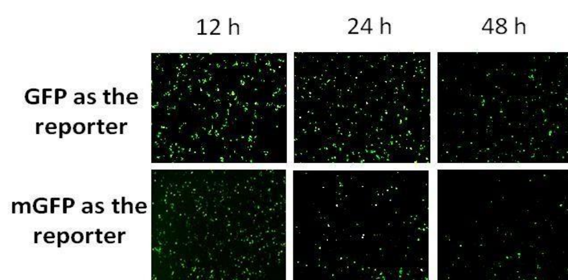
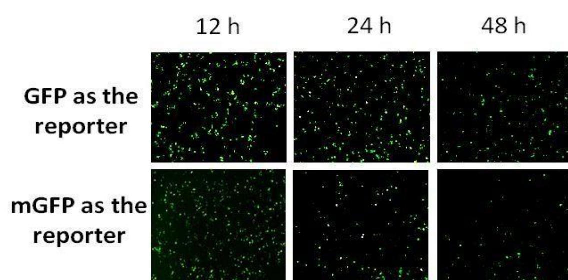
DBT supported study helps develop better genome editing system

New Delhi, Dec 23: CRISPR-Cas system of genome engineering is the most effective and simple to use method as compared to other known platforms of genome editing. The improvement of CRISPR/Cas9 system with respect to achieving higher editing efficiency is warranted. This is because the cell responds to the double-stranded DNA breaks and inhibits the genome editing efficiency through several unknown pathways. Therefore, the identification of pathways that target and inhibit the editing by CRISPR will help us improve the efficiency of this system. However, the limitation here is to capture the CRISPR editing in a facile and high-throughput way in a live cell.

To address this unmet need of a functional high-throughput assay, in a DBT-supported ongoing study under the Department's Genome Editing program, a team of investigators from IISER, Bhopal led by Dr. Ajit Chande has designed a reporter (called as mGFP)-based system that can be used as a functional determinant of CRISPR-mediated genome editing in live cells. The modified GFP reporter can indicate the editing (as seen by the loss of fluorescence upon editing) as early as 24 hrs time point. This would facilitate a high-throughput screening protocol in a shorter time window.



The mGFP-based reporter system to assess the efficiency of genome editing in live cells. The decrease in fluorescence over time is indicative of successful genome editing.



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