Dear Dr Sundar

Thank you ! for an "EXCELLENT CAFÉ" today

We, at Tsukuba & all the satellite CAFEs, enjoyed your talk and appreciate your efforts !

DAILAB-CAFE

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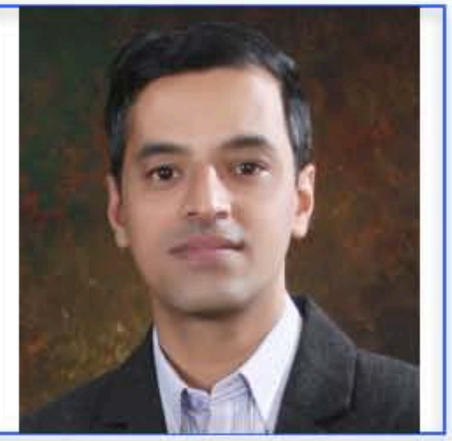
Series - 11

Date and Time - July 08, 2015 (12:00~13:00) (*LUNCH ON: Please bring your Lunch; Drink will be served*)
Venue - Central 4-1 (2F) Meeting Room-1

Speaker - Durai SUNDAR
Affiliation - Department of Biochemical Engineering and Biotechnology, IIT Delhi, India
E-mail: sundar@dbeb.iitd.ac.in



Title : Zinc Finger Nucleases - Past, Present and Future

Custom-designed zinc finger nucleases (ZFNs) - proteins designed to cut at specific DNA sequences - combine the non-specific cleavage domain (N) of *Fok*I restriction endonuclease with zinc finger proteins (ZFPs). Because the recognition specificities of the ZFPs can be easily manipulated experimentally, ZFNs offer a general way to deliver a targeted site-specific double-strand break (DSB) to the genome. They have become powerful tools for stimulating gene targeting in cells – the process of replacing a gene within a genome by homologous recombination (HR). The creation of designer zinc finger nucleases, and hence the development of ZFN-mediated gene targeting, provides molecular biologists with the ability to site-specifically and permanently modify plant and mammalian genomes including the human genome *via* homology-directed repair of a targeted genomic DSB. Site-specific engineering of the mammalian genome in cells so far has been hindered by the low frequency of homologous recombination (HR). In ZFN-mediated gene targeting, this is circumvented by using custom-designed ZFNs to cut at the desired chromosomal locus inside the cells. The DNA break is then patched using the new investigator-provided genetic information and the cells' own repair machinery. The high efficiency and accuracy of this process combined with the ability to design ZFNs that target almost any DNA sequence makes ZFN technology a powerful research tool for targeted engineering of the mammalian genomes, including the human genome. Our laboratory's current objective is to improve the efficiency and efficacy of ZFN-mediated gene targeting. In this seminar, I would give insights into the birth of this technology, discuss the current status and the future of zinc finger nucleases for applications in genome engineering.

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