

Vigyan Samachar: DBT News

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### **Some of the major achievements made by inStem during 2017-18**

In the past year, science at Institute for Stem Cell Science and Regenerative Medicine (inStem) has reached new heights and most of the laboratories have carried our excellent research and have successfully put published important papers that are building a strong foundation for stem cell science and its translation.



Institute for Stem Cell Science and Regenerative Medicine (inStem), Bengaluru

The institute has successfully installed India's first Cryo-EM and began its operation as a National Facility for generation of exciting and reliable data. During last couple of years, the Centre for Chemical Biology and Therapeutics (CCBT) theme has come out with credible data on new cancer targets and corresponding small molecule drugs.

At the Centre for Brain Disorders and Repair theme, the Accelerator program for Discovery in Brain disorders using Stem cells (ADBS) has become a platform to study deeply clinically phenotyped cohorts for familial neuropsychiatric diseases. The scientist at institute are studying brain disorders, its understanding, and its remediation by the deployment of stem cell technology, and are routing a flagship effort with the DBT in developing a biorepository of stem cell lines from patients. Such developments shall provide remarkable resource to scientific community.

During year 2017-18, institute has received rupees 853.00 million core grants, 457.78 million as EMG grants, 56 active grants and 308 plus manpower has been engaged to work in different facilities. The CCBT actively engaged in developing innovative approaches to create chemical tools that modulate novel classes of targets, and assists in exploring the fundamental biological mechanisms underlying human diseases.

Research team at CCBT has found over 10 different domains in human proteins which mediate phosphopeptide recognition during protein kinase signaling and such domains are utilized by hundreds of proteins in different signaling pathways. In the same year, researchers has reported the development of Bractoppin, a drug-like inhibitor of phosphopeptide recognition by the human BRCA1 tandem (t)BRCT domain, which selectively inhibits substrate binding with nanomolar potency *in vitro*. Institute aims at developing a powerful inter-disciplinary capability for chemical biology and therapeutics development in the inStem/NCBS campus.

Researchers have also made great progress in understanding wound healing process by deciphering the molecular mechanisms involved in the wound healing. The goal of such programmes is to utilize the knowledge to develop therapies for diseases where wound healing is deregulated, such as in diabetes, fibrotic diseases, cancer etc.

Other broad areas where huge progress have been made includes studies on elucidating unconventional mechanisms by which lysine methyltransferases influence cell fate decisions, epithelial homeostasis and inflammation, neurodevelopmental and neurodegenerative brain disorders, autistic function involving rat behavior and imaging, nano engineering, cardiomyopathies, regulation of cell fate, metabolic signaling etc. Institute has also been successful in making collaborations with other institutes working in same domains across the world.

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