

Department of Biological Sciences

Graduate Seminar

Speaker – **Ramesh Kumawat**

Date/Time – **19 Apr. 2017, at 10:00 AM**

Advisor – **Dr. R. S. Tomar**

Venue – **L6, LHC**

Cooperation between Rap1p and SAGA complex is required for efficient transcriptional responses regulated by the yeast MAPK Slt2

Abstract:

Yeast repressor activator protein (Rap1p) is involved in transcription activation, repression, telomere length maintenance and genomic stability [1]. Previous studies depicted that the N-terminal truncation of Rap1p (Rap1 Δ N) leads to hypersensitivity towards higher temperature (37°C) and cell-wall perturbing agents [Congo red (CR), Calcofluor white (CFW)] [2]. In the present study, we tried to explore the function of Rap1p in yeast physiology using its truncation mutants. Analysis of Cell Wall Integrity (CWI) pathway showed an increase in the chitin content in Rap1 Δ N mutant cells as compared to wild type. As slt2 is known to mediate cell wall stress response [3], we checked slt2 phosphorylation and found that it is increased in Rap1 Δ N. Moreover, SAGA complex, a robust chromatin modification machinery, plays an important role in inducing stress response genes. Interestingly, we found that certain subunit mutants of SAGA complex showed sensitivity to 'cell wall perturbing agents' thus providing a probable route to the dynamics in the regulation of the cell wall integrity pathway. Overall our findings suggest a possible connection between Rap1p and SAGA complex in cell wall homeostasis mediated by chromatin remodelers.

References:

1. Shore, D. & Nasmyth, K. (1987) Purification and cloning of a DNA binding protein from yeast that binds to both silencer and activator elements, *Cell*. **51**, 721-32.
2. Azad, G. K., Singh, V., Baranwal, S., Thakare, M. J. & Tomar, R. S. (2015) The transcription factor Rap1p is required for tolerance to cell-wall perturbing agents and for cell-wall maintenance in *Saccharomyces cerevisiae*, *FEBS letters*. **589**, 59-67.
3. Bermejo, C., Rodriguez, E., Garcia, R., Rodriguez-Pena, J. M., Rodriguez de la Concepcion, M. L., Rivas, C., Arias, P., Nombela, C., Posas, F. & Arroyo, J. (2008) The sequential activation of the yeast HOG and SLT2 pathways is required for cell survival to cell wall stress, *Molecular biology of the cell*. **19**, 1113-24.