ATAVISM

A STUDENT-RUN SYNAPSE NEWSLETTER

AUGUST 2020 · Volume 3 · Issue 2

ABOUT US

With an aim to nurture skills of all students, the Department of Biotechnology and Bioinformatics, JUIT, has created a platform called Synapse, for students to develop and exhibit their technical, outreach, arts and other skills.

About the name: Atavism is a phenotypic trait that appears suddenly in an organism. Yes, it refers to that dolphin with legs and the baby born with a tail! And just like its name, this newsletter is a little something of the blue. It is an effort to reach out and bring all of us at Department of BT & BI together. We are working on bringing to you the latest news in the biotechnology world, bizarre but true science headlines, and conversations that you should hear more of.

DEATHLY ARTEMISININ-RESISTANT MALARIAL PARASITES FOUND IN RWANDA!

Malaria is a deathly disease caused by the Plasmodium falciparum and led to around 405,000 deaths in 2018. Every year, millions contract the disease and Africa carries a large amount of the disease burden (more than 90%). After chloroquine-resistance became widespread, artemisinin-based therapies have become the standard for malaria treatment. Artemisinin comes from the chinese medicinal plant called Artemisia annua, also known as sweet wormwood. Other than malaria, Artemisinin can also inhibit some viruses, cancer cells and schistosomiasis.

A study on malarial parasites isolated from patients in clinical trials for artemisinin-based drugs has found a mutation (Pfkelch13 R561H) that makes the parasite resistant to artemisinin. The mutation Pfkelch13 R561H has also shown resistance levels similar to the Pfkelch13 C580Y mutation widespread in South-east Asia. Genetic analysis of the parasites also shows that the Pfkelch13 R561H mutation has originated in Africa itself. This study shows that artemisinin may soon be ineffective for treatment of malaria. Find the paper here.

References & Photo credits:

1. Fauxels by Pexels. Available under the Creative Commons Zero (CC0) License. Lucas Allman from Pexels. Available under the CC0 License. Downloaded from the Focused Photo Collection.
2. Uwimana, A., Legrand, E., Stokes, B.H. et al. Emergence and clonal expansion of in vitro artemisinin-resistant Plasmodium falciparum kelch13 R561H mutant parasites in Rwanda. Nat Med (2020). https://doi.org/10.1038/s41591-020-1005-2
3. https://www.who.int/news-room/fact-sheets/detail/malaria

4.10.3389/fpls.2017.01966, https://doi.org/10.1007/s11274-018-2432-9

A CONVERSATION WITH THE HEAD OF DEPARTMENT!

A few days ago, we got a chance to ask our Head Of Department, Prof. Sudhir Syal some questions about teaching, his job and research. The conversation was so great that we couldn't resist sharing a few excerpts of this lovely interview.

Q. When did you decide that environmental biotechnology is for you?

- When I was in PG, we had a subject called Ecology which had a lot of field activities. These allowed us to be near to nature and see the innovative way in which locals solved their problems.
During my PhD, I read about how oil spillage has caused damage to the aquatic species. These motivated to take up environmental biotechnology, an area which allowed me to go to villages and visit industries.

Q. How do you make sure that research doesn't become monotonous for you?

- If you don't want research to become monotonous for you, it is important that you listen to peer groups, update yourself by constantly feeding your brain with literature, and interact with people working in the same field. Another thing is that you respect the views of everyone and be open-minded to learn from everyone. You have to know and accept your limitations to learn and grow.

Q. Which part of your job is the most challenging? Is it writing publications or grading students?

- I have been grading papers and writing publications for a lot of years now so that isn't very challenging. Perhaps the most challenging part of my job as a Head of Department and an administrator is to get along with everyone.

Q. Why Teaching?

- During your childhood, you imbibe a lot of things from those around you. My mother was a school teacher, my maternal grandfather, a principal. I was already passionate about teaching when I was in school and the wonderful teachers I had in my graduation & PG only strengthened this interest.

Q. How do you keep yourself updated on the latest happenings of environmental biotechnology?

- I learn a lot about the latest research from my students, be it PhD, M.Sc. or even B. Tech. students doing their projects under me. I also listen to lectures by eminent personalities while I am exercising in the mornings. If you want to keep learning, you have to learn to say 'I don't know'.

Q. How hard is it to do a PhD?

- It depends on five things and they are the **Why?,** whether or not you have financial support or fellowship, the area of your interest, your supervisor and the infrastructure and facilities of the lab/institute you're working in. If these are good, PhD will be a breeze for you.
If you don't have any of these, doing a PhD can be very difficult.

References & Photo credits:
1. Photo taken from the Faculty Page of the JUIT, Department of Biotechnology and Bioinformatics website.

We'd love to hear from you! If you have any queries or feedback, or if you're a student looking to contribute, please send an email to 181824@juitsolan.in.

WOMEN ARE LIKELY TO EXPERIENCE ADVERSE EFFECTS OF DRUGS!

Researchers from UC Berkeley have studied more than 86 FDA-approved drugs, their pharmacokinetics and the adverse effects of these on patients. They have found that many of these have worse side-effects on women and this has been attributed to the low number of females in drug trials. The researchers have also found that these effects are in no way related to a person's weight, but their gender.
This study highlights the need for more female volunteers in drug trials, something agencies worldwide have been stressing on. The paper can be found here.

MACHINE LEARNING PIPELINE HELPS IDENTIFY DRUGS THAT COULD BE REPURPOSED FOR TREATMENT OF COVID-19

New research published in the Journal ***Heliyon*** describes a new drug identification pipeline based on machine learning. This pipeline, developed by the researchers of the University of California, Riverside predicts novel drugs and volatile compounds that could use to target and also treat the novel coronavirus. The interaction between the human targets of SARS-CoV-2 and the chemicals and drugs were modelled computationally. If you wish to read more, the paper can be found here.

BIOTECHNOLOGY AND BIOINFORMATICS TIDBITS

- **Does deforestation make pandemics like COVID-19 more likely?** With the coronavirus pandemic bringing life to a standstill, scientists are now investigating how deforestation increases the likelihood of pandemics and epidemics. Since zoonotic hosts (animals that can transmit diseases to humans) are founded in greater numbers in areas that are human-dominated, deforestation can be a likely cause for pandemics. Read the whole paper here.

- **Stress can trigger gut microbes to cause more inflammation.** A new study in mice has found that increased stress can trigger the gut microbes to cause even more problems for those with the sickle-cell disease. A plausible explanation for this phenomenon is that stress causes the gut lining to become permeable to certain microbes that can wreak havoc in the body.

References & Photo credits:
1. Kaboompics.com from Pexels. Qimono from Pixabay.
2. Gibb, R., Redding, D.W., Chin, K.Q. et al. Zoonotic host diversity increases in human-dominated ecosystems. Nature (2020). https://doi.org/10.1038/s41586-020-2562-8
3. https://www.nature.com/articles/d41586-020-02263-y, https://doi.org/10.1016/j.immuni.2020.06.025
4. https://doi.org/10.1016/j.heliyon.2020.e04639
5. https://doi.org/10.1186/s13293-020-00308-5

Author: Janki Insan, 181824, Literary and Outreach Team Member, Synapse Club, Department of Biotechnology and Bioinformatics, Jaypee University of Information Technology, Waknaghat

Edited by: Literary Team, Synapse, Department of Biotechnology and Bioinformatics Club, JUIT.