TIFR Centre for Interdisciplinary Sciences
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Seminar

Biological networks: disease and complexity

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In this talk I will ask the following questions and explain how biological networks help in answering them.

1) How mutation makes big changes? Where we show, taking mutation of HHT (and TP53) which causes Huntington's disease (cancer), that mutation primarily alters proteins ability to interact with other proteins; the differential networks of wild-type and mutant proteins can explain the loss or gain of biological processes in the pathogenesis of respective disease.

2) Why some spinal-cord injury leads to complete injury scenario (ultimate death or paralysis)? With the help of doctors and biologists we try to assimilate the enriched proteins in the cerebrospinal fluid of the injured patients, and then identify the respective functions which are altered.

3) What is the measure of complexity in animal kingdom? We will show quantitatively, using miRNA networks that, complexity depends on both, the number of genes and how well the genes are regulated (by miRNA or possibly transcription factors).

Ref :

[1] M. Basu, NP Bhattacharyyya and PKM, PloSone 8, e64838(2013),
[2] M. Sengupta et. al., PloSone 9, e110885(2014)
[3] M. Basu, NP Bhattacharyyya and PKM, EPL 105, 28007 (2014).

Wednesday, May 4th 2016

4:00 PM (Tea/Coffee at 3:45 PM)

Seminar Hall, TCIS