

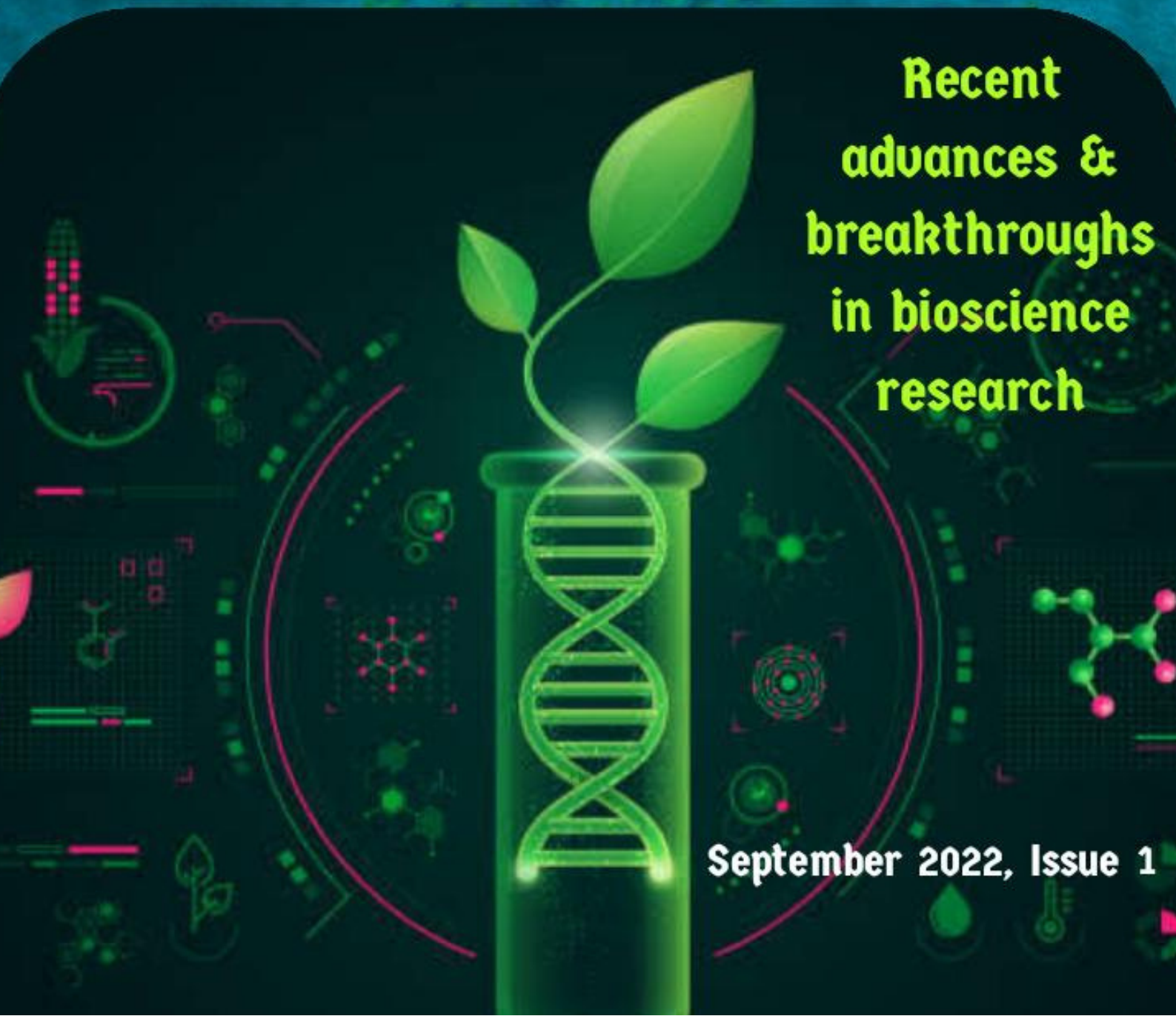
# *The BTOscope*

*A quarterly newsletter*

**Department of Biosciences  
Integral University, Lucknow**

**Recent  
advances &  
breakthroughs  
in bioscience  
research**

**September 2022, Issue 1**





## MALARIA VACCINE FOR KIDS (OCTOBER, 2021)

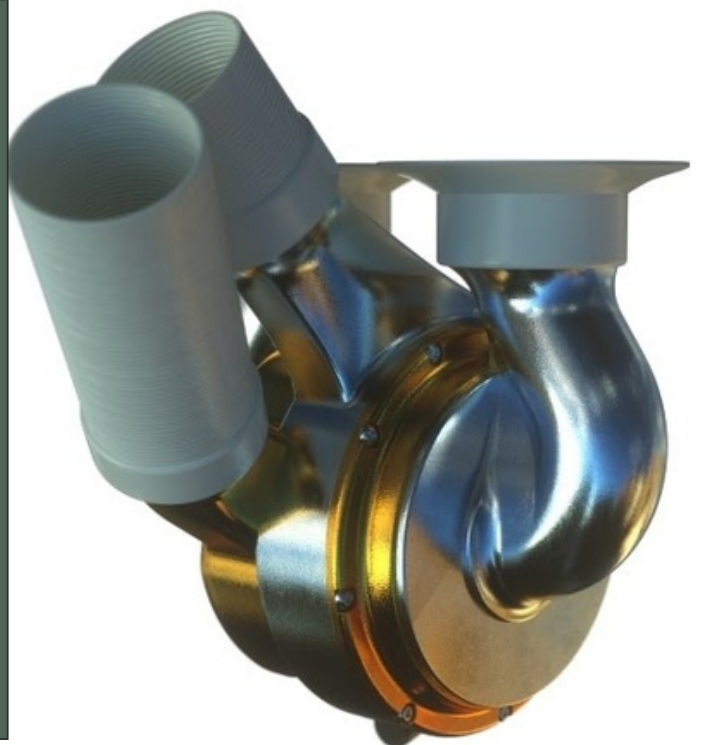
Malaria is still one of the most dangerous diseases on the planet that kills around half a million people annually. Over half of those are children under the age of five. The World Health Organization (WHO) in October 2021 approved the world's first malaria vaccine for kids, which is also the first vaccine against any parasitic disease. The new vaccine fights the deadliest of five malaria pathogens and is delivered in a series of four injections. This science breakthrough could prevent around 5.3 million malaria cases every year.

Source - <https://www.who.int/news/item/06-10-2021-who-recommends-groundbreaking-malaria-vaccine-for-children-at-risk>

## ARTIFICIAL TITANIUM HEART DEVELOPED (FEBRUARY, 2022)

Scientists have been trying to build an artificial heart for over 50 years now. Cardiovascular diseases (CVDs) take an estimated 17.9 million lives around the world each year and are the leading causes of deaths globally.

An Australian research team has created BiVACOR, a titanium heart that utilises spinning disc technology. It doesn't work exactly like a human heart but tries to surpass evolution with a better mechanism to pump blood around the human body. It has a circular pump suspended between magnets in an artificial heart made of titanium.



Source - <https://www.sciencefocus.com/news/artificial-hearts-made-from-magnets-and-titanium-could-save-many-lives/>





## COMPLETE HUMAN GENOME CODED (MARCH, 2022)

Scientists say they have finally assembled the full genetic blueprint for human life, adding the missing pieces to a puzzle nearly completed two decades ago. The last attempt, which was well applauded, was lacking in some areas since the DNA sequencing tools of the time couldn't read those portions. Even after upgrades, around 8% of the genome remained still missing.

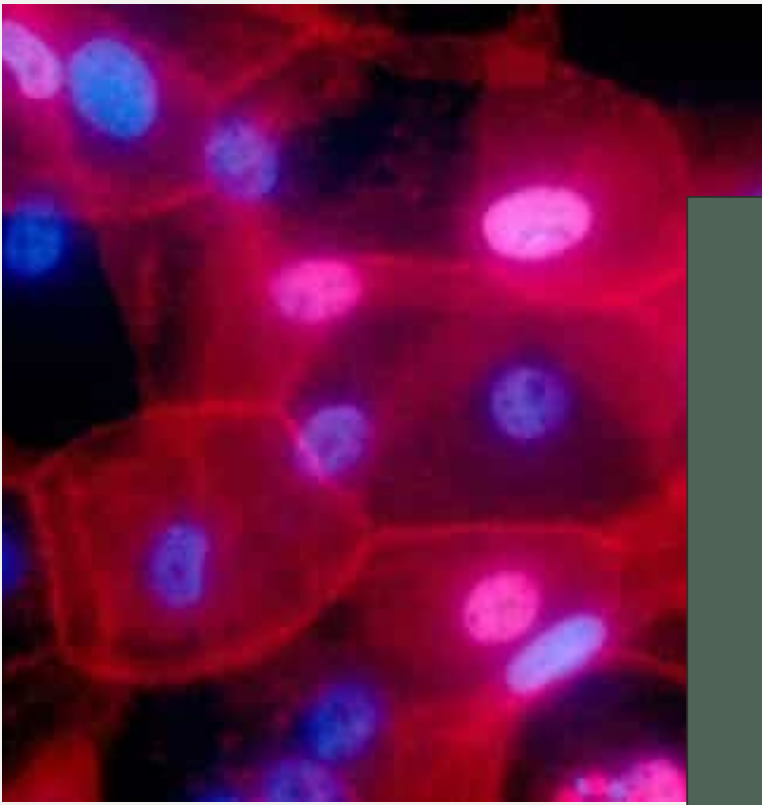
Source - <https://www.nih.gov/news-events/nih-research-matters/first-complete-sequence-human-genome>

## DISCOVERY OF "TRANSPARENT" BLOTCHED SNAILFISH (JUNE, 2022)

Sea scientists have discovered a 'transparent' kind of fish namely Blotched snailfish in waters during a routine survey. Notably, the transparent fish has unique features with spots on its body but is mostly transparent thus making it difficult for predators to target it.



Source - <https://news.abplive.com/science/rare-transparent-blotched-snailfish-camouflage-found-in-alaska-1540577>



Source - <https://www.indiatoday.in/science/story/us-cancer-drug-cure-dostarlimab-trial-successful-treatment-1959687-2022-06-08>

## CURE FOR CANCER (JUNE, 2022)

A small clinical trial discovered that every single rectal cancer patient who got an experimental treatment saw their disease vanish, in what looks to be a miracle and a "first in history".

According to the New York Times, 18 patients took a medicine named Dostarlimab for six months in a limited clinical trial done by Memorial Sloan Kettering Cancer Center, and all of them saw their tumours shrink at the end.

Experts stated that the malignancy is undetectable by physical examination, endoscopy, positron emission tomography or PET scans, or MRI scans. This shows that Dostarlimab has the potential to be a 'possible' cancer cure for one of the most lethal tumours.

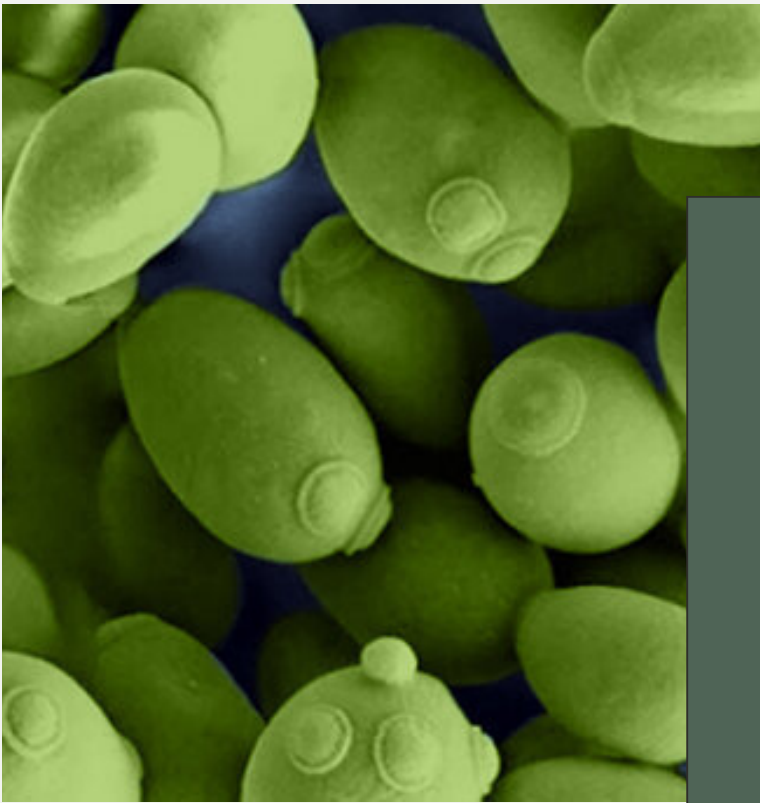


## OLDEST CASE OF A RARE GENETIC CONDITION DISCOVERED (AUGUST, 2022)

A group of international researchers has uncovered evidence of a super rare genetic condition that gives men an extra X chromosome, reporting the oldest clinical case of Klinefelter syndrome to date from a 1,000-year-old skeleton from Portugal.

Source - <https://www.sciencealert.com/rare-genetic-syndrome-in-1000-year-old-skeleton-is-oldest-case-ever-found>





## **NEW ALGORITHM UNCOVERS SECRETS OF CELL FACTORIES (AUGUST, 2022)**

Drug molecules and biofuels can be made to order by living cell factories, where biological enzymes do the job.

Now, researchers at Chalmers University of Technology have developed a computer model that can predict how fast enzymes work, making it possible to find the most efficient living factories, as well as to study complex diseases.

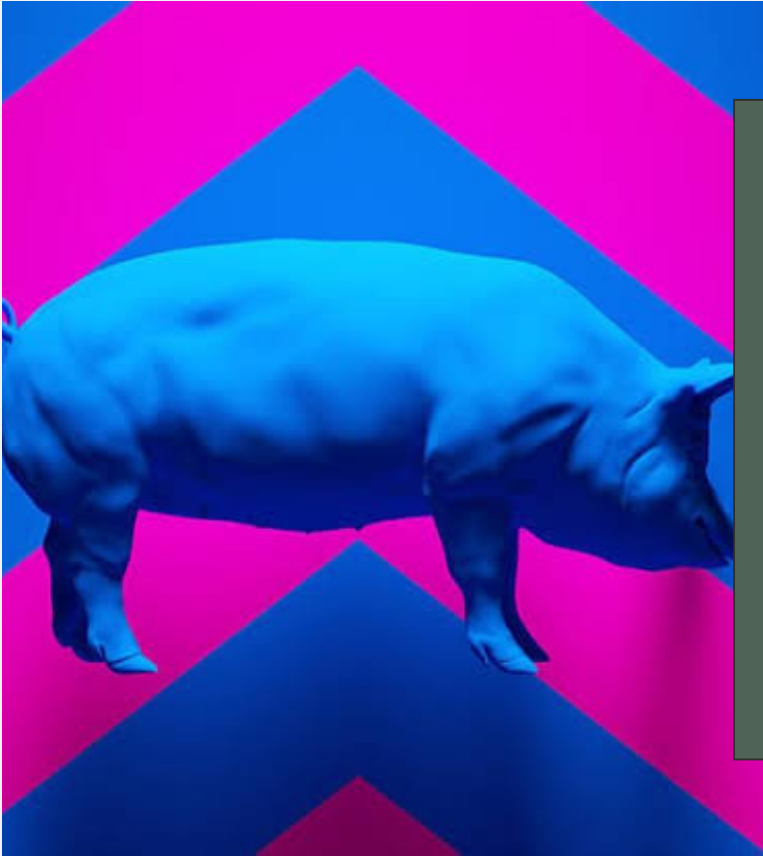
Source - <https://www.nanowerk.com/news2/biotech/newsid-61385.php>

## **CORALS PASS MUTATIONS ACQUIRED DURING THEIR LIFETIMES TO OFFSPRINGS (AUGUST, 2022)**

Researchers have documented that corals can pass mutations acquired during their lifetimes to their offspring, providing increased genetic diversity for potential evolutionary adaptation



Source - <https://www.technologynetworks.com/genomics/news/coral-can-pass-somatic-mutations-to-offspring-365281>



## PIG ORGANS PARTIALLY REVIVED HOUR AFTER DEATH (AUGUST, 2022)

Pig organs have been partially revived an hour after the animals were killed, in a breakthrough with the potential to transform medicine.

The technique could increase the number of organs available for transplant and buy doctors more time to save a life if applied to people.

The study also challenges assumptions about what happens in the moments between life and death.

Source - <https://www.scientificamerican.com/article/how-scientists-revived-dead-pigs-organs-and-what-the-feat-means-for-transplants/>



## FIRST SYNTHETIC EMBRYO DEVELOPED IN LAB (AUGUST, 2022)

The synthetic models developed normally until day 8.5 -- nearly half of the mouse's 20-day gestation -- at which stage all the early organ progenitors had formed, including a beating heart, blood stem cell circulation, a brain with well-shaped folds, a neural tube and an intestinal tract.

When compared to natural mouse embryos, the synthetic models displayed a 95 per cent similarity in both the shape of internal structures and the gene expression patterns of different cell types. The organs seen in the models gave every indication of being functional.

Source - <https://www.news18.com/news/buzz/scientists-develop-worlds-first-ever-synthetic-embryos-without-eggs-sperms-5711701.html>

# Recent Scientific Breakthroughs in Lucknow

## CDRI LUCKNOW SCIENTISTS RESEARCH ON NEW DRUGS FOR COVID TREATMENT

JAN, 2022 - CSIR - CDRI, LUCKNOW

Researchers at the Central Drug Research Institute (CDRI) in Lucknow are trying to develop another drug for Covid treatment without any side-effects.

A team headed by chief scientist Ravi Shankar, is working on two combinations to provide the safest medication to coronavirus patients.

"a combination of antivirals with different mechanisms can be more effective to counter the viral pandemic. We are working on two combinations - Umifenovir with Molnupiravir (an antiviral) and Umifenovir with Niclosamide (anti-parasitic)," he said

Source - [https://www.google.com/amp/s/m.timesofindia.com/education/news/cdri-scientists-working-on-two-combinations-of-covid-19-drugs/amp\\_articleshow/89030325.cms](https://www.google.com/amp/s/m.timesofindia.com/education/news/cdri-scientists-working-on-two-combinations-of-covid-19-drugs/amp_articleshow/89030325.cms)

## CSIR-NBRI DEVELOPING CANNABIS WITH LOW INTOXICATION FOR FARMING

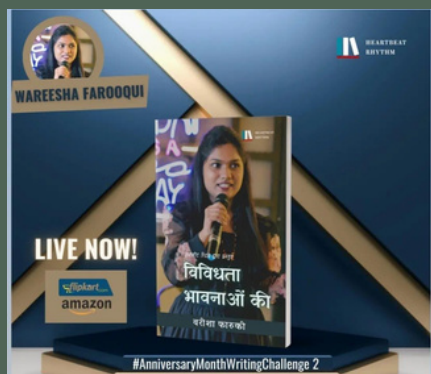
JUNE, 2022- CSIR - NBRI, LUCKNOW

Researchers at CSIR - NBRI, Lucknow are trying to develop low intoxicated Cannabis which can be used for farming. The motive is to bring down the level of THC (Tetrahydrocannabinol) percentage in Cannabis from its existing high level to 0.3%, so that it can be cultivated under the NDPS Act 1985. For its cultivation, it has to be given to farmers and this is only possible if its THC level is brought down.

Source - <https://www.google.com/amp/s/www.hindustantimes.com/cities/lucknow-news/csirnbri-developing-cannabis-with-low-intoxication-for-farming-101654712902380-amp.html>

## Students' accomplishments (Department of Biosciences)

Congratulations to Wareesha Farooqui student of B.Sc. ZBC for publishing of her poetry collection entitled 'Vibhidhata Bhavnaon Ki' ISSN 9798888059432.



Congratulations to Mohd Danish Khan student of B.Sc. LS for Co-authoring in the anthology "Autumn - Volume 6" by The Quill House Publication. ASIN B0B9V9NZZX





**Research Breakthroughs presented under RISE (Research in Science and Engineering) Program Series  
(May to December 2022)**

S.No.	Name of Research Scholar	Work Place	Title and link of the paper presented	Date Of Presentation
1.	Afza Ahmad	IIRC-I	Reversing insufficient photothermal therapy-induced tumor relapse and metastasis by regulating cancer-associated fibroblasts. (DOI: doi.org/10.1038/s41467-022-30306-7)	28-05-2022 (Research Breakthroughs)
2.	Sabeena Arif	IIRC-V	GC-MS-employed phytochemical characterization, synergistic antioxidant, and cytotoxic potential of Triphala methanol extract at non-equivalent ratios of its constituents. (DOI:doi.org/10.1016/j.sjbs.2022.103287)	11-06-2022 (Journal Club)
3.	Sonam Dwivedi	IIRC-II	Transdermal electroosmotic flow generated by a porous microneedle array patch (DOI:doi.org/10.1038/s41467-021-20948-4)	25-06-2022 (Research Breakthroughs)
4.	Shahreen Fatima Rizwi	IIRC-IV	Utilization of crude paper industry effluent for Polyhydroxyalkanoate (PHA) production (DOI: doi.org/10.1016/j.eti.2021.101692)	23-07-2022 (Research Breakthroughs)
5.	Parvej Ahmad	IIRC-VII	Diallyl disulfide improves lipid metabolism by inhibiting PCSK9 expression and increasing LDL uptake via PI3K/Akt-SREBP2 pathway in HepG2 cells. (DOI: doi.org/10.1016/j.numecd.2020.08.012)	27-08-2022 (Journal Club)
6.	Tabrez Faruqi	IIRC-V	Focal Adhesion Kinase (FAK)-Hippo/YAP transduction signaling mediates the stimulatory effects exerted by S100A8/A9-RAGE system in triple-negative breast cancer (TNBC) (DOI: doi.org/10.1186/s13046-022-02396-0)	03-09-2022 (Research Breakthroughs)
7.	Rafia Sheikh	IIRC-II	Metformin activates chaperone-mediated autophagy and improves disease pathologies in an Alzheimer disease mouse model. (DOI: doi.org/10.1007/s13238-021-00858-3)	10-09-2022 (Journal Club)



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