

Dear All,

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INDIAN INSTITUTE OF SCIENCE
BANGALORE

INSTITUTE COLLOQUIUM
(Biological Sciences)

PROF. V. NAGARAJA
Chairman, Department of Microbiology & Cell Biology

will deliver a lecture

on

MECHANISTIC AND FUNCTIONAL INSIGHTS INTO VARIOUS
CELLULAR DNA TRANSACTIONS

on Tuesday, January 27, 2009
at 4.00 pm in the Faculty Hall

THE DIRECTOR
will preside

All are cordially invited

Coffee/Tea: 5.00 pm
Venue: Reception Hall

Abstract

Our research efforts are on major DNA transaction processes essential for cell survival. DNA topology modulation, regulation of gene expression and R-M systems are the major areas of research with the aim to understand the molecular events and their importance in cellular function. I will present some of our salient findings on a few topics viz. transcription activation, transcription termination, topology-transcription coupling and cell survival strategies by protection of house keeping functions. The underlying connection in all these fundamental processes and the key concepts emerging will be apparent during the presentation.

I will describe an unusual multi step transcription activation mechanism which serves as an ?irreversible genetic switch? to control toxic gene expression. Then I will address well conserved but less understood problem in molecular biology, namely transcription termination. Our genome wide in silico analysis with the algorithm GeSTer developed by us and experimental verification reveals several new facets and variations in the conserved mechanism. In addition to the classical E.coli(or text book) type terminators, several new kinds terminators are shown to function as effective terminators.

The torsional strain in DNA resulting from various protein: DNA interactions is relieved by the action of dedicated bunch of enzymes known

as topoisomerases. How these molecular machines could be functioning together with transcription machinery in the cell is described next. Finally, I will present yet another emerging theme of the laboratory. Topoisomerases are essential house keeping enzymes and their protection as cell survival strategy and evolution of such mechanisms are discussed.
