Tata Institute of Fundamental Research
Survey No. 36/P, Gopanpally Village, Serilingampally, Ranga Reddy Dist., Hyderabad - 500107

Seminar

Small Molecule Controlled CRISPR–Cas9: Changing the Face-to-Fate of Genome-engineering in Cells and Beyond

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Harvard Medical School, MA

CRISPR/Cas9-based gene-editing technology has revolutionized the field of genome-engineering and gene-therapy. We have developed small-molecule controlled CRISPR/Cas9 system that can either be activated or inhibited in the cell, on demand. In the first approach, we have genetically engineered SpCas9 protein to build a small-molecule controlled CRISPR/Cas9 system. On the other hand, we have developed a suite of high throughput biochemical and cellular assays for systematically screening 100,000 compound library to identify inhibitors for wild-type SpCas9. We have demonstrated dose-dependent activation and inhibition of SpCas9-mediated genome-editing, transcriptional regulation, and base-editing in mammalian cells. The inhibitors were also able to impair the CRISPR-based immunity of bacteria against bacteriophage. The methods reinforce the ability of Chemico-bioengineering approach in manipulating complex biological processes. We envision that these small-molecule based regulators will impact the CRISPR/Cas9 technologies across biomedical to bio-safety platforms.

Friday, Jun 22nd 2018

11:30 AM (Tea/Coffee at 11:00 AM)

Seminar Hall, TIFR-H