

Webinar

Investigating order in chaos: metabolic/molecular components that cumulatively dictate aging and the emergence of diseases

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We are interested in unravelling molecular mechanisms that link metabolic or dietary inputs to cellular and organismal physiology with a specific emphasis on components that couple and regulate plasticity. Our research has provided a comprehensive systems-level understanding of the pathways involved in metabolic-sensing and their role in metabolic and energy homeostasis at molecular, cellular and organismal levels with implications on aging, diabetes and obesity.

Investigating or identifying rules of engagement that dictate the emergence of phenotypes and encompass the myriad components that makeup living systems is tantalizing. Based on close to a decade's work (in our group), we are now trying to dissect out emergent properties of molecular components that dictate physiological homeostasis, which is essentially a culmination of both evolutionary history of the species and life history of the individual organism. This is exciting since metabolism is one of the biggest contributors to noise or randomness. Moreover, given the dynamic oscillation of metabolic/energetic status in all living beings, it is still unclear how response thresholds, information gating and fidelity of state reversals are achieved. Our recent work has led us to propose how molecular/metabolic oscillations (amplitudes and frequencies), which are often masked in noise, could lead to a cumulative and long-lasting consequence on phenotypes.

In this talk, I will try to bring out some of the exciting aspects of our program and highlight fundamental discoveries, and how we are trying to translate our expertise to societal needs or national missions viz. Space biology and Double Burden of Malnutrition. While Space biology has aspirational value for India, Malnutrition in the country continues to severely undermine human growth potential.

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