], Guruprasad Medigeshi[4], Sudhir Krishna[1], Chitra Pattabiraman[1,5]
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[3]St. Johns Medical College, Bengaluru, India
[4]Translational Health Science and Technology Institute, Faridabad, Haryana, India
[5]University of Liverpool, Liverpool, UK

104. ***Investigating RNA-protein partnerships that regulate ribosome assembly***
Dolly Mehta[1,2], Sanjay Kumar[1], Arati Ramesh[1]
[1]National Centre for Biological Sciences, Bengaluru, India
[2]SASTRA, Thanjavur, India

108. ***Neural basis of sugar elicited search behaviour in Drosophila melanogaster***
Manal Shakeel, Roshan Fatima, Axel Brockmann
National Centre for Biological Sciences, Bangalore

112. ***Anthropogenic wetlands: Associations between aquatic vegetation, fishing practices and avian guilds***

Shivona Bhojwani[1,2], K.S Gopi Sundar[3,4] , Jagdish Krishnaswamy[5]
[1]National Centre for Biological Sciences, Bengaluru, India
[2]Wildlife Conservation Society - India Program, Center for Wildlife Studies, Bengaluru, India
[3]Cranes and Wetlands, Nature Conservation Foundation
[4]Program SarusScape, The International Crane Foundation (ICF)
[5]Suri Sehgal Centre for Biodiversity and Conservation, Ashoka Trust for Research in Ecology and the Environment (ATREE), Bengaluru, India

116. *The Citizen Science Programme at NCBS*

Swati Sidhu[1], Ramit Singal[2], Suhel Quader[1,2]
[1]National Centre for Biological Sciences, Bengaluru, India
[2]Nature Conservation Foundation, Bengaluru

120. *Electron Microscopy Facility: Techniques of Electron Microscopy*

Deepti Negi, Krishnamurthy H
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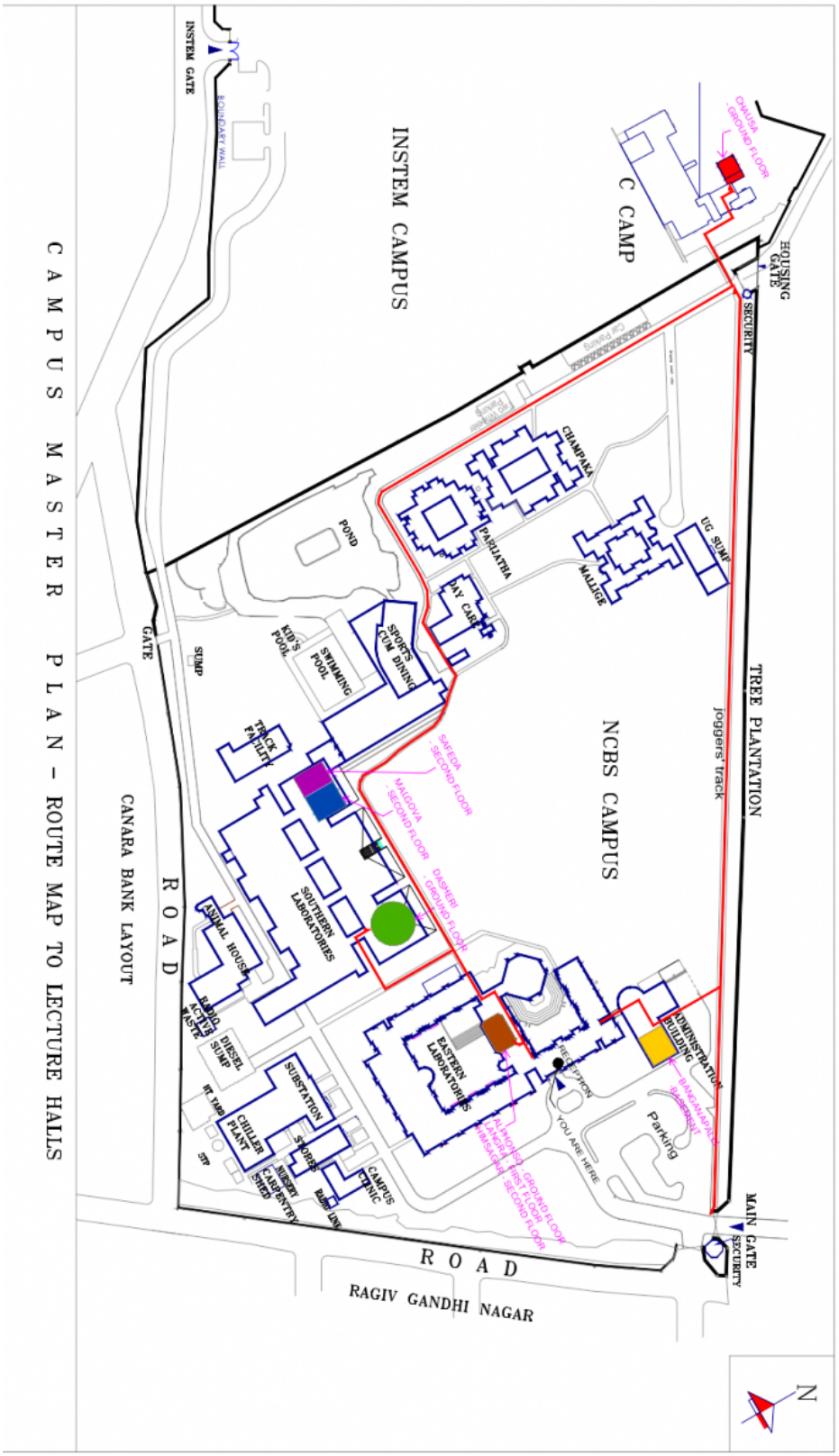
124. *NCBS/Instem X-Ray Facility*

Vinod Nayak
X-Ray Facility, Institute for Stem Cell Biology and Regenerative Medicine, Bengaluru, India


CAMPUS MASTER PLAN - ROUTE MAP TO LECTURE HALLS
INSTEM GATE
INSTEM CAMPUS
C CAMP
HOUSING GATE
SECURITY
CHAMPAKA
PARIJATHA
MALLIGE
UG SUMP
POND
DAY CARE
KID'S POOL
SWIMMING POOL
SPORTS GUM BINING
SUMP
GATE
TRUCK FACILITY
SAFEDA - SECOND FLOOR
MAIDAN
MAIDAN - SECOND FLOOR
DASHERI - GROUND FLOOR
NCBS CAMPUS
TREE PLANTATION
Joggers' track
CANARA BANK LAYOUT
ROAD
SOUTHERN LABORATORIES
ANIMAL HOUSE
BIOMED WASTE
DIESEL SUMP
SUBSTATION
CHILLER PLANT
STP
EASTERN LABORATORIES
RECEPTION
YOU ARE HERE
ADMINISTRATION BUILDING
BANGANAPALLI - BASEMENT
Parking
ALPHONSO - GROUND FLOOR
MANGO - FIRST FLOOR
PAYASAM - SECOND FLOOR
MAIN GATE SECURITY
ROAD
RAGIV GANDHI NAGAR
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