Department of Biological Sciences

Graduate Seminar

Speaker – **Anil Raj Narooka** Advisor – **Dr. Sunando Datta**
Date/Time – **20 Apr. 2017, at 4:00 PM** Venue – **L10, LHC**

GEFs: Variations in the Theme

Abstract:

Ras superfamily monomeric GTPase are key players in diverse cellular functions such as proliferation, motility, nucleo-cytoplasmic and vesicle trafficking. Ras superfamily is divided into five subfamilies Ras, Rho, Rab, Ran and Arf on the basis of sequence similarities and functional properties. These molecules function as binary switches where the GDP bound form is inactive and GTP bound form is active. Active form binds with downstream molecules which act as effectors for certain functions. Monomeric GTPases are cycled between active and inactive form by regulator molecules such as **g**uanine-nucleotide **e**xchange **f**actors (GEF) and **G**TPase **a**ctivating **p**rotein (GAP). GEFs assist in the activation of the small GTPase by replacing GDP-bound form with GTP-bound form by exchange of GDP with GTP whereas GAPs stimulate slow intrinsic GTP hydrolysis rate of the small GTPase thereby inactivating the active GTP-bound molecule. GEF molecules are specific for each subfamily of small GTPases and are therefore present as diverse domain families such as DH for Rho GTPase, Vps9 and DENN for Rab GTPase, Cdc25 for Ras GTPase and Sec7 for Arf GTPase leading to variations in the mechanism of activation.

In my talk, I'll discuss about the variations in the theme of activation by different GEFs.

References:

- Bos. Johannes L. et al. (2007). GEFs and GAPs: Critical Elements in the Control of Small G Proteins. *Cell* 129, 865-877.
- Langemeyer L. et al. (2014). Diversity and plasticity in Rab GTPase nucleotide release mechanism has consequences for Rab activation and inactivation. *eLife* 3:e01623