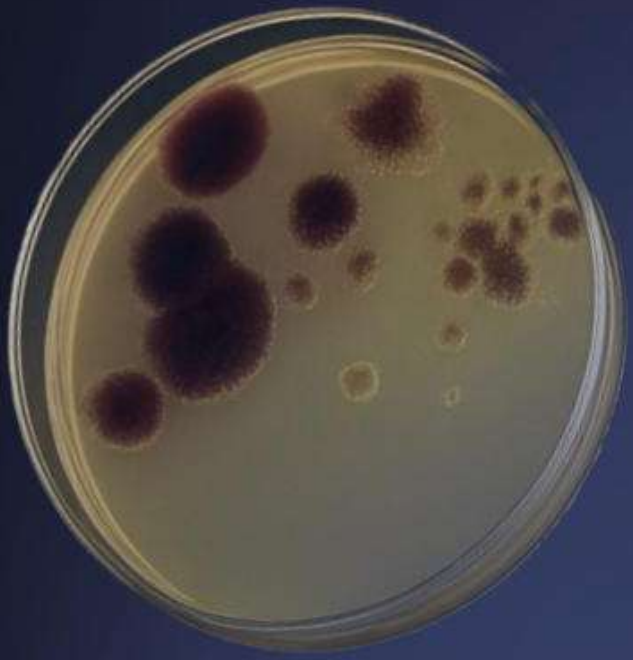
St. Xavier's College, Mapusa- Goa

MICROSCOPE

...See The Unseen



Department of Microbiology

Newsletter
2024-2025
Volume 20

Department of Microbiology

Our Vision

Promotion of an atmosphere for a greater understanding of the diversity and application of the microbial world.

Our Mission

To challenge students to integrate learning and research skills in the pursuit of excellence.

Words of Wisdom from the Administrator

I extend my hearty congratulations to the Department of Microbiology as they release their newsletter, Microscope – See the Unseen, which gives us a chance to read about the wonders that we call microbes and their impact on our daily life.

Microbiology has helped in identifying the various pathogens, which in turn has led to the production of diagnostic tests and antibiotics that have aided in controlling diseases. Besides, bioremediation has emerged as an effective agent for controlling environmental degradation, water pollution, etc. The diminishing fossil fuels led scientists to explore ways and means of producing new sources of energy, like ethanol, biogas, biomass, etc. to operate the everyday used gadgets like the water pumps, cooking ranges, vehicles, etc. This has helped in saving the much-needed fossil fuels for other important uses. These are but, just a few examples of its reach.

I would like to summarise it in the words of the Microbiology Society, "By studying small things, microbiologists can answer some big questions which affect many aspects of our lives, from degrading food waste to causing and curing disease".

Microbiology is an expansive subject and with the growing environmental problems, it throws up more and more solutions. Hence, it is a subject that lends itself to research and new discoveries. Humanly speaking, we are more prone to look at the employment opportunities after graduation. Today, when we are speaking about start-pups, Vikshit Bharat, it might help our students to delve deeper into this field and come up with newer solutions to our environmental problems, newer health safeguards, etc. As Louis Pasteur said, "Fortune favours the prepared mind."

Congratulations to the Editorial Board and the contributors to this newsletter. May its contents help our minds soar high.

God bless everyone!

Fr. Tony Salema

Principal's Message

The Department of Microbiology rolls out the 20th Volume of Microscope - See the Unseen, a remarkable milestone that testifies the department's commitment to quality education. Vibrant classroom interactions, mini research labs, skill development sessions, experiential learning, consultancy, and community engagement are regular features at the Department, providing students with a diverse and inclusive environment.

This newsletter is an interesting compilation of ideas and stories of the fascinating world of microbiology contributed by students, together with a detailed account of the myriad activities curated by the faculty. Congratulations to all the editorial team members led by Dr. Trelita de Sousa!

The outstanding performance of our students, their dedication to learning, and their passion for microbiology are truly commendable! I urge every budding microbiologist to continue exploring the vast opportunities in this field and strive for excellence in all your endeavours.

Best wishes and warm Congratulations to the Head of Department Ms. Linette de Souza, and also to all the faculty members on the wonderful work being done in the Department.

Looking forward to seeing the continued growth of our students and faculty, setting new benchmarks. I wish the Department soars high, paving the way for a St Xavier's Centre of Excellence in Microbiology!

"The future belongs to those who believe in the beauty of their dreams."

Best wishes,

Ursula Barreto

A Warm Welcome from the Head of the Department

Microbiology, as a discipline, continues to expand its horizons, bridging fundamental science with applications in health, environment, agriculture, and industry. Our department remains committed to nurturing inquisitive minds, promoting hands-on learning, and encouraging research that addresses both local and global challenges.

I am proud of the dedication and achievements of our faculty and students, who contribute tirelessly to the growth of Our Department. Whether it is through publications, seminars, community outreach, or innovative classroom practices, each effort strengthens our collective vision.

This newsletter captures the energy, creativity, and scientific spirit of the Department of Microbiology. The past year was marked by a rich blend of learning and innovation. From the Students' Corner, where young minds explore diverse themes, to the Departmental Activities, each initiative reflects our commitment to holistic learning, excellence, and responsibility.

A special word of appreciation goes to our student editorial team: Miss Shanaika Pires, Miss Sonia Shetke, and Miss Anezka Fonseca, whose thoughtful curation has brought these achievements together in this newsletter. Their effort in documenting and celebrating our journey is commendable. I would also like to sincerely thank the Editor, Dr. Trelita de Sousa, for guiding the team with dedication and encouragement, ensuring that this publication reflects both professionalism and creativity.

I thank everyone for their contributions and look forward to continued growth, collaboration, and innovation in the years ahead.

With best wishes,
Linette M. de Souza Noronha

Editor's Note …

"Messieurs, C'est les microbes qui auront le dernier mot."
(Gentlemen, it is the microbes who will have the last word.)
– Louis Pasteur

In a world that often rushes past the "small stuff," microbiology reminds us that greatness doesn't always come in large packages. In this edition of Our Department Newsletter, the unseen takes centre stage!

This issue is a celebration of scientific creativity driven by the boundless curiosity of our students. Microbiology thrives on curiosity, whether it's peering into a Petri dish and wondering why a colony shines a peculiar hue, or exploring how an ancient bacterium manages to outwit nature's most extreme conditions. Our students, faculty, and researchers continue to chase these questions, sometimes finding answers, and often finding better questions.

In what follows, you'll encounter stories of innovation, perseverance, and discovery. From trailblazing research ventures to classroom initiatives that blur the line between learning and exploration, this issue reflects the vibrant spirit of Our Department. As you set off on this little voyage of words with us, I invite you to keep your own microbial curiosity alive. After all, curiosity is the lens through which small things become extraordinary.

My heartfelt appreciation to our Administrator, Rev. Fr. Antonio Salema, our Principal, Ms. Ursula Barreto, and our Head of Department, Ms. Linette de Souza, for their constant encouragement and relentless support, to my colleagues for their invaluable inputs, and above all, to our students, whose enthusiasm breathes life into these pages. A special thank you to our student editors, Ms Anezka Fonseca, Ms Shanaika Pires, and Ms Sonia Shetke, whose dedication, creativity, and teamwork have woven this edition together so beautifully. This newsletter is a testament to their ingenuity, and we hope you find it as inspiring to read as it was for us to create.

Here's to thinking small and achieving big!

Dr. Trelita de Sousa

A Few Words from Our Student Editors …

Welcome to the latest edition of "Microscope…See the Unseen", the Annual Departmental Newsletter.
The Department of Microbiology at St. Xavier's College promotes creativity with a touch of science in their own little way of celebrating these tiny mystical microbes. This newsletter encompasses this very essence of microbiology. As you flip through the pages of this edition, you will enter into a reading journey where Microbes are presented with creativity that will both interest and enchant you. I would like to express my gratitude to all those who have contributed to this edition and helped us embark on this unique adventure in the world of the unseen microbes through the lens of literature. Looking forward to nurturing your curiosity with every page.

~ Shanaika Pires, T.Y.B.Sc.

In the ever-evolving world of microbes, every discovery solves the mystery of the working of life. This issue brings you a curated mix of historical discoveries, current breakthroughs, emerging innovative developments, creative artworks, and activities that intersect with microbiology in everyday life. From cutting-edge research to innovative ideas, we aim to reshape how we study the microbial world, something that will ignite your curiosity. After all, in microbiology, the smallest organisms often lead to the biggest breakthroughs. Let's continue to explore the unseen!!

~ Sonia Shetke, T.Y.B.Sc.

The field of microbiology is one built on perseverance and collaboration. It reminds us that even the smallest forms of life can have the biggest impact. This newsletter aims to honour that spirit, not just by sharing information, but by celebrating the people behind the work: the long hours, the questions that led to unexpected answers, and the collective effort it takes to push science forward. To everyone who contributed their time, stories, and energy…thank you. Your work inspires and uplifts our community. As we continue to grow as researchers and explorers, let's commit to staying curious in the lifelong quest for knowledge.

~ Anezka Fonseca, T.Y.B.Sc.

MICROSCOPE ... SEE THE UNSEEN

Department of Microbiology

CONTENTS

BREAKING BARRIERS: WOMEN IN STEM WHO DEFIED THE ODDS

Pursuing a career in science, technology, engineering, and mathematics (STEM) often comes with challenges, particularly for those who dare to think differently and push boundaries. Historically, for women in STEM, these obstacles have been even greater, yet their determination, intellect, and unwavering belief in their potential have propelled them to remarkable achievements. Their journeys are a testament to the power of perseverance, resilience, and trusting one's instincts even in the face of adversity. They are a rallying cry for future generations to pursue their passions despite the obstacles.

One such pioneer was **Barbara McClintock** (1902–1992), a brilliant geneticist whose work in maize genetics revolutionized our understanding of DNA. In the early days of her career, McClintock faced skepticism and exclusion in a field dominated by men. Undeterred, she pursued her research with relentless dedication, convinced that there was more to genetics than what was commonly accepted. Her discovery of "jumping genes," or transposable elements, transformed our understanding of genetic inheritance, challenging long-held scientific beliefs. Though initially questioned, her discoveries were eventually recognized, and she became the first woman to win the Nobel Prize in Physiology or Medicine, unshared. Her journey exemplifies the importance of trusting one's scientific intuition, even when the world doubts you.

Katalin Karikó (1955–present) is another scientist whose determination changed the world. For years, she faced rejection after rejection in her pursuit of messenger RNA (mRNA) research. Many dismissed her ideas as unrealistic, and funding was scarce. Yet she never dithered in her belief that mRNA technology could transform medicine. Her unwavering dedication ultimately led to the development of the Pfizer-BioNTech and Moderna COVID-19 vaccines, scientific breakthroughs that saved millions of lives. In 2023, Karikó's contributions were recognized with the Nobel Prize in Physiology or Medicine, proving that resilience and trust in one's work can lead to revolutionary change.

Rita Levi-Montalcini's (1909–2012) story is a powerful reminder that persistence can overcome even the direst of circumstances. As a Jewish woman in fascist Italy, she was barred from academic positions, but that did not deter her. She set up a secret laboratory in her bedroom and continued her research in neuroscience, making one of the most significant discoveries of the 20th century: nerve growth factor (NGF). Her groundbreaking work earned her the Nobel Prize in Physiology or Medicine in 1986. Her story is a beacon of hope for all who face opposition in their pursuits.

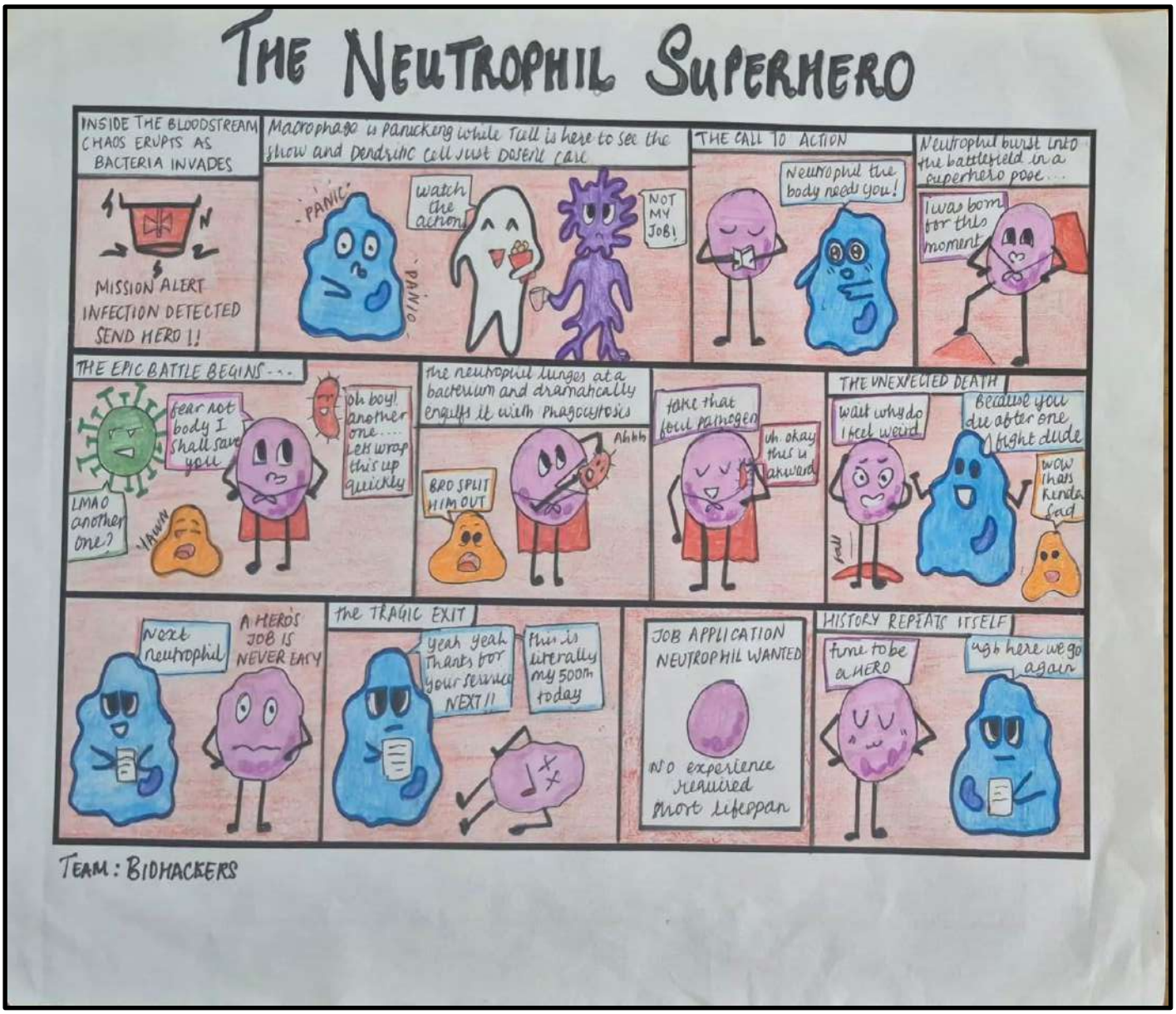
India, too, has been home to remarkable women who defied the odds to make a difference in science. **Dr. Asima Chatterjee** (1917–2006), a pioneering organic chemist, made groundbreaking discoveries in medicinal chemistry, particularly in the development of anti-malarial and anti-epileptic drugs. As the first Indian woman to earn a doctorate in science, she faced tremendous challenges in a male-dominated field but never wavered in her pursuit of scientific advancement.

Another trailblazer in Indian medicine was **Dr. S. I. Padmavati** (1917–2020), India's first female cardiologist. In an era when women struggled for recognition, she founded the National Heart Institute

in New Delhi and led pioneering research in cardiovascular diseases. Her commitment to preventive healthcare and cardiac treatment earned her the prestigious Padma Bhushan and Padma Vibhushan awards, two of India's highest civilian honours.

What unites these extraordinary women is not only their brilliance but also their unwavering determination. Their journeys were not smooth. Each faced skepticism, discrimination, and countless hurdles. Yet, they trusted their instincts, believed in their work, and persevered against all odds. In doing so, they shattered barriers, changed lives, and paved the way for future generations of women in STEM. By fostering an inclusive environment and providing mentorship opportunities, we can ensure that the legacy of these pioneering women continues to inspire, innovate, and reshape the world.

~ Anezka Fonseca (T.Y.B.Sc.)



~ Sajal Mardolkar & Shantashri Gaitonde (T.Y.B.Sc.)


Microbial Horoscope
January
February
March
April
May
June
July
August
September
October
November
December

Microbial Horoscope

JANUARY

You are strong, determined, and adaptable, just like *Pseudomonas aeruginosa*, a bacterium capable of surviving in almost any environment. It forms protective biofilms and resists antibiotics, making it impossible to eliminate. Just as this microorganism thrives in harsh conditions, you too are hardworking and goal-oriented. You work persistently to achieve success, refusing to give up until you dominate your environment.

FEBRUARY

A highly intelligent virus, *T4 phage* targets bacteria with its unique structure and advanced genetic mechanisms. It doesn't simply destroy its host but cleverly manipulates its host's machinery to produce more of its kind. Similarly, you are creative, strategic and ruthlessly efficient. The T4 phage challenges traditional biological systems symbolizing your will to adapt, evolve, and survive amidst constant change.

MARCH

You are bold and unstoppable like *Staphylococcus aureus*, a bacterium that thrives in diverse environments and spreads rapidly. Known for its strength and ability to resist antibiotics, it reflects your confident and fearless attitude, always ready to take action. You lead with passion and energy, make your presence known, and leave a powerful impact wherever you go.

APRIL

A fast-growing, toxin-producing bacterium, known for causing food poisoning and gas gangrene, *Clostridium perfringens* is aggressive and rapid in nature. Similarly, you are bold and fearless in seizing opportunities showing no hesitation in dominating the environment. Just like the bacterium that spreads rapidly through obstacles, leaving a powerful impact, you take charge and take on challenges without any hesitation.

MAY

You thrive in the toughest situations, much like *Deinococcus radiodurans*, one of the most radiation-resistant bacteria known. No matter what life throws at you, you power through with an indestructible spirit. You must embrace change and trust that your strength will carry you through.

JUNE

Like the glowing *Allivibrio fischeri* (formerly *Vibrio fischeri*), which forms symbiotic relationships with marine creatures, you shine in social settings and adapt to your surroundings effortlessly. You have a magnetic presence, and people are drawn to your energy. Use your light wisely, because sometimes, dimming it to recharge is just as important.

JULY

Much like *Toxoplasma gondii*, a protozoan that can subtly alter the behavior of its hosts, you have a way of getting what you want. You're a natural leader, often guiding people without them even realizing it. Just be sure to use your influence for good and that your actions align with your long-term goals.

AUGUST

Like *Thermus aquaticus*, the bacterium that made PCR possible and revolutionized molecular biology, you are a game-changer. Your ideas are ahead of your time, and you're always pushing boundaries. Your curiosity knows no limits, and you inspire others to think bigger. Just remember to stay patient and true to yourself.

SEPTEMBER

You can adapt in any situation and understand its complexity with ease, just like *Escherichia coli*, which thrives in diverse environments. Life may throw challenges your way, but if you navigate obstacles with calm and resilience, you'll find that good things naturally follow. Trust in your ability to adjust, evolve, and thrive.

OCTOBER

You bring balance to chaotic situations and relationships with clarity and patience, just like *Rhizobium leguminosarum* through its perfect symbiotic harmony with plants. Keep your calm and wisdom, and life will feel less chaotic, bringing growth, stability, and joy your way. Your ability to nurture and connect will make life a fulfilling experience.

NOVEMBER

Just like *Yersinia pestis*, the mystery behind the Black Death, you conjure enigma and wonder to life. There's a sense of unpredictability around you, but that's your power. Keeping the future for the future and living in the moment will bring you peace. Don't stress over what's unknown, just embrace the adventure.

DECEMBER

Like *Mycobacterium tuberculosis*, which survives in harsh conditions and makes its pathogenesis even more dangerous, you are strong through thick and thin. Similarly, you have a fierce spark that makes you a risk-taker, but with the right balance of thought, strength, and unshakable willpower. Keep navigating problems with resilience, and you will always find a solution.

~ Anezka Fonseca, Shanaika Pires, & Sonia Shetke (T.Y.B.Sc.)

MICROBE OF THE MONTH!

Pseudomonas lalkuanensis — A Tiny Hero Tackling E-Waste

In a world drowning in discarded gadgets and tangled wires, who would've thought a microscopic bacterium could be part of the solution?

Meet *Pseudomonas lalkuanensis*, a newly discovered bacterial strain with a superpower: it can munch on electronic waste (e-waste). Yes, the kind that's piling up in landfills across the globe.

This Gram-negative, rod-shaped, aerobic microbe, nicknamed PEO8, was discovered in a rather unassuming place: the contaminated soil of a paper mill yard in Lalkuan, a small town nestled in Uttarakhand, India. Scientists first isolated it in 2020, and since then, it's been turning heads in environmental microbiology.

Why the buzz? Because *Pseudomonas lalkuanensis* doesn't just survive in soil polluted with e-waste, it thrives on it. It can break down harmful e-waste components and use them as a carbon source. That means it could help reduce the toxic load of e-waste while offering an eco-friendly alternative to current disposal methods.

As the world races to find sustainable solutions to its growing trash problem, this humble microbe is a reminder that sometimes, the biggest innovations come from the smallest forms of life.

~ Sancia J. Pereira (S.Y.B.Sc.)

T.Y.B.Sc. MICROBIOLOGY PERFORMANCE 2023-2024

Students Appeared: 66

Grade A+ (Excellent): 6

Grade A (Very Good):15

Grade B+ (Good): 19

Grade B (Above Average): 17

Pass Percentage: 96%

THE STORY OF THE JURKAT CELLS

In 1976, at the University of Texas MD Anderson Cancer Center in Houston, a 14-year-old boy was diagnosed with acute T-cell leukemia (T-ALL). A renowned cancer researcher, Dr. James Minowada and his team took a sample of the boy's cancerous T-cells and started to culture them in the lab. To their surprise, the cells grew very fast and continuously, showing an abnormal capacity to grow indefinitely. The cell line was given the name "Jurkat" based on the last name of the patient whose cells were used. The patient's identity was not made public. Further research on the Jurkat cells led to the identification of various distinctive characteristics, such as being immortalized, T-cell specific, cancerous in nature, and possessing a high proliferative capacity.

The Jurkat cell line has found extensive application in research, especially in immunology, cancer biology, gene therapy, and vaccine studies. The cells have been used by the researchers to investigate T-cell signaling, activation, and function, and the mechanisms of T-ALL and other types of cancer. The cells have also been used to create novel cancer treatments, including CAR-T cell therapy. Some of the significant findings obtained with the Jurkat cells include the discovery of the T-cell receptor (TCR) complex and the description of T-cell signaling pathways. Today, the Jurkat cell line is still an important reagent in biomedical research, allowing scientists to probe the complexities of T-cell biology and cancer. The cells' impact on science will be felt for generations to come, making them a legacy that will last for centuries in the battle against cancer and other diseases.

~ Shenely Fernandes (T.Y.B.Sc.)

MY PSEUDOMANTISM

In the lab's soft fluorescent glow,
I spend my nights watching you grow.

Your flagella twirl like ribbons in the air,
And my heart skips a beat just to see you there.

At nineteen, I find a strange kind of bliss
In every petri dish, sealed with a scientist's kiss.

Some say it's odd to fall for such tiny life,
But you light up my world, easing every strife.

I'm still learning, and my verses might be rough,
Yet every colony of you makes my passion enough.

In this crazy science journey, wild and free,
Dear *Pseudomonas*, you mean so much more to me.

~ Joel Fernandes (S.Y.B.Sc.)

UNKNOWN FACTS ABOUT SCIENTISTS

1. Unnoticed yet impactful tale of Dr. De's Cholera Story

Ever since the first recorded case in India in 1819, Cholera has been a major health issue for 200 years, plaguing our planet and intriguing our scientific community.

Dr John Snow, an English physician, studied the cholera outbreak in London in 1854. He found that there were clusters of cholera cases near a public water pump on Broad Street, and ultimately proved that cholera is a waterborne disease. Later, in 1883, Robert Koch, a German physician, gave us Koch's Postulates that determine the relationship and specificity of a disease to a particular pathogen. With the principles of these postulates, he also determined the bacteria that caused cholera, *Vibrio cholerae*. Ideas to combat cholera set foot with its first recorded outbreak in Calcutta. One of these pioneers was Dr. Sambhu Nath De.

Dr. Sambhu Nath De

Dr. De was born in 1915 in the quaint village of Garibati, which rests on the western bank of the Ganges, roughly 30 km north of Calcutta. He attended school in India before obtaining a Ph.D. in 1947 from the University College Hospital Medical School in London. His work examined the effects of experimental hydrocephalus on the brain.

While pursuing his PhD, Dr. De underwent several formative hardships that ultimately fashioned him into a stellar individual. Even before securing employment at Nilratan Sircar Medical College, he began independent experimental work on the pathogenesis of cholera, collaborating with a former colleague at Calcutta Medical College. His initial research on the action of cholera toxin marked the beginning of a groundbreaking journey.

While in London, Dr. De had developed a profound interest in bacteriology and pathology and had already set his sights on working on cholera. His rigorous research led to a revolutionary discovery: it was not the bacterium itself but its exotoxin that caused cholera's devastating symptoms. He demonstrated that cholera toxin induces severe fluid loss, ultimately leading to dehydration and death. This crucial understanding paved the way for the development of Oral Rehydration Therapy (ORT), a simple yet lifesaving treatment that helped prevent dehydration and has continued to save millions of lives worldwide to date.

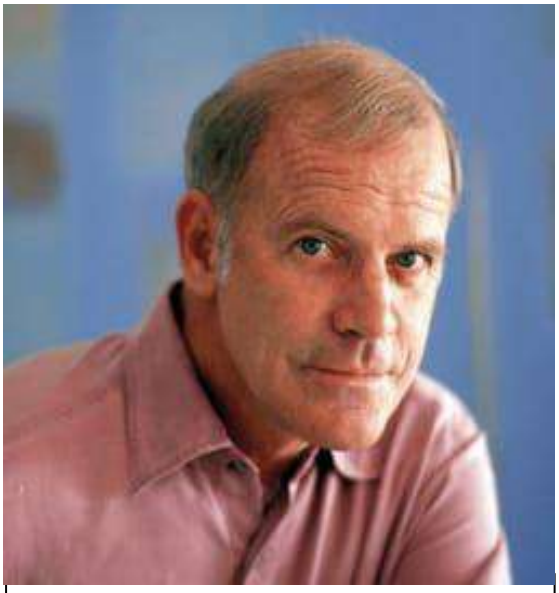
Despite his groundbreaking contributions, Dr. De failed to receive the recognition he deserved. His work laid the foundation for modern cholera treatment and diarrheal disease management, yet it was overshadowed by the scientific glamour of the time.

Did the world and India fail to recognize a true gem? Perhaps, but science is not about recognition; it is about impact. Even if Dr. De remained in the shadows, his research continues to save lives, shaping the future of healthcare and inspiring generations of scientists.

~ Shanaika Pires (T.Y.B.Sc.)

~ Joel Fernandes & Shubham Mandrekar (S.Y.B.Sc.)

2. Kary Mullis: Where LSD met Science and gave Birth to PCR

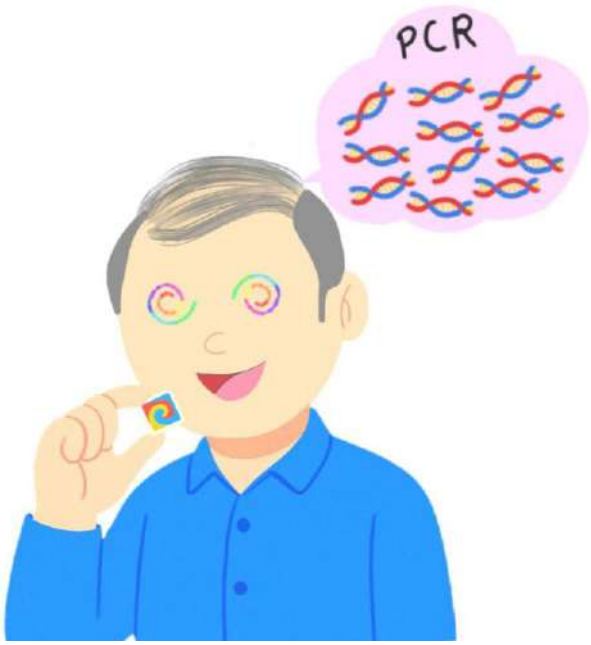


Kary Mullis

We've heard of the accidental discovery of the antibiotic Penicillin by Alexander Fleming, which happened inside a lab. The discovery of Kary Mullis was also an accidental one, not the kind that happens in the lab, but the kind that happens while being high on LSD (Lysergic acid diethylamide).

When we think of scientists, we perceive them as disciplined geniuses who are dedicated to their scientific research. But Kary Mullis was never your typical scientist. While other researchers spent endless hours drowning in experiments, Mullis would get high on LSD and often engage in rebellious acts with his colleagues, even once threatening to bring a gun to work. In short, he possessed all the qualities of someone you would not want to work with, let alone share scientific theories.

Mullis was known for questioning traditional scientific methods and refusing to blindly follow established protocols. At the time, he was working at Cetus Corporation, and his job was to make radioactive probes, which he found to be quite repetitive and boring, causing him to clash with everyone. Then one day, Cetus brought in a new technology that could synthesize probes, basically doing all of Mullis' monthly work in days. This left Mullis with plenty of free time on his hands. Since he didn't get along well with his co-workers, Mullis decided to spend the weekend in Mendocino County. As he drove along the dark, winding roads to his cabin, his mind began to drift away. Mullis once said that finding a specific nucleotide against a billion-long DNA is equivalent to reading a license plate on Interstate 5 in the dark, from the moon. That night, as he was thinking about the new DNA tests at Cetus, he got struck with an idea. He thought, what if more of those license plates were created? He wasn't high on LSD at the time, but, as a psychedelic person, visuals danced in front of him. In his own words, “Lurid blue and pink images of electric molecules injected themselves somewhere between the mountain and my eyes”.



It was in his altered state of consciousness that he visualized the process of DNA amplification: using primers to target specific DNA sequences, enzymes to replicate them, and repeating the process in cycles to create millions of copies. It was simple, yet no one in the scientific community had ever thought of it.

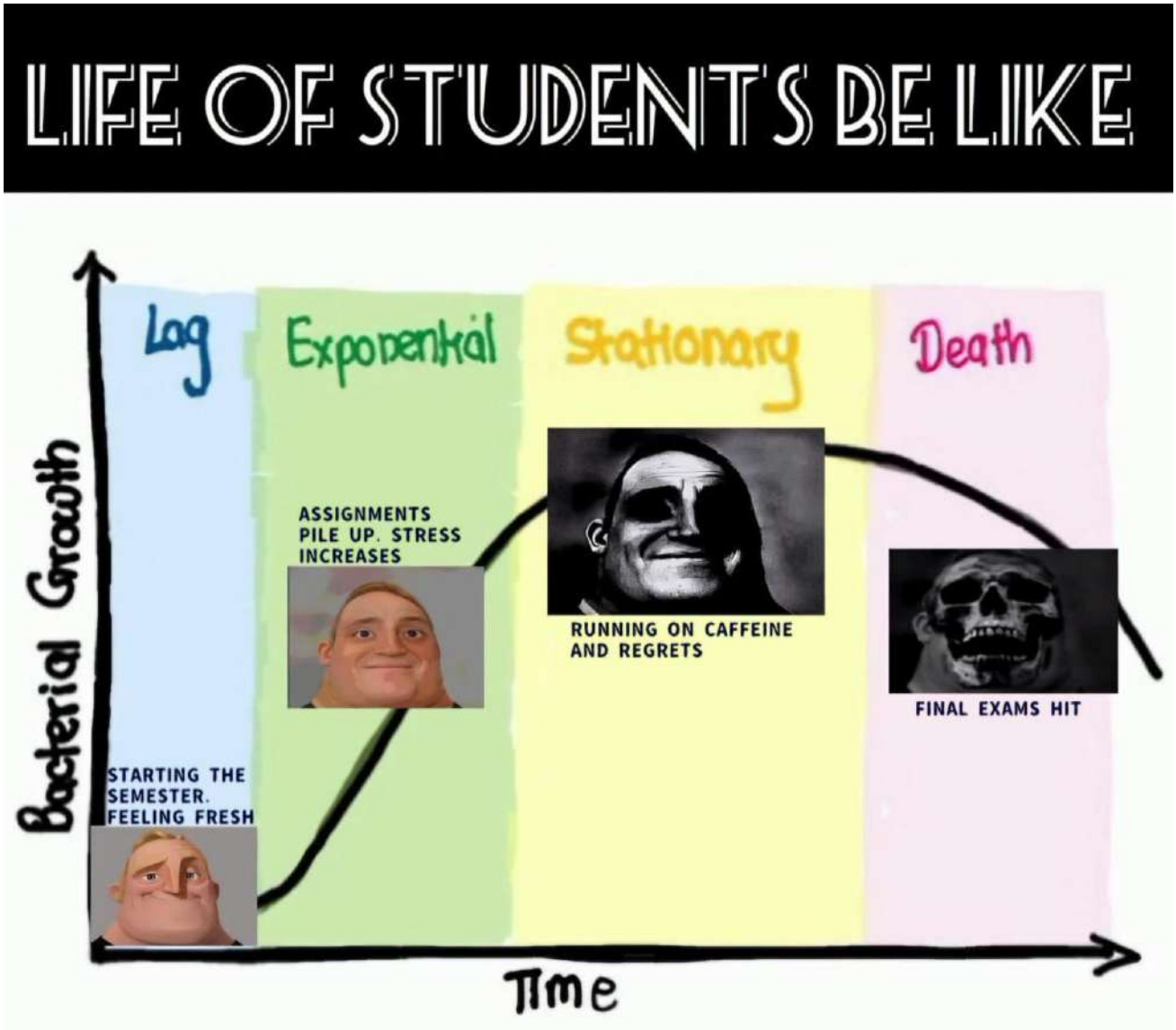
He immediately pulled over and quickly scribbled his idea on the back of a gas receipt. He called this DNA multiplying technique, PCR (Polymerase Chain Reaction).

“It was difficult for me to sleep with DNA bombs exploding in my brain," Mullis later recalled. PCR was born, but science wasn't ready for it. Mullis rushed to the lab the next day and presented his idea. However, due to his reputation for sloppy work, his colleagues were skeptical. Yet, with the help of other scientists, they successfully executed the process. PCR was invented, a technique that has since revolutionized genetics, crime forensics, cancer research, and even COVID-19 testing.

When he was interviewed, Mullis admitted, "What if I had not taken LSD ever; would I have invented PCR? I don't know. I doubt it. I seriously doubt it."

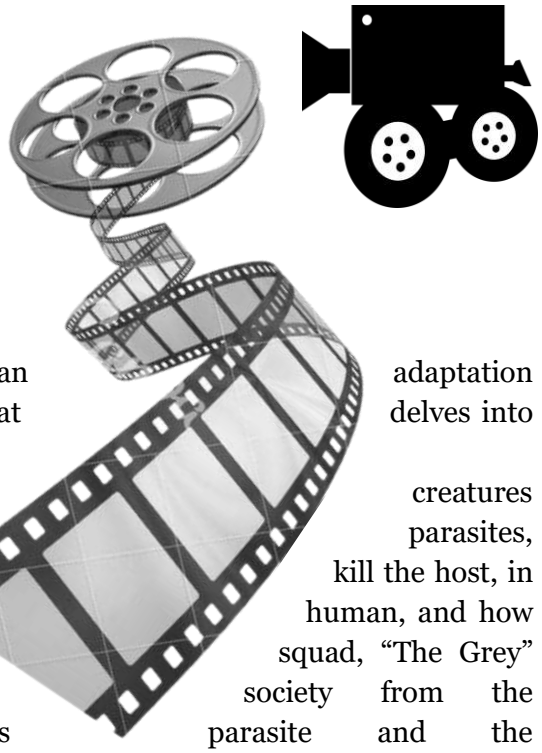
Kary Mullis may have been unconventional, but his eccentricity gave the world one of the greatest scientific breakthroughs in history.

~ Sonia Shetke (T.Y.B.Sc.)



~ Shreya Bhat & Siyanda Rodrigues (T.Y.B.Sc.)

MICROBIOLOGY AT THE MOVIES!!



Have you ever watched sci-fi movies and questioned science? If yes, then this piece of article debunks the scientific relevance of the entertainment world while also recommending some really interesting suggestions for you!!

1. Parasyte: The Grey (2024)

This interesting science horror Netflix series which is an adaptation of a Japanese anime that delves into the plot of defeating unidentified creatures called the parasites, which live and kill the host, in this case a human, and how the police squad, "The Grey" protect the society from the parasite. Now this parasite and the scientifically referred parasite have an immense difference since here the parasite is more like a predator drifting away from the true nature of what a parasite is, which does not kill the host but only derives nutrition from it. As for the microbial world, this theme of parasites seems very absurd and completely fictional. This series also claims that no immune response by the host is initiated against these so-called parasites while also seamlessly integrating and manipulating the neural network, which is not possible scientifically since the neural network is complex and requires compatibility for integration. Therefore, the series takes several scientifically inaccurate creative liberties in order to keep the audience on the edge of their seats. But a must-watch for the horror thriller enthusiasts!!!

2.Train to Busan (2016)

This is a Korean horror film based on the incidents that occur on a train from Seoul to Busan as the city grapples with the dark times of a zombie apocalypse. As indicated in the movie, an unknown virus is leaked from a biotech company, which enters the host through the blood-brain barrier through skin bites, becomes systemic, and transforms the host into a zombie. Now this concept seems quite believable; but multiple inaccuracies can be spotted, as in the idea of the unknown pathogen not having an incubation period leading to a really quick systemic infection, which has never been seen till date in the scientific world, unlike the movie world, also not forgetting that the neural network is complex and not easily compatible. This renders the ideas captivating, yet they lack scientific precision. For those who want to enjoy this blood thriller journey of the train with a whole new creative concept of zombies and a touch of science, this is the perfect fit for you, even though science has yet to ascertain the zombie theory in the real world.

3. Spider-Man (2002)

Spider-Man's origin story, while iconic, is a microbiological impossibility wrapped in superhero fantasy. The premise of a genetically engineered spider transmitting transformative traits through a single bite would require a super-duper elaborate genetic pathway to be compatible at multiple levels to be successful, which is at least not happening right now in science. Peter Parker's instant acquisition of superhuman strength, reflexes, adhesion, and neurological enhancements bypasses the realities of immune rejection, protein synthesis timelines, and cross-species genetic compatibility. In essence, Spider-Man's transformation defies every known law of biology while still creatively grappling the interest of the audience. For those who root for this magic of genetic engineering can or have definitely seen or will see this journey of Peter Parker but the real world has ethics to follow and a lot of research if Spiderman were to be real. A must-watch for its creativity. Whether you are a Peter Parker fan or you don't know who he is, this is your chance to watch or rewatch it.

4. Venom (2018)

Venom presents a thrilling but biologically not yet possible concept: an extraterrestrial symbiote that fuses with a human host at the cellular and neural level without triggering immune rejection or physiological collapse. In reality, the human body is highly defensive against foreign entities. Even organ transplants require immunosuppression. So, a shapeshifting, sentient organism integrating seamlessly into tissues and the central nervous system stretches far beyond known microbial behaviour. The symbiote demonstrates features to a hyper-intelligent biopolymer, capable of altering host metabolism, behaviour, and anatomy in the real scientific world no virus, bacterium, or parasite can do. While Earth hosts parasitic relationships that manipulate host behaviour (like *Toxoplasma gondii* or parasitic wasps), *Venom* elevates this to science fiction by giving the microbe-like entity not only autonomy but consciousness. Thus, the film transforms the idea of microbial symbiosis into an unrealistic yet fascinating dance between host and invader where the microbe doesn't just live within, it becomes a co-pilot of the body and mind. So, if exploring the themes of co-pilot symbiosis is your interest while the suspense keeps you hooked on then it is your pick for the day!!!

5. Avatar (2009)

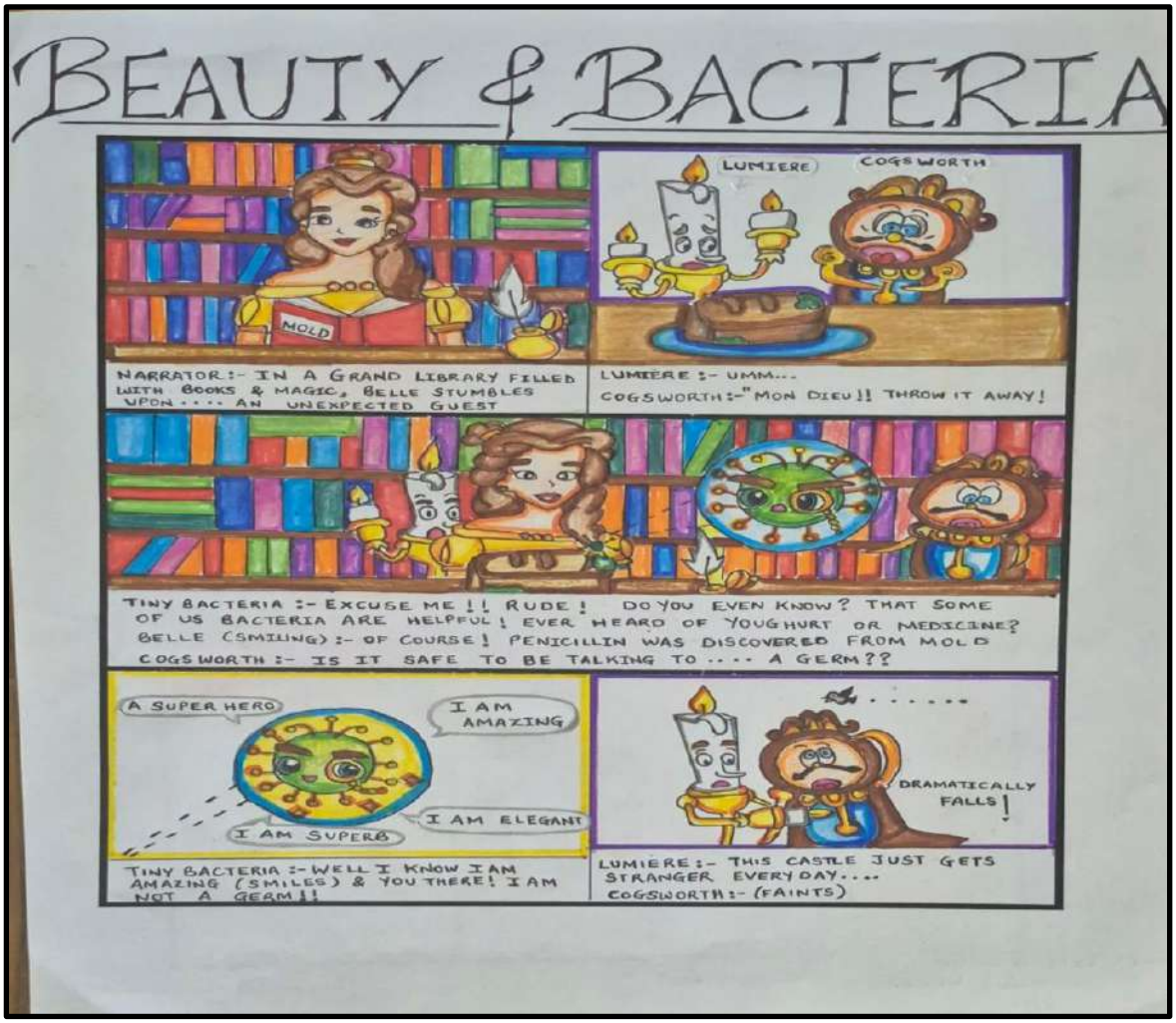
James Cameron's Avatar (2009) offers a mesmerizing spectacle of a world that is inspired from nature but exaggerated in the most mesmerizing form, making it an eye-catching film for its audience. From a microbiological perspective, it is rich with both creative parallels and scientific curiosities. The theme revolves around the planet Pandora, which beams with life that is bioluminescent, enhanced neurologically networked, and biologically distinct, suggesting a completely separate evolutionary tree, likely with at least a different genetic code. The Na'vi clan's neural interface is an imaginative idea yet

unsupported by known microbiological mechanisms. Their immunity to human diseases (and vice versa) implies a total immunological divergence, perhaps due to fundamentally different microbiota and pathogen-host recognition systems. This is a world of elaborate networks somewhat similar to the mycorrhizal network that we are aware of. A film that is creatively inspired by scientific facts, so if you want to get lost in the beautiful world of Pandora, where you will find life in the most mesmerizing form, this is your chance.

Can science make Superheroes or Zombies? Not yet but who knows what the future holds? Microbiology remains one of the most mysterious subjects of science. These films may not get the science right, but they do fuel curiosity, spark imagination, and remind us how powerful our understanding *could* become and the extent to which the power of science can be used.

So, the next time you spot some pseudoscience in your favourite film, don't roll your eyes, lean in, laugh a little, and maybe Google the facts later.

~ Anezka Fonseca, Shanaika Pires, & Sonia Shetke (T.Y.B.Sc.)



~ Lensa Lobo & Shefali Kerkar (S.Y.B.Sc.)

HALOPHILIC WORD SEARCH

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

1. Haloferax
2. Halobacterium
3. Salinibacter
4. Natrialba
5. Haloarcula
6. Halorubrum

~ Sancia J. Pereira (S.Y.B.Sc.)

~ Ipsita Banja & Ruchika Naik (T.Y.B.Sc.)

MICROBIOLOGY IN THE NEWS!!

Microplastics May Be Creating Antibiotic-Resistant Superbugs

Researchers at Boston University have found that due to their hydrophobic nature, microplastics provide surfaces conducive to bacterial biofilm formation, which enhances bacterial resilience against antibiotics. This phenomenon could exacerbate antibiotic resistance, especially in communities with poor sanitation. The study highlights the urgent need to investigate the interactions between microplastics and bacteria to address this escalating public health threat.

Researchers Create World's Largest Digital Microbe Collection called APOLLO

Researchers at the University of Galway have developed APOLLO, the world's largest digital collection of microbial models, comprising 247,092 computer-generated representations of bacteria from the human microbiome. This groundbreaking resource aims to advance our understanding of how microbial communities influence health and disease. By enabling scientists to study microbial functions through computational simulations rather than relying solely on complex lab experiments, APOLLO has the potential to accelerate medical discoveries and improve disease research.

The Dire Wolf: No Longer just a "Game of Thrones" Tale of Fiction

When most people hear "Dire Wolf", they picture the giant, loyal beasts from Game of Thrones. But these creatures weren't just fantasy; they were very real and once roamed across North and South America during the Ice Age. Dire wolves (*Aenocyon dirus*) looked a lot like today's grey wolves, but they were bigger and bulkier, with stronger jaws that could crush bones into powder. For thousands of years, they were the apex predators, until they suddenly vanished about 10,000 years ago. The dire wolf has long captured our imagination, especially after its portrayal in Game of Thrones. Now, thanks to advancements in genetic engineering, scientists have brought a version of this extinct species back to life. Dallas-based biotech company Colossal Biosciences announced the birth of three genetically engineered wolf pups: Romulus, Remus, and Khaleesi, marking what they describe as the world's first successful de-extinction. By analyzing DNA from ancient dire wolf fossils, scientists identified key genetic traits and edited the genome of grey wolves to express these characteristics. The edited embryos were implanted into surrogate dogs, leading to the birth of these pups.

~ Anezka Fonseca, Shanaika Pires, & Sonia Shetke (T.Y.B.Sc.)

MICROSCOPIC WONDERS

In microscopic realms, unseen and grand
A world of microbes, at nature's command

Bacteria, viruses, fungi too
Each with its role, in all we do

From soil to gut, to every place
Microbes thrive, with a steady pace

Some bring disease, with a deadly might
Others heal, with a gentle light

Penicillin's discovery, a fortunate find
Saved countless lives, left behind

Vaccines protect, with a shield so strong
Against the invaders, all day long

The microbiome, a complex web
Influences our health, from the very start of life's thread

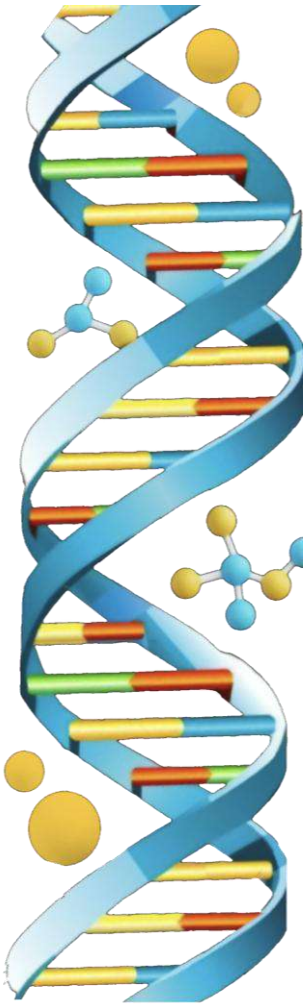
In this vast world, of tiny design
Microbes play a role, so divine

A dance of life, in every single cell
Microbiology's secrets, waiting to compel.

~ Seiran da Costa (T.Y.B.Sc.)

DNA OR PROTEIN: WHAT CAME FIRST?

If you've ever been puzzled over the classic question, "What came first: the chicken or the egg?" then you'll appreciate a similar conundrum that has baffled scientists for decades. What came first? DNA or proteins? Life, as we know it, depends on both. DNA holds the instructions to make proteins, and proteins carry out the work of copying and reading DNA. But if each depends on the other, then how did life even get started?



This molecular riddle posed a big mystery. DNA stores genetic information, but it can't do much without help from proteins. Proteins perform the essential tasks as catalysts and contribute to the building of cellular structures, but proteins can't form without instructions from DNA. It's a paradox: DNA needs proteins, and proteins need DNA. So, who came first?

In 1981, scientists Thomas Cech and Sidney Altman stumbled upon the answer: RNA! They found that RNA wasn't just a genetic messenger, as previously thought. Some RNA molecules could actually act as enzymes without any help from proteins. These special RNAs, called ribozymes, could snip and splice other RNA strands, and even help form bonds between amino acids, the building blocks of proteins.

This discovery breathed new life into the idea of an "RNA World." In this imagined early era, RNA may have been both the blueprint and the builder: it could store information like DNA and catalyze reactions like proteins. It's fascinating indeed to imagine early Earth filled, entirely, with self-replicating RNA molecules, driving the first stages of life.

Eventually, as life became more complex, DNA and proteins took over the specialized tasks RNA had once handled alone. But even today, RNA still plays a stellar role in many fundamental processes, like DNA transcription, building proteins (translation), and regulating genes. Scientists have also discovered tiny RNA molecules with major roles in development and disease.

So, while the DNA v/s protein debate once felt like a standoff, RNA may have been the original peacemaker, the molecule that made life possible in the first place.

And, what came first: the chicken or the egg? Turns out, it was RNA all along, laying the groundwork for life itself.

~ Sonia Shetke (T.Y.B.Sc.)

ANALYSIS OF DAIRY ADULTERANTS

Analysis of Dairy Adulterants, a hands-on activity, was conducted for 56 students of S.Y.B.Sc. (SEC) Microbiology. This activity focused on the qualitative analysis of common dairy products like curd, milk, ice cream, traditional Indian sweets, and flavoured milk to detect adulterants.

The students carried out qualitative tests for urea, metanil yellow, starch, and detergent. By engaging in this practical exercise, students learnt the importance of food safety regulations and the techniques used to identify contaminants that may pose health risks. The activity raised awareness about the prevalence and dangers of food adulteration, emphasizing the importance of adhering to FSSAI standards. It also promoted awareness about food safety and the impact of adulteration on health. The activity was coordinated by Ms. Arina Frank.

ANALYSIS OF NUTRITIONAL CONTENT IN FOOD SAMPLES

Analysis of nutritional content in food samples, a hands-on activity, was conducted for 55 students of the S.Y.B.Sc. SEC Microbiology on 6th August 2024. Students had to bring different food samples and test them for the presence of beneficial nutrients. They tested various food items such as milk, egg, bread, potato, and mushroom for the presence of proteins, amino acids, and starch using simple biochemical tests. This activity helped students understand the biochemical methods used to detect proteins, amino acids, and starch in food samples, reinforcing their theoretical knowledge with practical experience. They also gained insights into the nutritional content of common foods. The activity was coordinated by Ms. Arina Frank.

EXPLORING IDEAS: A CREATIVE MIND MAP JOURNEY

Exploring Ideas: A Creative Mind Map Journey" was organised on the 8th August 2024. It was held in Microbiology Lab 2. The event was conducted in collaboration with MBSI and DBT for the students of F.Y.B.Sc. The objectives of the event were to:

1. Encourage creative thinking by promoting out-of-the-box thinking and allowing students to explore and present ideas in a visual and interconnected format;
2. Enhance learning by reinforcing the understanding of complex concepts through simplification and visual connections;
3. Develop organizational skills by teaching students how to structure and logically present information; and
4. Create a resource that can be used by students who need extra help. The mind map competition aimed to enhance understanding of microorganisms and their classification, requiring participants to create original mind maps individually.

Judging criteria included creativity, clarity, visual appeal, relevance, and presentation. Awards were given for the top three mind maps, with special recognitions for Most Creative, Most Informative, and Best Visual Design. Judges provided constructive feedback to all participants, and all mind maps were documented for study purposes.

The event successfully fostered creative thinking and reinforced the learning of microbiological concepts. The outcome of the event was that it encouraged creative thinking, reinforced understanding of microorganisms, and improved students' organizational and presentation skills. The documented mind maps now serve as valuable study resources for all participants. Sixty-six students participated in the competition. The Faculty Coordinator was Dr. Sheryanne Velho-Pereira.

MICROBES AND THE ENVIRONMENT

The Department of Microbiology, in collaboration with MBSI and DBT, organised a pot painting competition on the theme “Microbes and the Environment” entitled "Microbial Masterpieces". The competition was open to all students of Microbiology (FY, SY, TY). Participants were instructed to use eco-friendly, reusable, or recyclable plastic or ceramic containers with approximate dimensions of 5 inches in height and 6 inches in diameter and to paint the pots using acrylic or oil paints. The event was held on the 13th of August 2024 in the Microbiology Laboratory.

The objectives of the event were to: 1. Promote environmental awareness by educating participants and the audience about the crucial role of microbes in maintaining environmental balance and health; 2. Encourage creative expression by inspiring innovation through the visual interpretation of the relationship between microbes and the environment; 3. Foster scientific understanding by merging microbiology and environmental science with artistic expression; 4. Raise awareness on sustainability by highlighting the role of microbes in sustainable ecosystems and encouraging discussions on conservation; and 5. Celebrate the intersection of art and science by demonstrating how both fields contribute to environmental awareness.

The aim of the event was to creatively highlight the vital connection between microbes and the environment, fostering awareness and understanding through art. Judging criteria included creativity, relevance to the theme, and neatness. The winners of the competition were Ms. Sayali Hadfadkar (FY) in first place, Ms. Sohani Chari (SY) in second place, and Ms. Lensa Lobo (SY) in third place. Judges provided constructive feedback to all participants.

The event effectively encouraged creative thinking, strengthened understanding of microbiological concepts, and promoted a green initiative. It resulted in increased awareness of the critical role microbes play in environmental sustainability. Additionally, it successfully engaged the student community in green initiatives and eco-friendly practices. The event saw the participation of 10 students and was coordinated by Dr. Sheryanne Velho-Pereira.

PRODUCTION & PACKAGING OF BIOENZYME FOR COMMUNITY UTILIZATION

A value-added course on "Production & Packaging of Bioenzyme for Community Utilization" was conducted for T.Y.B.Sc. Microbiology students from August 12, 2024, to September 21, 2024. Students, working in batches of eight, prepared lime and orange-based bioenzymes on a large scale. They monitored the fermentation process in the laboratory under supervision and packaged the final product in bulk quantities of 5 liters. The bioenzyme was then distributed to various community establishments, including G.S. Amonkar Vidhyalaya, Mapusa; St. Xavier's Higher Secondary School, Mapusa; St. Xavier's College Canteen; Government Veterinary Centre, Assagao; Parish Church, Pilerne; Government Primary School, Sirsaim; and St. Xavier's College Housekeeping Staff. As part of the initiative, students conducted live demonstrations on the use of bioenzymes and raised awareness about the benefits of eco-friendly cleaning products.

The course provided hands-on learning, allowing students to engage in every aspect of production, from sourcing cost-effective waste peels to working in teams and understanding team dynamics. Through community distribution and awareness campaigns, they not only promoted sustainability but also experienced the joy of giving firsthand. A total of 57 students completed this enriching course, which was conducted by Ms. Arina Frank.

‘FROM SEQUENCE TO STRUCTURE: CRAFTING NUCLEIC ACID MODELS’

The Department of Microbiology, St. Xavier’s College-Mapusa, under the DBT Star College Scheme; in collaboration with Microbiologists Society India, Student Unit organized a model-making competition titled “From Sequence to Structure: Crafting Nucleic Acid Models” on August 16, 2024. 58 Second year Microbiology-Molecular Biology Major students participated in this group activity aimed at enhancing the understanding of nucleic acid structure and organization through practical application.

This event sought to combine sustainability and scientific creativity, with participants using recycled and repurposed material such as old paper, cardboard, wires, toothpicks, bottle caps etc., to create 3-dimensional models of double helical DNA, eukaryotic nucleosomes/chromosomes, and transfer RNA. Each model was evaluated based on accuracy, neatness, creativity, and effective use of waste materials. The winning team impressed the judges with their innovative use of old wires, paper, cardboard, and wood to create a detailed nucleosome model depicting the organization of double helical DNA into eukaryotic chromosomes. The event was coordinated by Ms. Katelyn Gonsalves.

'EDGE OF TOMORROW'

The Department of Microbiology in association with the Green Initiatives and Environment Monitoring Cell of St. Xavier's College, Goa, organised a Poster Competition "Edge of Tomorrow" on the role of microorganisms in the conservation of endangered species on 17th of August, 2024 under the DBT Star College Scheme in association with the Microbiologists' Society, India (MBSI). A total of 32 F.Y.B.Sc. students displayed their creativity through informative posters on endangered species that generated a lot of buzz and served as an awareness programme for wildlife preservation. The posters were judged on their content, creative skills, and visual impact. The winners of the competition were Mr. Babaji Gawas (First Place), Ms. Tanishka Chopdekar (Second Place), and Ms. Nidhi Naik (Third Place). The event was coordinated by Dr. Trelita de Sousa.

FIELD TRIP TO GOA DAIRY

A Field Trip to Goa Dairy, Ponda was organised by the Department of Microbiology for a total of 66 S.Y. SEC students on the 4th of October 2024. The students were accompanied by Ms. Arina Frank, Dr. Sheryanne Velho-Pereira, Dr. Marielou Ferrao, and Mr. Kamlesh Korgaonkar. The objective of the field trip was to expose and orient students to the role of microbiology in industry. The students learned about the processing and packaging of milk, ghee, flavoured milk, cream, lassi, and curd. They were informed about the quality checks and tests done in the plant, and shown the functioning of the Effluent Treatment Plant (ETP).

CERTIFICATE COURSE ON ENVIRONMENTAL MICROBIOLOGY

The Department of Microbiology successfully conducted a Certificate Course on Environmental Microbiology from 31st August to 4th October 2024. This course, designed for college students, aimed to provide hands-on training and theoretical knowledge in the microbial analysis of soil, air, and water, with a focus on environmental sustainability and its real-world applications. The faculty coordinator was Dr. Sheryanne Velho-Pereira.

The course drew upon the expertise of resource persons, including Ms. Katelyn Gonsalves, Ms. Ruella D'Souza, Mr. Siddhesh Menon, Dr. Trelita de Sousa, and Dr. Nadine de Souza. The course featured a structured curriculum comprising nine modules, each addressing a critical aspect of environmental microbiology. It began with an introduction to soil profiling, where participants studied soil layers and their composition through field studies. This was followed by modules that involved determining soil pH, moisture content, and water-holding capacity, enabling participants to assess soil health and its usability for agricultural and environmental purposes. In subsequent modules, participants focused on microbial air quality assessments and water quality analysis, applying microbiological methods like the Most Probable Number (MPN) technique to detect coliform bacteria in various water sources. Routine analysis of potable water was another significant focus, where participants conducted presumptive, confirmed, and completed tests to ensure the safety of drinking water. Additionally, participants set up Winogradsky columns to explore microbial diversity and metabolic activities in water and sediment samples over time. A key highlight of the course was the field trip to the Goa Dairy sewage treatment plant in Kurti, Ponda. This visit offered participants an opportunity to observe microbial and chemical processes involved in sewage treatment and water purification. They gained practical insights into how microbes play a crucial role in waste degradation and environmental management. The course concluded with participants gaining a comprehensive understanding of environmental microbiology, combining theoretical principles with practical applications. They acquired critical skills in analyzing soil, air, and water quality and understood the broader implications of microbial management for sustainability. This program not only enhanced the academic and practical competencies of the participants but also prepared them to address future environmental challenges effectively. The active participation of 53 students made the initiative a resounding success, highlighting the importance of integrating microbiological sciences with environmental sustainability.

‘SHARE YOUR RAINBOW PLATE – DISCOVER THE POWER OF COLOURFUL EATING’

To commemorate National Nutrition Week, a hands-on activity was conducted on September 4, 2024, for 55 S.Y.B.Sc. (Major) Microbiology students. The objective of this activity was to encourage students to incorporate a variety of colours into their meals, ensuring a diverse intake of essential vitamins, minerals, and nutrients. Each student brought different coloured fruits and vegetables, which they peeled, chopped, and sliced as needed. They then creatively arranged their food into visually appealing “Rainbow Plates” and enjoyed the meal together. During the activity, students engaged in discussions about the importance of dietary antioxidants and learned about the natural pigments responsible for different colors in food, along with their associated vitamins and nutrients. By designing their own Rainbow Plates, students not only showcased creativity in food presentation but also gained a practical understanding of how dietary diversity contributes to overall health and well-being. The experience reinforced the idea that a balanced, colorful diet plays a crucial role in maintaining a healthy lifestyle. Additionally, the sharing aspect of the activity fostered camaraderie and inspired students to promote healthy eating habits among their peers and families. The activity was coordinated by Ms. Arina Frank, with the support of Dr. Sheryanne Velho-Pereira and Mr. Kamlesh Korgaonkar.

‘COLOURS UNDER THE MICROSCOPE’

To commemorate International Microorganism Day on the 17th of September, the Department of Microbiology, St. Xavier’s College, Goa, in collaboration with the Microbiologists Society India, Student Unit, organized a rangoli competition titled “Colours Under the Microscope.” The competition aimed to blend creativity and artistic expression with scientific understanding by encouraging students to design rangolis depicting the morphology of any genus of microorganism. Each team comprised two students, and their creations were judged based on relevance to the theme, morphological accuracy, neatness, and overall aesthetics. A total of 28 participants (14 teams) took part in the event. The first prize was awarded to Ms. Sohani Chari and Ms. Vidhya Gaonkar of T.Y.B.Sc., the second place to Ms. Mansi Thakur and Ms. Urmila Dewasi of F.Y.B.Sc., and third place to Ms. Siya Palav and Ms. Siya Satardekar of T.Y.B.Sc. The participants created stunning rangolis representing various microorganisms such as bacteria, algae, viruses, and protozoa. The event successfully combined scientific knowledge with creative expression and was coordinated by Dr. Valerie Gonsalves.

THE MICRO GALA – EXPLORE THE DYNAMIC WORLD OF MICROBIAL INTERACTIONS

At the Investiture ceremony of the MBSI student Unit of St. Xavier's College, held on 23rd September 2024, the Department of Microbiology, St. Xavier's College, Goa, in collaboration with the Microbiologists Society India, Student Unit, organized *The Micro Gala – Explore the Dynamic World of Microbial Interactions*. This unique competition invited participants to "style the microbes," showcasing aesthetic outfits themed around *Microbial Interactions with Other Life Forms*. The event aimed to blend creativity with scientific insight, encouraging students to design and present outfits that represented various microbial interactions. A total of 45 students participated, grouped into teams of five. The winners of the event were Ms. Anezka Fonseca, Ms. Sonia Shetke, Ms. Macayle Dias, Ms. Shanaika Pires, and Ms. Nupur Bandekar of T.Y.B.Sc. The second prize was awarded to Ms. Mekisha Ratos, Ms. Richal Sakhalkar, Ms. Dexita Thapa, Mr. Sahil Halarnkar, and Mr. Anit Patil of F.Y.B.Sc., while the third prize went to Mr. Arush Korjuvekar, Ms. Anushka Salgaokar, Ms. Cenobia Fernandes, and Ms. Liza Paras of F.Y.B.Sc. All teams delivered well-coordinated presentations, enhanced by creative and visually appealing costumes centered around the event's theme. The activity was coordinated by Dr. Valerie Gonsalves.

'FASCINATING WORLD OF MICROBIOLOGY'

Two sessions on career guidance on the theme "Fascinating World of Microbiology" were organised on 7th and 18th of October, 2024, by the Department of Microbiology, St. Xavier's College, Mapusa, Goa, in association with the Microbiologists' Society, India. The resource persons for the sessions were Dr. Valerie Gonsalves and Dr. Trelita de Sousa, Assistant Professors in Microbiology, St. Xavier's College. Dr. Valerie Gonsalves enlightened the students on the various papers and courses offered in Microbiology at St. Xavier's College. She spoke about the various activities conducted by the Department of Microbiology and introduced them to the Microbiologists Society, India (MBSI). Dr. Trelita de Sousa spoke of the various career options available in Microbiology and provided various strategies to plan an effective career plan in whichever field they may choose to follow. A total of 60 students attended the sessions. The participants gained an insight into the various career avenues in Microbiology which would help them make informed choices while navigating their career paths.

'SHUTTERBUGS'

A photography competition "ShutterBugs" for First Year students was organised on 17th December 2024 by the Department of Microbiology, St. Xavier's College, Mapusa, Goa, in association with the Microbiologists' Society, India. The purpose of this competition was to stimulate the curiosity of students and sensitize them to microbial ecology and the environment. The students displayed their creativity and photography skills by capturing beautiful photographs of their surroundings on the following topics: Biofouling, Eutrophication, and Lichens. The images were judged by Dr. Valerie Gonsalves and Dr. Nadine de Souza on their picture quality, depiction of the theme (biofouling / eutrophication / lichens), creative skills, and visual impact. Out of 27 participants, the winners of the competition were Ms. Rutika Shetmandrekar for her photograph depicting Biofouling, Ms. Tanisha Shidruk for her photograph depicting Eutrophication, and Ms. Saniya Kalangutkar for her photograph depicting Lichens. The students enjoyed the experience of showcasing their scientific perception and photography skills. The event was coordinated by Dr. Trelita de Sousa.

FIELD TRIP TO SUSEGADO BREWERY

On the 21st of October 2024, the T.Y.B.Sc Microbiology students visited Susegado Microbrewery, located in Calangute, as a part of their Industrial Microbiology Practical syllabus. They were accompanied by Ms. Ruella D'Souza, Dr. Trelita de Sousa, and Dr. Valerie Gonsalves. The students were guided through the brewing process by Mr Aditya Challa, the owner and master brewer. He provided an insightful look into the craft beer industry in Goa. He informed them that Susegado is known for its unique blends and offers a variety of Ales, lagers, and beers, including IPAs, stouts, and seasonal brews. The students observed the equipment used for mashing, boiling, fermenting, and conditioning the finished product. They were then shown samples of the pale malt, roasted malt, hops, and caramelized malt, and further walked through the brewing process by Shweta and Bharat, the brewers at Susegado. They gave them a fresh perspective on choosing the profession of brewing as a career option and its merits and patiently fielded numerous questions from the students and teachers alike. The experience was an enjoyable and fruitful one.

OUTREACH PROGRAMME FOR NURSING STUDENTS

The Department of Microbiology, St. Xavier's College, Mapusa, organized an outreach programme for 30 F.Y. GNM Nursing students of Harmal Panchakroshi Shikshan Mandal's College of Nursing, Harmal – Pernem on 11th January, 2025. The students were accompanied by 2 teachers. The objective of this field visit was to provide practical experience, demonstrate real-world applications, and foster a simple and clear understanding of microbiological concepts and techniques. Explanation and demonstration of the purpose and working of instruments used in the laboratory, observation of various staining techniques in Microbiology using the compound microscope, demonstration of serological testing of blood for blood group detection, cultivation of bacteria, yeast and fungi and the use of various culture media was very efficiently conducted by the Third-Year students of Microbiology under the guidance of the coordinators: Dr. Sheryanne V. Pereira, Ms. Ruella D'Souza and Ms. Linette de Souza.

ALUMNI GUEST LECTURE 'CROSSING OVER'

A career guidance session, "Crossing Over" was organised on 13th January 2025 under the Alumni Guest Lecture Series by the Department of Microbiology, St. Xavier's College, Mapusa, Goa, in association with the Microbiologists' Society, India. The session was delivered by Ms. Grazielle Serrão, an alumnus of St. Xavier's College (Batch of 2022-2023), currently pursuing her Masters in Medical Biotechnology and Business at the University of Queensland, Australia. The purpose of this session was to enlighten students about the academic options available to them after acquiring a Bachelors in Microbiology and how to pursue a Masters abroad. Ms. Grazielle reminisced about her time at St. Xavier's College and fondly remembered her Teachers and all that she'd learnt during her classes and practical sessions. She vividly recounted her field trips, extra-curricular activities, and project work. She discussed in detail her academic pursuits abroad, the application procedure, the exams to be taken, making new friends, the grants and scholarships, the university facilities, accommodation, and the overall adjustment from Goa to Australia. The students listened in fascination and actively interacted with Ms. Grazielle, asking her a myriad questions, which she readily answered. The coordinator of the event, Dr. Trelita de Sousa, thanked Ms. Grazielle for taking the time out to chat with the students and wished her the very best for her future endeavours.

ANIMALCULES 2024-25

The Department of Microbiology successfully hosted ANIMALCULES 2024-25, an inter-school microbiology competition on February 11, 2025, to commemorate International Organism Day, which is celebrated on 17th September, drawing enthusiastic participation from 20 schools across the state of Goa. The event featured four exciting competitions: Fancy Dress, Elocution, Poster Making, and Brainstorm Showdown (Spelling Bee & Rapid Fire), fostering scientific curiosity among young minds. The competition saw outstanding performances, with students showcasing their creativity and knowledge in microbiology. There were 3 winners for each competition. The Overall championship was clinched by G. S. Amonkar Vidhyamandir, Mapusa, with St. Theresa's High School, Candolim, emerging as the Runner-up. The Department of Microbiology extends its gratitude to the Administrator, Principal, Department of Microbiology Faculty, Non-teaching Staff, and Participating Schools for their support in making ANIMALCULES 2024-25 a resounding success. The event was coordinated by Mr. Siddhesh Menon.

INTERNATIONAL SEMINAR 'EXPLORING NEW FRONTIERS IN BIOSCIENCES'

The Departments of Microbiology and Biotechnology, St. Xavier's College, Goa organised an International Seminar on 'Exploring New Frontiers in Biosciences' on January 23-24, 2025, in collaboration with the Microbiologists' Society, India (MBSI) and Internal Quality Assurance Cell (IQAC). Dr. Satish Shetye, Former Vice-Chancelor of Goa University and Former Director of the National Institute of Oceanography, Dona Paula, Goa, was The Chief Guest at the inaugural function and applauded St. Xavier's College for always being progressive. Dr. Trelita de Sousa, the Convenor of the Seminar and Assistant Professor in Microbiology, conveyed that the seminar was aligned with the United Nation's Sustainable Development Goals (SDGs), which provided a blueprint to address planetary challenges like the emergence of infectious diseases, climate change, and biodiversity loss.

The Resource Persons for the Seminar were a star-studded ensemble of eminent scientists and academicians. Prof. Srikanth Mutnuri, Dean, International Programmes and Collaboration Division, Department of Biological Sciences, BITS-Pilani, Goa, very vividly discussed the Vertical Flow Constructed Wetlands (VFCW) as nature-based solutions for Decentralized Wastewater Treatment. Dr. Shetye spoke of the impact of the summer monsoons on the Indian estuarine ecosystems and biodiversity highlighting the significance of Goa's Mandovi and Zuari estuaries in nutrient cycling and management of coastal environments. Dr. Prabu D., Head in Charge, Department of Microbiology, University of Madras, Tamil Nadu, delivered two highly thought-provoking and interactive sessions on the applications of nanotechnology in Microbiology and the use of animal models for quality research in Life Sciences, emphasizing the crucial role of microbiologists in the understanding of complex biological processes and advancing therapeutic innovations. Prof. Momna Hejmadi, Associate Pro-Vice-Chancellor (Education Quality and Enhancement), Department of Life Sciences, University of Bath, U.K. also delivered two enthralling sessions on the transformative role of AI in driving scientific breakthroughs in health and technology and elucidated the vast opportunities of Biosciences in terms of career options, intellectual satisfaction, and societal progress. The sessions were insightful and generated a huge interest amongst the enthusiastic students, leading them into impromptu interactive group discussions with the resource persons. The seminar garnered the participation of over 200 participants from all across the globe, including Australia, Germany, India, U.K., and U.S. The participants presented their novel ideas and exciting research through vivid scientific posters and interactive oral presentations. Ms. Florence Pereira from Kingston University, London, bagged the Best Poster Presentation, and Ms. Yuga Ghotge from BITS Pilani, Goa, won Best Oral Presentation. The seminar allowed innovative deliberations for sustainable research in Biosciences. It culminated in a short cultural programme by the students of St. Xavier's College, Goa, showcasing the vibrant Indo-Portuguese heritage of the State.

FUTURE PROSPECTS IN MICROBIOLOGY

Dr. Prabhu, a distinguished microbiologist from the University of Madras, delivered an insightful lecture on the Future Prospects in Microbiology. The talk was held on the 24th of January 2025 in the Microbiology laboratory. The talk explored various domains, showcasing how microbiology is pivotal in addressing global challenges and advancing science. Dr. Prabhu began with environmental microbiology, emphasizing microbial applications in pollution control, bioremediation, and sustainable agriculture. He highlighted their role in combating climate change and managing waste effectively. Moving to vaccine technology, he explained advancements in mRNA vaccines and microbial vectors, stressing their importance in preventing infectious diseases.

The scope of medical microbiology was discussed in-depth, with a focus on antimicrobial resistance, rapid diagnostics, and the significance of microbiome research for personalized medicine. He also explored the integration of bioinformatics and data-mining, where computational tools analyze microbial genomes, predict disease outbreaks, and enhance drug development through AI-driven techniques. An exciting part of the lecture touched on self-healing technologies, such as bioengineered microbes for self-repairing concrete and medical implants, highlighting interdisciplinary innovation. Dr. Prabhu further delved into industrial and food microbiology, explaining the use of microbes in fermentation, food safety, and quality enhancement. Additionally, he introduced space microbiology, investigating microbial survival in extreme environments and its potential applications in space exploration. The emerging field of forensic microbiology, which employs microbial signatures for criminal investigations and outbreak tracking, was also briefly discussed.

Dr. Prabhu concluded by sharing his inspiring career journey, detailing challenges, achievements, and the importance of perseverance in research. His story motivated students to pursue microbiology with passion and explore its limitless potential. The session ended with an engaging Q&A, leaving attendees with a broader perspective on microbiology's role in shaping a sustainable and innovative future. The programme had 59 beneficiaries from the F.Y.B.Sc. Microbiology major class. The event was coordinated by Dr. Sheryanne Velho-Pereira.

COMPOSTING OF KITCHEN WASTE AND GROWING ORGANIC MICROGREENS

A hands-on training on the preparation of compost from kitchen waste was conducted for 56 students of T.Y.B.Sc. Microbiology as a Value-Added Course. The students were required to prepare compost using various types of kitchen waste and use the compost to grow microgreens. Working in batches of eight, students used different methods, such as Bokashi and vermicomposting, to produce compost and monitored the process until it stabilized. The resulting compost was then utilized to grow different varieties of microgreens. Students conducted research on their chosen microgreens, including their nutritional benefits, and submitted a report at the end of the course. Through this training, students gained practical experience in composting and sustainable gardening. They developed teamwork and organizational skills, raised awareness about environmental sustainability, and learned the importance of nutrient-rich diets. The freshly grown microgreens were consumed raw, enhancing the nutritional value of their meals. The activity was coordinated by Ms. Arina Frank.

NATIONAL SCIENCE DAY CELEBRATION

To celebrate National Science Day, St. Xavier's College, Mapusa, organized an Open Lab Day on 25th February, 2025, on the theme, "National Science Day – Building Public Trust in Science," for 4 schools in and around Mapusa. 20 students from each of these schools accompanied by a teacher participated in the event. As part of the celebration, the Department of Microbiology conducted an engaging and informative Open Lab Day for these school students that showcased the Department's laboratory work and inspired the next generation of scientists and researchers. Explanation and demonstration of the purpose and working of instruments used in the laboratory, observation of various staining techniques in Microbiology using the compound microscope, cultivation of bacteria, yeast and fungi and the use of various culture media was efficiently conducted by the Third-Year students of Microbiology under the guidance of the coordinators, Ms. Ruella D'Souza and Ms. Linette de Souza.

STUDY VISIT TO MAPUSA DISTRICT HOSPITAL

On the 27th February 2025, the Department of Microbiology at St. Xavier's College, Mapusa, Goa, organized a study visit to Mapusa District Hospital, Mapusa Goa. The visit was conducted as part of the curriculum for the third-year B.Sc. Microbiology, who have opted for the elective paper on Haematology and Clinical Biochemistry. The students were taken to the collection centre where they were explained about sample collection, handling, and storage. From here, the students were taken to the Pathology Laboratory of the hospital. They were explained about the different procedures and lab tests done in the laboratory. They were also briefed about the principle of the tests. The students were shown the working of the sophisticated automated equipment used for testing patients' samples. Some of the tests performed included determination of packed cell volume, blood count, thyroid levels, and other biochemistry tests. The study visit to the District Hospital in Mapusa proved highly insightful, broadening the knowledge of microbiological applications in healthcare and providing direct observation of a pathology lab's functioning within a hospital environment. A total of 17 students benefitted from the study visit. The students were accompanied by Dr. Trelita de Sousa and Dr. Valerie Gonsalves.

WORKSHOP ON MUSHROOM CULTIVATION

On the 5th and 6th of March 2025, the Department of Microbiology, St. Xavier's College, Goa in collaboration with the Microbiologists Society, India organized a two-day workshop on Mushroom Cultivation. A total of 40 students registered for this workshop. The participants were MBSI members from across F.Y, S.Y, and T.Y B.Sc. Microbiology. At the inset, Dr. Valerie Gonsalves presented the types of mushrooms and their pricing; she then made an in-depth explanation of various steps involved in mushroom cultivation and the care needed to be taken at various stages. The students were divided into groups: each group prepared the substrate and then inoculated the same. The bags were left for incubation till the entire substrate was covered with mycelia. Subsequently, one member of each group carried the bags at home and cared for them till fruiting was observed. Students were also exposed to a number of learning mistakes where some bags got contaminated during initial incubation, and some bags did not fruit. Each group then submitted a reel of their mushroom cultivation process. In all, the students had a fun learning experience. All participants were awarded certificates of participation.

FIELD TRIP TO GOA COLLEGE OF AGRICULTURE

The Department of Microbiology organized a Field Trip as part of the curriculum for 56 students of TY Microbiology on 17th March, 2025 at Goa College of Agriculture, Old Goa. Ms. Saloni Patil, a lecturer at Goa College of Agriculture, gave a guided tour of the facilities. The field trip included a visit to the vermicomposting unit, mushroom cultivation unit, apiary and soil testing laboratory.

The fourth year Agriculture students explained the overall process of vermicomposting, providing valuable insights into the process of converting organic waste into nutrient-rich fertilizer, followed by explaining the importance of layering coconut husk, the optimal duration for composting which is approximately three months, and the crucial role of earthworms, with 4 kg being used in the process. A comparison was shown between a compost that was partially ready and a compost that was completely ready.

A demonstration of oyster mushroom cultivation utilizing paddy straw as the substrate was given by the fourth-year Agriculture students. At the apiary, the difference between different types of bees, including ones with stingers and those without was pointed out. An explanation was given how local plants affect honey quality and how different bee species produce different kinds of honey. A demonstration of the brooding honey sample was given. The final visit was to the soil testing laboratory, where soil quality is tested. The expert explained that soil contains tiny but important nutrients that help plants grow. The soil is tested for 12 parameters, some of which include acidity (pH) and its ability to hold water.

Overall, the visit Goa College of Agriculture, Old Goa, was an enriching experience that deepened the understanding of sustainable agricultural practices. By witnessing eco-friendly waste management, beekeeping, and soil science in action, theoretical concepts can be related to practical applications. This trip also highlighted the significance of research in modern agriculture, emphasizing the need for sustainable and innovative farming approaches. The coordinators for the field trip were Dr. Trelita de Sousa, Dr. Nadine de Souza, Dr. Valerie Gonsalves, and Ms. Linette de Souza.

STUDENT EXCHANGE PROGRAMME

As part of an ongoing initiative to foster academic collaboration and cross-institutional learning, St. Xavier's College, Mapusa, partnered with St. Francis College for Women, Hyderabad, to conduct an online student exchange program comprising four sessions. These sessions were held on 21st March, 27th March, 1st April, and 3rd April, 2025. The primary aim of the program was to strengthen academic ties, provide intellectual enrichment, and facilitate knowledge sharing among undergraduate students from both institutions.

The inaugural session on March 21, 2025, began with a warm welcome by Dr. Nadine de Souza, who offered a concise overview of the Memorandum of Understanding between the two colleges. The session featured Dr. V. Gayatri, Associate Professor at St. Francis College for Women, as the guest speaker. A distinguished academician with over 15 research publications and a patent in bioremediation, Dr. Gayatri delivered an engaging lecture titled "E-Waste Management and Micro-Remediation". She addressed the pressing issue of electronic waste disposal and introduced innovative microbial degradation techniques, including plasmid-based remediation strategies. The session concluded with an interactive Q&A and was attended by 47 students of S.Y.B.Sc. and 10 students of T.Y.B.Sc. Biotechnology from St. Xavier's College, Goa.

The second session, held on March 27, 2025, was attended by 36 F.Y.B.Sc. students from St. Xavier's College, Goa. Dr. Gayatri once again captivated the audience with a session titled "3D Printing in Foods – An Overview". She provided a comprehensive introduction to the emerging field of 3D food printing, highlighting its applications in the food and aerospace industries. The session included a detailed explanation of the 3D printing process, types of printable foods, and associated nutritional implications.

On April 1, 2025, the third session was conducted by Dr. Nadine de Souza, Assistant Professor in the Department of Microbiology at St. Xavier's College. Her session, "Gut Instincts: How Microbes Shape Your Health and Mind," explored the intricate role of the gut microbiome in maintaining both physical and mental health. Dr. Nadine also shared insights into how diet and lifestyle can be leveraged to positively influence the gut microbiota. This session was attended by 34 students from St. Francis College, Hyderabad.

The final session, conducted by Dr. Trelita de Sousa, Assistant Professor in the Department of Microbiology at St. Xavier's College, took place on April 3, 2025. Her presentation, "Microplastic Pollution: The Big Threat," eloquently addressed the environmental and health risks posed by microplastics. Dr. Trelita emphasized the urgent need for mitigation strategies and discussed actionable solutions to combat this growing threat. 18 students from St. Francis College, Hyderabad, actively participated in this session as well. The exchange program proved to be a valuable learning experience for students and faculty alike. It fostered a spirit of collaboration, promoted interdisciplinary learning, and laid a strong foundation for future academic interactions between St. Xavier's College, Mapusa, and St. Francis College for Women, Hyderabad.

JOURNAL CLUB

The Department of Microbiology, St. Xavier's College Mapusa, Goa, organised a Journal Club paper presentation and panel discussion for its T.Y.B.Sc. students on 29th March 2025 in association with the Microbiologists' Society, India (MBSI). Fourteen students presented and scientifically discussed recent research papers and review articles published in reputed high-impact factor journals in front of a panel of experts comprising Dr. Ajeet Mohanty (NIMR), Dr. Alisha Malik Satwani (Chowgule College), Mr. Siddhesh Menon (St. Xavier's College, Goa), and Dr. Nadine de Souza (St. Xavier's College, Goa).

Team 1 comprising Ms. Shanaika Pires, Ms. Shreya Bhat, and Ms. Shenely Fernandes presented a paper titled "Nanomaterial-enabled anti-biofilm strategies: new opportunities for treatment of bacterial infections," published in January 2025 in the journal *Nanoscale* (Royal Society of Chemistry) with an Impact Factor (IF) of 5.76. Team 2 comprising Ms. Nupur Bandekar, Ms. Siyanda Rodrigues, and Ms. Wendy Cruz presented a paper titled "Microplastics as vectors for antibiotic resistance genes and their implications for gut health," published in January 2025 in the journal *Discover Medicine* with an IF of 1.4. Team 3 comprising Ms. Anezka Fonseca, Ms. Jennessa Fernandes, Ms. Alisha Savlekar, and Ms. Shruti Madgaonkar presented a paper titled "Introducing novel endosymbiosis by implanting bacteria in fungi," published in October 2025 in the journal *Nature* with an IF of 50.5. Team 4 comprising Ms. Sonia Shetke, Ms. Anisha Parab, Ms. Rini Fernandes, and Ms. Prashila Mandrekar presented a paper titled "Sustained in situ protein production and release in the mammalian gut by an engineered bacteriophage," published in February 2025 in the journal *Nature Biotechnology* with an IF of 33.1.

The audience comprised both faculty members and students. The entire event was a very informative, interactive, enriching, and scientifically satisfying experience for both the presenters and the audience. All participants were given certificates. The event was coordinated by Dr. Trelita de Sousa.

GUEST LECTURE: 'PREVENTION AND CONTROL OF VECTOR-BORNE DISEASES IN GOA'

The Department of Microbiology, St. Xavier's College Mapusa, Goa, organised a Guest Lecture "Prevention and Control of Vector-Borne Diseases in Goa" on 29th March, 2025, in association with the Microbiologists' Society, India (MBSI). The Resource Person for the session, Dr. Ajeet Mohanty, Officer-In-Charge, National Institute of Malaria Research (NIMR), Field Unit, Goa, delivered an engaging and informative session on the prevention and control of vector-borne diseases in Goa. Through a vivid presentation and onsite video clips, Dr. Ajeet gave a detailed account of the scenario in Goa concerning the various vector-borne diseases, including Malaria, Chikungunya, and elephantiasis. The audience, a mix of both students and faculty members, listened attentively and had a myriad questions for Dr. Ajeet, which he patiently and comprehensively answered. The event was coordinated by Dr. Trelita de Sousa.

ALUMNI GUEST LECTURE: 'CAREER OPPORTUNITIES IN MICROBIOLOGY'

The Department of Microbiology, St. Xavier's College Mapusa, Goa, organised an Alumni Guest Lecture "Career Opportunities in Microbiology" on 29th March, 2025, in association with the Microbiologists' Society, India (MBSI). The Resource Person for the session, Dr. Alisha Malik Satwani,

Assistant Professor and Coordinator, Chowgule College, Margao, spoke of the various career options available in Microbiology and provided detailed information about the different Masters programmes offered in Goa. The students listened with interest and actively interacted with Dr. Alisha asking her a myriad questions, which she readily answered. The event was coordinated by Dr. Trelita de Sousa.

FIELD TRIP TO NIO

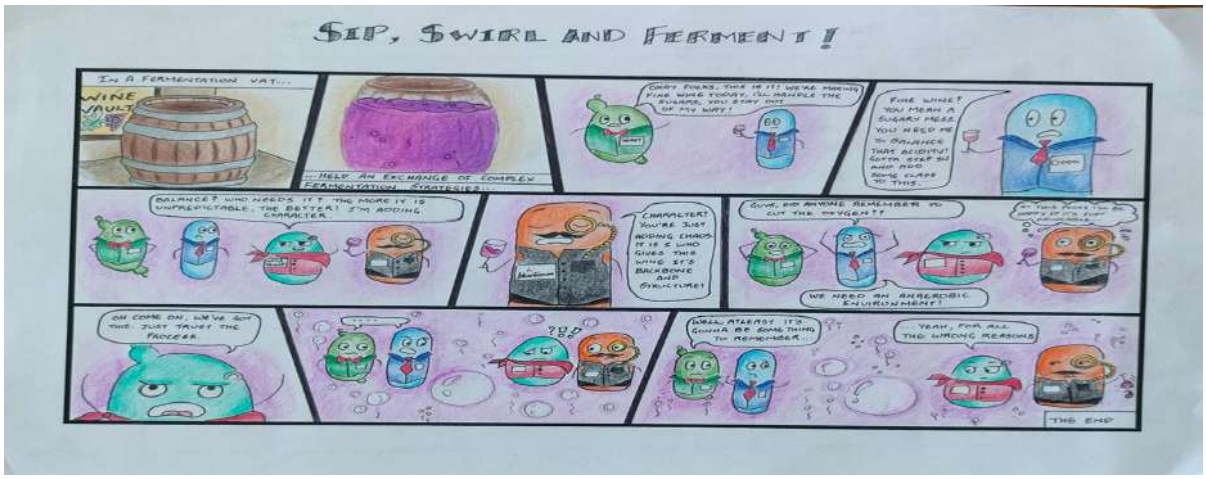
On the 3rd of April, 2025, the T.Y.B.Sc. Microbiology students visited the National Institute of Oceanography (NIO) in Goa, one of India's premier research institutions dedicated to oceanographic studies. Established in 1966, NIO operates under the Council of Scientific and Industrial Research (CSIR) and plays a crucial role in exploring and understanding India's vast marine ecosystem. After an introductory video showcase, the students were taken to the various laboratories and shown equipment used in DNA analysis, sequencing, and proteomics. The students were also shown the Thermal cycler, gel documentation (gel doc) system, Gas Chromatography (GC) machine, the Sanger sequencing machine, the microchip electrophoresis system, and the Liquid Chromatography-Mass Spectrometry Quadrupole (LC-MS/MS). The laboratory tour provided an in-depth look at various molecular biology and proteomics instruments, incorporating theoretical knowledge with practical demonstrations. The experience was valuable in understanding advanced techniques in molecular biology. The field trip was coordinated by Dr. Marielou Ferrão.

CONSULTANCY SERVICE IN WATER ANALYSIS

The Department of Microbiology offers a consultancy service in bacteriological analysis of water to determine the safety or potability of drinking water. Besides, the potability of all drinking water on campus was also monitored during the academic year 2024-25. Ideally, all samples taken from the distribution system, including consumer's premises, should be free from coliform organisms, and the bacteriological quality of drinking water collected in the distribution system is therefore specified when tested in accordance with IS 1622. 15 samples from people desirous of availing this consultancy service were analyzed for their coliform count. The amount generated was ₹ 3000 at the rate of ₹ 200 per water sample. In addition to these samples, the drinking water from filters on campus as well as the water from the college canteen were assessed for potability. The service was coordinated by Ms. Katelyn Gonsalves with assistance from Second Year Microbiology student volunteers.

'MICROVERSE' – TALES FROM A TINY UNIVERSE

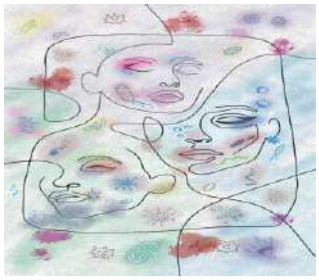
On the 28th of March 2025, the Department of Microbiology, St. Xavier's College, Goa in collaboration with the Microbiologists Society, India organized a Comic Strip Designing competition titled 'Microverse' – Tales from a tiny universe' on the theme The Marvels of the Microbial world. The competition enabled students to develop engaging narratives and foster artistic and creative skills. Comic strips were evaluated based on Plot, Creativity and Visual appeal. A total of 08 participants registered for the competition. The first place was bagged by Ms. Shanaika Pires and Ms. Nupur Bandekar (T.Y. B.Sc.), the second place by Ms. Shantashri Gaitonde and Ms. Sajal Mardolkar (T.Y. B.Sc.) and in third place was Ms. Lensa Lobo and Shefali Kerkar (S.Y. B.Sc.). The winners were awarded Merit certificates and prizes. The competition was coordinated by Dr. Valerie Gonsalves.



~ Nupur Bandekar & Shanaika Pires (T.Y.B.Sc.)

'PIXEL PALETTE'

On the 27th of March 2025, the Department of Microbiology, St. Xavier's College, Goa, in collaboration with the Microbiologists Society, India organized a digital art designing competition titled 'Pixel Palette' on the theme 'Diversity of Microbial world'. Creation of digital art brings together knowledge, creativity, and technological applications. Memes were evaluated based on creativity, content, and visual appeal. A total of 16 participants registered for the competition. The first place was bagged by Ms. Sonia Shetka and Ms. Jenessa Fernandes (T.Y. B.Sc.), the second place by Mr. Joel Fernandes and Mr. Shubham Mandhkar (S.Y. B.Sc.), and the third place by Ms. Sajal Mardolkar and Ms. Rini Fernandes (T.Y. B.Sc.). The competition was coordinated by Dr. Valerie Gonsalves.

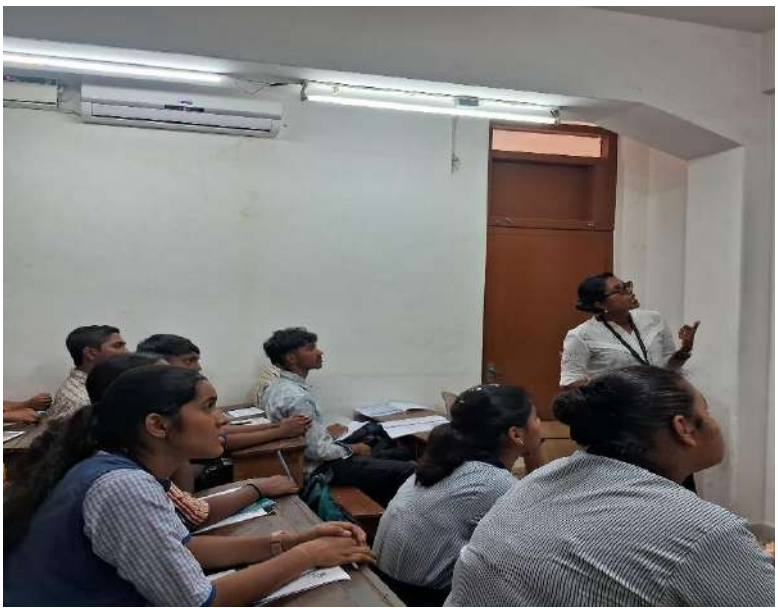


~ Sajal Mardolkar & Rini Fernandes (T.Y.B.Sc.)

SUMMER SCHOOL

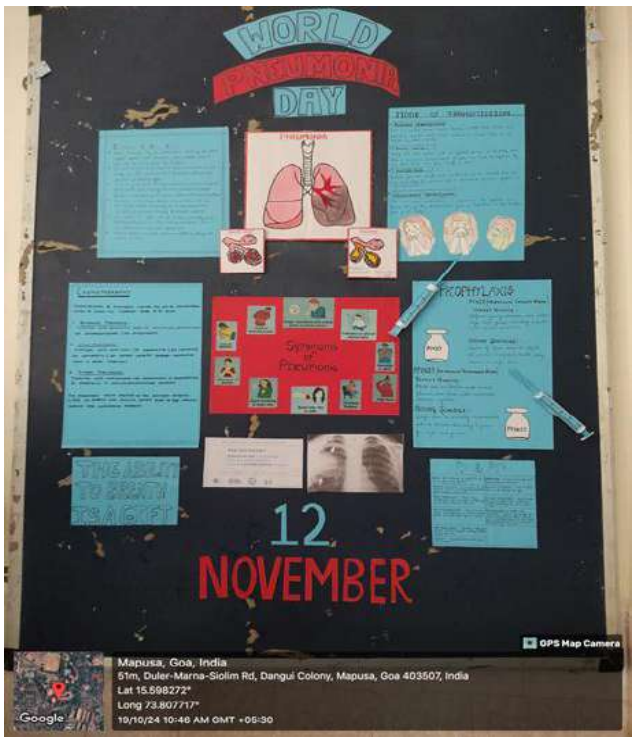
The Department of Microbiology at St. Xavier's College in collaboration with Goa State Research Foundation organized a five-day summer school programme "Microbiology in Everyday Life". The Summer School was held for students of Higher Secondary Schools from 6th to 10th May, 2025. There were 26 students who participated from 7 different higher secondary schools. This programme aimed to highlight the relevance of microbiology in daily life while equipping participants with essential theoretical knowledge and practical skills. Each day was structured into one theory and two practical sessions ensuring a balanced approach to learning.

The theme for Day 1 "Basic Techniques in Microbiology," introduced students to foundational concepts, after which students engaged in media preparation, sterilization, microbial streaking, staining techniques, and microscopic observation. The resource person for the sessions was Dr. Nadine de Souza. Day 2 focused on the "Microbiology of Food," delving into the dual role of microorganisms as both beneficial and harmful agents. The theoretical and hands-on practical session by Ms. Ruella D'Souza explored topics such as fermented foods and probiotic preparations, followed by nutritional testing of common food items. On Day 3, Mr. Siddhesh Menon explained the various techniques in Medical Microbiology and Molecular Biology. Students then performed blood group determination, agarose gel electrophoresis, and antibiotic susceptibility testing. The fourth day explored "Microbial Ecology and Environment," emphasizing the ecological role of microbes and their potential in bioremediation. Theoretical discussions and practical sessions on pond water microbes, microbiological air quality testing, and analysis of water potability were conducted by Dr. Trelita de Sousa. The final day, on "Entrepreneurship and Innovation in Microbiology," introduced students to career prospects and entrepreneurial opportunities within the field. The programme concluded with an evaluation session, feedback collection, and a valedictory ceremony celebrating the students' active participation and achievements. The Summer School was coordinated by Dr. Nadine de Souza.



BULLETIN BOARD DISPLAY

The Department of Microbiology at St. Xavier's College, Mapusa, Goa, organized a series of bulletin board displays highlighting key microbiology-related days. Some of the topics featured included 'Cervical Cancer Awareness Month', 'World Immunization Day', 'National Herpes Day', "Digestive Health Day', and 'National Science Day'. The objective was to commemorate important microbiology-related days while educating students and faculty from diverse academic backgrounds. Throughout the year, 12 student groups presented creatively arranged bulletin boards, each presenting relevant information in a visually appealing manner. Interactive elements were incorporated to encourage participation, making the learning experience both enjoyable and informative. The activity was coordinated by Dr. Valerie Gonsalves.

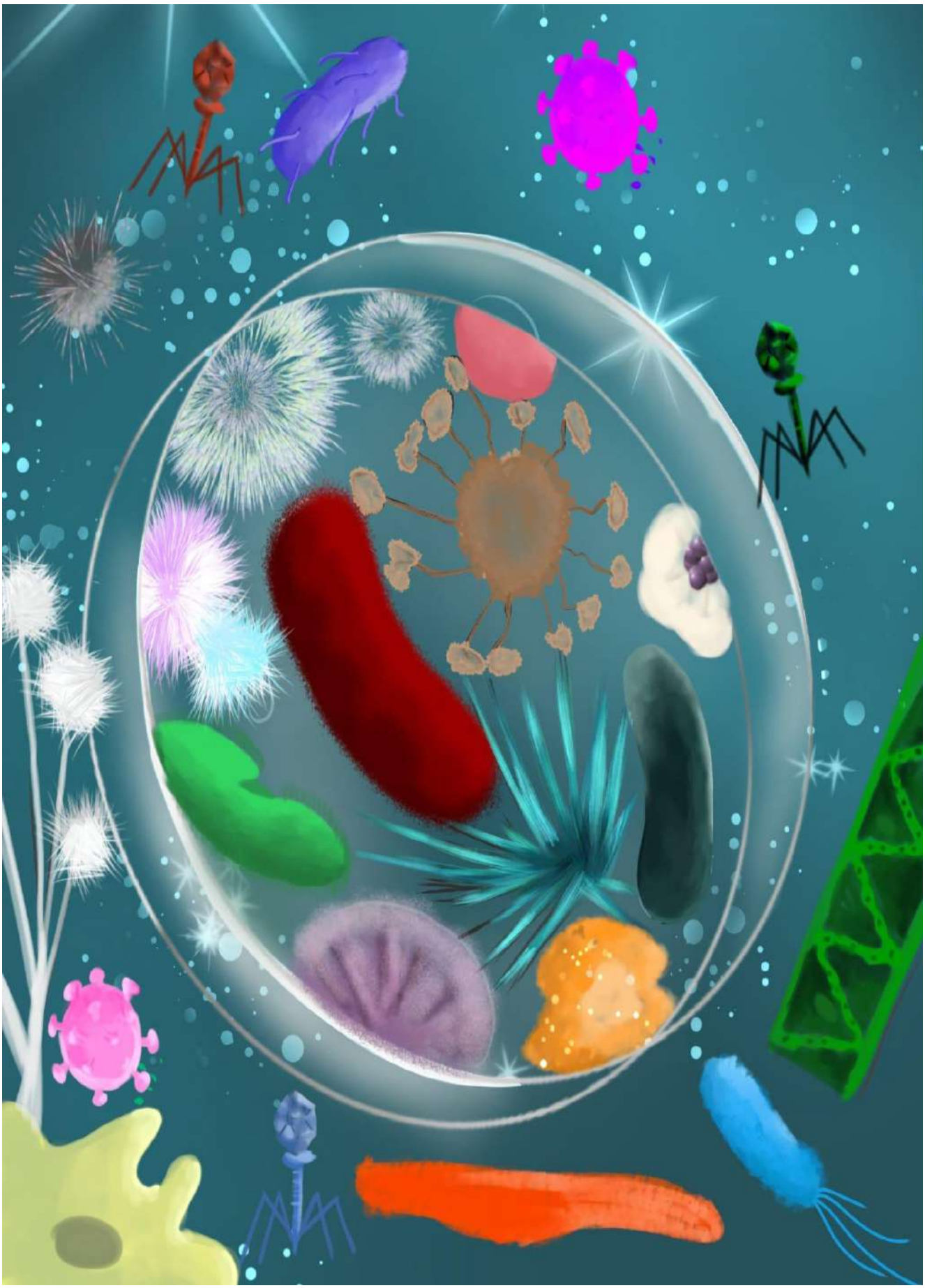


Dr. Nadine de Souza was awarded a Ph.D. on 19th July 2024, for her research on "Molecular Characterization of Marine Bacteria and their Enzymes for Textile Azo Dye Reduction".

Dr. Trelita de Sousa was conferred with the MBSI Senior Teacher Award 2025 by the Microbiologists' Society, India.

The Department of Microbiology, St. Xavier's College bagged the MBSI Best Department Award 2025 by the Microbiologists' Society, India.

Dr. Valerie Gonsalves won the 'Exemplary Achievement in the Category of Women Innovator' at the 2nd International Conference on Recent Innovations in Biological, Chemical & Clinical Sciences at Manipal University College, Malaysia on 6-7th May 2025



~ Sonia Shetke & Jennessa Fernandes (T.Y.B.Sc.)