

RMRC, Bhubaneswar

(Laxmi Narayan Memorial Library)

Weekly Current Awareness Service

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“Self Education is, I firmly believe, the only kind of education there Is ”

— Isaac Asimov

About Monday Morning

Monday morning is a weekly E- CAS (Electronic Current Awareness Service) of RMRC Library, Bhubaneswar which carries one Biomedical & health science news item and some useful current medical research links so that the scientists can access the articles. This E- Bulletin starts its journey from 21st Nov. 2016. In this maiden attempt we cordially invite your inputs and suggestions to improve in future.

Dr. Banamber Sahoo, Lib & Inf. Officer
Poonam Singh Deo & Hemanti Mahali (Lib. Trainee)

Tuneable genetic clocks to improve biotech strategies

CELL OSCILLATOR

LONDON: Scientists have worked out how to fine-tune cellular clocks, which might lead to optimised production of drugs, biofuels and other chemicals.

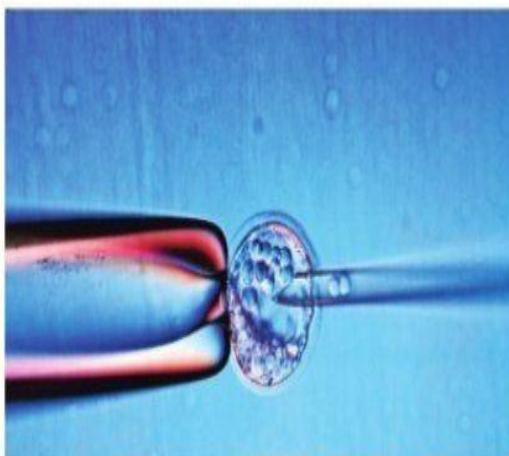
In genetics, oscillators are biological 'clocks' that express certain key genes at regular time intervals, said researchers from Imperial College London. Such oscillators exist in all realms of life, from bacteria to humans — and their rhythms are at the core of essential processes like cell division and metabolism.

“We have shown that it's possible to independently tune the amplitude and frequency of genetic clocks, giving us greater

control over their output,” said Guy-Bart Stan from Imperial's Department of Bioengineering.

Currently, host bacterial cells are genetically altered to express genes that control the expression of desired proteins. Genetic oscillators were some of the first bio-circuits constructed in synthetic biology and have already been used in various applications. In the study published in *Cell Systems*, researchers used computer modelling to unravel the links between amplitude and frequency in current genetic oscillators, and based on this, proposed new design principles to control amplitude and frequency independently.

These newly designed genetic



clocks could help build more complex genetic networks for drug delivery, and even introduce a personalised medicine element. Oscillators can be manipulated

by external cues. Scientists are increasingly giving genetic oscillators to engineered cells, to help them control the release of drugs and biofuels.

Yet until now it has been difficult to control the frequency and amplitude of oscillations separately. Researchers now have shown new ways of better controlling genetic oscillations by tuning the desired amplitude and frequency. This could let cells 'budget' resources by reducing the amount of time that genes stay 'on', which cuts the energy burden and the accumulation of toxic compounds in the cell.

It would streamline the process of producing drugs, biofuels and other chemicals, making operations productive and efficient. The study has shown new ways of better controlling genetic oscillations by tuning the desired amplitude and frequency.

1. Genetic Adaptation to Cold Brought Migraines With It

A human genetic variant in a gene involved in sensing cold temperatures became more common when early humans migrated out of Africa into colder climates between 20,000 and 30,000 years ago, a study published today (May 3) in PLOS Genetics shows. The advantage conferred by this variant isn't definitively known, but the researchers suspect that it influences the gene's expression levels, which in turn affect the degree of cold sensation. For more details click on the below link <https://www.the-scientist.com/?articles.view/articleNo/52484/title/Genetic-Adaptation-to-Cold-Brought-Migraines-With-It/>

2. The first smallpox treatment is one step closer to FDA approval

As bioterrorism fears grow, the first treatment for smallpox is nearing approval. Called tecovirimat, the drug stops the variola virus, which causes smallpox, from sending out copies of itself and infecting other cells. "If the virus gets ahead of your immune system, you get sick," says Dennis Hruby, the chief scientific officer of pharmaceutical company SIGA Technologies, which took part in developing the drug. "If you can slow the virus down, your immune system will get ahead." For more details click on the below link <https://www.sciencenews.org/article/first-smallpox-treatment-one-step-closer-fda-approval?tgt=nr>

3. Scientists downsize bold plan to make human genome from scratch

A bold plan to synthesize an entire human genome has been scaled back, aiming at a more technically attainable near-term goal. Instead of synthesizing all of the human genome's 3 billion DNA base pairs, the project will now attempt to recode the genome to produce cells immune to viral infection. For more details click on the below link <https://www.nature.com/articles/d41586-018-05043-x>

4. 5 Healthy Habits That Could Extend Your Life By A Decades

The researchers from the Harvard University's T.H. Chan School of Public Health in Boston found that women and men who maintained the healthiest lifestyles were 82 per cent and 65 per cent less likely to die from cardiovascular disease and cancer, respectively. For more details click on the below link <https://www.indiatimes.com/health/healthyliving/5-healthy-habits-that-could-extend-your-life-by-a-decade-344648.html>



E- CAS (Current Awareness Service)

Monday Morning team
Library & Information Division
ICMR-Regional Medical Research Centre
Bhubaneswar- 751023, ODISHA ,
E- Mail: drbsahoo@gmail.com, Tel: 9438182087