

## **Seminar**

# **Optimal methylation noise for best chemotactic performance of *E. coli***

**Sakuntala Chatterjee**

**S. N. Bose National Centre for Basic Sciences,  
Kolkata**

In response to a concentration gradient of chemo-attractant, *E. coli* bacterium modulates the rotational bias of flagellar motors that control its run-and-tumble motion, to migrate towards regions of high chemo-attractant concentration. Presence of stochastic noise in the biochemical pathway of the cell has important consequence on the switching mechanism of motor bias, which in turn affects the runs and tumbles of the cell in a significant way. We study the effect of signaling noise on the chemotactic performance of the cell and find that the best performance is obtained at an optimal noise strength. We show that when the concentration of a motor protein, CheY-P falls below a certain (noise-dependent) threshold, the cell tends to move down the concentration gradient of the nutrient, which impairs its chemotactic response. This threshold value decreases as noise is increased, and this effect is responsible for noise-induced enhancement of chemotactic performance.

***Wednesday, Nov 8<sup>th</sup> 2017***

***04:00 PM (Tea/Coffee at 03:30 PM)***

***Auditorium, TIFR-H***