Rudra Narayan Dubey

Current Position: Research Teaching Specialist in the Department: Pharmacology at University of Medicine and Dentistry of New Jersey

Education: Ph.D. in Biotechnology (2001) from Panjab University in Chandigarh, India

Non-scientific Interests: Biopreneurship, traveling, sports, and music

I have always been fascinated with epigenetic regulation by chromatin, where heritable genetic information is encoded not just by DNA sequence but also by the proteins that package DNA. I was fortunate to get my graduate training in the laboratory of Dr. Jagmohan Singh who made the striking discovery that DNA polymerase plays a crucial role in heterochromatic silencing in fission yeast. In the search for essential genes that are involved in silencing in fission yeast, I isolated a novel mutant sng2-1 (an APC/E3 ligase mutant), which was silencing defects at the mating type and centromeric loci. The sng2-1 gene proved difficult to identify; however, I mapped it to chromosome II. Sti1 came up in my suppressor screen and suggested that sng2-1 might be an allele of cut4 as Sti1—as reported by Dr. Yanagida's group. It was an exciting finding that sng2-1 was tightly linked to cut4, a gene that has a role in anaphase. Subsequent work showed that the role of cut4 (and also cut9, another subunit of APC) was mediated through a mutually cooperative recruitment of Swi6/HP1 and possibly Clr4.

As a postdoctoral fellow in the laboratory of Dr. Marc Gartenberg at the University of Medicine and Dentistry of New Jersey, I studied various aspects of transcriptionally silent chromatin in budding yeast. I discovered that RNA polymerase III machinery plays an instrumental role in establishing cohesion of the silenced HMR locus. I identified parameters important for cell cycle-dependent positioning of the locus within the nucleus and characterized cell cycle events that are critical for establishment of the silent state.

I received the Robert Wood Johnson Medical School Department of Pharmacology Award for Outstanding Research (2008) as well as the Young Investigator Award.

Nandni Nakwal

Current Position: Postdoctoral research fellow in the Institute of Biotechnology, Department of Molecular Medicine, at University of Texas Health Science Center in San Antonio, Texas

Education: Ph.D. in Biotechnology (Molecular Biology) (2007) from the Institute of Microbial Technology (IMTECH) in Chandigarh, India (in conjunction with Jawaharlal Nehru University in New Delhi, India)

Non-scientific Interests: Nature, music, and travel

In 2001, I joined the group of Dr. Jagmohan Singh in the Department of Yeast Development Biology at IMTECH. I was uncertain about the higher order chromatin structure, but during my research and discussions with Dr. Singh, I developed a great interest in the mechanism of heterochromatin formation and gene silencing. In the last six years of my doctoral research, I investigated the role of APC/C-E3 ligase in gene silencing. Interestingly, we found that APC/C-E3 ligase, which plays a vital role in sister chromatid separation, functions in the assembly of the heterochromatin formation and gene silencing and thereby ensuring the chromosomal integrity and segregation during cell division. Our studies indicate that APC components interact with chromodomain protein Swi6 and histone methyl transferase Clr4. Their cooperative interactions were found to be critical for the establishment of gene silencing and also for the heterochromatin formation at the mating and centromeric loci. The details of our findings are elaborated in this minireview.

Read Drs. Dubey and Nakwal's article entitled: Interaction of APC/C-E3 Ligase with Swi6/HP1 and Clr4/Suv39 in Heterochromatin Assembly in Fission yeast
http://www.jbc.org/cgi/content/full/284/11/7165