



## RESEARCHERS COMBINE TWO PRECISION DRUGS TO FIGHT CANCER!

Every day, around 1660 people lose their battle against cancer. Despite many therapies and drugs available, cancer still remains the second leading cause of death worldwide. To combat this deadly disease, scientists and medical researchers are trying to launch a dual prolonged attack on tumours by combining two innovative precision medicines. Precision medicines are an approach towards disease treatment and prevention that takes an account to individual variability in genes.

Researchers have recently tried to target two weaknesses of cancer at the same time - a damaged system for DNA repair and addiction to AKT molecule (pathway indicators). So, they combined drug Olaparib (licensed for ovarian and breast cancer) with newly developed and promising drug Capivaretrib.

The team from the Institute of Cancer Research (ICR), UK, found that this drug combination was prudent and also hit the targets at places which stopped responding to chemotherapy. The Phase-I trial had 64 patients with tumours were given this combination of drug and out of which 45% were benefited. These results clearly show that the combination was promising and has the potential to work well. The team at ICR is also looking forward to later-stage clinical trials to access the drug combination's benefit and to consider patients with tumours that have no faults in DNA repair and AKT molecules. These studies and researches show us cancer can be fought and millions of lives be saved every year.

## ABOUT US

Atavism is a phenotypic trait that appears suddenly in an organism. Yes, it is that feature we have always had the genes for, but have never expressed. Have you heard of the dolphin with legs or the baby born with a tail? Because if you have, you know what we're talking about!

Just like its name, this newsletter is a little something that we always had the genes for, but we never expressed. We agree that the newsletter isn't as weird as the chicken with teeth but it sure is something out of the blue to bring all of us together. We aim to make this newsletter the place you can go for the latest news in the biotechnology world, bizarre but true science headlines, and insightful conversations.

### References & Photo credits:

1. Photos from Pexels.
2. <https://www.sciencedaily.com/releases/2020/09/200914194027.htm>
3. <https://cancerdiscovery.aacrjournals.org/content/early/2020/09/18/2159-8290.CD-20-0163>

# Busting religious myths on genetically engineered food!



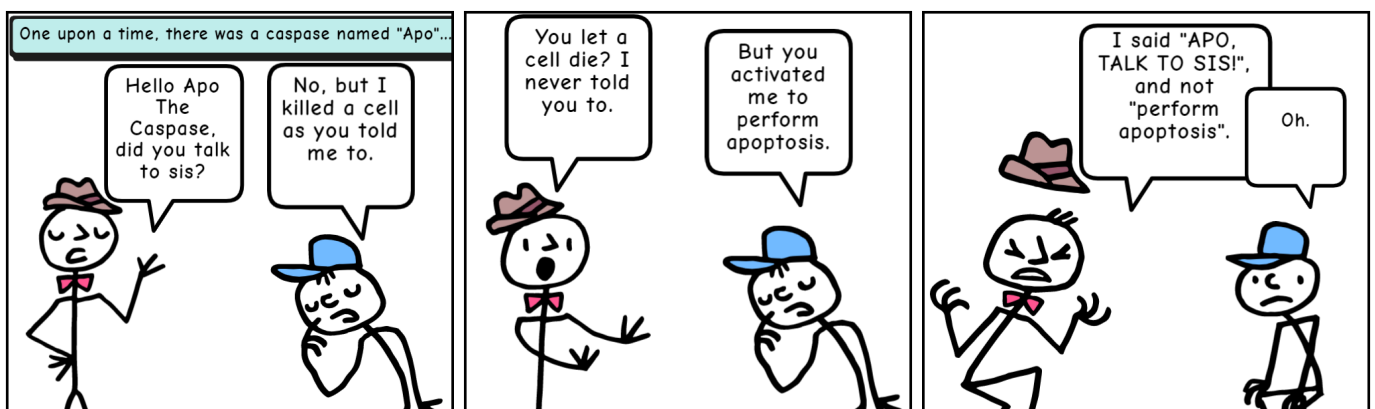
Being vegetarian in India is not just a healthy lifestyle choice, but it is also associated with religious sentiments, about 23% to 37% of Indians are vegetarians. Blurring lines between what is to be considered vegetarian and non-vegetarian food is most likely to cause chaos in our society. Majority of the people have an abstruse dilemmas about the ethics behind the genetically engineered food. They think that eating animals with human genes can lead to cannibalism and eating a plant with animal or human genes will lead to them going against their religious beliefs.

Such type of ethical controversies will continue to occur if we do not make people aware of the science behind genomes and genetic similarity. Genes are just combinations of A, C, G and T molecules. All living organisms share common ancestors in the past as they originate from the same phylogenetic tree due to which all organisms are genetically similar to the one another.

The most controversial GE foods have been strawberries and tomatoes, which are genetically-engineered to have more frost-resistance and longer shelf life by adding anti-freezing genes in them from Antarctic fish. This is done with the help of *Agrobacterium tumefaciens* vector. Here, 60% of tomatoes and strawberry genes and 84% of fish genes match our own! Pork, the most consumed meat in the world, is 84% genetically similar to humans and about 60% of a banana's genome matches our own. So, you eating more than 50% of a human while eating pork or banana!

Therefore, religious controversies regarding GE food are unsubstantial as they do not hold any logical significance.

## MISUNDERSTANDINGS!



### References & Photo credits:

1. <https://veganpublishers.com/gmo/>
2. <https://link.springer.com/article/10.1007/s10806-012-9429-4>
3. <https://rdo.psu.ac.th/sjstweb/journal/27-4/02-strawberry-gene.pdf>
4. <https://onlinelibrary.wiley.com/doi/pdf/10.1111/1750-3841.13191>
5. Comic made using <https://www.makebeliefscomix.com/Comix/>
6. Photos from Pixabay, Pexels

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# BIOTECHNOLOGY & BIOINFORMATICS TIDBITS



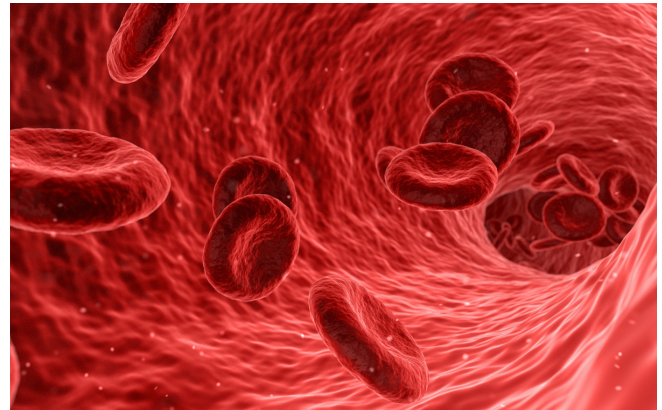
## CONTROLLING GENES USING BLUE LIGHT?

Researchers from University of Bonn have devised a new and ingenious method to control the shredding of mRNA transcriptions using molecules that can be controlled by light.

Normally, when cells no longer need a protein, they destroy the mRNA coding for a protein by shredding. Using this mechanisms, researchers were able to add markers to mRNA so that the proteins were never built at all. This technique was RNA silencing and it has been used to understand the function of various mRNAs in the cell.

The new technique utilizes PAL, a bacterial molecule that changes shape in the presence of blue light. A pocket on this PAL molecule acts a sort of switch to which molecules called aptamers can bind. In this research, scientists used markers that can shred mRNA and bound them to aptamers. This means that in the presence of blue light, the PAL binds to the aptamer and the marker cannot shred the mRNA and so the proteins are made.

Since this approach can be used on any kind of cell provided we have a degradation marker for a gene, we could soon be using blue light to learn what roles various proteins play in the cell.



## NEW DATA FROM THE GTEx PROJECT

The Genotype-Tissue Expression (GTEx) project, a consortium of many research groups and institutions aiming to find out how genes are regulated in various tissues, has uploaded a new series of datasets which could provide wonderful insights into gene expression and regulation in 54 different tissues of the body. The data collected from hundreds of recently deceased patients can prove to be immensely helpful in understanding how genes are regulated and diseases are caused.

## MUTATIONS ACROSS POPULATION CAUSE CHANGES IN BLOOD CELLS

A study of DNA variation in blood cells from 746,667 people around the world has shown that there are mutations specific to populations and these could explain why certain populations can resist infections and others are more likely to cause cancer. The researchers from University of Montreal, who tested 45 million mutations from each sample, say that this is a major step towards understanding populations and further studies on how these mutations affect the health of individuals could prove to be fundamental in creating personalized therapies.

**We want to hear from you!**

If you want your opinion on biology to be featured in our next issue, please send it to [181824@juitsolan.in](mailto:181824@juitsolan.in).

**You can write to us even if you have any ideas or feedback for us!**

### References & Photo credits:

1. [https://www.sciencemag.org/news/2020/09/invaluable-database-helps-solve-mystery-how-genes-are-regulated?utm\\_campaign=NewsfromScience&utm\\_source=Contractor&utm\\_medium=Twitter](https://www.sciencemag.org/news/2020/09/invaluable-database-helps-solve-mystery-how-genes-are-regulated?utm_campaign=NewsfromScience&utm_source=Contractor&utm_medium=Twitter)
2. <https://gtexportal.org/home/>
3. <http://dx.doi.org/10.1016/j.cell.2020.06.045>
4. <https://www.sciencedaily.com/releases/2020/09/200904090308.htm>
5. <https://www.sciencedaily.com/releases/2020/09/200925113327.htm>
6. <http://dx.doi.org/10.1038/s41467-020-18673-5>