ZOOLOGY DEPARTMENT | MAITREYI COLLEGE

IRIDESCENCE

ISSUE 6: SESSION 2025-26

Timekeepers of the Wild

Where evolution ticks and the wild keeps time

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Source: Unsplash

From the Principal's desk

Prof. Haritma Chopra
Principal, Maitreyi College

I am very happy and excited to present the sixth issue of Iridescence, the annual e-magazine of Zoology Department, to all its readers.

Iridescence, as in the past five years, has been showcasing the multitude of talents of both the students and faculty members of Zoology and Life Sciences departments. This year's issue focuses on the theme Time-keepers of the Wild, and includes a diverse, evocative, and artistic collection of articles, poems, travelogues, photographs, crosswords, book recommendations, interviews with scientists and our alumnae.

I would like to extend my appreciation to the editorial team, advisory board and all the contributing students involved in the production of this magazine. And, I encourage future contributors to keep up with the spirit of the magazine.

Happy reading!

The Advisory Board

"*Mic testing... check one, two, three.*" This sound check ensures that everything is in order and the show is ready to be staged. It marks the beginning of a performance, ready to be presented to the audience by a team that has put in immense effort and endless rehearsals behind the scenes. Yes, we are finally here! — Team Iridescence arrives with its sixth edition, the Annual e-magazine of the Zoology Department, Maitreyi College, bringing new science stories that explore diverse themes, beautifully illustrated with photographs captured by our students.

It is an absolute pleasure to welcome you to this edition of Iridescence. It has been a wonderful year for us. We have been so relaxed since we selected our team of Editorial Board members. The team has worked admirably, cohesively and with utmost dedication. As always, we have tried to bring out an issue that is more appealing than the last one, while maintaining the standards set by the previous issues. The magazine is a compilation of diverse contributions — articles, interviews with scientists and our alumnae, science poetry, photographs, illustrations, travelogues and a special books section.

It is not just a magazine; it is a showcase of the talent of our young minds who work together as a team, developing skills in editing, creative writing, production, post-production, and beyond. As a team, they encounter new challenges and opportunities, learning to respect each other's vision, agreements, and disagreements while working in a cohesive and collaborative manner. We are honoured to have been part of this vision for the past five years and will continue this journey with utmost sincerity and dedication, as new members join each year to showcase their talent and hard work through the pages of our magazine.

To all the readers, we wish you would like and enjoy this year's compilation and appreciate the efforts of the team. We would welcome and eagerly wait for your feedback, questions, suggestions, or concerns, at zoomagazine2020@gmail.com.

Dr. Anshu Arora Anand
Lt. (Dr.) Archana Aggarwal
Dr. Jaspreet Kaur

A Letter to You

FROM:

The Editorial Board

Shreyanshee Vaidya

Editorial Head

B.Sc. (H) Zoology, III Year

Having once been a member myself, it feels both surreal and deeply emotional to write this as the Editorial Head of Iridescence. Over the past three years, this magazine has been more than a publication to me, it has been a journey of growth and learning. I have found in it a space where my love for biology could merge seamlessly with creativity, where curiosity was not just encouraged but truly celebrated.

As I step away, I carry immense gratitude for the people, the process, and the countless ideas that came to life through shared effort, and give you the sixth edition which stands as a true reflection of our collective passion and dedication.

I hope as you turn these pages, you find yourself asking questions, noticing details, and feeling inspired not just by science, but by the beauty of nature and the art that lies within it. If this issue sparks even a small sense of wonder or creativity, it has done what Iridescence has always done for me.

Design Head

Lyra Singh

B.Sc. (H) Zoology, III Year

Iridescence holds a very special place in my heart. Watching it come to life last year as a member was a beautiful experience, but as the Design Head this time with added responsibilities, this edition feels very personal. The magazine gave me a space to explore my love for biology and the natural world and express it in the most creative and artistic ways. Whether it is science, books, art or presenting it all through different designs, I could work on all my interests to bring something this beautiful to life.

And it wouldn't have been possible without the amazing set of people I have worked with on this, all of them brimming with so much creativity and brilliance. I hope you immerse yourself in these pages and let the fascinating world of science captivate you, like it has with all of us.

Janvi

Marketing Head

B.Sc. Life Science, II Year

Being a part of Iridescence has been nothing short of an honour for me. This beautiful journey has been exciting as well as very inspiring. I have witnessed the power of storytelling unfold into the most beautiful and amazing ways. From enlightening articles to inspiring interviews to awesome media recommendations, we bring it all together for our readers. Hope you enjoy reading our magazine as much as we loved creating it for you. Happy reading!

Akshara Saxena
B.Sc. Life Science
III Year

From a blank page to pure magic, being a part of the Editorial Board felt like discovering sparkle on every page. What started as ideas and drafts slowly turned into something beautiful. We hope you enjoy this magazine as much as we did while creating it. Wishing you an informatively creative read.

I really appreciate the chance to be part of the editorial board of Iridescence. Being a Life Sciences student and working on the magazine enhanced my experience even further as it not only broadened my views on wildlife and nature but helped my skills develop as a writer and an editor. I loved how committed the team was in making this magazine a success. I truly enjoyed contributing to a platform that values the beauty of the natural world and I am thankful to everyone who played a role in making this experience both meaningful and memorable.

Anjali Mishra
B.Sc. Life Science
III Year

Khushi Walia
B.Sc. Life Science
III Year

Being a part of the editorial team for this magazine has been a really special experience for me. The entire team has put in a lot of effort into curating something this meaningful, and working on it has been just as enjoyable as it has been rewarding. I truly hope our readers enjoy going through this edition as much as we enjoyed creating it.

This being my first time working on the magazine made the experience even more meaningful. From ideas to execution, it has been a journey full of learning, creativity, and growth. It helped me see things from a new perspective and appreciate the effort behind every page. I'm thankful for this experience and hope you find this magazine as engaging and enjoyable as we found it while creating it.

Vashita Vishwakarma
B.Sc. Life Science
III Year

Ishika Poswal

B.Sc. Life Science

II Year

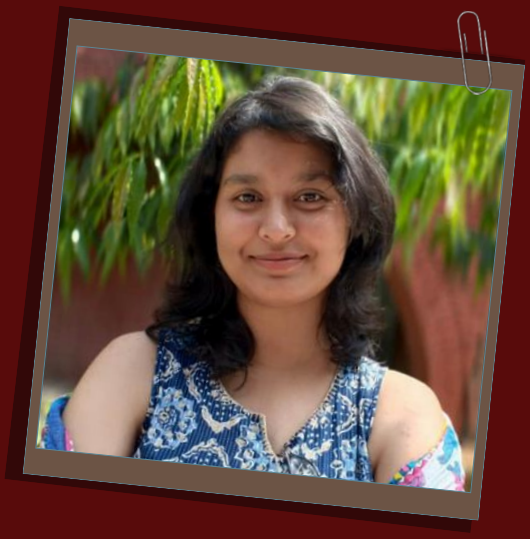
This is my first time being a part of the editorial board, and it has been a truly wonderful experience. From brainstorming ideas to meeting last-minute deadlines, every step has been truly rewarding. I got the opportunity to learn many new things and understand the importance of teamwork and coordination. Working with such sweet and supportive members made this journey even more special. I am really grateful for this opportunity and look forward to working together again in the future.

Being part of the magazine has been like stepping into a space where seeds of thoughts and creativity blooms beautifully into ideas that will last. Let it be finding the perfect picture or curating the best edits or simply observing and showing the beauty of nature around us. It made me realise that there's always more to everything and I hope you find this magazine evocative and learn something interesting.

Cheshta Yadav

B.Sc. (H) Zoology

I Year

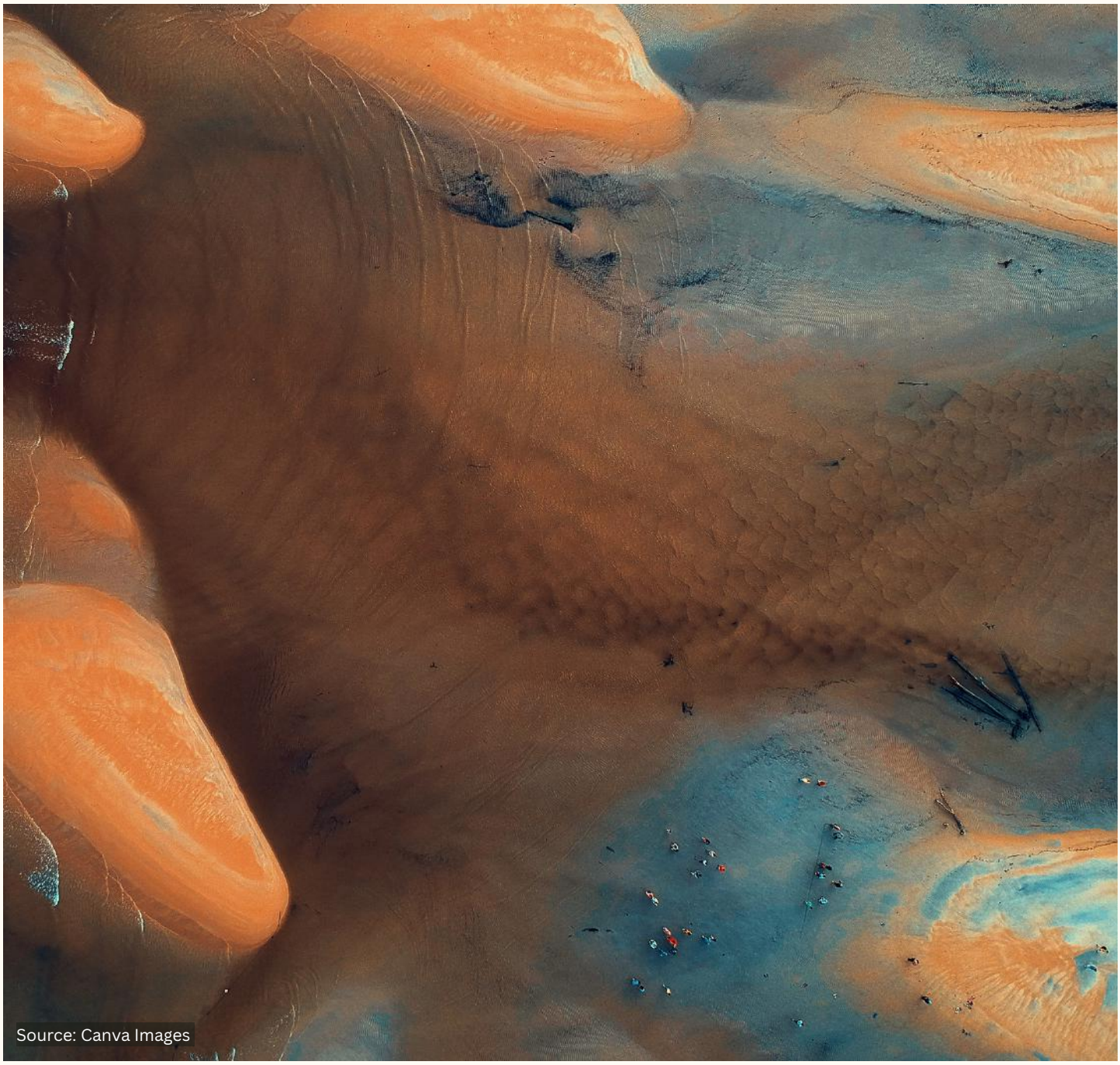


Kavya Subodh

B.Sc. Life Science

I Year

Working on this magazine has been one of the most insightful experiences I've had, from working on creating fresh ideas to interviews, articles and everything in between. I couldn't have asked for a better experience. I hope you have as much fun reading this beauty as we did in creating it!



Source: Canva Images

STEM-INIST ERA

Interviews

Scientist's Interview

"Nothing in life is to be feared, it is only to be understood. Now is the time to understand more, so that we may fear less."

— Marie Curie

QnA with **Dr. Munia Ganguli**, Ph.D.
Scientist G, CSIR-Institute of Genomics & Integrative Biology (CSIR-IGIB),
Professor, Academy of Scientific & Innovative Research (AcSIR)

Q How did you pivot from your early academic years to nanotechnology research, and what were the key hurdles in establishing yourself as an independent investigator?

So basically, my training has been in chemistry, my graduation, post-graduation, as well as my PhD. I did work in the area of material science; I was doing my PhD at the Indian Institute of Science (IISc), and that's where I got interested in material properties, understanding materials and how they behave. Nanomaterials were part of that, it was a 'boom' at that time. I didn't work on them directly then, but I was in a department where it was one of the buzzwords, and I was surrounded by people working in the early days of nanotechnology. When I came here, my job was to build a bridge between nanomaterials and biology, specifically, how you can use nanotechnology to understand biological processes and apply them to a biological context. As you can imagine, I was not really trained in biology, so it was a big jump. But the good part was that the Institute had a lot of resources. My colleagues were mostly from biology backgrounds, so I could learn a lot from them. My students have mostly been from biology backgrounds, and I learned a lot from them as well. It was a give-and-take, it wasn't straightforward and there was a lot of catching up to do, but I think the environment here made it possible.

Q Which foundational lab techniques and analytical skills are indispensable for zoology and life sciences students pursuing a research-heavy career in biotechnology?

During graduation and post-graduation, you learn fundamentals like molecular biology, biochemistry, and lab techniques, often through a six-month dissertation. While today's resources cover theory and practice, the core of research curiosity and observation cannot be formally taught. Experimental science relies on asking "why" when things don't work; without careful observation, you might miss a failure's lesson or a new discovery. In biology, dealing with living systems requires meticulous, unbiased data analysis. These critical skills aren't learned in a course but are developed by doing, observing mentors, and engaging with peers, the inherent qualities of a successful researcher.

Q How would you describe the current academic and collaborative culture within your laboratory, and how do you define "success" for a research project?

I maintain a lab size of eight or nine people to ensure a well-knit environment with high interaction. Projects are rarely individual; they typically involve PhD students, assistants, and trainees working together in a collaborative space where adjusting to each other's styles is essential. This spirit of collaboration extends to the institute level as well. Since no single lab has every resource or area of expertise, reaching out to others is necessary to answer complex research questions. With about 35 to 40 scientists, our institute thrives on these critical interactions. Modern science is no longer purely individual-driven; solving the bigger questions requires a collective approach where a group combines its diverse strengths.

Q Among the many projects your laboratory has undertaken, is there a particular research achievement that you are especially proud of?

It's difficult to choose a favorite because every project is significant; the belief that a pursuit is worthwhile is amazing in itself, even if results differ from expectations. However, two projects stand out. One gained international recognition, including in Chemical & Engineering News, when we developed a "cold screen" for the DRDO, a chemical mixture applied to the skin to prevent frostbite. This was a unique and special departure from my usual work. The second is a recently completed project that has opened many new avenues. We designed unique polymers capable of delivering nucleic acids to the brain. This is incredibly challenging because the blood-brain barrier normally blocks such large, hydrophilic molecules, but our polymers condense them into particles that cross efficiently. We are now pursuing similar designs for other organs, making this work very dear to me.

Scientist's Interview

In your view, how has the scientific environment changed over the years in terms of inclusivity and opportunities for women in research?

It's difficult to say things have stayed the same, as we have come a long way compared to fifty years ago. I saw the struggles my aunt faced as a scientist at BHU, which were incredibly hard. Today, there is finally a recognition that it isn't a level playing field and we must make it equitable. Many government and institutional schemes now encourage women to stay in science, but we still have a long way to go, especially regarding the mindset. It is not about a "handout," but about accounting for certain aspects of a woman's life to ensure they don't drop out of the scientific ecosystem. Women are half the population; ignoring them hinders progress. In our institute, 70% of PhD candidates are girls, yet leadership positions across the country look like a shrinking pyramid. Women often struggle to juggle roles during their middle years, which is where funding agencies and leadership must provide space. Our culture and the people we work with must believe in this change for things to truly improve.

With the coming of AI and automation, given the trajectory of nanotechnology, what is the relative importance of integrating computational modeling with traditional wet-lab workflows for the next generation of researchers?

It is a crucial consideration that we must all bear in mind. In our work, we design specific chemicals to deliver nucleic acids in vivo for therapeutic purposes. Conventionally, we look at existing literature for cues and then handle the design ourselves. Internationally, where high-throughput screening is available, people screen thousands of compounds to find a match. However, AI is already changing that; you can now input existing data to identify the best solution before implementing it in the wet lab. This will soon become a routine, assistive tool that simplifies many aspects of our journey. It is going to change things for the better by making research much more efficient. In our own work, we are already exploring how AI can help us optimize our material design.

How have you intentionally structured your laboratory environment to ensure that women scientists receive the mentorship and resources necessary to lead high-impact projects?

Throughout my 20-year career at CSIR-IGIB, the composition of my lab environment had more women than men, largely because more female students apply. Every student comes with a unique story and I make it a point to listen. Many join us at 23 or 24, a time when societal or parental pressure to marry often conflicts with pursuing their career and aspirations. When these issues arise, I talk to the students directly. I believe that while your personal life should be rich, it should never come at the cost of your career and vice-versa. Balancing both is simply a matter of shifting priorities; some months a project requires you 24/7 and other times home needs you more. Recognising these dynamics is essential, especially for students from diverse backgrounds who may feel lost navigating these challenges. This is where the mentor's role is critical. At IGIB, almost 40% of our faculty are women, which is a rarity in India. This provides students with visible role models successfully navigating both spaces, proving they can figure out their own paths when given the right support.

What strategies do you recommend for women in science to navigate the unique pressures of a demanding academic and laboratory career?

Each day is different, some days the lab takes priority while on other days home comes first. It is vital to choose a work environment conducive to this growth, providing the room to navigate both spaces. As women, we often try to carry everything ourselves and feel guilty when we can't juggle it all, but many people are ready to help if you simply ask. If you don't reach out, the ecosystem won't know you are struggling and policies won't change. We have to realize we don't have to be 'Dashabhuja' (ten-armed), it is okay to falter and ask for help. I am deeply grateful for the support I've had; the house help who cared for my daughter contributed as much as my PhD students to my ability to work. Asking for help is not a weakness. We must also demand that partners share domestic responsibilities and tone down the burden of perfection. As Sheryl Sandberg says, "Done is better than perfect." Don't let the pursuit of perfection stop you. It is more important to keep moving forward, speak up, clearly state your needs, like workplace creches, and choose environments that support your cause.

Scientist's Interview

Q What piece of advice would you like to leave with the young students in the audience who aspire to follow a similar path in scientific innovation?

My key takeaway is to read extensively to shift your perspectives. Listen to podcasts, read interviews, and explore biographies, like the one on Jennifer Doudna, to open your imagination. If there is one thing to remember: read. And, you have to dream. You have to figure out what your passion is and not let circumstances stop you from that dream. You have to be bold enough, be strong enough, and also be vulnerable enough to achieve that dream. That is something that I think all students should keep in mind.

Interviewed by:
Janvi & Kavya Subodh

Insights from Dr. Munia Ganguli's lab

Photographs from lab of Dr. Munia Ganguli, CSIR, IGIB

Visiting Dr. Munia Ganguli's lab at CSIR-IGIB was a golden opportunity that felt truly surreal. For a Life Sciences student, walking through those halls was like stepping directly into the future of science.

I went in with so many questions about what a career in high-level research actually looks like. Seeing the marvels of nano-biotechnology in action and experiencing the high-energy environment Dr. Munia has built was a transformative experience. Her team isn't just doing research; they are working with a deep passion to solve real-world healthcare challenges.

I am incredibly grateful to Dr. Munia and her brilliant researchers for opening their doors and sharing their wisdom. Being there leveled up my own enthusiasm and gave me a sense of clarity that is hard to put into words.

If you want to witness the advancement and innovation that is redefining what's possible for our generation, scan the QR code to watch "A Day at CSIR-IGIB", a short video made by me, and immerse yourself in the journey.

Janvi
B.Sc. Life Science
II Year

Scientist's Interview

"Genes are like the story and DNA is the language that the story is written in."

— Sam Kean

QnA with **Dr. Aastha Mishra**, Ph.D.
Principal Scientist, CSIR-Institute of Genomics & Integrative Biology (CSIR-IGIB),
Associate Professor, Academy of Scientific & Innovative Research (AcSIR)

Q Every scientist has a "Eureka" moment or a mentor who changed everything. What were the primary academic catalysts and/or personal experiences during your foundational years that pulled you toward studying environmental disease risk and epigenetics?

I don't know about the eureka moment, but I can share an incident that generated a great deal of curiosity in me towards the intriguing field of science.
I very clearly remember when I was studying in Standard 7, I came across an issue of National Geographic that explained the 'Human Genome Project', a landmark project in human history that began in 1990. Reading that article was an eye-opening moment for me. This was not only new to me, but it also compelled me to look at science from a very different perspective.
I pursued my career in the same domain and completed my studies at one of the country's premier genomics institutes. I am fortunate to get the opportunity to work at the same institute.

Q When you look back at your journey, what were the initial thoughts or motivations that drove you to commit to your career?

Perseverance.
If I had to put it in one word, that would be the one I would go with. I was always a meticulous student. During my academic years, I took a focused approach and always kept it very simple. As I was moving ahead with that zeal and completed my academic milestones. Everything else started falling into place.
Whether it was a Master's, NET or JRF, the focus was clear to do my best at that point and time. Over time, my persistence, which defined my approach to studies, helped me navigate and eventually clear these milestones. As I moved through my PhD and the years that followed, I realized that what truly stayed with me was my perseverance.

Q For students currently pursuing Zoology or Life Science, what specific laboratory techniques and analytical mindsets do you consider indispensable for a career in molecular genomics?

Molecular genomics relies fundamentally on high-quality data, as it underpins reproducibility, reliability, and meaningful biological interpretation. This, in turn, depends not only on robust experimental design but also on skilled hands at the bench. While analysis is critical, it cannot rescue poor data. If the data is compromised, nothing downstream holds value. Therefore, strong hands-on expertise in genomic techniques and statistical rigor are essential, all grounded firmly in scientific integrity.

Q In your work on cardiovascular disorders within the Indian population, what specialized skills are required to successfully bridge the gap between genotype and phenotype data for real-world disease management?

This will largely be the same as the points discussed above. In addition, such research demands a tightly integrated, bidirectional ecosystem between clinicians, who directly engage with patients, and researchers who handle patients' samples and downstream analyses. A strong liaison between the clinical and research environments is therefore indispensable for establishing robust genotype–phenotype correlations. This can only be achieved through standardized SoPs, shared data systems, and continuous, well-structured feedback loops.

Q You've received prestigious recognitions like the INSA Medal (2016) and the DST-INSPIRE Faculty Award (2017). What were your thoughts and feelings in those moments? How have these honors practically influenced the growth and visibility of your laboratory?

Scientist's Interview

It encourages you to an extent that brings a sense of fulfillment and validation. I believe that receiving these awards early in my career helped me develop a mindset rooted in self-confidence, that led me to pursue a position that is a good fit for my skill set. However, a laboratory's growth and visibility are not determined by any individual's awards, instead by the collective strength of multiple factors evolving over time. In my view, the quality of science and strong, meaningful collaborations are the two most critical pillars for building a research-driven laboratory. Equally important is investing in junior researchers, not only in their scientific development, but also in shaping them as responsible and thoughtful individuals. They are the flagbearers of tomorrow's science, and nurturing the right qualities in them is essential to sustaining a healthy, progressive scientific environment.

Q What specific strategies do you recommend for fostering a professional environment that actually encourages women to stay in advanced research long-term?

It should not be about women, or for that matter, men. The real point, according to me, would be to keep it simple for any researcher if we wish them to commit to a productive longer term.
Create an ecosystem that helps them pursue their goal without any partiality. A system for equals.
I believe that only then can we create an environment where they would choose to stay and grow in the long term. At the heart of this is a culture of respect, which, in my experience, is the most important factor in any professional space. Researchers need support and mentorship, at the same time, they need flexibility and inclusivity that comes naturally, but not as special provisions for women. I also feel that access to opportunities should be based on merit and be completely unbiased. Strengthening this aspect, along with clear, supportive institutional policies, can make a meaningful difference in retaining researchers in the field, especially women.

Interviewed by:
Shreyanshee Vaidya & Khushi Walia

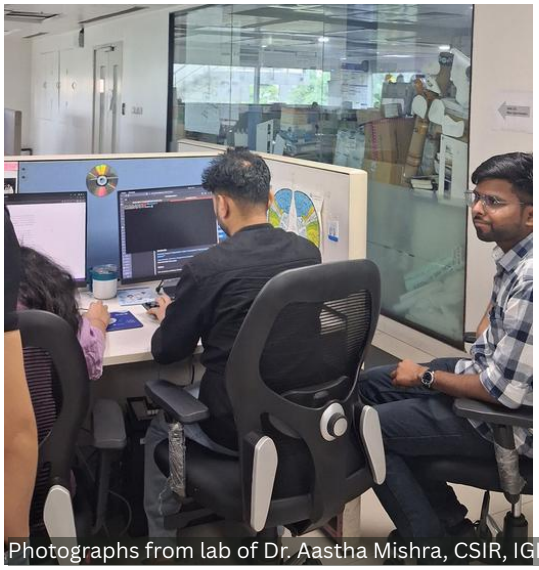
Q How do you view the current landscape for women in decision-making roles? What systemic or cultural shifts are still "missing" to ensure the next generation of female researchers has an equitable playing field?

Let me start with the example of our current Director General of the Council of Scientific and Industrial Research (CSIR), Dr. N Kalaisalvi.
Her holding such a prestigious chair itself establishes the position of women leaders in our landscape.
In my opinion, the domain we are in, it cannot be anything but merit. I cannot imagine a better time for my young female researchers. With advances in technology, especially in AI, we are better positioned to achieve better, faster, and more accurate outputs than ever. In this ever-evolving era, keep yourself updated and at par with the latest in your specific domain.

Q What message would you like to share for the aspiring scientists as they begin their professional journey in STEM?

Realize your immense potential and never hesitate to express your unique perspective and ideas. Build meaningful associations, stay committed to your path, and celebrate even the smallest victories along the way. Most importantly, never feel diminished by criticism, embrace it with an open mind, learn from it, and always keep believing in yourself.

Insights from Dr. Aastha Mishra's lab



Photographs from lab of Dr. Aastha Mishra, CSIR, IGIB

For a kid who loves biology, this place looked like a science nerd's dream. I have always had so many anxious questions in my mind, what would working in a research institute look like? How different exactly is the PhD environment? But being here, even if just for a few hours, has given me a sense of relief. Being at IGIB feels surreal, so many cubicles, desks, even if empty, all narrated stories of people who study or work there. An entire floor filled with amazing equipments and laboratory reagents, extremely grounded people whose minds were filled with wisdom and ideas, everything just made me feel a weird mix of thrilled and nervous.

This interviewing experience has levelled up my spark and enthusiasm. So in hopes of bringing clarity and motivation to you, I bring to you, my personal takeaways from our interactions with Dr. Aastha Mishra and her brilliant PhD students Swati, Roshni, Krishna, Kanika, Mansoor and others.

- Always network! You never know when or where you'll connect with someone who actually sees the spark in you. Maybe your future supervisor is sitting right across that table in the conference, so go put yourself out there.
- Peer discussions are gateway to success. Everyone comes across hurdles, what helps at times, is to look at a problem from a different perspective or from a distance, a fresh set of eyes will always help. Share your load, work on feedback.
- Don't treat opportunities as just a line in your resume, make sure wherever you go you perform to your fullest, you never know which place would provide you the most valuable lesson in life. There is always something to learn or unlearn.
- PhD needs commitment (and so does any other profession you chose) but moreover you should always learn how to balance. A mantra to remember is 'breathe and strike again', failures and setbacks are part of the journey, but not losing faith in your own self is crucial.
- Passion is of vital importance. Don't just go for the materialistic aspects of a career but also what it gives you. In the end it's you and what you will be after 10 years.
- At times, let life take its own course; maybe universe has wonders waiting just for you.

Shreyanshee Vaidya
B.Sc. (H) Zoology
III Year

Alumna's Interview

"Opportunities don't happen. You create them."

— Chris Grosser

QnA with **Sakshi Deonath**, B.Sc. Life Science, Batch of 2021-2025
Master's Scholar, Life Science Informatics, Technische Hochschule Deggendorf, Germany

Q Reflecting on your B.Sc. in Life Science at Maitreyi College, University of Delhi, what standout academic experiences laid the groundwork for your passion in life sciences?

During my B.Sc. in Life Science at Maitreyi College, University of Delhi, the exposure to the interdisciplinary nature of life sciences laid the foundation for my passion in this course. Subjects like Microbiology, Genetics, Bioinformatics, and Immunology especially caught my attention. Moreover, I enjoyed working in the practical laboratories. It was during this period that I realized I did not just want to study biology descriptively but also apply it analytically and technologically. That curiosity is what eventually pushed me toward Life Science Informatics.

Q How did your undergrad training in medical diagnostics prepare you for advanced lab work?

My undergraduate training in medical diagnostics offered me a solid practical foundation. I learned how to pipette, precision work, sterile handling, observation, and most importantly, patience if the results had any error. These fundamentals became very useful to me, as I already understood the importance of reproducibility in experiments.

Q Moving from India to Germany for your Master's, what global adjustment challenges, like cultural shifts, language barriers or academic differences, have you faced, and how did you overcome them?

Moving to Germany definitely came with challenges, language being one of them. Even though my course is taught completely in English, daily interactions require German. There are a lot of academic differences as well. Education in India is more theoretical than practical, whereas in Germany the focus is more on independent learning and its practical use in our lives. Honestly, I thought it would be difficult for me to adjust here. However, the people that I met here have been nothing but welcoming and warm.

Q What specific lessons from your undergrad journey were most crucial in helping you transition to advanced traineeships like MTT Assay and cell culture at the International Centre for Stem Cells?

The biggest lessons were patience and consistency. For a successful experiment, one needs to be precise and execute all the procedures with utmost care. This is even more important when it comes to cell culture, where contamination control is critical. I never let these techniques intimidate me; instead, I asked either professors or lab assistants to help me break down the complex steps into easy and understandable ones. This helped me remain confident with all the experiments.

Q Your leadership in Zeal Dance Society and sports awards (e.g. weightlifting and cestoball championships) built key soft skills. How do they support your adaptability abroad?

One thing the people often confuse is that academics and extracurriculars are very different. However, I believe they both had an equal influence on me. I learned teamwork, communication, and management skills through my leadership in Zeal Dance Society. Sports taught me discipline, perseverance, and how to remain calm and composed under pressure. While adjusting in Germany, these skills became very useful. These experiences helped me stay adaptable and self-assured, whether it was working with peers from diverse cultures or managing academic stress.

Q In your ongoing MSc in Life Science Informatics at Technische Hochschule Deggendorf, how are you applying certifications like Vaccine Technology alongside skills like DNA fingerprinting and immunoelectrophoresis?

What fascinates me about Life Science Informatics is how it integrates biological knowledge with computational knowledge. My prior lab experience and knowledge about vaccines, DNA fingerprinting,

Alumna's Interview

and immunoelectrophoresis have helped me have a thorough understanding of the biological side, while Informatics has taught me how the biological data sets produced from these techniques can be analyzed and modeled on a large scale.

What advice or key message would you share with juniors and readers embarking on their life sciences journey, drawing from your full path in academics, labs, and extracurriculars?

I would say always stay curious and never let anything limit your imagination. Life Sciences has a broader aspect than one could even think of. Analyze both laboratory and computational elements, as the field is evolving at a rapid pace. Also, don't overlook practical skills, internships, or extracurriculars, as they frequently shape you in ways that textbooks cannot. Always stay consistent, as showing up every day can make you stand on stages of life you could never have imagined.

Interviewed by: Janvi

"Somewhere, something incredible is waiting to be known."

— Carl Sagan

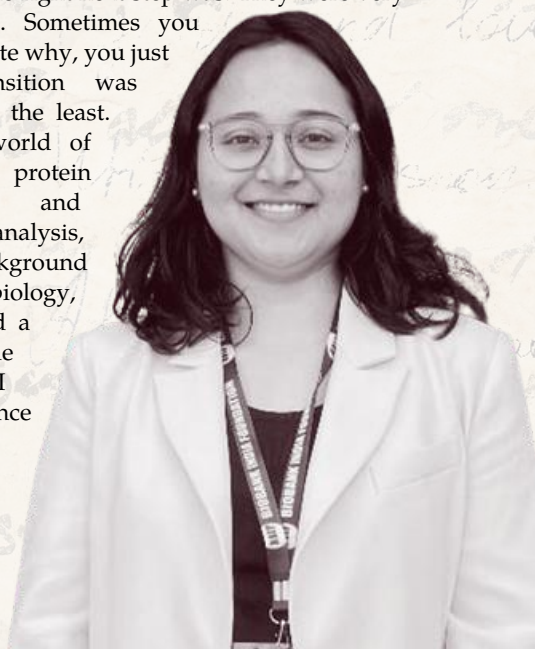
QnA with **Shivani Sharma**, B.Sc. (H) Zoology, Batch of 2015-18
Research Scientist, Memorial Sloan Kettering Cancer Centre, New York, United States

Please share your academic and professional background. How did your early experiences at Maitreyi College shape the research questions you pursue today, and when did the boundary between "learning science" and "doing science" first blur for you?

I pursued my B.Sc. (Hons.) in Zoology from Maitreyi College, University of Delhi. Zoology as a discipline, trains you to observe, whether it's animal behaviour, ecological systems or biological processes. By the time I reached JNU for my M.Sc. in Molecular Medicine, everything clicked. It was not just the coursework, it was the hands-on experience in the lab, active research discussions, working with actual experimental systems, troubleshooting real problems and seeing results take shape through your own effort. My supervisor, Dr. Souvik Bhattacharjee, was particularly influential, the way he approached scientific questions, the rigour he brought to the bench and the freedom he gave me to think independently really attracted me deeply to research as a career path. Working on *P. falciparum* parasite-host interactions during my master's dissertation made me realise I was not just studying science anymore, I was contributing to it, even in a small way. That foundation directly shaped the work I pursued in my PhD, developing rapid diagnostics for measles using RT-LAMP and CRISPR, funded by WHO-SEARO. The thread connecting everything has been a consistent desire to make diagnostics more accessible where they're needed most.

What motivated your first major career shift after undergrad, and what key lesson did it teach you about pursuing science?

After my B.Sc. in Zoology, I found myself constantly curious about what was happening inside the biological systems I had been studying. Zoology gave me an appreciation for life on a broader scale, how organisms function, adapt and interact, but I kept wondering about the molecular machinery that drives it all. That curiosity is what drew me toward Molecular Medicine at JNU. Honestly, it was not a very calculated decision at all. I remember going back and forth quite a bit, troubling many of my teachers in the Zoology department, asking for their guidance and trying to figure out what the right next step was. They were very patient with me. Sometimes you can't fully articulate why, you just know. The transition was humbling, to say the least. Moving into a world of gene expression, protein interactions and computational analysis, when your background is classical biology, means you spend a fair amount of time feeling lost. But I think that experience of starting over,



Alumna's Interview

of being a beginner again, was incredibly valuable. It taught me patience with the learning process and made me more empathetic toward complexity, both in science and in general. The other thing it reinforced was that your background is never a limitation if you're willing to build on it. My zoology training gave me a systems-level perspective that I didn't fully appreciate at the time but has quietly shaped how I think about research problems ever since, including during my PhD, where understanding disease in a broader public health context mattered just as much as the molecular work itself.

Q How has your view of academic success shifted since undergraduate days? What key experiences drove that evolution?

As an undergraduate, I think my understanding of success was fairly conventional: do well in exams, grasp the concepts and perform consistently. That's what the system rewards at that stage and honestly, that's what I focused on. But research has a way of quietly dismantling that definition. When you're in research, there are no marks for effort. An experiment doesn't care how hard you worked, it either works or it doesn't. And more often than not, it doesn't. I think sitting with failed experiments, inconclusive results and long stretches where nothing seems to be moving forward genuinely reshaped how I think about success. A few experiences really drove that shift. Working on my PhD thesis taught me that meaningful work is slow, iterative and often unglamorous. The published paper looks clean and linear, but the actual process is anything but learning to find value in that messy, uncertain process, was a real shift for me. Presenting at international conferences and workshops also changed my perspective, not because of the recognition itself, but because those platforms showed me that success in science is deeply collaborative and communicative. It is not just about what you discover but about how effectively you can share it, discuss it and have it challenged. So today, I think of success less as performance and more as contribution, however small, to a larger body of knowledge.

Q Beyond the scientific method, how did you craft your personal strategy for tackling research uncertainties in your intense research journey?

Honestly, I don't think I had a strategy at first, it developed slowly through experience and a fair amount of trial and error. In the beginning, when experiments failed or results were ambiguous, my instinct was to immediately repeat everything and work harder. But I quickly realised that working harder without stepping back and thinking differently rarely solves the actual problem. So, the first thing I learned was to pause before reacting, to sit with an unexpected result and ask what it might actually be telling me, rather than treating it purely as a failure. I also leaned heavily on conversations with my supervisor, with lab mates and even with people outside my immediate field. Some of my best troubleshooting insights came from discussions that weren't even directly about my problem. That taught me that isolation is perhaps the worst strategy when facing uncertainty in research.

Q How has South Asian University shaped your understanding of science as a truly global endeavour?

South Asian University has a very distinctive character; being established by eight SAARC nations, it naturally attracts students and faculty from across the region. And honestly, some of the most shaping experiences there had nothing to do with the lab. Making friends from Nepal, Sri Lanka, Bangladesh, and Bhutan, people with completely different cultural backgrounds and ways of seeing the world, broadened me as a person in ways that quietly fed back into how I think as a researcher, too. Within the research itself, collaborating with experts from WHO-SEARO and US-CDC during my PhD gave me a genuinely global perspective on what science needs to accomplish. Those interactions shifted my thinking from asking whether my diagnostic platform worked in a lab setting to whether it would actually be useful in a rural clinic with minimal resources. That is a very different and much more grounding question. So, SAU shaped my understanding of science as a global endeavour, both in and out of the lab, through the people I worked with professionally and the friendships I formed personally. It taught me that meaningful research is always in conversation with the world beyond your bench.

Q What's the one unspoken rule you'd share with a student aiming for an international scientific career?

If I had to pick one thing, I would say stay connected to your original purpose of why you entered science. But alongside that, build genuine networks before you need them. I think these two things go hand in hand. When your purpose is clear and you know you are trying to contribute something meaningful, the connections you build become more authentic. You are not networking to advance yourself, you are connecting with people who share the same larger goal. It is very easy to get caught up in the metrics, publications, citations and the institution you are at. But I think the most important question to keep coming back to is, "Am I actually contributing something?" Even if it is small. So, I think whether you build a national or international career is honestly secondary. What matters is that your work is contributing to something larger than yourself. If that purpose stays clear, the right collaborations, the right opportunities and the right people tend to find their way to you naturally.

Interviewed by: Janvi

Source: Photograph by Shruti Sarkar
B.Sc. Life Science, III Year

BIOFRAMES

Photography

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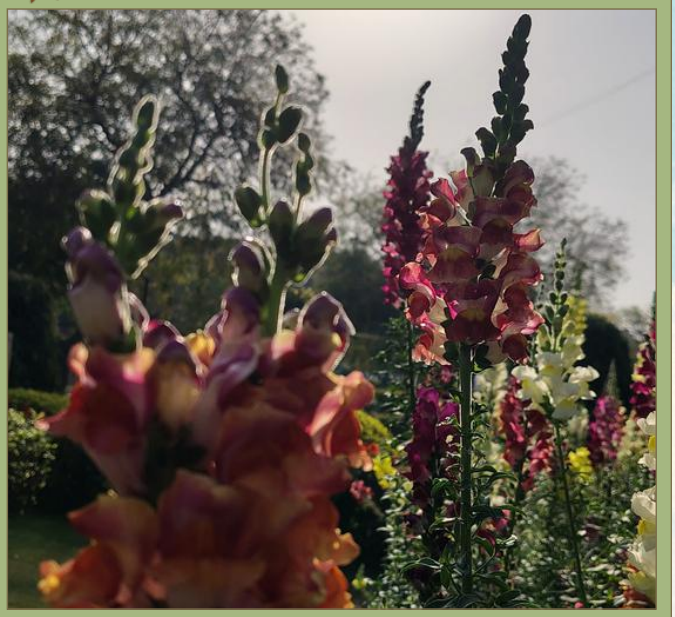

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Vashita Vishwakarma
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B.Sc. Life Science
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Shruti Sarkar
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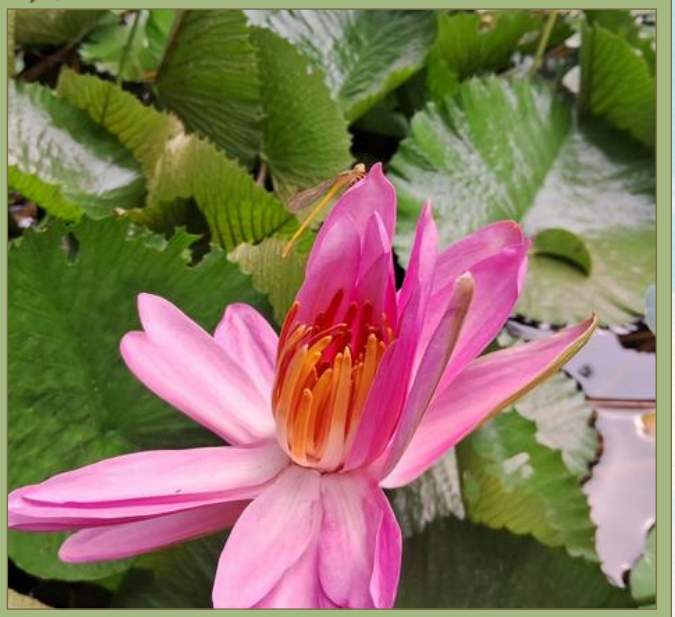

Khushboo Kalra
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Akshara Saxena
B.Sc. Life Science
III Year

Cheshta Yadav
B.Sc. (H) Zoology
I Year

Khushboo Kalra
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I Year

Source: Photograph by Shruti Sarkar
B.Sc. Life Science, III Year

INK & IMPACT

Articles

TIMEKEEPERS OF THE WILD: WHEN NATURE LEARNS TO TELL TIME

Time in nature cannot be told by looking at clocks or calendars. Time is gauged through changes in shadows, cooling of nightfall, arrival of rainfall in spring, and movement of the moon. Animals must be in the right place and take action at the right time to survive. The answer nature has provided to cope with this dilemma is the presence of a biological clock that is unseen, exact, and part of life itself.

These biological clocks have been referred to as biological rhythms, which help the organisms to organize themselves according to periodicities in their environments. The circadian rhythm has been identified as the most basic biological clock for regulating patterns such as sleep-wake cycles and hormone production. Derived from the Latin words '*circa diem*', which means "about a day," the term refers to a clock that functions regardless of light or dark conditions.

This process lies at the core of the whole system. In mammals, there is an area of the brain called the suprachiasmatic nucleus that serves as the master clock. Each day when light hits the eyes, the internal clock is reset, making sure that the clock is aligned with the time of sunrise. On the cellular level, certain genes work as clocks that switch on and off in cycles creating chemical messages that reach as far as behavioral rhythms. They cannot be seen, but control everything from waking up to sleeping.

It is clear that their influence extends to all life forms found on earth. While birds are active enough to sing and soar early morning, it would be impossible to spot the bats unless there is darkness around them. This is why the desert rodents operate during the night in order to conserve energy and water. There is a similar routine among insects. Wildlife timekeeping is not limited to just the day and night cycle.

Source: Unsplash

With the help of seasonal patterns, animals become able to understand natural timekeeping. Changes in days will make migratory birds ready for their long journey, amphibians will breed during monsoons, and mammals will prepare their bodies for winter. In the sea, we have another unique phenomenon carried out by corals known as the mass-spawning event. This phenomenon shows us that the moon too acts as a clock in nature.

However, in the present day, all these ancient timings are being disrupted by various factors. These include artificial lighting, which has made it hard to tell day from night; changes in the climate have led to shifting seasons; and habitat modification is taking place at a faster rate than organisms' circadian clocks can adjust to.

Nature's timekeepers have taught us that there is a particular rhythm in our life on Earth. Conservation of wildlife does not just mean conservation of the wildlife itself; instead, it is the conservation of the rhythm of nature that has been controlling the life on Earth for millions of years. The sound of silence of nature reminds us that time is another force of nature.

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ENGINEERING A GENOMICALLY RECODED ORGANISM WITH ONE STOP CODON

Scientists have long been fascinated by how the genetic code works - the system of codons which tells cells how to make proteins. Normally, all living things use the same set of 64 codons to code for 20 amino acids and three stop signals (UAA , UAG and UGA). But what if we could redesign this code to make new types of life forms that could use different or artificial amino acids? This idea has led to the creation of Genomically Recoded Organism (GROs) (Grome et al., 2025)

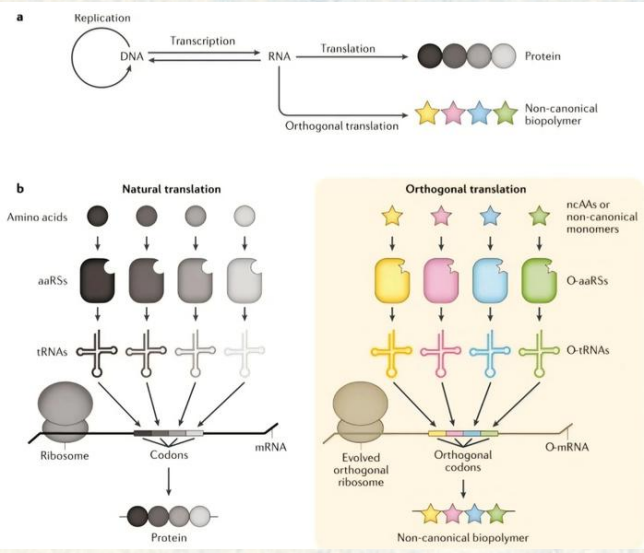
In this research, scientists successfully created a bacterium (*Escherichia coli)* whose entire genetic code was recoded to use only one stop Codon (UAA) instead of three. This means all the TGA codons in the genome were replaced with TAA. By doing so, they made space in the code to use the freed codon (TGA) for new, unnatural amino acids. This change can allow the organism to build protein with special properties useful in biotechnology and medicine (Chin 2020).

The team used several modern genetically engineering techniques.They began with a normal *E. coli* strain and replaced every instance of the TGA stop Codon with TAA using a method called MAGE (Multiplex Automated Genome Engineering). This process allows many DNA sites to be edited at once. Then they used CAGE (Conjugative Assembly Genome Engineering) to combine all the edited parts of the genome into one complete, fully recoded version (Isaacs et al., 2011)

They also used Red recombination, a precise DNA replacement technique, to help make targeted changes efficiently. Post editing, unwanted marker genes were deleted to prevent any potential mutations in the genome, keeping it stable. To further confirm that these changes worked, scientists checked the DNA by running PCR tests as well as whole genome sequences to ensure that every stop codon was replaced successfully without the introduction of any harmful mutations.

The bacteria were grown in different nutrient media, such as LB and TB broth, and treated with antibiotics to select only those cells that carried the correct DNA. Chemicals like IPTG and arabinose were used to turn on certain genes when needed .

To test if the genetic code functioned correctly, scientists inserted a fluorescent reported protein. If the cell glowed, it meant the stop Codon was being read incorrectly, but the results showed accurate stop recognition, proving that the single stop codon system worked efficiently. They also used computer tools like Alpha fold to predict how the new protein would fold and behave.



The figure illustrates the general process of genetic code reprogramming, where codons are reassigned to new meaning to expand the protein making capacity of cells.

Genetic code Reprogramming and stop Codon Reassignment.

This study represents a major step towards completely rewriting the genetic code. By reducing three stop codons to one, scientists created room in the genetic code to introduce new amino acids, expanding the possibilities of protein design . Such organisms can be used to produce new biomaterials, drugs, or enzymes that natural life cannot make.

To conclude, this work effectively opens new opportunities for future biotechnology innovation and synthetic biology by showing how the code of life can be reprogrammed safely and precisely.

Preeti Kumari
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THE EPIDEMIC OF BROKEN THINKING

The things you do to yourself, does things to you

The human brain is astonishing; it stores and keeps track of multiple patterns, ideas, and concepts. Everyone is born with an almost equal number of neurons at birth, how do they exhibit such great plasticity and retention all at once to give rise to such diverse thinking minds? The brain acts as a system for timekeeping aiding in maintaining attention span, memory consolidation, circadian rhythm and dopamine cycles. This article unravels how in this modern day world the constant extensive stimuli like social media, multitasking and fast content are disrupting these internal clocks.

The haunts of being chronically online

The internal clock of the brain that maintains our sleep-wake cycle is called circadian rhythm, this is controlled by a cluster of cells called the suprachiasmatic nucleus (SCN) located in the hypothalamus. The SCN activity is majorly influenced by light, and in today's world an extreme constant light exposure source is your digital gadgets! Today we suffer from the disease of constantly being online and surrounded by gadgets. Your smartphones emit blue light and radiation which degrades the quality of sleep, not only that but it also impacts vision, concentration levels and retention power. A person that often gives into doomscrolling tends to become more alert at night, and even minor disturbances cause sleep disruption or in extreme cases often lead to insomnia.

Overconsumption, a silent killer

Today, entertainment is available in the palm of your hand, there is little to no recreational or physical activity in one's day to day life, but rather an evil habit of endlessly consuming media content 'doomscrolling'. Now-available short form content has not only led to reduced attention span and impatience, but since it produces easy and rapid dopamine spikes it also leads to reduced sensitivity over time. This creates an endless spiral, where more and more stimulation is required for feeling any sense of joy or any other emotion, which in turn accelerates compulsive scrolling, causing functional inability to complete daily tasks. Not just the speed of stimulus or amount of content consumed but depletion of attention span, is another major issue today. 1-minute quick videos with skippable bits are dominating over the previously re-read books and journals and magazine kind of world, increasing reliance on audio-visual format of content. Additionally, since our brain has limited functional capacity to process or store information, these constant stimulations cause memory and sensory overload, and finally the brain switches to 'quick and shallow' mode of understanding for day-to-day tasks which in turn, triggers an entirely different set of psychological and life based issues.

Cognitive de-Evolution

Early humans evolved reasoning as a survival skill, to understand good and bad outcomes, decoding different patterns, be it social issues or scientific phenomena. In the current social scenario, where everyone wants to succeed and be the best, this skill is fading away. With the increase in accessibility of information and dependency on AI, the speed of outcome generation is currently seen as the symbol of efficiency. For any given task, or story, the rush to get to the point of conclusion is extensive. And this is where AI comes to the spotlight. AI (Artificial Intelligence) provides every possible information required in just a few seconds, without the need of any mental or manual labour. Since the brain trains itself on the basis of repeated behaviour (called neuroplasticity) if low-effort high-speed work is recognized as THE best, the brain and body tends to evolve in a way to generate similar outcomes. The value of 'Smart' work rules over 'Hard' work. Therefore, with time, the brain optimizes itself for speed instead of in-depth knowledge. And so begins, once again, a chain process that causes overall degradation of cognitive abilities.

Fast thinking, a calamity?

A few decades ago, quick thinkers were considered to be the epitome of smartness. In support of this ideology, Kahneman's 'Thinking, Fast and Slow' shines light on perks of fast thinking, how fast thinking is crucial for life, it's intuitive, biased and low effort, moreover a necessary survival skill. So why so much of an issue now? Empty vessels make the most noise, people have accepted skimming through topics or watching a clickbait reel on a sensational topic as a full fledged replacement of deep understanding. Shallow understanding is the death of understanding, learning and curiosity, not just that, it also impacts creative

capacity of a person leading to brain fog, memory block, and depleted retention and focus power. Society needs to embrace nuance again, accept that thoughts or concepts or theories can also be grey instead of just being black and white. The epidemic isn't fast thinking, but the fact that we stop there and don't reason anymore. Thus Fast-thinking, once meant to be a saviour instinct is now acting as an autoimmune disease.

Meta-cognition a crucial skill

Broken thinking is impacting creativity, curiosity, and logic which not only leads to death of originality but also meta-cognition. Ability to observe, re-think, analyse, rectify or improve one's own ideas and understanding upon new experiences or change in perception is META-COGNITION. To know one's own self deeply, is beautiful and magnificent, it is what makes us human. People are not perfect, improving and embracing flaws are both equally important. This is what controls the quality of work we bring forward, or the person we evolve into. As of now, we are dependent on AI for every niche thing, relying on something that keeps creating with absolutely no sense of originality or thought, but only repetition and similarity, leading us to absorb repetitive, often false information, as truth, therefore, entirely uprooting and killing reasoning and cognition. Today, the conclusions are not well thought but rather just sourced from AI or influencers, again based on their half-cooked interpretations or irrational beliefs in crowd narrative. Hence, the real problem is that the current world demands skepticism, whereas we now source information through human-trained-bots and brand-managed-influencers. Since natural selection does not care about intelligence and cares about rewards and adapting methodologically to the observed outcomes, it is important to change the narrative of successful outcomes and understand that sitting with a difficult problem rather than jumping into half-hearted conclusions or stolen ideas, is human, it is okay. Because sooner or later, efforts will be rewarded.

What comes next?

Realization of the thought 'I am unable to create or think something originally' has kept me up to write this article. As every other article ever written on the spectrum of self-help i'm not going to suggest '10 mindfulness activities to unlock your full potential' or 'ways to rewire your brain' but I would rather leave you with a thought - Humans evolved to be recognized as 'the smartest species to exist' because we were able to master time by tracking seasons, memory, and thought. But today, with this changing speed, in the everlasting rush, we might be losing the exact thing that made us intelligent; the ability to think, reason and generate. So where does this lead us to? How does this impact us evolutionarily? Do we, with time, start selecting fast processors but shallow thinkers? What happens in the world where thought and creativity no longer exists? Let these thoughts bother you, perhaps like me, it would push you to become a better, more thoughtful version of yourself.

Who needs to be blamed?

World and tech will always evolve, TVs have existed for decades before this, we never blamed the device for existing when someone spent numerous hours watching it right? Therefore, if thought well enough, advanced technologies and facilities existing in this developed world might just be both, the boon as well as the bane of our generation's existence. People like us who have fallen into the endless cycle of doomscrolling, overconsumption, and are unable to create or reason, have become so due to the outcomes of their own actions. Every habit you have built over the past few years will catch up to you one day, and each one will have a different consequence. It is crucial to be smart now, to take a step back when you can. Think about who and how and what you want yourself to be like in say 2050, your actions have a full-circle impact. The quick 5 minute scroll break turning into forgetting about the initial task, will catch up to you. It is on you to realise the flaw, the underlying issue and consciously choose what is best for you. As humans, technology is not to be blamed, it is us losing self-control and giving into easy wins. So strive to continue being the smartest species to exist and actively think and reason, find optimal ways to utilize AI and other available resources. Use them as tools to your success and not the only bearer of it. If the problem lies in disrupted internal timekeeping, the solution also lies within. Don't reject the technology but rather embrace it and learn how to rebalance your interaction with it. Remember that to be human is not to respond immediately, but to think and feel deeply. Let the tools created by mankind serve their fullest purpose in your life, while making sure that each scroll, each click is mindful and let it slowly heal your broken thinking because in the wild rhythms of time, maybe the best possible skill to learn is to know when to slow.

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KEEPER OF THE FOREST CLOCK

Field notes about the primate queen

The morning sunlight pierces through the vast, green canopy of the Tanzanian forest, touching the Earth as if illuminating it were its only purpose. Mother nature is in her truest form, as distant calls echo through the valley in the air which is thick with untouched purity. This is the heart of Africa, where the wild remains powerful and unrestrained, untouched as a place most never dared to enter. From afar, soft footsteps rustle against the forest floor. Out of the shadows enters a troop of chimpanzees, moving with the ancient rhythm of the wild. And trailing quietly behind them is a young woman-slender, sunkissed, with a notebook pressed gently to her chest. She doesn't walk with tardiness, rather looks confident of her choice. Her eyes bright with curiosity, scanning the landscape with excellent precision. Wonder in her eyes, and courage in her heart, and adrenaline flowing through her veins, she changed the world of biology. The forest doesn't resist her, it seems to breathe around her, accepting her as one of its own.

This young woman is none other than Dr. Jane Goodall. Born in England, she spent around six decades in research on chimpanzees. A well known primatologist, she never had a university degree. At the age of 18, she left school and landed in Africa to begin her fieldwork and study animals. She has always had a fascination with animals since her childhood. The biggest quality she developed within all these years since her childhood was observation which proved to be crucial in her research and fieldwork. Later she got her PhD from Cambridge without a university degree, becoming one of the few people to achieve this feat. She worked as a secretary before being invited by Louis Leakey, the famous anthropologist. She was 26 when she arrived at Gombe which turned out to change everything we understand about the wildlife. She didn't barge into the world of chimpanzees but she waited and let them trust her. This trust that built between them led to her major scientific discoveries. he had named the chimps which built the first step of trust.

One day while observing the chimps, she noticed David Greybeard near the termite hill. She saw him strip leaves off the twig.

She watched patiently, unaware that a single twig would rewrite the timeline of human evolution. David used the twig to fish termites. This shattered the belief that humans were the only toolmakers. It changed

Source: Wikimedia Commons

anthropology and evolutionary history.

When we discuss the diet of chimpanzees, leaves and fruits are what come into mind. Well, that was never the case. Jane was sitting under the tree, going through her notes she made through her observation when suddenly she heard a loud cacophony from a distance. She went towards the noise and witnessed cooperative hunting of colobus monkeys. Better observation explained the social interaction and shared food rituals.

Primates are known for their strong social structures and hierarchies. Well, how fascinating it would be to witness it in real life. Goodall got to see the dominance structures, alpha males, female leadership, alliances, grooming as a social glue and conflict resolution. Her quiet gaze mapped invisible timelines - power rising and falling like tides within the chimp community.

Chimpanzees show joy, grief, jealousy and affection. Mothers comfort and nurture their infants.

Did you know that the orphan chimps have adoptive families to whom they are clung all the time? This portrays that emotional complexity and individual personalities aren't just limited to humans. Jane listened to the forest songs - soft hoots, warning cries, playful chatters - each fragment of an ancient language. Communication and vocalisations along with body language and gestures made the chimps more

humanized than ever. War isn't only limited to humans and this was proven by the four year long conflict between two chimp groups documented by Jane. This revealed that chimps can be territorial and violent. This discovery was shocking and reshaped our understanding of primate behaviour. Well, this one is regarded as the raw truth of the wild. Jane's research is one of the longest continuous wildlife studies in history. Her six decades of notes track births, deaths, dominance cycles, family legacies, and changing forest conditions.

Why is Jane Goodall a true timekeeper? Her methods that led to these discoveries involve a lot of patience, perseverance, determination and dedication. Her research time period itself screams volumes of these qualities. She would sit for hours, not moving, even making the forest forget her presence. She named the chimps, not number them. David Greybeard, Fifi, Freud and more because she saw them as individuals not just mere animals. She would follow the chimps gently, without disturbing and intruding them. Her field notes were a real treasure. They recorded daily routines, behaviour changes, weather and patterns that only appear after years. This is pure "timekeeping". Later in her life, she shifted from research to conservation. Establishing JGI (Jane Goodall Institute) which looked after habitat restoration, anti-poaching work and sustainable livelihoods of communities. A youth movement called "Roots and Shoots" in 60+ countries. Jane Goodall had seen how the forest

Source: UN Climate Change/Hajü Staudt via Creative Commons

changed through the years. She had felt it for years. The steady rhythms she had once documented - the seasonal fruiting of trees, the migration of birds, the birth pattern of chimpanzees - began to shift and falter. It was through Jane's eyes that the world learned that when nature's clock gets disrupted, every single species feels it, including our own, as the ancient, unchanging timelines of the wild grew unpredictable under the weight of climate change and urbanization. Deforestation caused displacement, warming temperatures altered food availability and human encroachment pushed all wildlife into widely unfamiliar conditions and behaviours.

Dr. Jane Goodall took her last breath on 1st October, 2025. Even though she's gone, her legacy beats on in every forest she fought to protect. Her life reminds us that time is fragile, nature is sacred, and one patient observer can shift the fate of this world.

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Spot the difference!

Given are two images of a rabbit and a hare. Can you tell us which is which? Hint: pay attention to their fur and legs!

1

2

Source: Canva Images

Answers on page 72

DYNAMIC PROGRAMMING OF SEQUENCES

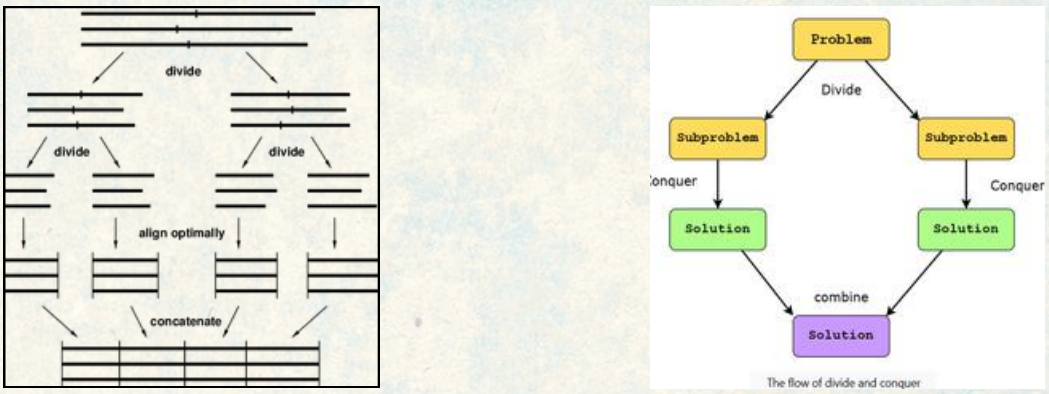
A Useful Life Hack!

In bioinformatics, sequence alignment is done using a set of instructions or algorithms with a Dynamic Programming (DP) approach. This approach is used in the Needleman-Wunsch (Global alignment) and Smith-Waterman (Local alignment) algorithm. The three-step process of this 'divide and conquer' strategy involves, first, breaking the problem (sequences to be aligned) into smaller problems (meaning small alignments); second, solving each problem separately and tabulating their results (in a matrix or grid); and, lastly, tracing back to obtain the final optimal solution of the initial, target problem. The characters of sequences (nucleotides or amino acids) to be aligned are written across a matrix or a table with rows and columns and a scoring scheme is used. The character matches are given positive scores and the mismatch scores may not be given any score while the gaps or indels are always given negative scores (gap penalty). So, this strategy helps us to get an optimal (solution) sequence alignment from innumerable possibilities of sequence alignments for a given set of sequences. An example of this approach for sequence alignment is depicted in Fig. 1.

This concept is not only important for understanding how to align sequences to determine their similarity or difference, but it also teaches an important life skill. As Richard Bellman, who developed dynamic programming stated 'An optimal solution to a problem contains within it optimal solutions to subproblems'.

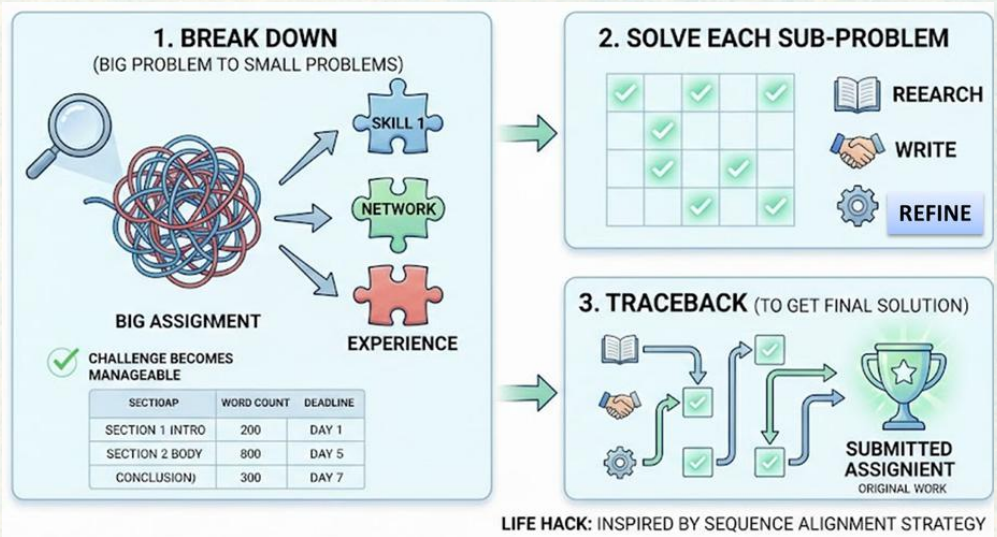
The same concept can be applied in our daily lives to solve our real-world problems or challenges. It is a powerful problem-solving technique that offers an easy hack for solving problems in our lives that appear challenging and stressful. In other words, this topic demonstrates how we can translate a scientific concept into a cognitive strategy to solve real-world problems. The DP algorithm provides a set of instructions in a 3-step process to achieve the desired result. So, this strategy can be applied in our daily lives where we are often confronted with problems and get stressed by them. If we can apply these steps, we can conquer the fear of the problem at hand and solve it easily.

The first step of DP offers an important lesson: when we encounter a problematic situation or a task that seems gigantic to solve, we should try to break it down into smaller problems. A tall mountain looks difficult to climb, while small mountains may seem like a ladder to reach the final destination. So, when we analyse the complexity of a problem and break it down, we have conquered our fear, and the focus has now shifted to getting the solution rather than the existence of the problem itself. This shift in perspective empowers us to address the problem differently, with an optimistic approach. We change our questions to ourselves from 'How will I solve this problem?' to 'What's the smallest part of this problem that I can solve right now?' This change in thinking is the real 'life-hack'. Let's understand this through a small analogy.



Source: Figure. 1. Schematic representation of DP in sequence alignment, Image credits (a) Reinert et al., 2000; (b) https://www.educative.io/answers/what-is-divide-and-conquer-and-dynamic-programming

Often, students find it difficult to write an assignment on their own without using any internet resources or AI tools. It seems like a huge task for them, so they often copy the content and submit it. So, in this scenario, if they can use the first step of DP to split the problem into smaller ones, the challenging task may become easier. For example, if they break down the assignment and prepare a table of contents, including the expected word limit for each section and the tentative deadline for each subtopic, this roadmap will help them complete and submit the assignment on time (Figure 2). In this manner, the assignment will be an original piece of work. Breaking a bigger problem into smaller ones gives a sense of relief and assurance that the problem can be solved. Then the second step of DP approach teaches an extremely important lesson: if we write down the solutions to each smaller problem from the first step, we do not need to solve them again if they are encountered. So, tabulating results avoids recomputing the problems and this memorization of results saves time. This may include writing a journal or diary entry or making a note somewhere so that one can reflect on it later. Although similar problems can yield different results in our daily lives at different times or what was the optimal solution for a problem last year may not be optimal in its real sense next year, unlike sequence alignment algorithm. However, recording the solutions to each smaller problem individually will give the individual a sense of achievement that will inspire them to move forward. Another major learning point at this step is that we can learn from the mistakes made earlier. We can reflect on our decisions and then prepare strategies to improve and make more informed decisions in future for similar problems. This is where the final third step of traceback helps us. It's like connecting the dots to get the final answer. In sequence alignment, the traceback step provides the optimal alignment of a given set of sequences. In solving real-world problems, traceback helps us decide and select the best answer to smaller problems, then combining those solutions to get the desired result of the larger problem we set out to solve. This kind of DP approach has already been implemented in mobile applications to deliver food along the shortest route, and on our phones to fix a typo before we even notice it. We can also learn from this useful approach and manage our problems more efficiently. Dynamic programming reminds us that no problem is too big until it is divided wisely. So, the next time you encounter a problem that may seem like a daunting task at first, try using Dynamic programming to solve it.



Source: Figure 2. Image created using Google Gemini using the prompt 'Dynamic programming-project assignment-life skill'

Reference:
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DNA-GUIDED TRANSCRIPTION FACTOR INTERACTIONS

Unveiling the Hidden Code behind Gene Control

Although they carry the same DNA, a nerve cell and a muscle cell in our body act completely differently. This is a result of gene regulation, how cells choose which genes to turn on or off. We had known that special proteins called transcription factors were involved in controlling this process by binding to particular DNA sequences. However, new research from Nature in 2025 revealed that the process was far more complex and coordinated.

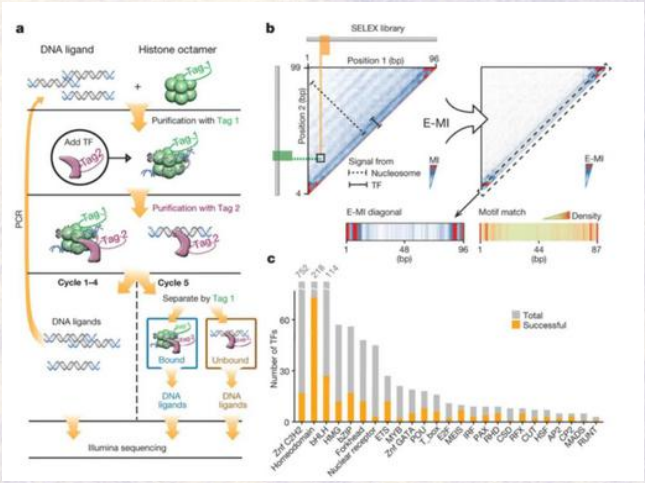
DNA contains all the cellular information, and TFs recognize particular DNA motifs and regulate the activation or silencing of a gene. With about 1,600 TFs in humans, scientists once thought each worked alone. But it came as a question that just like other proteins in living cells that interact, form teams that read DNA together in special combinations could TFs?

Study investigates 58,000 potential pairings

Using an improved technology called CAP-SELEX (Consecutive Affinity Purification-Systematic Evolution of Ligands by Exponential enrichment), Xie and colleagues at the University of Toronto tested 58,754 pairs of TFs to see if they could bind DNA in a cooperative manner. In this approach, they combined TF proteins with millions of small DNA fragments, filtering out the ones that bound most strongly. When two TFs come together on DNA, they leave behind a characteristic pattern-like two puzzle pieces fitting next to each other. The team found over 2,000 TF-TF interactions, many of which involve new, "composite" DNA motifs previously unknown. Often these motifs require very specific spacing and orientation for the proteins to fit in properly.

Unveiling the Hidden Code behind Gene Control

1. NCAP-SELEX selects nucleosome-bound DNA for TF binding using dual purification tags.
2. E-MI analysis separate true TF-binding from nucleosome signals via 3-mer enrichment patterns.
3. The most analysed TF belongs to Znf-C2H2 and homeodomain families.



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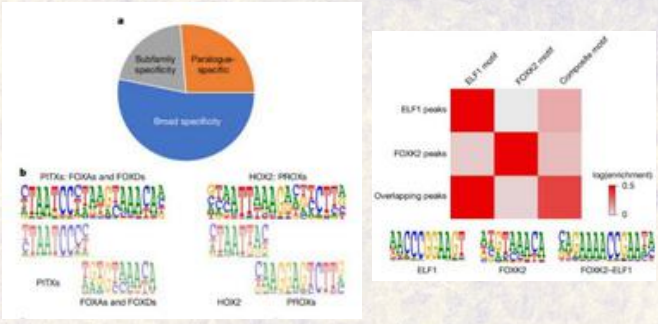
A new dimension to the gene regulatory code

The finding implied that the human regulatory code wasn't simply a list of single-TF motifs but also contained thousands of DNA-guided partnerships. Some TF pairs recognized motifs only when DNA was slightly bent, demonstrating that the genome encoded rules for such interactions.

These composite motifs were found enriched in cell-type-specific open chromatin regions-areas of DNA that are active in only certain tissues. For example, some pairs were common in brain cells but absent in liver cells. That means cooperative TF binding helps explain how identical DNA sequences can produce different gene-expression programs in different cell types.



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TF Interaction Specificity

1. Nearly half of composite DNA motifs are specific to TF paralogues or subfamilies, others show broad family-level interactions.
2. Specific pairings occur between the PITX-FOXA/FOXD and HOXA2/HOXB2-PROX families.
3. The FOXK2-ELF1 motif is enriched at overlapping ChIP-seq peaks, which confirms co-binding.

Importance

Understanding TF cooperation revealed that context-that is, which TFs are present together and how they align on DNA-can utterly alter the rules of gene control. This, in turn, was to have major implications for developmental biology, elucidating how embryos generate complex patterns from overlapping gradients of TFs.

Diseases including cancer are often the result of misfiring TFs. By knowing which TFs are normally paired, it becomes possible to predict how gene networks go wrong if one of their partners is mutated, and it gives an important map for medicine, gene therapy, synthetic biology, etc. It can also be used in designing CREs by CODA framework which will help in medical diagnosis , research and other sectors.

CODA Framework for Designing Synthetic CRES

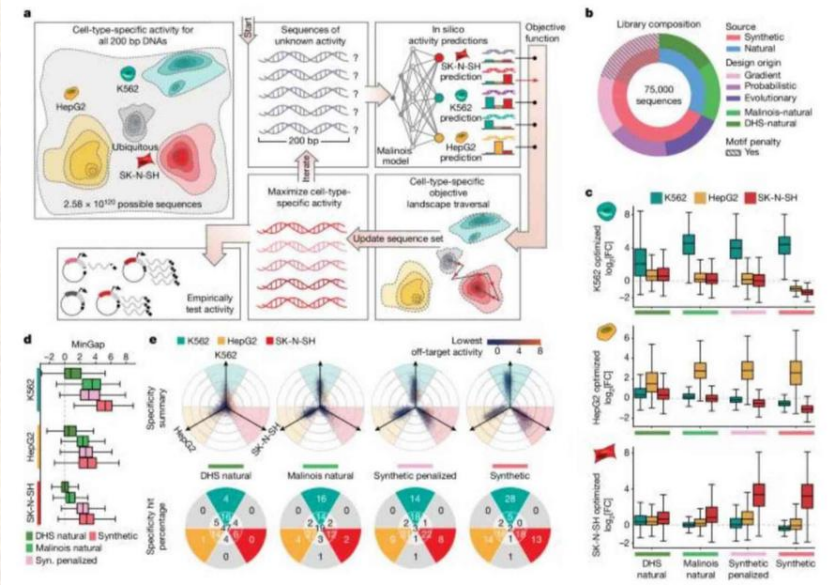
1. CODA uses iterative computational modeling (Malinois) to optimize DNA sequences for cell-type-specific enhancer activity.
2. MPRA library has 75,000 natural and synthetic candidate CRES.
3. Box plots show CRE activity (log, [FC]) in K562, HepG2, and SK-N-SH cells.
4. MinGap scores access CRE specificity.
5. Propeller plots visualize specificity and off-target activity, synthetic elements show strong targeted performance.

Future Aspects

The researchers estimate that they have uncovered only about one-third of all possible TF partnerships. Predicting the interaction between two proteins and DNA remains a problem, as current models struggle to capture such three - way interactions.

Conclusion

The work of Xie and his colleagues marks a milestone in decoding the second genetic code, the set of rules guiding our DNA to control itself. In the future, understanding this code may enable us to design genes that would have desired activity patterns.



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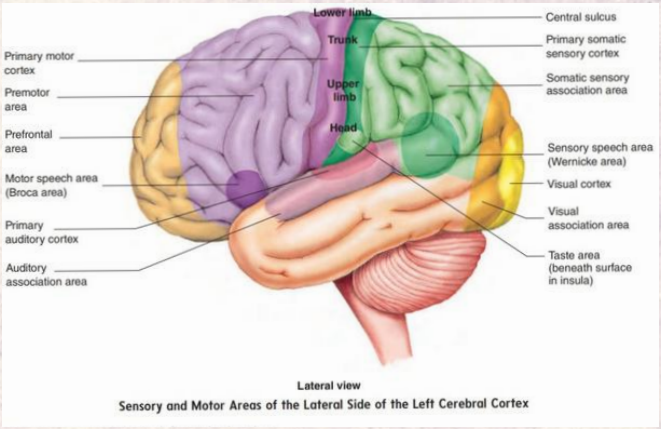
MUSIC AND OUR BRAIN

A deep dive into the working of music and why it feels like so much

Growing up, I'm sure all of us have listened to music in some shape or form. From nursery rhymes to that one song that plays on the radio and that one Instagram audio you can't get out of your head. Arguably, music constantly surrounds us and is a lovely mode of expression of emotions from joy, fear, grief, triumph, awe and hope etc. and many uncountable, inexplicable ones. If you've noted, it also shapes how we feel. In movies, the soundtrack and background music greatly impact the storyline that is meant to be conveyed to the audiences, largely amplifying the emotion conveyed. It can affect how we feel in time periods and short as seconds, conveying much more than simply words do. In fact, there have been instances where simply music has done all the talking like in the film "Maestro", there is a powerful scene with no dialogue whatsoever, just music. From soft voices to strings all the way to loud instruments and bell, the emotional build-up remained consistent with musical crescendo. Viewers report understanding the feeling without any explanation which in itself goes to show how music can tell a story on its own. Music brings in connectivity. I'm sure you must've attended a concert or a large gathering that involves music. In such environments, the overall feeling is almost surreal, as if we're in a different realm of being altogether, connecting strangers even. Our bodies also react physically to music as they do to the corresponding, showing actions like heart rate speeding up, goosebump formation, tensing up or relaxation of the body etc. These aren't simply reactions to the emotions but to the music itself and is not imagination. Our brain is built to react strongly to sound. But that then leads us to the question, "What's so different about the sound of music as compared to others that makes us feel so intensely and has such power over us?"

That is what we will analyse today.

In order to understand the working of music on the brain, neuroscientists used brain-scanning tools including an electroencephalogram (EEG) which analysed brain waves and magnetic resonance imaging (MRI) which created clear images of the brain, analysing which areas of the brain became active when people listen to music. One might expect a result involving one area of the brain but it was found that



Source: https://www.brainkart.com/article/Speech---Brain-Functions_21821/

unlike any other sounds and auditory stimuli, music did not activate just one area of the brain but multiple! There was no "music center" found but multiple other areas were stimulated, even presumably unrelated ones.

Music stimulated:

- The auditory cortex (hearing area)
- The amygdala (emotional area)
- The hippocampus (memory area)
- The motor cortex (movement area)

This largely explained the powerful feelings music invoked. It was clearly because, unlike most other stimuli, it stimulated and connected all these given systems at the same time!

Now that we know the areas of our brain that DO get stimulated, how does music and its effect, actually work? Well, here's how:

Music tunes enter our ears and the first stop is at the auditory cortex, where the pitch, loudness and the rhythm of the music is processed. Once this happens, the amygdala and the hippocampus are stimulated soon after, creating intense emotion in accordance to the music and pulling out memories and past experiences relevant to this emotion, respectively. The motor cortex also gets activated which makes us want to move to the music. Not only this, but in other parts or the body, more specifically the limbic system, pleasure chemicals like dopamine are also released that impact our feelings towards the music and while listening to it.

As we can see, this explains why music feels so deeply meaningful, emotional and even physical.

Another very interesting aspect of music is the way it plays with the brains natural expectations and emotions. Our brains are phenomenal at pattern recognition. When we listen to music, our brain attempts to guess the note or beat that follows because of this feature and when, naturally, the music delays, changes or in any way surprises us, there is a short period of tension our brains feel. When the music finally resolves, this is followed by a sense of relief. This explains well why we all love beat drops in music and why the anticipation to one is so exciting. All of this is controlled by a part of the brain called the orbitofrontal cortex which helps the brain analyze and decide when something feels satisfying or disappointing. At the same time, emotion centres and the autonomous nervous system is stimulated, affecting heart rate, breathing etc. This is why in horror movies, the background tracks amplify the intense fear factor and the anxiety that comes with and conversely, how slow music can generally calm us now.

This also shows how music isn't simply something that sounds good or feels good, but it also affects, even physically changes our moods and how our body feels.

After reading all this, there must be a question that pops up, which is, if music affects us so deeply both emotionally and physically, can't it be used to help improve those who struggle with the same? The answer is - Yes.

Music is actively used for patients with depression, dementia, Parkinson's disease and even post strokes to improve responses. Patients are even made to actively sing or play music instead of just listening for better responses. If you've visited a mental health institution, you will be sure to find at least a couple of musical instruments present.

It is shown to have a positive impact on people with epilepsy, sometimes even, reducing the occurrence of seizures.

Musical memory is much stronger than regular memories formed because of the number/amount of areas in our brain and body that are stimulated. Hence, in several neurodegenerative disorders, it is actively used for improved results in memory as well as better communication. The very famous Pixar movie "Coco" very beautifully illustrates the same.

It is important to note, however, that despite such lovely impacts and results, music is not magic and is not something that automatically cures mental situations and illnesses. Scientists are cautious, ensuring that the impact of music is not over-exaggerated. However, even then, impacts and effects do exist.

The future of music in neurobiology and mental health does remains strong. Researchers hope to use music carefully in medicine, using brain scans to apply the best music to the given subjective situation. Music therapy is also growing more organised and scientific over time as well.

To sum it up, music is beautiful. It is such a huge part of everyone's lives and we are all so naturally sensitive to rhythm and sound that it is a major source of comfort and simply feeling and being *human*. It has helped us communicate in the past, still helps us connect today, and probably always will.

Music is not just entertainment and has never been - it is part of how the human brain works.

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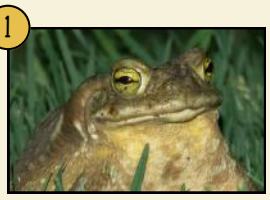
I Year

Spot the difference!

Frogs and toads are similar but definitely not the same. Can you differentiate between them?
Hint: its all about colours~

1



2

Source: Canva Images

Answers on page 72

INSOMNIA: A NEUROBIOLOGICAL BREAKDOWN

Insomnia is one of the most common problems faced in our daily lives. But have you ever wondered about the science behind it? If not yet, this article will help you to understand the same.

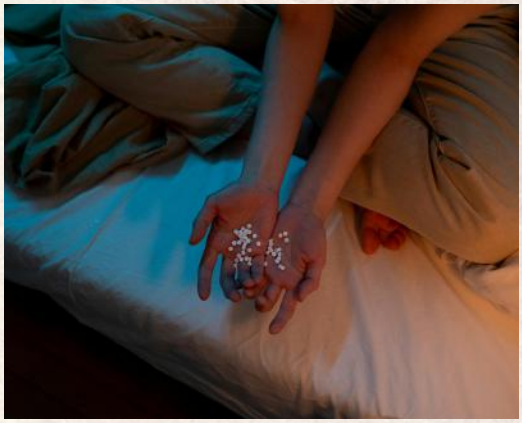
Insomnia disorder is characterized by dissatisfaction with sleep quantity or quality, associated with difficulty falling asleep, frequent nighttime awakenings with difficulty returning to sleep, or awakening earlier in the morning than desired. The common symptoms observed include fatigue, daytime sleepiness, and mood disturbances. It's a matter of fact that insomnia has been identified as both a symptom and a disorder. Insomnia can be associated with circadian rhythm disorders or primary sleep disorders. Among the most common circadian rhythm disorders leading to insomnia are shift-work sleep disorders and the phase advance syndrome seen in the elderly. Here, we will be primarily focusing on circadian rhythms and their influence on insomnia.

The circadian cycle/rhythm is a natural cycle of physical, mental, and behavioral changes that the body goes through in a 24-hour cycle. This clock is primarily synchronized by external time cues, especially the light-dark cycle, also known as zeitgebers, and is controlled by a small area in the middle of the brain, known as the master biological clock, the Suprachiasmatic Nucleus (SCN) in the hypothalamus of the brain, which is primarily set by light and darkness signals from the eyes, and coordinates internal processes like sleep, hormones (melatonin), and body temperature through specific clock genes.

In a circadian cycle, light acts as the primary indicator for the SCN. When light enters the eyes, specialized retinal cells detect brightness and signals are sent directly to the SCN. Further, the SCN interprets this as day or night. This process results in melatonin hormone (secreted by the pineal gland) suppression in the presence of light, leading to wakefulness and vice versa in the absence of light. In a healthy cycle, melatonin levels start increasing from early night, reach a peak, and drop-down by the morning, forming a hyperbole graph aligning the sleep cycle with circadian rhythm.

What goes wrong in Insomnia: The Broken Signal?

The core Neurobiological Reasons Behind the "Broken Signal" in Insomnia can be associated as follows:



Source: Pexels

1. Clock Signal Failure: In simple words, the clock sends time cues, but target systems fail to translate them into physiological sleep, causing insomnia. It can be explained with the help of a condition called circadian signal uncoupling. Circadian signal uncoupling occurs when these internal rhythms get out of sync with external cues or with each other. In this condition, the circadian rhythm promotes alertness and prevents sleep. As a result, night is recognized at the level of the clock but is not translated into physiological sleep, producing a functional disconnection between timekeeping and sleep execution.

2. Melatonin Rhythm Disruption: Normally, melatonin release begins several hours before sleep, signaling the initiation of biological night and facilitating sleep initiation by suppressing wake-promoting neural activity. In insomnia, this signal is observed to be weak and late, often due to excessive evening light exposure and increased circadian arousal, resulting in insufficient inhibition of alertness systems. As a result, the required neurochemical threshold value for sleep initiation is not achieved, leaving an individual tired.

3. Persistent Hyperarousal: Persistent hyperarousal insomnia is defined as a chronic sleep disorder where the brain and body remain in a heightened state of alertness, making it difficult to fall or stay asleep, even when relaxed. Due to the failure of neural deactivation, along with increased cortisol levels because of overactivity of the hypothalamic pituitary adrenal (HPA) axis and sustained high-frequency cortical EEG activity.

4. **Circadian homeostatic desynchrony:** It is defined as a misalignment between the body's internal biological clock and the drive for sleep based on how long one has been. Although adenosine-driven sleep pressure is high, circadian alerting mechanisms still remain active, rendering the brain tired but neurologically resistant to sleep. This misalignment underlies prolonged sleep latency and poor sleep consolidation in insomnia.

Mental Erosion

Mental erosion can be defined as the deterioration of cognitive and emotional functions because of the disrupted biological rhythms in the brain. When the body's internal clock starts misfiring, as in the case of insomnia, the functions of the neuronal system related to memory, attention, and emotional control begin to break down. When sleep patterns are continuously disrupted, it affects the activity of the hippocampus region in the brain related to memory consolidation; however, the continuous secretion of stress hormones damages the prefrontal cortex region in the brain, making one less focused and less capable of decision-making. Mental erosion can thus be termed as the gradual biological decay of the brain because of the ineffective communication between the neuronal system and the hormonal system of the body related to time functions.

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Spot the difference!

While both of them are INSANELY adorable, they are also widely similar. So tell us, which one is the seal and which one is the sea lion. Hint: look at their ears

1

2

Source: Canva Images

Answers on page 72

Spot the difference!

Here's a difficult one- can you tell us which image is that of an alpaca and which one of the llama? Hint: it's the ears again!

1

2

Source: Canva Images

Answers on page 72

THE STICKY SECRET BEHIND A FASTER RIBOSOME HUNT

Hidden deep inside every living cell are countless microscopic machines that work tirelessly as the protein factories of cells, called ribosomes. They are intricate RNA-protein complexes that, along with several helper molecules, form the translational machinery. In other words, they read genetic instructions (mRNA) and assemble amino acids into the proteins required for several life-sustaining biological functions, ensuring that every cell functions, repairs, and grows as precisely as nature indicates. But to understand how anything functions, scientists need to isolate it, which in the case of ribosomes have turned out to be an extremely time and cost consuming process that does not even generate the required outcomes. A latest breakthrough, a new method called RAPPL (RNA Affinity Purification using Poly-Lysine) by Erath et al., 2025, promises to change that by using a simple, sticky trick acting as a lifeboat to molecular study of ribosomes.

Why Isolating Ribosomes Matters

Isolating ribosomes helps uncover protein synthesis, translational errors and even how antibiotics could block or alter this process Additionally, they are also a key to understanding disease pathways and identifying drug targets (Mehta et al., 2012). However, ever since its discovery in 1955 by George Palade, scientists have been trying to figure out a way to capture and study these molecular makers in order to understand how life translates its own code. Classical approaches such as differential ultracentrifugation, sucrose cushioning, or density gradient methods, immuno-precipitation, anion exchange chromatography are extremely slow, material- hungry, and often incompatible, causing practical barriers in research [See Table 1 : Comparing Traditional vs RAPPL]

RAPPL - The Lifeboat for Ribosomal Study

The developers of RAPPL during their study discovered that poly-lysine, a cationic polymer consisting of multiple units of lysine often used for DNA/RNA isolation has never been employed for the purification (isolation) of ribosome- or translation-associated factors. Since ribosomes are basically rRNAs, so experimentally, for their isolation, clarified cell lysate was mixed with magnetic beads coated in poly-lysine. Thus, ribosomes and their associated RNAs/proteins stuck to the beads, exploiting a simple phenomenon of electrostatic attraction. These beads were then washed and gently eluted. Meaning, that they focused on isolating and subsequently characterizing ribosome and its associated translational machinery from abundant and limited starting material by employing RAPPL technique generally used for isolating a variety of functional RNAs and it worked.

This entire process takes roughly 45-60 minutes and requires much less starting material than traditional methods, without even utilizing any fancy equipment. Additionally, they also applied a straightforward structural biology method to purify ribosomes from the human intercellular pathogen *Cryptosporidium parvum*, a difficult-to-process parasite, and *Cryptococcus neoformans*, an encapsulated yeast not visualized before.

Science behind this breakthrough

To determine the authenticity and effectiveness of the proposed concept, it was tested across various complex material samples like bacteria, yeast, parasites, cultured human cells, tissues and small animals with minor lysis tweaks per sample [Table 2].

Feature	Traditional Methods	RAPPL Method	Feature	Traditional Methods
Basis	Density separation	Electrostatic attraction	Basis	Density separation
Time	8–24 hrs	45–60 mins	Time	8–24 hrs
Equipment	Ultracentrifuge, gradients	Magnetic beads	Equipment	Ultracentrifuge, gradients
Sample Need	Large volumes	Minimal material	Sample Need	Large volumes
Yield	Low, fragmented	High, intact, functional	Yield	Low, fragmented
Scope	Limited organisms	Broadly applicable	Scope	Limited organisms
Feature	Traditional Methods	RAPPL Method	Feature	Traditional Methods
Basis	Density separation	Electrostatic attraction	Basis	Density separation
Time	8–24 hrs	45–60 mins	Time	8–24 hrs

Table 1.: Comparing Traditional vs RAPPL

Experiment	Sample / Organism	Purpose	Method / Comparison	Main Findings / Outcome
Development of RAPPL	General workflow	To design a rapid, economical ribosome isolation method using poly-lysine	RNA affinity purification using poly-lysine–coated magnetic beads	Developed a 45–60 min protocol that avoids ultracentrifugation; compatible with many sample types
Cross-species validation	*E. coli*, *S. cerevisiae*, *T. brucei*, *C. neoformans*, mammalian cells, tissues, and small animals	To test whether RAPPL works universally across organisms	Applied same principle with minor lysis-buffer adjustments	Successfully isolated ribosomes and translational components from all tested systems
rRNA and ribosomal protein enrichment	*E. coli*, *S. cerevisiae*, human cells	To confirm that RAPPL specifically pulls down ribosomes	rRNA analysis, mass spectrometry, Western blot for ribosomal proteins	Enrichment of rRNA and ribosomal proteins confirmed; minimal contamination from other cellular RNAs/proteins
Comparison with traditional isolation	*E. coli*	To compare RAPPL with ultracentrifugation-based ribosome purification	Sucrose cushion vs RAPPL	RAPPL was 4–5× faster, required 10× less material, and yielded similar purity and integrity
Functional activity assay	*E. coli* ribosomes	To check if RAPPL-isolated ribosomes are functionally active	In vitro translation of eGFP reporter	Translation activity comparable to commercially purified ribosomes; ribosomes remained active
Antibiotic resistance study	Uropathogenic *E. coli* clinical isolates	To explore ribosome-associated antibiotic resistance mechanisms	RAPPL followed by analysis of bound proteins	Identified ribosome-associated resistance factors, showing RAPPL's utility in medical microbiology
Structural integrity test	*C. neoformans* ribosomes	To assess if RAPPL preserves ribosome structure for cryo-EM	RAPPL + cryo-electron microscopy	Generated a 2.7 Å resolution structure of the 80S ribosome, confirming structural preservation
Associated factor enrichment	Multiple eukaryotic systems	To see if translation-associated complexes co-purify	Mass spectrometry of co-purified proteins	Detected translation initiation, elongation, and quality control factors along with ribosomes
Yield from minimal input	Small-scale lysates	To test efficiency with limited material	RAPPL using 1 mL *E. coli* culture / ~10⁸ mammalian cells	Ribosomes successfully isolated, showing method effective even with tiny samples

Table 2.: Overview of the major experiments and their outcomes in the RAPPL study (Erath et al., 2025)

Across these systems, through RAPPL by consistently enriching both ribosomal RNA and proteins, researchers proved the method successfully captures intact, complete ribosomes. In addition, through experimentation, it was shown that the isolated ribosomes were active, as evidenced by the fact that they were capable of synthesizing the reporter protein eGFP in an experiment. This activity became essential for practical purposes, where, using clinically obtained samples of *E. Coli* bacteria that were resistant to antibiotics, they could quickly detect factors that lead to ribosomal resistance. Finally, this method turned out to be so delicate and efficient that researchers were able to produce an unprecedented high-resolution 2.7 Å structure of the ribosome of the *C. neoformans* yeast using cryo-EM imaging technology.

Conclusion

Ultimately, a simple concept of 'opposites attract' chemistry worked as an amazing molecular research tool that can potentially be effective across various domains of life. By reducing the time, cost and sample requirement of ribosome isolation, this method effectively removes practical barriers while proving to be a key in unlocking rapid identification of new antibiotic resistance factors and providing crystal clear targets for the next generation of diagnostic medicine. This clearly depicts how sometimes the simplest and not high-end protocols can bring the most mind-blowing breakthroughs. In essence, RAPPL is not just a shortcut, it's a reminder that sometimes profound scientific revolutions begin with a simple spark of re-thinking. Taking a step back and looking at the problem from a different perspective.

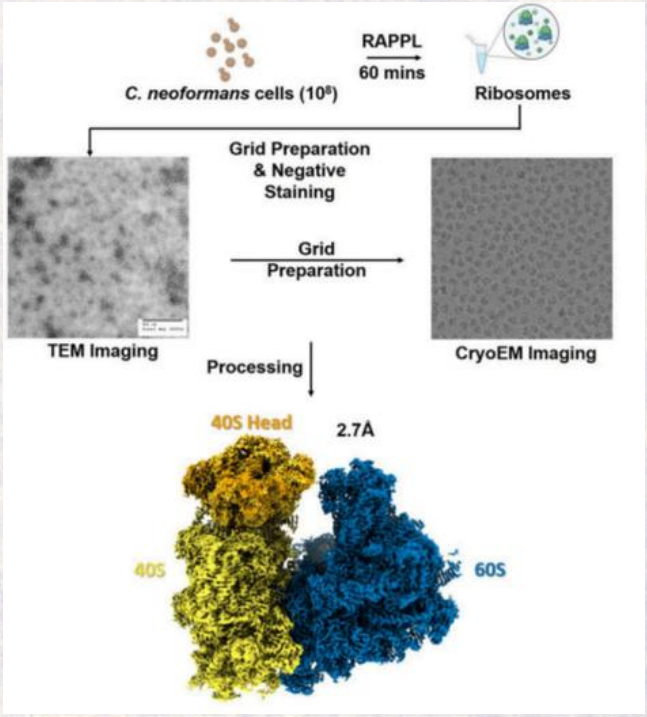

Figure 1.: C. neoformans ribosome visualization

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Shreyanshee Vaidya
B.Sc. (H) Zoology
III Year

THE IMPOSSIBLE PECULIARITIES OF JURASSIC PARK (1993)

Steven Spielberg's cult classic sci-fi film baffled millions in 1993, and continues to do so decades down the line, inspiring generations to venture into palaeontology, archaeology and classical zoology. It created mass sensitization towards complex concepts such as homeothermic organisms, animal cognition and the evolution of theropods. However, many concepts shown in the film are now disproven, or just entirely redundant to begin with, and to me, picking these apart serves as an unending source of amusement. This is going to be something between a film review and a frustrated, yet bewildered critique. The fundamental premise of the film was that genomic material was isolated from blood supposedly preserved in amber- which never made any sense to me, because this would have provided a medium for rapid degeneration and wasting of any sort of genetic or chromosomal material. Jack Homer, an American palaeontologist, served as the scientific advisor on the film, and postulated an idea that *Tyrannosaurus rex* had an enhanced olfactory receptor system, placing it in a scavengery niche during the late Cretaceous period; and that it had a weak field of vision- both of which we now know are untrue.

Dilophosaurus were scaled down to being about 2 feet in height, when we know actual specimens prove them to have been anywhere from 25 to 30 feet. The supposed 'venomous' nature of it is also extremely unlikely, due to the absence of hollow teeth, which are required for ejecting venom. A more well-known inaccuracy was the size and sociality of Velociraptors. They were demonstrated as large and hostile reptiles, when in reality, they were probably the size of chickens (you could put them in a broth) and were covered in feathers. The latter was not known at the time of the release of the film. Them moving around as pack animals, planning coordinated attacks is beyond the realm of their cognition, because it is entirely implausible that they possessed any sort of abstract thinking and coordination skills. All along the film, the cries and noises of these restored dinosaurs mimicked sounds of whales and growls of modern therian carnivores but all of this does not hold up when evidence suggests the presence of a syrinx for vocalisation; which means that they probably made low frequency infrasonic sounds.

Source: Canva images

I frequently oscillate between liking and disliking the franchise- maybe because I am too neck deep in the field and my preferences have evolved, but if it wasn't for the way these films were, I wouldn't get to write quirky articles like these. Maybe a part of me is resentful of not being able to enjoy the genre anymore in the same way I did as a child. One point I did really enjoy about the film is the character of Ellie Sattler, who is definitely the only paleo-botanist in all of movie history. It serves as a very poignant point of representation.

To conclude this, I do believe that sci-fi films expose a deeply human desire to control nature and its outcomes, but we forget that we are a part of all evolutionary synthesis- not spectators of it. Broadly, I do appreciate the scientific outreach of such films, but I would adore them if they incorporated academically accurate information as well.

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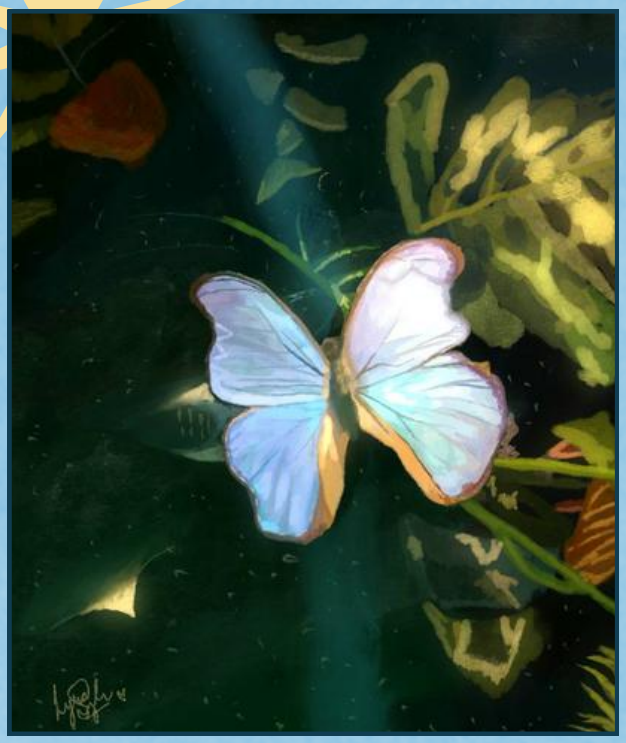
Auyona
B.Sc. (H) Zoology
II Year

Source: Artwork by Lyra Singh
B.Sc. (H) Zoology, III Year

STROKES OF IMAGINATION

Artworks



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III Year

Shruti Sarkar
B.Sc. Life Science
III Year

Shruti Sarkar
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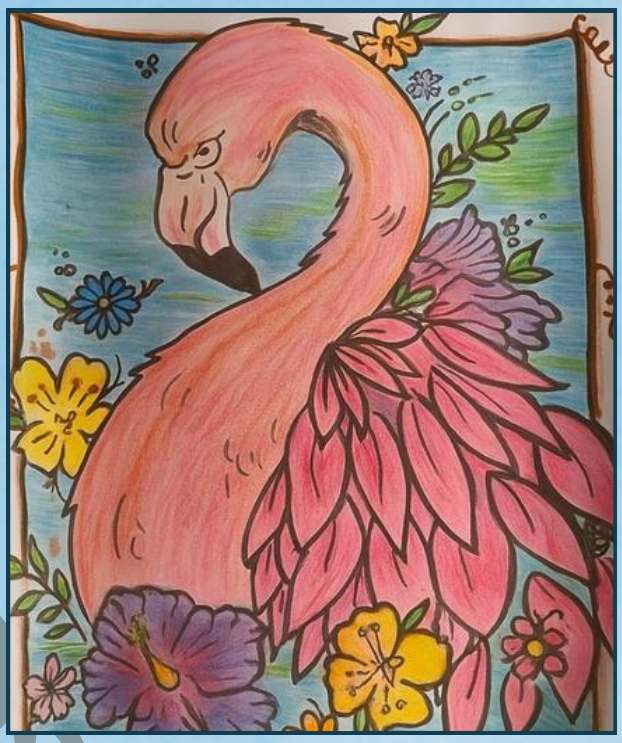
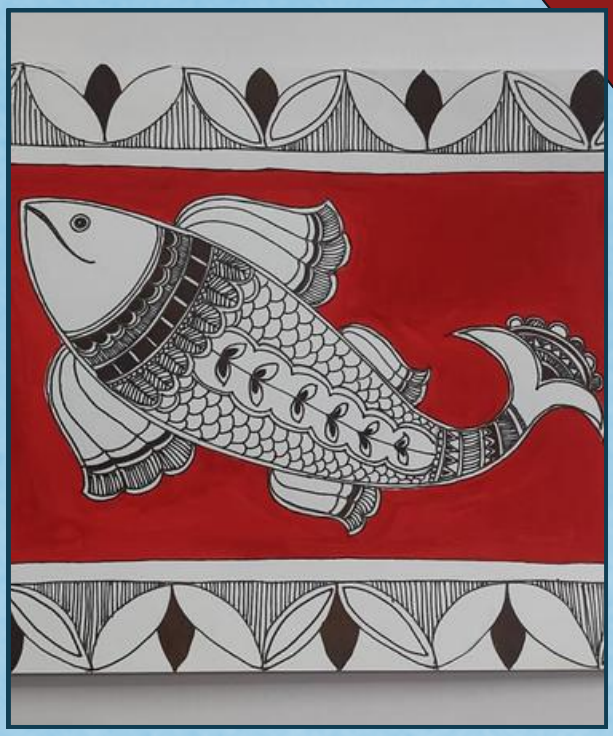
III Year

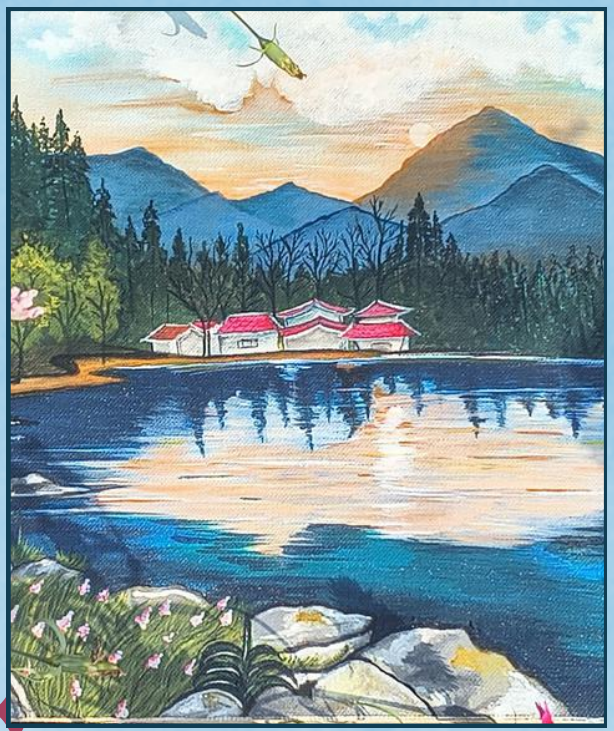


Swayam Shree
B.Sc. (H) Zoology
I Year

Parishruti Gogoi
B.Sc. (H) Zoology
III Year



Parishruti Gogoi
B.Sc. (H) Zoology
III Year



Akanksha Khare
B.Sc. Life Science
II Year

Source: Unsplash

MICROLINES

Poetry

BLINKING STARS

Where living beings do not know,
the warmth of the sun,
And the calm of the moon,
Extremophiles persist in dormancy,
metabolism running on fleeting gleams.

A world existing beyond Earth,
with blinking stars, stellar flares,
and a biological clock without hands.

Time doesn't stop but pauses,
with every nascent pulse of starlight.

Silence isn't craved but achieved,
serenity is not mistaken
for the end of life,
still emphasizing healing over assimilation,
Where life survives through synchronization.

Patience evolves before complexity,
restraint is learned before excess.
Yet the presence of life is noticed.

Beyond the wonder-world of humans,
there exists a life, quietly unhurried,
knowing the subtle truth of astronomy,
blended with the heart of biology,
in a beautiful world called Astrobiology.

Akashara Saxena
B.Sc. Life Science
III Year

THE WILD CLOCK TICKS IN MICROBIAL MINUTES

Nature keeps its own sense of time,
quiet and slow,
a minute passing into soil and water.
Small living things move on their own,
doing their work without being noticed.
Under fallen leaves and along slow rivers,
microbes continue their life cycle.

Old matter breaks down
and slowly turns into something useful again.
Nothing happens suddenly,
everything takes its time.
Energy moves from dead material
to new growth,
step by step.
There is no hurry,
and nothing is wasted.

This steady process helps
keep balance in nature.
There is no sound to mark this time,
no sign that people can easily see.
Still, all living things depend on it.
Life continues because
of these unseen workers.

Minute by minute,
these small lives continue,
working quietly without drawing attention,
keeping the wild steady in the background,
as time passes on in its own way.

Rizwana Tabasum
B.Sc. (H) Zoology
IV Year

IF WE WERE HUMANS

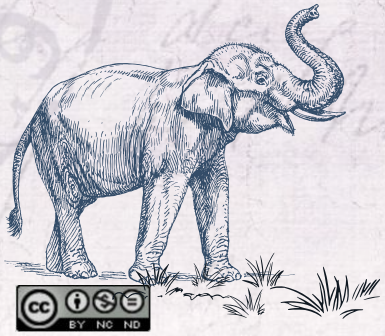
If paws were palms and scales were skin
Being born an animal wouldn't be a sin
The hound that shivers in the rain
With a heavy heart and loyal pain
Was birthed as human kin
Wouldn't have to worry about her pups in bin
If an elephant walked in human shoes, with a
name, a voice and a life to choose
We'd see that his heart so majestic and vast
is haunted by ghosts of traumatic past

If birds were a person with right to voice
We would've never confined them in cage and leave no choice
We mock their "bird brain" while they master our speech
Confining them in cage, freedom out of reach
When in cage, mate falls away, song turns to cries
The survivor might starve while the spirit within dies

If chimpanzee were human, we'd honor their mind
But since they have a tail, we leave their tale behind
With fingers formed like mine and yours
They trace the bars of the metal door
If only they were kin in law and society
We'd see in the eyes, the anxiety and cruelty
But since they only "ape" our ways
We choose to ignore their pain like always
Behind a wire, a cage, a pane, a wall
Is the closest cousin, ignored by all

If whales walked beside us and talked like us
We'd acknowledge their great mourning and discuss -
A whale mother who carries her calf through oceans
Shows the calf the beauty of blue world, of the life beneath the
waves and foams in slow motion.
If they were like us, we'd protect them at any cost
In the visage of sentient God.

If they were humans...they'd be free
Wouldn't have to worry about uprooted tree
But though they are livings with different skins
Theirs empathy reaches where our hasn't been
If we treated them well as our equal in soul
We can help them to heal the heart that
our cruelty once broke!



Cheshta Yadav
B.Sc. (H) Zoology
I Year

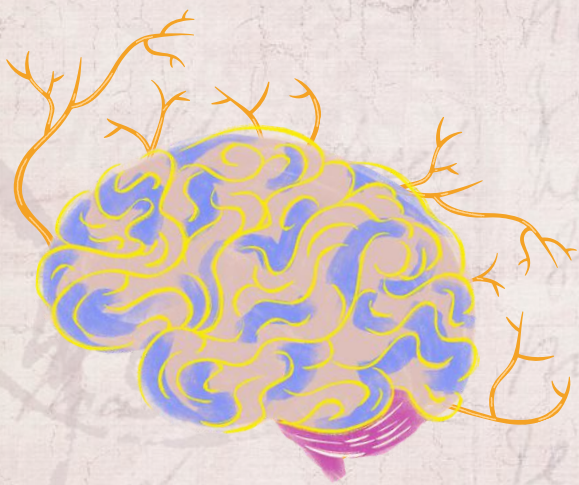
THE SUPRACHIASMATIC SYMPHONY

A burst of cells, the neural crest unwinds,
As stem cells map the dawn of fragile minds.
The infant's clock, not yet bound to the sun,
Just pulsing tides where dopamine has spun.

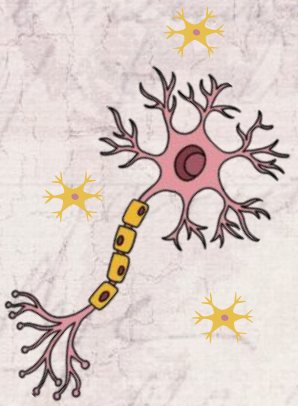
With youth, the amygdala begins to flare,
A surge of wild emotion, raw and bare. Synaptic pruning
carves the pathways deep,
While bold circadian rhythms guard our sleep.

The frontal lobes mature as ticking slows,
To tame the limbic currents, highs and lows.
The suprachiasmatic nucleus holds the beat,
Where conscious thought and deep affections meet.

At last, the myelin thins, the neurons rest,
The aging clock slows down inside the breast.
Yet all our joy and grief, from dawn to dawn,
Glow in the synapses when youth is gone.



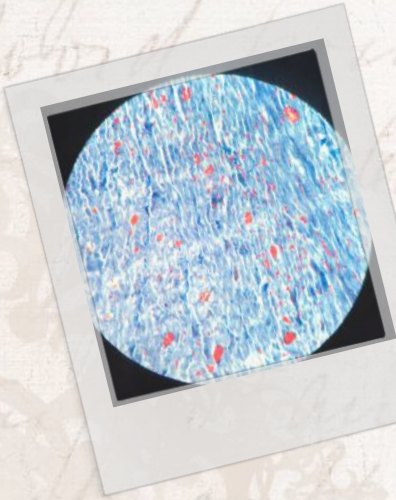
Manya Sharma
B.Sc. (H) Zoology
III Year



RINGER'S HEARTS AND SOOTED DRUMS

Wax trays with pinned rats and frogs,
Forceps, needles, scissors and cotton balls,
Stains of blood and muscle fibers
Carefully pulling out each nerve fiber,

That delicate inner ear of *Scoliodon* and
Facing the animal fear head on,
Comb-like texture of pigeon's pecten
Squeezing blood from leech's gut pattern,



Those beating hearts and twitching muscles
Clearing out digestive system of mussels,
That tiny nerve ring of earthworm to find,
Required patience, practice and focused mind,

To find nerves through tentacles of *Sepia*,
Unfolding the layers to reveal anatomical euphoria,
Neatly labelling nerves with pieces of black paper,
Steady hands trained to handle with care,

Muscle twitch on sooted drum,
pumping hearts with Ringer's solution,
Tracing each blood vessel with sheer dedication
Cutting sections for histology slides,
Eosin Haematoxylin gave 'Holi' vibes,

Skill we learned from our hands,
From beating hearts and floating glands,
Cockroach's tiny brain to find,
Needed steady hand and precision combined.

Learning by doing is all that matters,
Zoology lived in that lab scatter.
Now gone are those days of dissections,
When learning was a satisfaction,
When curiosity was turned to fascination,

Nostalgic memories evoked the thought
When science was felt and not just taught.

Dr. Jaspreet Kaur
Associate Professor
Department of Zoology

Source: Photograph by Vashita Vishwakarma
B.Sc. Life Science, III Year

ODYSSEY

Travelogue

Bir Valley

The summer I turned into a mountain enthusiast

It was a random day during the excruciating summers of June when my family made a spontaneous decision to travel. The destination? That was something to be figured out while on the road! And that spur of the moment decision led us to the valleys of Bir, a village in the hills of Himachal Pradesh, known for being the "Paragliding Capital of India".

I was immediately captivated by the place – the endless hills blanketed in a luscious green, the sounds of birds everywhere like a welcome song, and the strong, cold winds carrying the scent and promise of rain soon to arrive. It was breathtaking. By the time we reached our stay, we were greeted with a beautiful rainbow beaming against the honey-colored sky. It took away all my exhaustion and worries in an instant, I had never fallen in love with a place this quickly! Even the place we were staying in, and the people hosting us, made it feel right at home.

At night, I went out to explore the place with my family. The weather was perfect, with the intoxicating scent of rain and earth surrounding us. That's when I saw something that made me feel like a little child discovering magic for the first time – fireflies! I had never seen those before.

They were glowing against the dark backdrop of the forest like glitter. And when one landed in my hand, I was full of so much wonder and excitement. In that moment, it felt like it was just me and the forest surrounding me, full of beautiful and fascinating life. I have always loved animals, and it thrills me every time I encounter them. I wanted to stay there forever.

The next day some of my family members decided to go paragliding, and I backed out because I had nearly broken my ankle from twisting it the night before, making it difficult to even stand up straight. But the truth was, I was relieved, since I am terribly scared of heights (we'll get back to this later). We then set out to explore the place, all the markets, valleys and rivers. I was having the time of my life, sitting by a stream trying to capture everything I could of the moment into my memory. There's something about watching in stillness the world go by, the tranquility of the moment, that reminds me of some lines from Mary Oliver's poem 'Entering the Kingdom' –

"The dream of my life
Is to lie down by a slow river
And stare at the light in the trees–
To learn something by being nothing"

I had never felt so much peace as I did in that moment, taking in the world surrounding me while listening to Hozier's music.

That night, I decided to overcome my fear of heights and agreed to go paragliding. The next morning, before the sun even rose I found myself in a car with my brother and sister, heading to what I believed was my possible end. The view from the hills, and the journey there would've been captivating if it were not for my heart beating wildly in my chest, like a bird trying frantically to escape its cage. Which could be a beautiful metaphor about the fact I was breaking free of my fears to literally 'fly', but in that moment it felt more like I was a bird trying to escape from the fate of Icarus. To make it worse, my companions all went before I did. So I found myself standing on a hill all alone surrounded by strangers, listening to "I Will Survive" by Gloria Gaynor on a loop, wondering what choices in my life led to that moment. My only options were to jump or get stranded there – no network, no family. So I ran with my broken foot and took the leap... and forgot why I was ever scared.

The moment I was in the sky I thought to myself, "Well this is worth an embarrassing fall to my inevitable end." And I had the best time up there. The hills, the villages, the mist wrapped around them all like a blanket. It was perfect, and I was wondering why I was ever scared of that. When you're soaring through the sky, uncertain about the next moment but too captivated by everything to even think of it, you realise how small your worries are in the face of nature. To be able to 'fly' like that, to look at the world from such a distance while you're actively moving towards it, is a feeling I could never put down in words. It is a feeling one must experience oneself.

As I eventually reached the ground (thankfully not in the way I had imagined I would see land), one thing was clear – no matter how scared I was of doing something, I would not let that fear hold me back. There is so much to experience in the world, so much to see, I could not let my worries keep me from witnessing all of it.

I also realised I shouldn't panic as much, when I saw the dozen replies I had received from my friends to the 'goodbye texts' I had sent them that morning.

Bir was a beautiful place. I had so many 'first' experiences; the forests and the valleys had me mesmerised, and the people made it feel right at home. Don't be afraid of spontaneous plans or trying out new, albeit scary, things. Keep your heart open to new experiences, and to the wonders of nature. That is the closest you will come to experiencing magic. The world is a beautiful place — leave some space for it to surprise you. I leave you with another set of favourite lines by Mary Oliver, from her poem 'When I am Among the Trees':

"And you too have come
into the world to do this, to go easy,
to be filled with light, and to shine."

Lyra Singh
B.Sc. (H) Zoology
III Year

Amritsar

The pool of nectar

When the pressure of life burdens my shoulder, the only place I can remember is Amritsar. Amritsar, where the air smells of love and hospitality, where 'paaths' echoes through the narrow lanes of the city's old structure, where every face holds that million dollar smile and all united by one common phrase "Waheguru" which literally translates to "Wonderful Lord".

The foundation of the city was laid down by the fourth Sikh guru, Guru Ramdas Ji in 1574 AD. The Amrit Sarovar, which gives rise to the name "Amritsar" or "Ambarsar", was initially constructed by Guru Ramdas Ji. His successor, Guru Arjan Dev Ji completed the project and located the Harmandir Sahib in its midst. This is our present day Golden Temple, also known as Sri Darbar Sahib. To describe the majesty of the Golden Temple is to describe the divine grace, which is not sufficient by words.

The temple glitters in the midst of the Sarovar, as the literal ship that is set to sail the soul to the other side, the Sachkhand. The divine vibrations of Amritsar are sublime.

The hospitality and people of Amritsar go out on all fronts to welcome their guests. The piping hot kulchas from tandoor served at "Pehelwan Kulchas" are a fan favourite. People start lining outside this humble place tucked into the narrow bylanes of the old city at the break of dawn. The classic punjabi thali laden with parathas dripping with ghee paired perfectly with the luxurious daal makhani at "Brother's Dhaba" is just perfect to make you forget all your "dieting goals"! Those huge lassi glasses at one glance are enough to last you throughout the day, but the most delicious Amritsari delicacies will make you feel hungry in no time. Sarso da saag, makke di roti, safed makhan, malai, lassi ... .and I am salivating again! Amritsar is truly a foodie's paradise. But the ride doesn't just end here.

The world-famous "vadiyan" and "papad" of Amritsar are the most famous souvenirs that people carry back home apart from the beautiful memories. Talking of souvenirs, the phulkari embroidered dupattas and punjabi suits are quite popular among tourists. The "peepal pati" design jewellery and jadau jewellery is also very popular.

But Amritsar is not just a city famous for its culture and food. Amritsar is also the land of heroes who sacrificed their lives for the sake of humanity. The most remarkable heroes of India have been connected to Amritsar for aeons. Baba Deep Singh Ji, the most honored and revered martyr of Sikh history also lived and served in Amritsar. A saint, a warrior, a true hero who sacrificed everything to maintain the sanctity of the Golden Temple. When in 1757 Jahan Khan attacked Sri Darbar Sahib, Baba Deep Singh Ji called for a religious war. At the age of 75, he marched with 500 warriors towards Amritsar, who by Tarn Taran swelled to 5000 warriors. In the brutal combat, Deep Singh Ji demonstrated unparalleled courage and bravery. His head was severed from his body, yet he continued to fight fiercely against his enemies. He offered his head at the feet of Guru Sahib.

Located a few metres away from the Golden Temple is the Jallianwala Bagh. On 13 April 1919, General Dyer cornered innocent civilians by closing the only entrance and opened fire on a peaceful crowd gathered at the Bagh to celebrate Baisakhi. The massacre claimed about 1500 lives. To this day the Jallianwala Bagh stands as the symbol of tyranny and injustice that was bestowed upon the people of the subcontinent. The Jallianwala Bagh memorial and the Amar Jyoti pay tribute to all those who lost their lives in the brutal massacre.

Another symbol of deep-seated fervour for the nation is the Attari-Wagah "flag retreat ceremony". The patriotic spectacle takes place as the sun begins to descend. The ceremony is commemorated by both the Indian and Pakistani soldiers, culminating in the synchronised lowering of the national flag. The air at Attari-Wagah border tastes of fierce pride, as our soldiers march towards the gate where they greet the soldiers of Pakistani forces. The crowd cheering and chanting the praises of their nation is a sight to behold.

Amritsar always surprises me, unfolding a new tale of humanity. Each visit not just cleanses my body, it nourishes my soul. The land where my Guru walked once, the land of Sufis, the land of poets, the land of five rivers, the land of Punjab will forever be close to my heart. As I try to repack my bags and leave Amritsar, my heart feels heavy. The memories I made here are all I will be left with when I return to my fast-paced life. Until next time Ambarsar. Chardi Kala!

Janvi
B.Sc. Life Science
II Year

Jodhpur and Jaisalmer

A Mesmerizing Journey to Rajasthan

Traveling to Rajasthan had always been a dream. This trip to Jodhpur and Jaisalmer became one of the most unforgettable experiences of my life. We woke up early every day, getting ready in the quiet of the morning and leaving before sunrise. The journey felt magical. The views from the bus were so beautiful that it never felt tiring. With my friends around, every moment was fun. We sang songs, danced in our seats, laughed endlessly, and turned the bus into our own little celebration.

After reaching Jodhpur and settling into our hotel, we went out to explore the city. The Umaid Bhawan Palace was one of the most beautiful palaces I have ever seen. Its grand architecture and royal charm left me mesmerized. We also visited the magnificent Mehrangarh Fort, which stood tall with its rich history and offered breathtaking views of the city.

After a long day of traveling and exploring, we returned to the hotel, but the fun didn't stop there. That night, we had an amazing pool party. We danced, laughed, and enjoyed ourselves to the fullest.

Our journey then took us to Jaisalmer, where the golden desert welcomed us with unforgettable experiences. We went camel riding across the sand dunes, rode motorbikes on the soft sand, and enjoyed open jeep rides filled with thrill and excitement. It was one of the best experiences ever. One of the most magical parts of the trip was staying overnight in an open desert camp. The atmosphere there was serene and peaceful, completely different from busy city life.

Surrounded by endless sand dunes and under a sky full of stars, everything felt calm and beautiful. We spent the night singing and dancing together, creating memories that felt dream-like. Waking up early in the morning at the camp was an experience in itself. Away from all the city noise, the silence of the desert felt pure and peaceful. The cool breeze, the soft light of the rising sun, and the quiet surroundings made it a truly beautiful moment.

We also explored the lively markets of Jaisalmer, filled with colorful handicrafts and traditional items. A peaceful boat ride added a relaxing end to our journey. Throughout the trip, we enjoyed local cuisines for breakfast, lunch, and dinner at various places, each meal giving us a taste of Rajasthan's rich culture.

This trip was not just about visiting places but also about the joy of traveling with friends, sharing laughter, and creating unforgettable memories. From royal palaces to golden deserts, from thrilling adventures to peaceful mornings, every moment of this journey will always stay close to my heart.

Nidhi Kumari
B.Sc. (H) Zoology
III Year

Source: Canva Images

COGNITIVE INSPECTION

Crosswords & puzzles

Survive a day in the Arctic

Imagine you are a majestic white polar bear in the Arctic roaming on the ice. Do you think you'd survive in this environment? Let's find out!

1

It's morning and you are very hungry suddenly you catch a faint fatty but similar scent drifting from a crack in the ice. What do you do?

- Lie perfectly still by the hole
  - **Success!** *After some time a seal resurfaces and, with a lightning fast paw swipe, you secure a meal!*
- Dive into -1° C of water to catch the prey
  - **Oops!** *Seals see you and run away.*

2

Now, you turn to tend to your cubs. But wait! The piece of ice holding your cubs has broken off and is slowly drifting into the ocean! You:

- Go around on ice to a spot to reel them back onto land
  - **Success!** *You successfully bring them back on solid land without risking your lives.*
- Jump into the water to retrieve the pups
  - **Oops!** *You and your pups lose conserved body heat on the way from water to ice, putting your lives in danger.*

Fun fact! Polar bears can smell prey from 20 miles away!

3

While feeding your cubs, a younger, leaner male approaches you. He begins to "hufff"– a sign of aggression. You:

- Stand your ground
  - **Success!** *You win the stand off, but must eat quickly before other predators arrive*
- Share your food
  - **Oops!** *Oh no! Now there is a scarcity of food*

Fun fact! Polar bears are the world's largest land carnivores, weighing up to 680 kg!

4 You are now tired and the ice has started retreating. The problem is you are far from the nearest stable land, what will you do?

Doggy paddle swim to nearest land

Use a floating piece of ice to hitchhike

Success!

You are able to swim safely to nearby land by using your front paws as oars

Oops!

Conserving energy by using a drifting chunk of ice might sound like a smart idea, but if current pulls you up...things may go south and you can end up stranded

Fun fact!

To trap the heat in their body during the harsh winter, the skin of polar bears is actually black!

5 You noticed a strange looking bear at a whale carcass near you. It has creamy white fur and a distinct hump on it's shoulder, What will you do?

You scavenges the scraps

Assert dominance and fight

Success!

Smart move! You just saved your energy and avoided any unnecessary injury

Oops!

You lost, since you were already tired from all the swimming

Fun fact!

While bears are solitary, "scavenging sharing" happens during high yield season

Congratulations!

Title Unlocked : Master of the Arctic

You are now safe and need rest along with your cubs. The night time is here. You found a safe nice spot, dug a shallow bed and made yourself comfortable to spend the night peacefully sleeping with your cubs tucked in!

References:
1. https://polarbearsinternational.org/news-media/articles/surprising-facts-about-polar-bears
2. https://www.natgeokids.com/uk/discover/animals/general-animals/polar-bear-facts/

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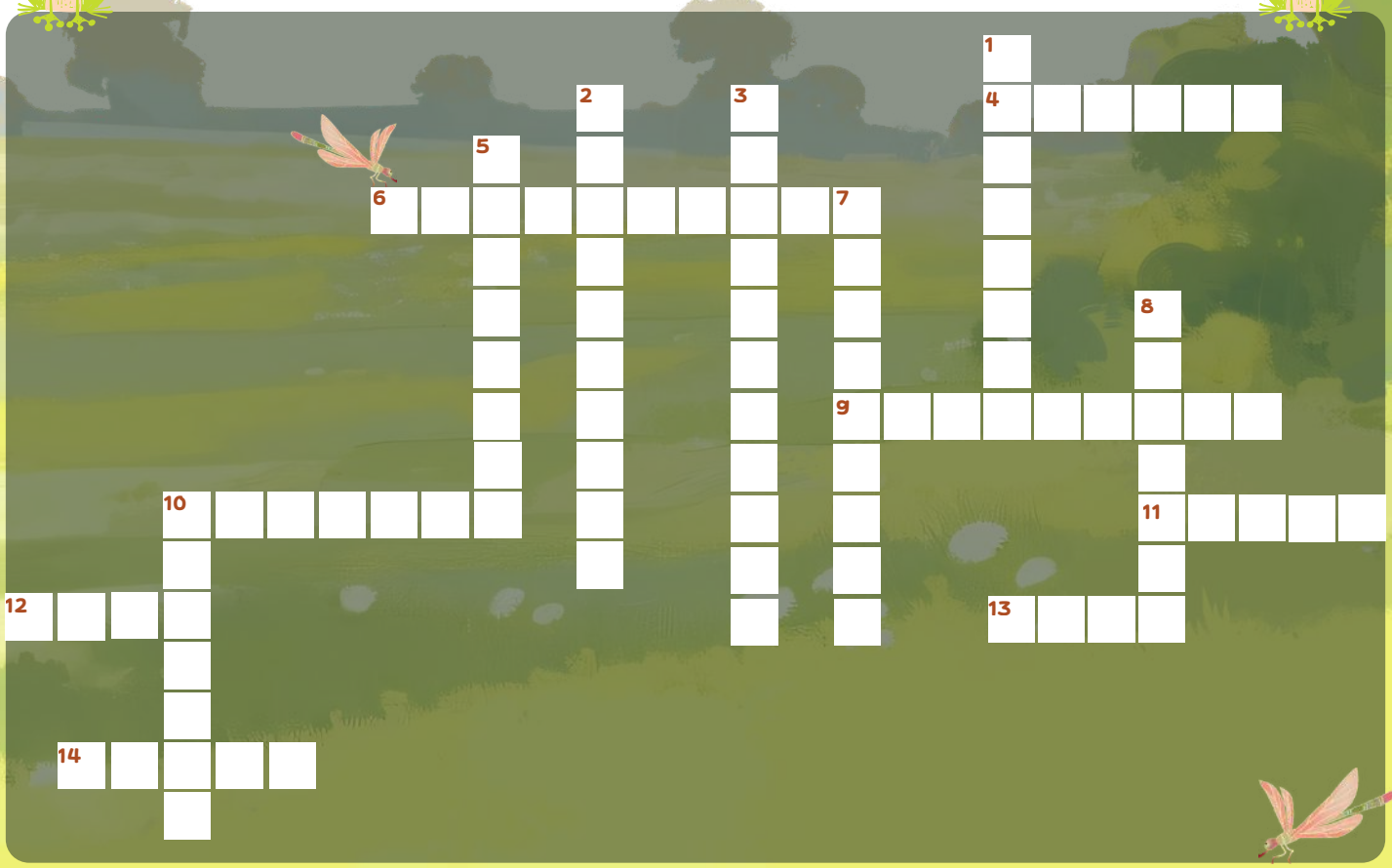
MARSH MOSAIC

memory at work



Answers on page 72

ACROSS:

4. Lacking oxygen; typical of marsh sediments
6. Plants adapted to aquatic environments
9. Interconnected community of living organisms
10. Tall marsh plant with stems
11. Simple plant-like aquatic organisms
12. Partially decomposed wetland vegetation
13. Grass-like wetland plants
14. Long-legged wading bird

DOWN:

1.Marsh plants with cylindrical flower spikes
2. Cold-blooded water-land animals
3. Saturated with excess water
5. Slightly salty water mixture
7. Marsh dominated by sedge plants
8. Land periodically saturated with water

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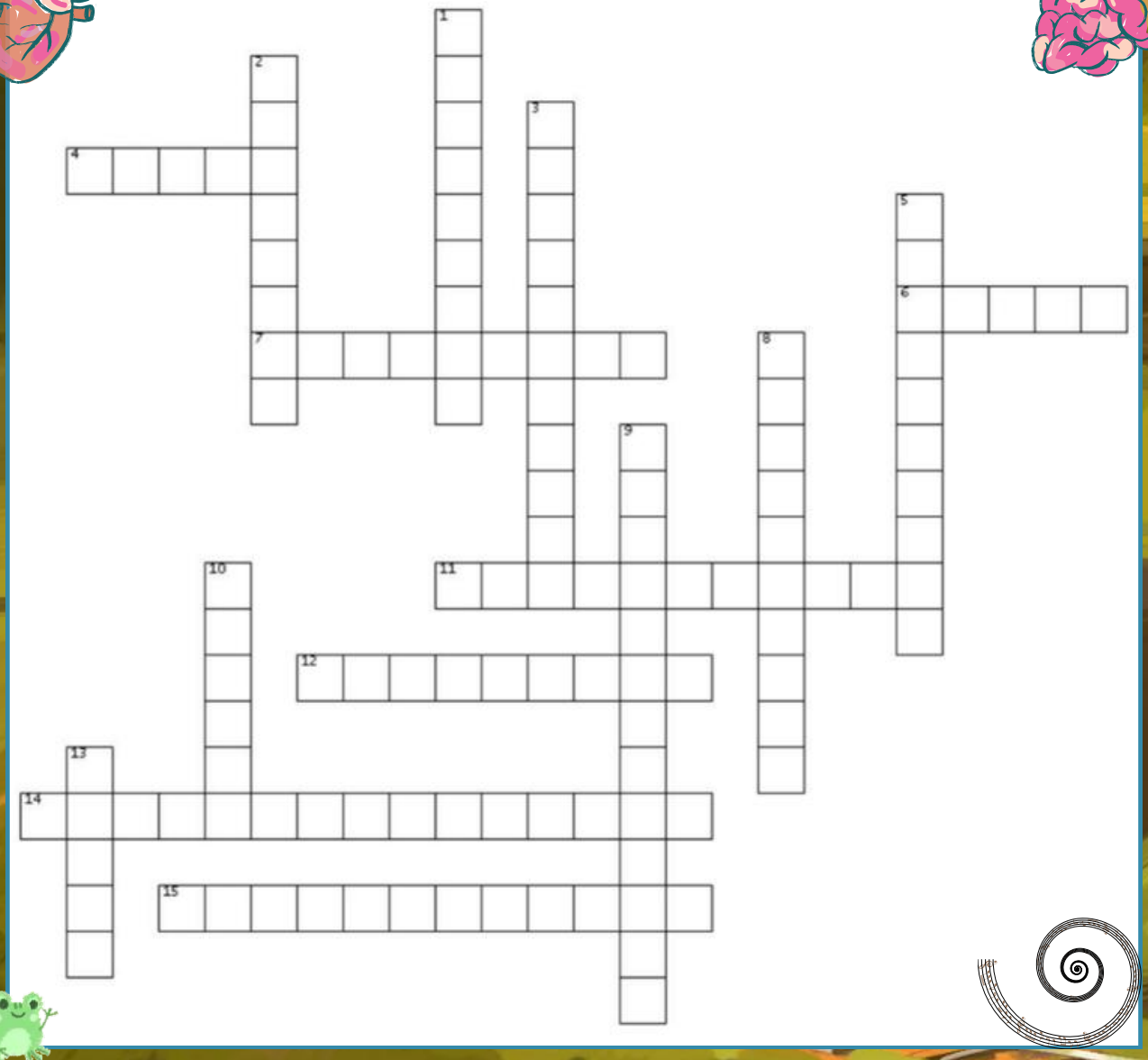
B.Sc. Life Science
II Year

RHYTHM OF LIFE



Answers on page 72

ACROSS:

4. Rhythmic beating of the heart
6. Speed or pace of a biological or natural process
7. 24-hour biological cycle in living beings
11. Body's internal balance or steady state
12. Change in heritable characters over generations
14. Occurrence of events in a coordinated pattern
15. Renewal or repair of tissues

DOWN:

1. Regular contraction of the heart
2. Information used to maintain control or balance
3. State of balance in a system
5. Chemical processes that sustain life
8. Change in response to the environment
9. Study of biological rhythms and timing
10. Process of increasing in size or complexity
13. Repeating sequence of events or processes

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DARE TO SOLVE?

Flex your vocabulary (across and down)
and make the grid bite the dust

O	K	V	V	A	C	I	D	O	P	H	I	L	E	S	U	D	A	L	E	C	N	E
R	V	G	M	D	E	T	E	M	O	C	Y	Q	X	O	O	S	P	A	C	E	C	I
G	M	Y	A	T	C	M	M	E	Q	U	T	D	Y	E	D	B	B	L	R	T	C	P
A	I	D	G	A	A	V	I	T	R	H	I	O	P	X	I	E	I	L	N	A	E	D
N	C	N	N	I	F	E	C	H	E	T	L	V	L	T	O	R	O	I	O	R	M	M
I	R	I	E	R	R	C	R	A	X	I	I	S	A	R	R	E	S	T	I	D	O	E
C	O	W	T	E	U	R	O	N	O	L	B	P	N	E	E	H	I	H	T	I	I	T
X	G	R	O	T	S	Y	B	O	P	O	A	A	E	M	T	P	G	O	A	G	B	E
A	R	A	S	C	B	O	E	G	L	G	T	C	T	O	S	S	N	T	I	R	O	O
R	A	L	P	A	U	S	T	E	A	E	I	E	A	P	A	O	A	R	D	A	R	R
C	V	O	H	B	S	P	S	N	N	R	B	P	R	H	I	M	T	O	A	D	T	I
H	I	S	E	O	X	H	I	I	E	O	A	R	Y	I	Q	T	U	P	R	E	S	T
A	T	R	R	N	X	E	T	G	T	S	H	O	I	L	D	A	R	H	O	T	A	E
E	Y	A	E	A	J	R	O	N	O	F	E	B	W	E	L	U	E	J	I	J	R	X
A	P	M	O	Y	Y	E	R	U	X	U	Z	E	N	E	L	I	H	P	O	L	A	H
M	Y	H	Y	C	P	Z	P	F	T	S	P	I	R	U	L	I	N	A	E	I	U	O

Answers on page 72

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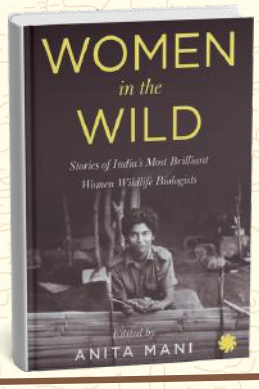
Source: Canva Images

FROM GENES TO GENRES

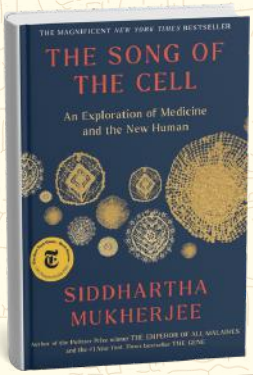
Media recommendations

Book Recommendations



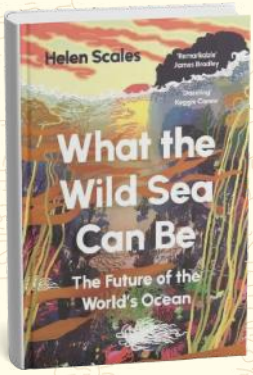
Women in the Wild by Anita Mani

An anthology on some brilliant women wildlife biologists in India, perfect for those interested in research and wildlife.



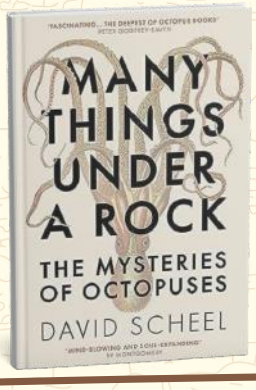
The Song of the Cell by Siddhartha Mukherjee

A journey into the world of cell biology – exploring the history and our understanding of cells and systems, and their importance in the field of medicine.



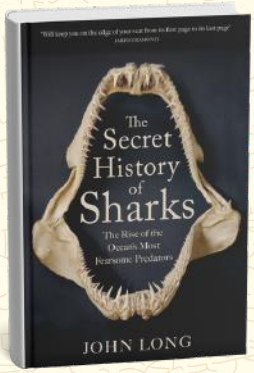
What the Wild Sea Can Be by Helen Scales

Must-read for those who want to learn more about the history and significance of the Ocean, and why ocean conservation is important.



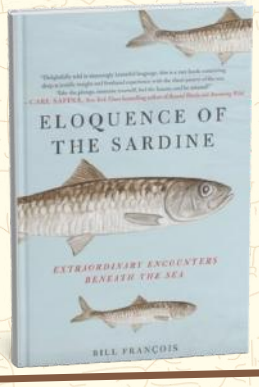
Many Things Under a Rock by David Scheel

A dive into the remarkable intelligence of octopuses, and an attempt at uncovering the mysteries around one of the least understood marine creatures.



The Secret History of Sharks by John A. Long

A riveting exploration of sharks and their nearly 500 million year long history of survival and evolution.



Eloquence of the Sardine by Bill François

An exploration into the lives of sea creatures - how they communicate and what they can teach us.

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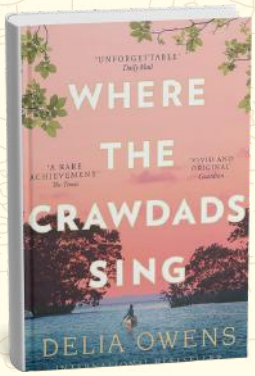
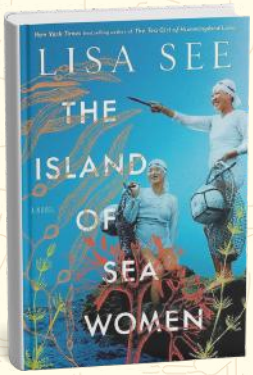
III Year



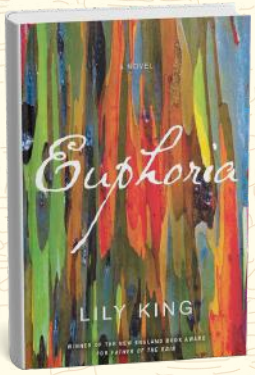
Where the Crawdads Sing by Delia Owens

A zoologist's beautifully crafted tribute to the marsh. The marsh where biological instincts govern survival and the "Marsh girl" defies isolation. The marsh is her protector and her guardian.



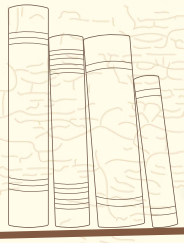
The Island of Sea Women by Lisa See

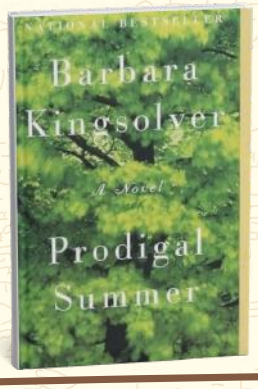
A deep dive into the cold Jeju waters reveals breathtaking resilience of its women free-divers. It's a story of symbiotic strength of female led marine cultures, especially in Korea.



Euphoria by Lily King

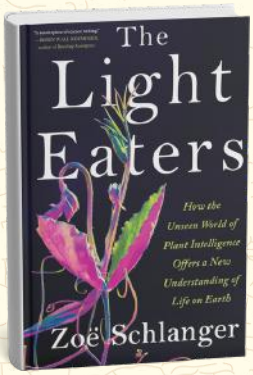
An anthropologist's obsession for studying remote tribal societies lays the foundation for this very well written book. It's an intense tale that explores the dangerous and complex relationships between tribes and nature.





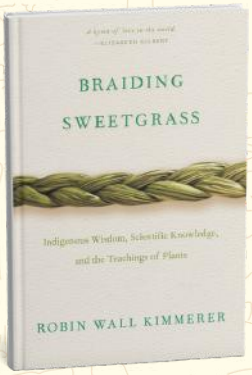
Prodigal Summer by Barbara Kingsolver

In the Appalachians, three stories intertwine and create a celebration of the raw and buzzing fertility of the forest and the necessity of predators.



The Light Eaters by Zoë Schlanger

Prepare to be stunned by the secret life of plants, creatures that communicate, remember, and solve problems without a brain.



Braiding Sweetgrass by Robin Wall Kimmerer

A beautiful synthesis of indigenous wisdom and plant biology, teaching us to listen to the language of the land.

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NAT GEO: *What's the one for you?*

Given are five questions related to your personal preferences. You have to choose what resonates with you best. Remember your choices! Based on your unique combination of answers, we'll recommend what documentary should be your next watch!

1. What one word jumps out at you right now — Thrill, Gentle, or Mysterious?

   A) Thrill
   B) Gentle /calm
   C) Mysterious

2. Are you someone who likes to sit back, take it slow, and really soak everything in, or do you need the action to keep moving and for the stakes to stay high?

   A) Take it slow
   B) High-stakes

3. Are you someone who is happiest curled up somewhere cozy and comfortable, or are you the type who needs to be outside, moving, exploring?

   A) Cozy & indoors
   B) Outdoors & exploring

4. When you settle in to watch something, do you want to feel calm and reflective, like the world has slowed down, or do you want your heart rate up and your eyes glued to the screen?

   A) Calm & reflective
   B) Heart pounding

5. When it comes to social interactions, are you someone who prefers to spend most of their time alone or do you prefer moving with groups?

   A) Solitary
   B) Group

WATCH THIS DOCUMENTARY (BASED ON YOUR ANSWER)!

AAAAA→ Rainforest Hidden Predator - Nat Geo Wild: Borneo's Secret Kingdom

AABAB→ Great Migration / Savanna Herds - Nat Geo: Great Migrations

ABBBB→ Wolf Pack / Yellowstone - Nat Geo: Wild Yellowstone

ABBBA→ Snow Leopard / Big Cat Country - Nat Geo Wild: Tiger: Spy in the Jungle

BAAAA→ Baby Animals / Den Life - Nat Geo Wild: Animal 911

BAAAB→ Elephant & Whale Family Life - Nat Geo: Secrets of the Whales

BBBBB→ Penguin Colonies / Antarctic Life - Nat Geo: Frozen Planet

BABAB→ Pacific Northwest Forest Seasons - Nat Geo: America's Wild Spaces

CAAAA→ Deep Ocean Alien World - Nat Geo: Blue Planet

CBBBA→ Deep Sea Predators / Giant Squid - Nat Geo: Deep Ocean

CABAB→ Amazon Micro World / Rainforest Layers - Nat Geo: Wild Amazon

CBABB→ Wetlands & Living Fossils / Crocs - Nat Geo: Okavango: River of Dreams

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B.Sc. Life Science
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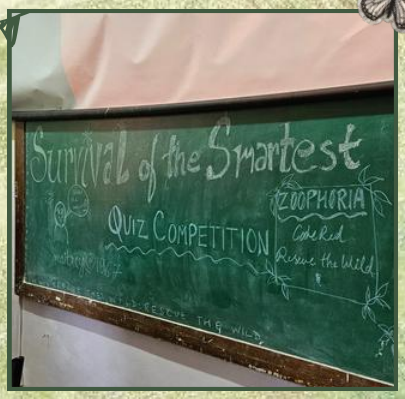
YEAR 2024-25 AT A GLANCE

ZOOPHORIA

The Annual Fest of Zoology Department

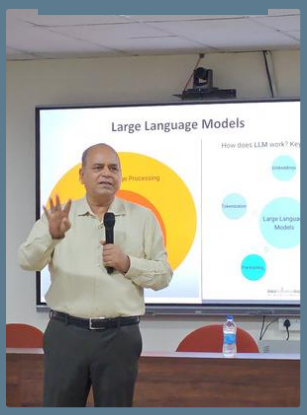


TRINITY

The Annual Fest of Life Science Department

ZOOLOGY DEPARTMENT 2024-25

SEMINARS



Teachers' day celebration

Seminar on "Happiness is a Choice" by Ms. Divya Shah

Farewell to Batch of 2022-26

ANSWERS

MARSH MOSAIC

Across:
4. Anoxic
6. Hydrophyte
9. Ecosystem
10. Bulrush
11. Algae
12. Peat
13. Reed
14. Heron

Down:
1. Cattails
2. Amphibians
3. Waterlogged
5. Brackish
7. Sedgeland
8. Wetland

RHYTHM OF LIFE

Across:
4. Pulse
6. Tempo
7. Circadian
11. Homeostasis
12. Evolution
14. Synchronization
15. Regeneration

Down:
1. Heartbeat
2. Feedback
3. Equilibrium
5. Metabolism
8. Adaptation
9. Chronobiology
10. Growth
13. Cycle

DARE TO SOLVE

EXOPLANET	FUNGI	RADIATION
EXTREMOPHILE	PROTIST	MICROGRAVITY
MICROBE	SPIRULINA	SUBSURFACE
BIOSIGNATURE	HALOPHILE	CYANOBACTERIA
ASTEROID	ACIDOPHILE	ARCHAEA
COMET	LITHOTROPH	BIOSPHERE
METEORITE	PLANETARY	MICROGRAVITY
TARDIGRADE	MAGNETOSPHERE	CRATER
METHANOGEN	ASTROBIOME	PHOTOSYNTHESIS
EUROPA	SOLARWIND	GEOTHERMAL
ENCELADUS	CRYOSPHERE	MARS
HABITABILITY	REGOLITH	LIFEFORMS

SPOT THE DIFFERENCE

Page 28:
1- Rabbit 2- Hare

Page 34:
1- Toad 2- Frog

Page 36:
1- Sea-lion 2- Seal
1- Alpaca 2- Llama

Fillers by:

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III Year

Meet The Team

Row One (from left to right): Ishika Poswal, Akshara Saxena, Lt. (Dr.) Archana Aggarwal, Dr. Jaspreet Kaur, Dr. Anshu Arora Anand, Lyra Singh, Shreyanshee Vaidya, Vashita Vishwakarma

Row Two (from left to right): Kavya Subodh, Cheshta Yadav, Anjali Mishra, Khushi Walia, Janvi

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