

# SEMINAR

Department of Biological Sciences



**Thurs, 26 Jan 2012 | 4pm | DBS Conference Room 1**

Hosted by A/P G V Shivashankar

## Genetic constraints on adaptation: tales of beetles and bacteria



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*'Starting January 2012, I will be setting up my new lab at the National Center for Biological Sciences (NCBS) in Bangalore, India.'*

Adaptation to new environments has resulted in spectacular diversification of life on earth. The nature and rate of adaptation is influenced not only by ecological factors, but also the genetic makeup of organisms. I present two case studies where I experimentally tested genetic constraints on adaptation at different scales. At a broad level, I show that genetic variation in *Tribolium castaneum* beetle populations is important for adaptation to a new suboptimal habitat. At the molecular level, I show that codon usage in an enzyme-coding gene can influence the dynamics and mechanism of adaptation in *Methylobacterium extorquens* bacteria. Thus, genetic variation per se can greatly alter adaptive trajectories, and even synonymous mutations can alter future genome evolution.