

## From HOD's Desk

Dear Readers of Synapse,

Recently, I had an honour to interact with our Hon'ble Chairman Sh. Manoj Gaur Ji and his interest in the progress of the department is a great motivation for all of us. We are thankful to Hon'ble Chairman Sir and our VC Sir – Prof. Vinod Kumar ji for guiding us.



The journey of Corona Pandemic is still going on and even in this challenging times our department is bestowed with a sanction of a major grant of 1.3 crores for DBT M.Sc. Biotechnology Program. Dr. Anilkant is coordinator of this project. Congratulations.



Any department stands firm due to research work of its scholars. They are silent workers and contribute significantly in building the department. We greatly admire our past and current scholars. Five scholars, graduated during Pandemic time. Now these girls are doctorate and we are proud of them.

1. Congratulations Dr. Poonam and her guide Dr. Rahul Shrivastava
2. Congratulations Dr. Deepika and her guide Dr. Gopal Singh Bisht
3. Congratulations Dr. Kritika Kaushal and her guide Dr. Anil Kant
4. Congratulations Dr. Nupur Munjal and her guide Dr. Tiratha Raj Singh
5. Congratulations Dr. Sonia and her guide Dr. Jata Shankar

I take this opportunity to congratulate all. Department needs your best wishes and support as we started a new M.Sc. Program as well in Microbiology from the current session. My best wishes to Synapse team. Thank you for connecting with alumni Aditya Sahni. I had an opportunity to closely interact with him through a research project. He is one of our proud alumni and next time when you catch him, request for a singing performance as he was one of the leading singers of JUIT. Cheers!!

- Prof. Sudhir Kumar



## From the Faculty Incharge

A popular American English proverb, “when the going gets tough, the tough gets going” aptly verves with team SYNAPSE 2021 especially during the second surge of COVID-19. Synapse is not only reconnoitering different worlds of Biotechnology and Bioinformatics but also elevating the spirits of teamwork, leadership qualities and networking opportunities. On top of it all, it is cultivating the students' superlative soft skills as well as technical and human resource management skills with finesse. So, SYNAPSE is platform for holistic development.

- Dr. Hemant Sood

## ALUMNI TALK: An Interview with Aditya Sahni, Co-founder, ELEM India



Mr Aditya Sahni completed his B. Tech. in Biotechnology from JUIT in 2016, following which got his Masters degree in Process Safety and Environmental Engineering from University of Magdeburg in Germany. An entrepreneur at heart, he started Drishtikon in his final year of B.Tech and is now working on his newest venture, ELEM India. We got a chance to meet him virtually and talk to him about many topics, including his experience studying and working in Germany. Some excerpts from the session are shared below. You can read the full interview [here](#). The full interview discusses careers in research, visa and language requirements.

### Q: What advice do you have for undergraduate students?

I would say never give up on your hobbies, do what you want, do not get distracted by what others are doing and introspect; find the thing you want to do in life. Studying for long hours can be frustrating and a hobby helps you with that. Also, develop skills, be it educational or co-curricular. Building skills will get you a lot more opportunities than your grades.

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### Q: Why did you leave the campus placement in your final year?

During my final year, I was very clear that I wanted to do a PhD and go abroad. But, I decided to sit in placements for a company and I made it to the interview. I do not think I did very well in the interview but I was offered the job. Later on, a teacher asked me what I wanted to do and reminded me that the company is going to be investing in me and if I am unsure, I am also taking up someone else's opportunity. After that discussion, I stepped back.

### Q: When should we start preparing for competitive exams?

If you want to do MS or M.Tech. in India, you need to qualify the GATE exam. You cannot start preparing for the exam in your 7th or 8th semester, now is the time to start! You just have to find the subjects you are strong at. Scores are relative, doing six subjects out of ten thoroughly are enough to crack the exam. Understand your calibre, your pace and make target plans according to your learning capabilities.

### Q: What do you think is very important if a person is making plans to study abroad?

Decide where you want to go. Be clear about where you have to go, how much you can spend, what are your targets, and most of all, what is your purpose behind going there (do you want to settle there, or you just want to study and come back). These are the major things you need to keep in mind.

1. **Exams:** There are a few exams that you have to take so that you can check them off of your admissions checklist. You can give IELTS/TOEFL, GRE or GMAT.
2. **Research:** If you are interested in doing research, or you want to do a PhD later on, then the first thing to do is to identify the area you want to work in. If you know which area you want to work in, it streamlines your research and you can then hit the right target. You can search for programs of your interest on the German Academic Exchange Service website ([daad.de](https://www.daad.de)).

### Q: How to apply to German universities?

Some universities have application portals through which you can apply. You should be ready with your transcripts from the previous semesters, your passport, Class 10th and 12th certificates, any publications or articles you have published, and any achievements that you have along with your statement of purpose. You can also apply through a government portal, called Uni-assist, which is used by many government institutions for admitting students. If your application is sent to the university via Uni-assist, you will most likely be accepted. Just ensure you apply at the earliest. In certain courses, there are very limited seats and you are offered a seat as soon as they screen your application.

### Q: What do you recommend I do if I want to go to Germany?

Start today! Prepare for TOEFL/IELTS, GRE (certain universities ask for GRE) and do not wait until the last moment to give your exams and apply. If you start preparing and do it gradually, you will easily get great scores. Also, it's preferable if you have an A1 level German certification at least as this is the most basic and elementary level of the language.

Credits:

1. Interview by the Synapse Team, the complete interview can be accessed at: [https://drive.google.com/file/d/1VOrDqR\\_-FOKcYQ9LjquPIKNFHMgmj5J/view?usp=sharing](https://drive.google.com/file/d/1VOrDqR_-FOKcYQ9LjquPIKNFHMgmj5J/view?usp=sharing), we thank Mr. Sahni for sending us the photo.

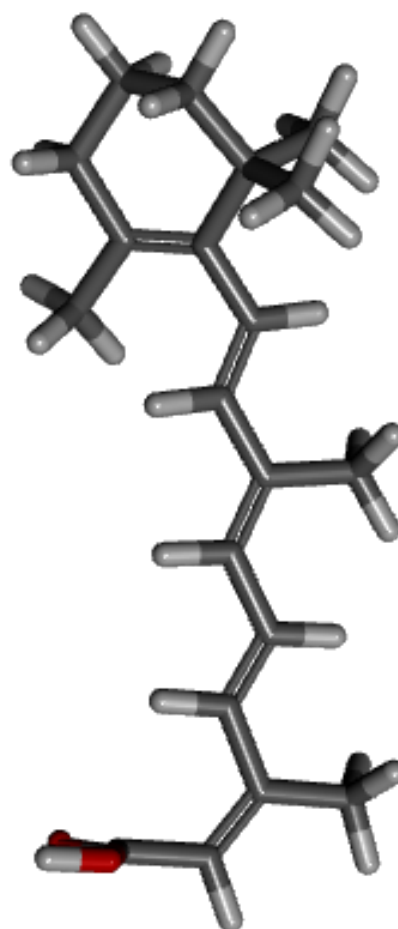
## ISOTRETINOIN: A DISEASE CURE OR A PRECURSOR?

Isotretinoin (13-cis-retinoic acid) is a vitamin A-derived drug touted to be the permanent cure for Acne vulgaris. Besides severe nodular acne, it is also used in the treatment of certain skin cancers. Originally sold by the brand name of Accutane, it has many generic versions with varying potency available on the market today. It has a reported efficacy of up to 90%, yet its use continues to raise eyebrows.

First, let us take a look at its pharmaceutical history. On launch in May 1982, Accutane's sales skyrocketed far beyond the expectations of its original manufacturer, Roche Pharmaceuticals. But within only nine months of its launch, babies born with birth defects started getting reported. Later, both doctors and scientists who worked on the drug testified to have been aware of the potential dangers associated with the drug.

Isotretinoin is a teratogen (embryo malformation-causing agent) and is highly likely to cause birth defects like visual impairment, missing or malformed earlobes, small or missing thymus gland, congenital heart defects, facial dysmorphism, and abnormalities in the brain function. Consumption of even a single dose by women during pregnancy or a short time before conceiving can lead to the appearance of these conditions. Pregnancies of most women who take this drug end up in abortion or miscarriage. Isotretinoin also affects the gastrointestinal system and reproductive system where it is known to cause inflammatory bowel disease and erectile dysfunction, respectively. Psychological side effects associated with Isotretinoin include depression and psychosis, though the former is relatively rare. Some temporary side effects include hair thinning, chapped lips, skin yellowing, headache, blurred vision, seizures, vomiting, dizziness, rectal bleeding, etc. Isotretinoin use is also linked with possible permanent effects like cessation of long bone growth in young people and decreased night vision.

Considering the various risks associated with Isotretinoin countries like Sweden and Italy have banned its usage. In many other countries, it can only be prescribed by dermatologists or specialist physicians. Women who may or do get pregnant while taking Isotretinoin are strongly advised and counselled to terminate their pregnancies. A program called iPLEDGE has been mandated by the Food and Drug Administration since March 2006 in the United States. iPLEDGE works as a risk evaluation and mitigation strategy with the major purpose of preventing pregnancy in women taking Isotretinoin. However, registration is mandatory for everyone taking Isotretinoin regardless of sex or gender. The program has received a fair share of criticism from medical specialists and consumers alike for its intensive monitoring regime.



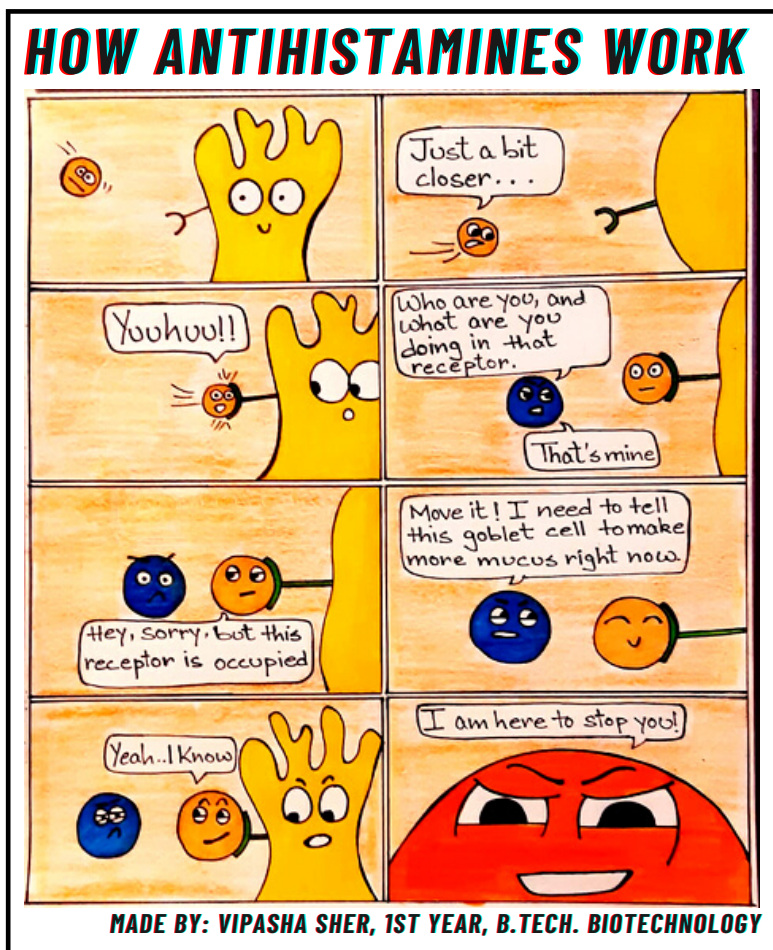
### References & Photo credits:

1. Isotretinoin structure downloaded from PubChem, PubChem ID: 5282379. Visualized using Discovery Studio Visualizer
2. Photo from stevepb from Pixabay.
3. [https://www.huffpost.com/entry/health-news-you-wont-read\\_b\\_130213](https://www.huffpost.com/entry/health-news-you-wont-read_b_130213)
4. <https://www.healthline.com/health/iplede>
5. <https://medlineplus.gov/druginfo/meds/a681043.html>

## Complete human genome sequence: Are we there yet?

When the first human genome sequences came out in 2001, sequences from about 15% of the genome were missing. As newer technologies were developed, these missing areas began to be sequenced. In 2013, the missing sequences went down to 8%. Recently, scientists collaborating from across the globe have released a preprint which shows that they now have covered all the missing regions and added 200 million base pairs to the sequence published in 2013.

They have also discovered 115 new protein-coding genes, taking the total of genes to 19,969. The sequencing experiments were carried out using cell-line derived DNA[1].

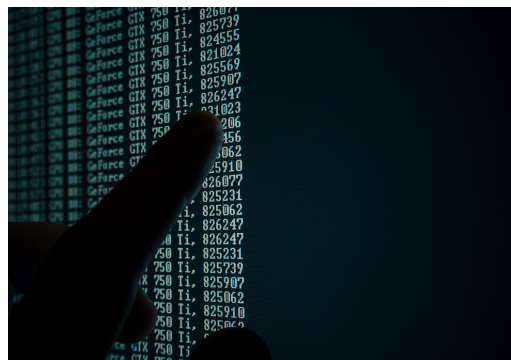


## Articles you shouldn't miss!

### CRISPR INJECTED INTO THE BLOOD TREATS A GENETIC DISEASE FOR FIRST TIME

Results of a clinical trial that used a CRISPR-Cas9 approach to treat transthyretin amyloidosis have been published. This article from Science tells you all about it and other interesting treatments being developed using CRISPR-Cas9 [2].

### EVERYONE SHOULD DECIDE HOW THEIR DIGITAL DATA ARE USED—NOT JUST TECH COMPANIES



This excellent article discusses the problems faced with the large amounts of data being collected from our devices every day. If you enjoy reading about how your data is being used, this article is going to be a lovely read for you! [3]

### CANCER CELLS EAT THEMSELVES TO SURVIVE

Yes, this new research by Danish scientists adds more to the questions we have about cancer. If cancer interests you, this news report is going to too! Read [here](#) [4].

## ARE YOU EVEN READING?

If you are, you're sure to have feedback for the team. Send it to [181824@juitsolan.in](mailto:181824@juitsolan.in) so that we can know. We would also love to feature your opinion on biology topics or your coverage of the latest research in the next issue. Your email could make our day!



References & Photo credits:

- <https://www.nature.com/articles/d41586-021-01506-w>
- <https://www.sciencemag.org/news/2021/06/crispr-injected-blood-treats-genetic-disease-first-time>
- <https://www.nature.com/articles/d41586-021-01812-3>
- <https://www.sciencedaily.com/releases/2021/07/210702153918.htm>
- Photos credits: Pexels, Pixabay

# ARE BIOTECHNOLOGY AND BIOINFORMATICS BECOMING MORE RELEVANT TODAY?



This piece has been written to highlight the prominence of the field of Biotechnology and Bioinformatics. Often, Biotechnology and Bioinformatics are mistaken to be the same thing but they certainly are not. And while science has rapidly developed within the last few years, Biotechnology and Bioinformatics remain fields that are largely undermined and often disregarded. Careers in engineering (software) and medicine, on the other hand, are perceived to be of greater importance and those with very high dignity. It is such a saddening fact that despite Biotechnologists and Bioinformaticians contributing to numerous roles in science, students are never encouraged to take up biotechnology and bioinformatics as their majors.

The situation is especially horrific in a developing nation like ours. We all know how Research and Development is a crucial element for the furtherance of any field whether it is medicine, law, political job or any other branch of engineering. And this is especially true for Biotechnology and Bioinformatics. Our tools and techniques may not seem familiar and enjoyable, but they are all revolutionary.

Do you, by any chance, know of tissue culture, the technique which involves the production of plants in vitro by taking some living cells. It is the reason many medicinal plants can be grown quickly under laboratory conditions and used for treatments.

And, how can we even forget the Polymerase Chain Reaction? Also known as PCR, this process is used to produce millions of copies of DNA and is used for anything from solving a crime scene to testing for COVID-19. Let's also mention flow cytometry while we are it, because if it was not for flow cytometry, we'd have nothing for cell counting, cell sorting, biomarker detection, and protein engineering.

The list of techniques that have helped us in all spheres of life is never ending but you need to know how important it is for Biotechnologists and Bioinformatics to use statistical analysis. They do spend a lot of time, crouching over their lab notebooks and making sense of all kinds of experimental data. Absolutely that kind of data which impacts how we are treated when we're sick!

We could go on, but I think we have made our point. You will have to accept that people in the fields of Biotechnology and Bioinformatics do contribute to the advancement of various resources in the health department, medicine factory, R&D centers, and industries. Biotechnologists work with environmentalists, businessmen, pharmacists and engineers to make this world more habitable place for animals and humans alike. They use renewable sources of energy to replace non-renewable ones. They work on pollution-free automobiles and manage the wastes from factories and hospitals.

It is high time we change our perception of these fields, because if there ever comes a drug for COVID-19, it will be due to Biotechnologists and Bioinformatics optimizing, testing, validating the drug molecule.

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Efforts by: **Synapse Club, Department of Biotechnology & Bioinformatics, Jaypee University of Information Technology**

References & Photo credits:

1. Piece written by Ragini Mishra
2. Photos from Pexels & Pixabay.