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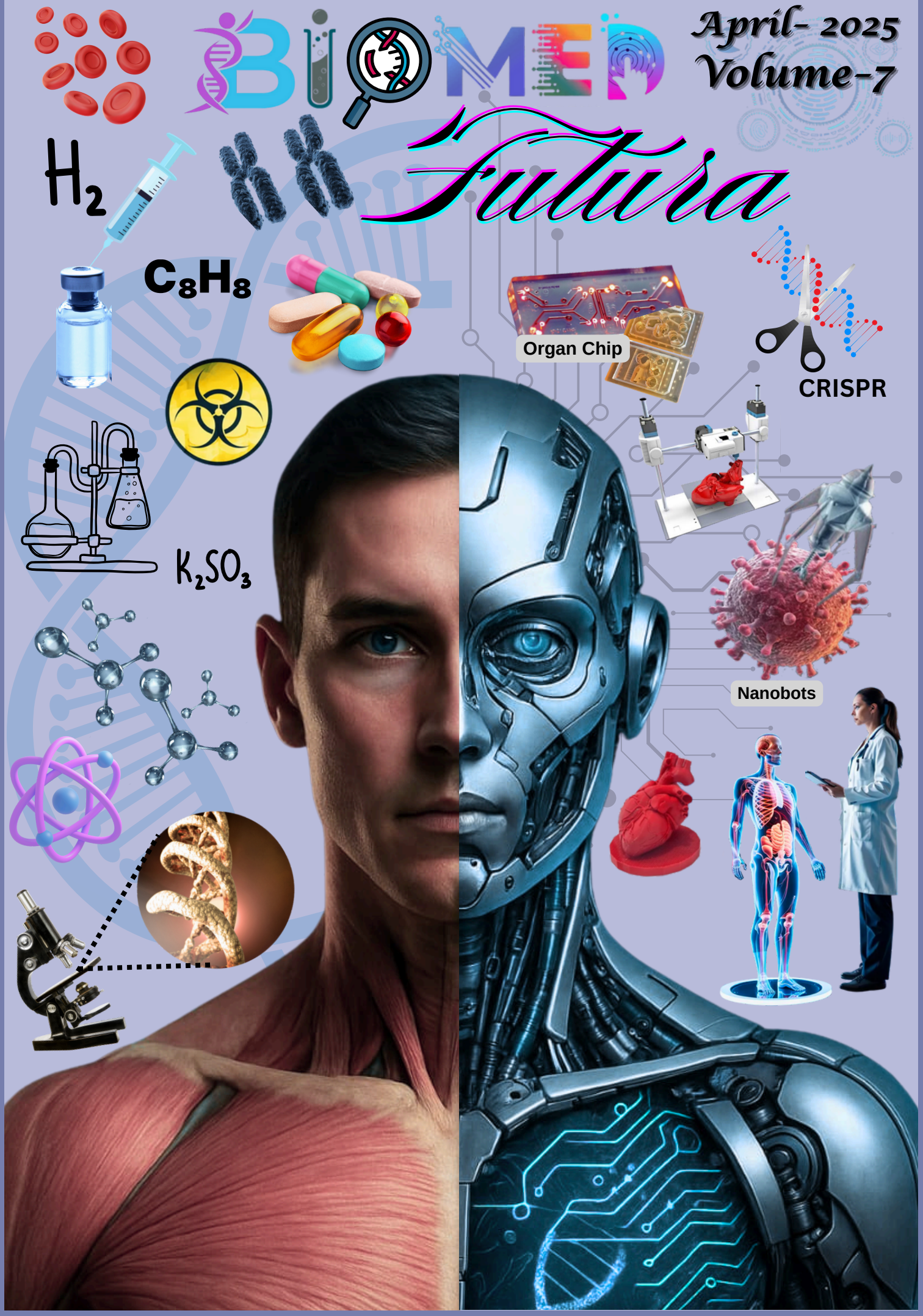
BIOMED Futura



BIOMED FUTURA
DEPARTMENT OF BIOMEDICAL SCIENCE
BHARATHIDASAN UNIVERSITY

Gratitude to Our Guiding Lights

Dr.G.MATHAN
Coordinator-BioMed Futura

His unwavering faith in student potential, his encouragement to question boldly, and his wisdom to guide without restricting are the threads that have stitched this vibrant scientific community together.

Dr. Mathan's leadership is not measured in milestones alone, but in the minds he's inspired — to think deeply, act ethically, and dream audaciously. We thank him not only for his direction, but for the belief he instills in us every day.

Dr.K.PREMKUMAR
Professor

Dr.S.D.SARASWATHY
Associate Professor

Dr. S. SHANMUGAAPRIYA
Associate Professor

You are the voice that challenges our assumptions, the guide that nurtures resilience, and the spark that turns curiosity into inquiry. Whether in lecture halls, labs, or brief moments between practicals, your presence has shaped how we think, how we learn, and how we dream. We honour your unwavering support from behind us.

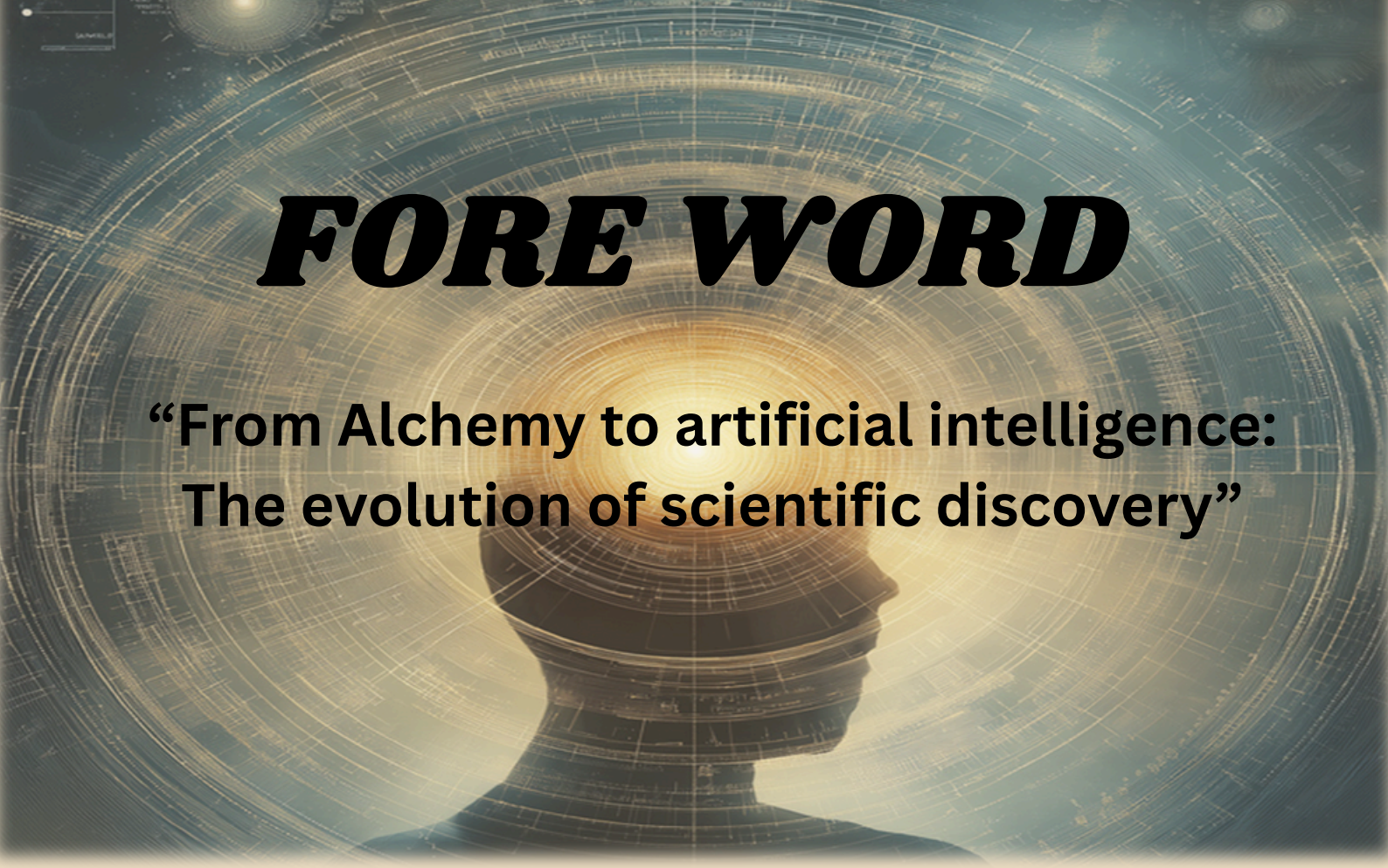
About Biomed Futura

Biomed Futura isn't just a club — it's a movement, where science meets spirit

Established in 2017, Biomed Futura is the in-house academic club of the Department of Biomedical Science. It serves as a dynamic platform where students transform curiosity into contribution, and learning into leadership. Rooted in the vision of inspiring bold thinking beyond classroom boundaries, the club cultivates globally competent individuals who combine scientific excellence with social responsibility.

From its inception, Biomed Futura has pulsed with creative energy — organizing thought-provoking events, weekly meetings, and hands-on activities that encourage students to think beyond convention. Members of the club, elected by peers, drive initiatives with passion and purpose, fostering a strong sense of ownership and teamwork.

Every year, the club invites distinguished speakers from diverse scientific domains to spark dialogue, nurture intellectual growth, and promote interdisciplinary collaboration — empowering students to tackle complex challenges with holistic insight. Through debates, quizzes, speeches, and student-led research magazines, Biomed Futura validates the voices and visions of emerging scientists. It stands as a vital force within the department, championing liberal education, ethical inquiry, and a culture of innovation.



FORE WORD

“From Alchemy to artificial intelligence: The evolution of scientific discovery”

Welcome to the inaugural edition of Biomed Futura Digest. As we embark on our editorial journey, we begin with a theme close to every curious mind — the evolution of scientific exploration.

From mystical cures to molecular interventions, the story of biomedical science is a tale of transformation. Ancient healers spoke through herbs and intuition, while modern researchers decode pathogens in nanoscale chambers. What unites them? Curiosity. Courage. A relentless pursuit of understanding.

This issue maps the metamorphosis — tracing milestones from medieval medicine to microfluidic marvels. At Biomed Futura, we embrace both retrospective wonder and futuristic ambition, believing that innovation blooms when we honor the legacy of questions asked long ago.

Let us journey together — across centuries, across cells, and into the heart of discovery.

Warmly,
Janani R & Meiyamai S P
Editorial chiefs, BioMed Futura.

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கல்லூரி மாணவர்களுக்கான அறிவுரை

இளைய தலைமுறையினராகிய ஒவ்வொருவருக்கும் வாழ்வின் இலக்கும், அதை நோக்கிய கனவுகளும் இருத்தல் இயல்பு. தாம் கல்வி பயின்ற துறைக்கேற்ற பணிவாய்ப்பு அமைய வேண்டும், விரும்பிய நிறுவனத்தில் சேர வேண்டும் என்றெல்லாம் தீர்மானித்திருப்பீர்கள். அதேவேளை, நிறுவனங்களும் தமக்குரிய பணியாளர்களைத் தேர்ந்தெடுப்பதற்கான சில நெறிமுறைகளை வகுத்துள்ளன.

ஓர் இளைஞனின் வாழ்வு கல்லூரியிலே மலர்ந்து, அவன் சேரப் போகும் நிறுவனங்களிலே மேலும் விரிவடைகிறது. இவ்வுலகில் அவன் பெறும் அங்கீகாரம், அவன் ஆற்றும் பணியைப் பொறுத்தே அமையும்

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கூடுதல் திறன்களின் தேவை

இக்காலத்து நிறுவனங்கள், பல்திறன் படைத்தோரையே எதிர்பார்க்கின்றன. எடுத்துக்காட்டாக, ஒரு பெரும் நிறுவனத்திற்கு முப்பது இளைஞர்கள் தேவைப்படுகின்றனர் எனக்கொள்வோம். தங்கள் கல்லூரிக்கு நேர்முகத் தேர்வு நடத்த வருகிறார்கள். அங்கு ஐம்பது மாணவர்கள் அமர்ந்திருக்கிறார்கள். அவர்கள் அனைவரும் சிறந்த மதிப்பெண்களைப் பெற்றவர்கள்; தொழிற்சார்ந்த அணுகுமுறையும் கொண்டவர்கள். இச்சூழலில், ஐம்பது பேரில் முப்பது பேரைத் தேர்ந்தெடுப்பது எவ்வாறு? ஐம்பது பேரும் அந்நிறுவனத்தில் பணிபுரிய விழைகிறார்கள். இந்நிலையின்போது, நிறுவனங்கள் அம் மாணவர்களிடம், கல்வி தவிர வேறு எவ்வெத் திறமைகள் யாரிடம் உள்ளன என்று ஆராய்ந்து, அவற்றின் வாயிலாகவே தேர்ந்தெடுப்பர்.

மென்திறன்கள்

அத்தகைய கூடுதல் தகுதிகளே மென்திறன்கள் என உரைக்கப்படுகின்றன. "மென்திறன் என்பன யாவை?" என வினவுகிறீர்களா? தெளிவான பேச்சுத்திறமை, தனித்தன்மை, கூரிய அவதானிப்பு, புதுமையான சிந்தனை போன்ற பலவும் மென்திறனில் அடங்கும். தொடர்புகொள்ளும் திறனை எடுத்துக்கொள்வோம். ஒரு மாணவன் கல்விப் புலத்தில் சிறந்து விளங்கலாம், நன்கு கற்றிருக்கலாம், பாடப்பிரிவில் தேர்ச்சி பெற்றிருக்கலாம். ஆனால், நேர்முகத் தேர்வில் வினவப்படும் கேள்விக்கு விடையளிக்கத் தெரிந்தால்தான் அத்திறன் வெளிப்படும். பல மாணவர்கள் கேள்வி கேட்கப்படும்போது பதிலுரைக்கத் தடுமாறுவர். ஆனால், அதையே செயல்வடிவில் காட்டச் சொன்னால் சிறப்பாகச் செய்வார்கள். ஆனால், துரதிருஷ்டம் என்னவெனில், அதை நேர்முகத் தேர்வில் பேசிப் புரியவைப்பதில் தவறிவிடுகிறார்கள்.

தகவல் தொடர்புத் திறன்

தகவல் தொடர்புத் திறன் என்பது அத்தகு செயலல்ல! அது ஒரு தீர்வை நோக்கியே அமையும். பேசுபவருக்கும் கேட்பவருக்கும் இடையே ஓர் உறவை அது உருவாக்கும். நமக்கும் நம் குடும்பத்தாருக்கும் இடையே, மாணவருக்கும் ஆசிரியருக்கும் இடையே, அலுவலகத்தில் பணிபுரிவோருக்கு இடையே எனப் பலவாறாக இத்தொடர்பு விரிவடைகிறது. பொதுவாக, தகவல் தொடர்பு என்பது அன்பு, ஆணை, வேண்டுகோள், அதிகாரம், பொறுப்பு எனப் பலவித உணர்வுகளை வெளிப்படுத்துவதாகும். ஒருவருடைய தேவைகளை மற்றவர்களிடமிருந்து பெற்றுக்கொள்ள ஒவ்வொருவருக்கும் உதவும் ஒரு பெரும் சாதனமே தகவல் தொடர்பு. இதுவே மென்திறன்களில் மிக முக்கிய அங்கம். ஆதலால், கல்லூரிப் பருவத்திலேயே சிறந்த தகவல் தொடர்புத் திறனையும் வளர்த்துக்கொள்ளுங்கள். ஒன்றுக்கு மேற்பட்ட மொழிகளை எழுதவும், படிக்கவும், பேசவும் கற்றுக்கொள்ளுங்கள். இது உங்கள் மதிப்பை அதிகரிக்க உதவும்.

-நிவேதா சி
நான்காம் ஆண்டு

CASE STUDY

BREAKING BOUNDARIES IN NEUROLOGY

Study on Refractory Focal Epilepsy in a Young Adult

-Vigneshwari S
3rd Year BMS

OVERVIEW

Epilepsy affects millions, but about one-third of patients don't respond to medications. This condition known as refractory epilepsy impacts not just health, but jobs, confidence, and independence. Early detection for Refractory Lupus Epilepsy is crucial due to significant risk associated with uncontrolled seizures, brain damage and increased mortality .This case shows how one young adult found hope through timely diagnosis and surgery.

CONDITION

The patient, a software engineer, experienced frequent episodes: sudden unresponsiveness, lip-smacking, and hand movements. Tests revealed abnormal brain activity and damage in a deep region of the brain called the hippocampus a condition called **mesial temporal sclerosis** (MTS).

He tried two anti-seizure medications with little success. Finally, he was evaluated for surgery. A left anterior temporal lobectomy was performed, targeting the seizure focus.

TREATMENT & RECOVERY

Post-surgery, he followed a routine including medication, sleep management, and a ketogenic diet. Within six months, he became completely seizure-free. His memory and mental focus improved. He returned to work with restored confidence.

DISCUSSION

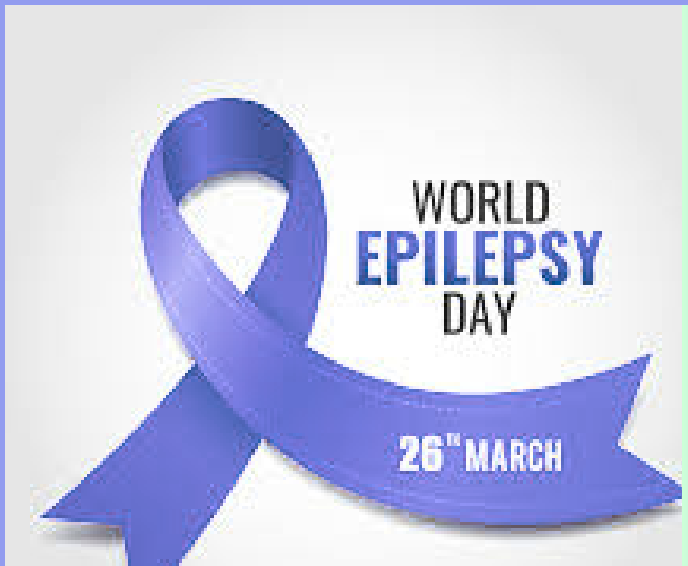
This case underlines the need for early recognition of refractory epilepsy. While many case studies focus only on medication, this report emphasizes the life-changing impact of surgical care. MTS-associated epilepsy responds well to surgery with success rates up to 70%.

FUTURE PERSPECTIVE

- AI-powered seizure forecasting
- Wearable neurochips
- Gene-guided brain modulation
- Gut-brain axis therapies

CONCLUSION

Epilepsy may challenge the brain—but it doesn't have to control the future. This case echoes a bold truth: with timely diagnosis, advanced care, and courage, even the most stubborn seizures can be silenced. As science pushes the boundaries of what's possible, patients aren't just surviving—they're thriving, rewiring not only their brains, but their entire lives.



RIDDLES

1. I act like a digestive system in an animal cell. I contain enzymes that break down wastes and other materials. **What am I** ?

2. I'm the stack of membranes modifying and packaging proteins, I'm like the cells post office sending things to various regions . **what am I** ?

3 I act like a storage container holding into important molecule until they're need to sustain here. **What am I ?**

4. I'm the organelles that's like a protective shield guarding the cell's genetic material with a careful yield. **What am I ?**

5. I'm the brain of the cell you see containing DNA directing what will be I send out messages plants for all with out me the cell can't call. **What am I ?**

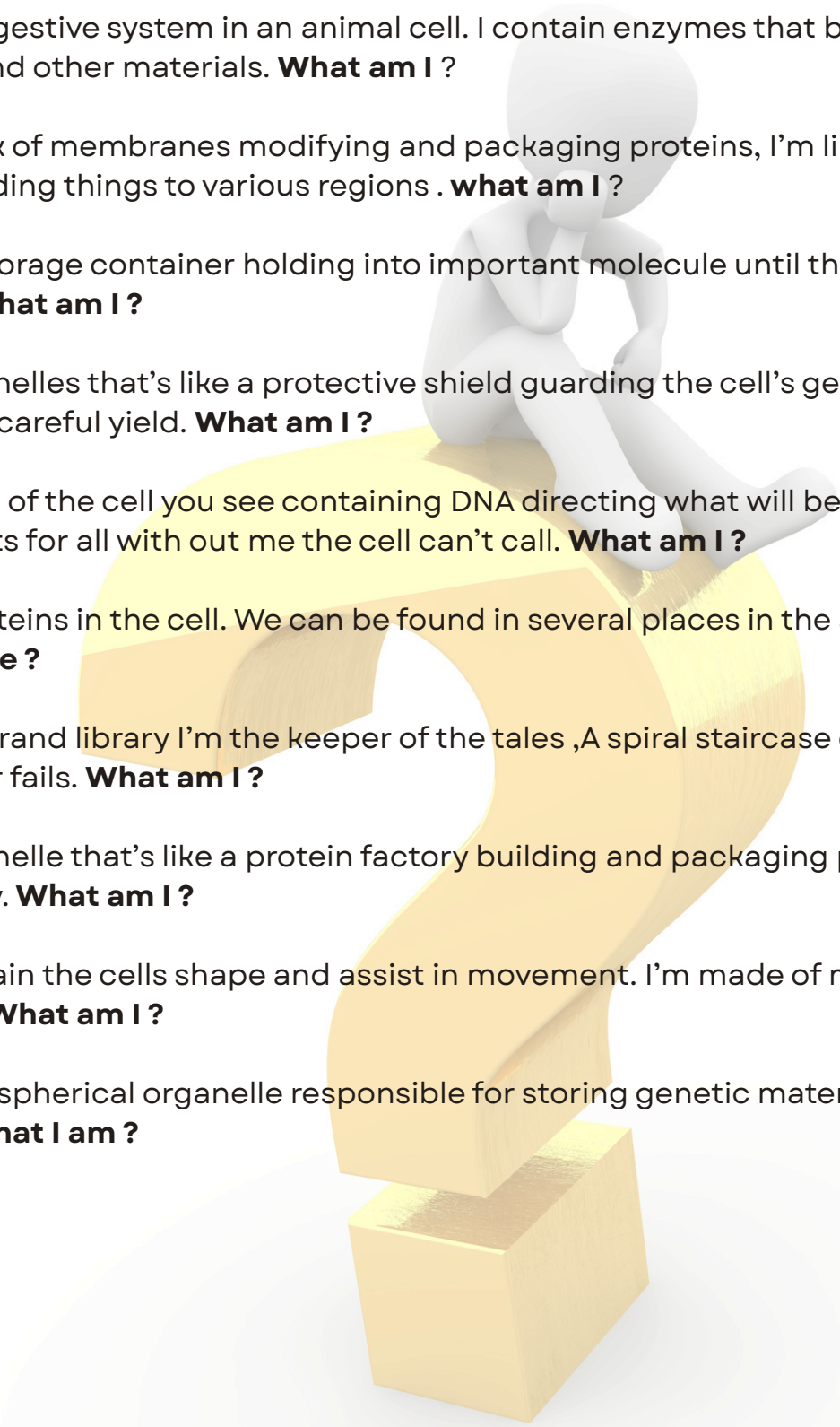
6. We build proteins in the cell. We can be found in several places in the all including both ERs. **We are ?**

7. In the cells grand library I'm the keeper of the tales ,A spiral staircase of genetic code that never fails. **What am I ?**

8. I'm the organelle that's like a protein factory building and packaging proteins with great efficiency. **What am I ?**

9. I help maintain the cells shape and assist in movement. I'm made of microtubules and filaments. **What am I ?**

10. I am a small spherical organelle responsible for storing genetic material in prokaryotes. **What I am ?**



ANSWERS:

1)Lysosome 2)Golgi Apparatus 3)Vacuole 4)Nuclear membrane
5)Nucleus 6)Ribosomes 7)DNA (found in the nucleus)
8)Endoplasmic Reticulum(ER) 9)Cytoskeleton 10) Nucleoid

- Sivabharathi S
2nd Year BMS

ARTIFICIAL OVARIES
SCIENCE APPROACHES A FERTILITY BREAKTHROUGH

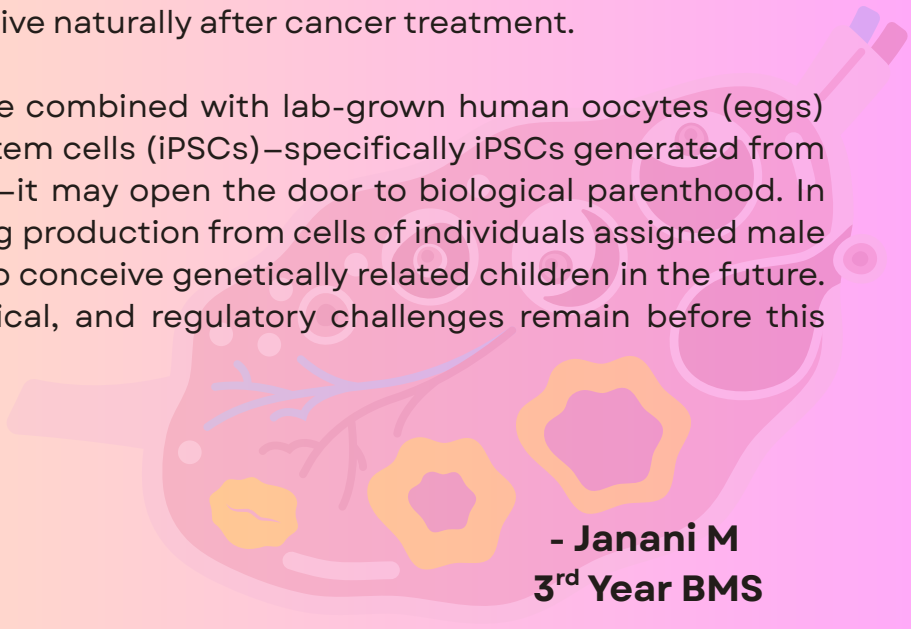
An artificial ovary is a potential fertility preservation treatment that aims to mimic the function of the natural ovary. Artificial ovaries could be an effective alternative in fertility preservation. According to the Centre of Disease control and Prevention, 13.4% of woman within age 15 to 49 have impaired fertility as complication of conditions such as polycystic ovarian syndrome, and it is believed to be a combination of genetic predisposition and environmental factors.

At the beginning of 2024, scientists from the University of Michigan created the first Cellular atlas of human egg formation by studying five donated ovaries using art cell and genetic mapping technologies. By examining the movement and structural change of follicles as they progress through different maturation stages, scientists identified key factors that enable follicle to mature. Scientists have successfully 3D-printed ovarian structures using biodegradable hydrogels that mimic the extracellular matrix of natural ovaries. These engineered structures aim to support follicle development and hormone production, offering a potential pathway to restoring or enabling fertility.

Artificial ovaries hold significant future potential for transgender individuals, particularly trans women (individuals assigned male at birth who identify as female). While this technology is still in early research stages and not yet clinically available for this application, its development marks a promising step forward in reproductive science.

Artificial ovaries offer a way to preserve fertility for young female cancer patients who may face premature ovarian failure due to cancer treatments. Unlike ovarian tissue transplantation, artificial ovaries can be designed to minimize the risk of reintroducing malignant cells that may be present in the original ovarian tissue. If successful, artificial ovaries could allow women to conceive naturally after cancer treatment.

If artificial ovaries can eventually be combined with lab-grown human oocytes (eggs) derived from induced pluripotent stem cells (iPSCs)—specifically iPSCs generated from a trans woman's own somatic cells—it may open the door to biological parenthood. In theory, this could enable mature egg production from cells of individuals assigned male at birth, potentially allowing them to conceive genetically related children in the future. However, significant scientific, ethical, and regulatory challenges remain before this becomes a clinical reality.



- Janani M
3rd Year BMS

DINGA DINGA: MYSTERY VIRUS THAT CAUSES EXCESSIVE BODY – SHAKING IMPACT HUNDREDS IN UGANDA

- Subadharshini M
3rd Year BMS

Dinga Dinga Disease is a self-limiting condition mainly affecting women and girls in Uganda's Bundibugyo District. It is characterized by uncontrollable body tremors, high fever, extreme weakness, and sensations of paralysis, significantly impairing daily activities. Although the cause remains unknown and the disease is under investigation, no fatalities have been reported.

Introduction:

In the early months of 2023, a novel illness known locally "Dinga Dinga Disease" interpreted as body tremors disease or "Dancing Disease" surfaced in Uganda. This mysterious disease which mainly affects women and girls was first identified in the **Bundibugyo district of Uganda.** The symptoms of Dinga Dinga, especially the uncontrollable shaking or tremors reminiscent of the "Dancing plague" or "Choreomania" of 1518 in Strasbourg, France. At that time, people uncontrollably danced for days and sometimes it even led to exhaustion- related deaths. The most distinctive symptoms is excessive shaking of the whole body, which severely impact patients mobility and can lead to temporary paralysis, especially when attempting to walk or stand. These episodes of tremors can last for hours and are accompanied by other symptoms such as fever, persistent headaches, cough, runny nose, and general body pain leaving the victims completely incapacitated. Meanwhile, investigations are being done to determine if respiratory pathogens like COVID- 19, malaria or measles are the cause. However, the illness remains unidentified pending lab results.

In addition, the emergence of DDD (Dinga Dinga Disease) strikes amid a series of other health crises in Uganda which has faced an outbreak of a new strain of mpox (monkeypox) that resulted in several deaths. Also, the Democratic Republic of the Congo (DRC), which borders Uganda, has recently experienced a deadly wave of a mysterious illness dubbed "Disease X." This unknown pathogen claimed over 400 lives, Sparking fears of a potential global epidemic. Some authorities suspect that Disease X is connected to malaria because majority of affected patients in the region tested positive for the mosquito-borne illness. The recurring outbreaks in Uganda and neighboring regions should provoke a scientific research commitment towards African continent

Case overview:

An 18-year-old patient from Bundibugyo reported experiencing sudden weakness, paralysis, and uncontrollable body shaking when attempting to walk, but has since recovered after receiving treatment at a local hospital. According to District Health Officer Kitiya Christopher, the illness—referred to as "Dinga Dinga Disease"—is currently being treated with antibiotics by community health teams, though its exact cause remains unclear. Herbal remedies are discouraged, and patients are urged to seek care at official health facilities. Most cases resolve within a week, and no deaths have been reported. Experts have likened the condition to the historical Dancing Plague of 1518, due to the shared symptom of involuntary, repetitive body movements.

According to the WHO, the Panzi health zone has reported 394 cases, with 30 fatalities linked to similar symptoms in the region.

Local outbreak: Currently, no cases have been reported outside of Bundibugyo district, and it is not clear whether the disease is spreading to other regions of Uganda or neighboring countries.

Conclusion:

The emergence of Dinga Dinga disease represents a significant challenge for uganda's health authorities and affected communities. As investigations continue, early detection and community engagement play pivotal roles in controlling this outbreak. As researchers strive to uncover the mystery surrounding Dinga Dinga, the need for vigilance, prompt response and supportive heath care measures remains critical. As Dinga Dinga disease is still under investigation and evolving, the case definition may be refined over times as more data become available. For the most accurate and up- to- date information, health authorities and the will continue to provide guidance as the situation develops. The ongoing research is focusing on identifying the pathogen responsible for illness and preventing its spread to other regions.

"WHEN THE VIRUS DANCES, HEALTH DISAPPEARS-LET'S END THE SHOW"

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Dinga Dinga Disease Uncovered: A Call to Act Fast Against Uganda's Puzzling Health Crisis. Dr. Tensaba Andes Akafa1, Dr. Kingsley Iyoko Iseko

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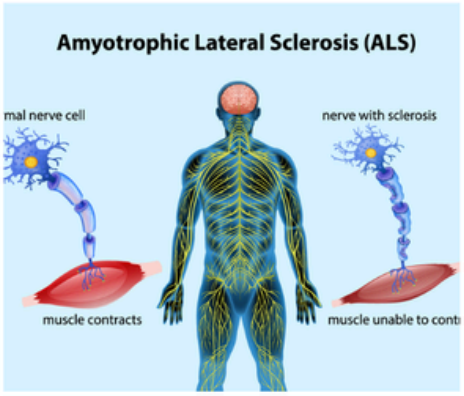
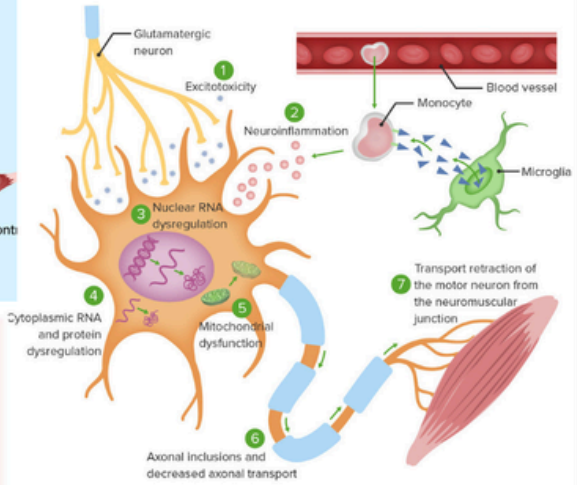
AMYOTROPIC LATERAL SCLEROSIS

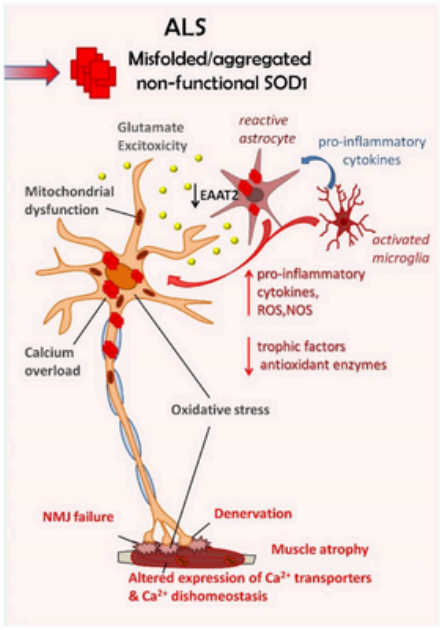
Amyotrophic lateral sclerosis (ALS), also known as Lou Gehrig's disease, is a progressive neurodegenerative disorder that primarily affects the motor neurons responsible for controlling voluntary muscles.

- V. INDHU DIVYA
IV year



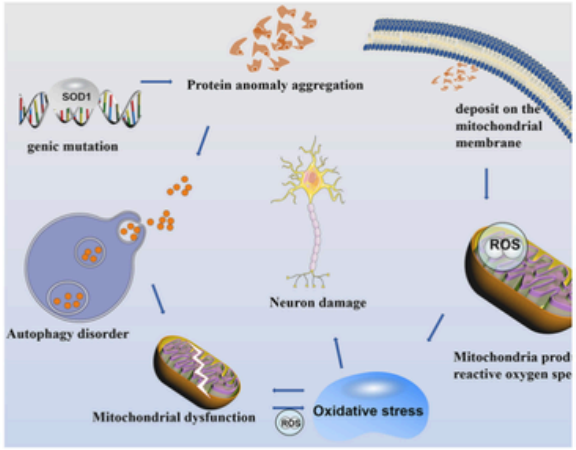
ALS kills motor neurons causing muscle to weakens and eventually paralyze.





Mutations in this gene do not cause ALS by loss of SOD1 function but rather by rendering the protein prone to aggregation, which disturbs multiple important cellular functions

THESE PROTEIN AGGREGATES DISRUPT NORMAL CELLULAR PROCESSES AND LEAD TO NEURONAL TOXICITY.MOTOR NEURONS ARE PARTICULARLY SUSCEPTIBLE TO OXIDATIVE STRESS.



Treatment

RILUZOL

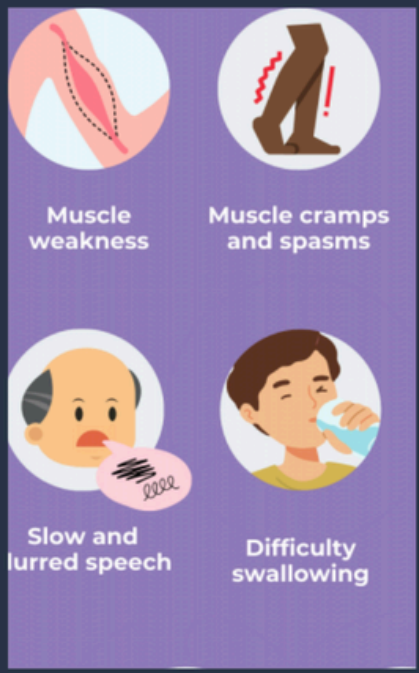
- Reduces glutamate levels in the brain, potentially slowing disease progression.
- Extends survival or time before mechanical ventilation.

FACTS ABOUT ALS:

Every 90 minutes someone is diagnosed and passes from ALS.

- **90% of cases occur without a family history.**
- **Onset is usually between the ages 40 & 70 years.**
- **Life expectancy is 2 to 4 year.**
- **called Lou Gehrig's disease**

Signs & symptoms



TARGET. EDIT. HEAL: CRISPR'S PRECISION THERAPY

-Dency Eva A
3rd Year BMS

Infant with rare, incurable disease is the first to successfully receive personalized gene therapy treatment. Gene-editing platform lays groundwork to rapidly develop treatments for other rare genetic diseases.

A research team supported by the National Institute of Health (NIH) has developed and safely delivered a personalized gene editing therapy to treat an infant with a life-threatening, incurable genetic disease. The infant, who was diagnosed with a rare condition **carabamoyl phosphate synthetase 1** (CPS1) deficiency shortly after birth, has responded positively to the treatment. The process, from diagnosis to treatment , took only six months and marks the first time the technology has been successfully deployed to treat a human patient. The technology used in this study was developed using a platform that could be tweaked to treat a wide range of genetic disorders and open the possibility of creating personalized treatments in other parts of the body.

Researchers at the Children's Hospital of Philadelphia (CHOP) and the Perelman School of Medicine at the University of Pennsylvania developed a personalized CRISPR-based therapy to treat a baby with CPS1 deficiency—a rare genetic disorder that prevents proper breakdown of protein byproducts in the liver, leading to toxic ammonia buildup. This marks the first known use of a custom CRISPR therapy for a single patient, specifically targeting non-reproductive liver cells to avoid heritable changes. CPS1 deficiency can cause severe brain and liver damage, and while treatment usually involves a low-protein diet until liver transplant, patients remain at risk of rapid organ failure due to stressors like infection or dehydration.

The child received an initial low dose of the CRISPR therapy at six months, followed by a higher dose later. Signs of effectiveness appeared early, with the child tolerating more dietary protein and requiring less medication to control ammonia levels. Notably, the child safely recovered from a cold and gastrointestinal illness—events that would typically pose severe risks. The delivery method used allowed for repeated dosing, enabling a cautious and safe start with a low dose.

"We were very concerned when the baby got sick, but the baby just shrugged the illness off," said the geneticist. For now, much work remains, but the researchers are cautiously optimistic about the baby's progress.

As a platform, gene editing – built on reusable components and rapid customisation – promises a new era of precision medicine for hundreds of rare diseases, bringing life-changing therapies to patients when timing matters most: Early, fast, and tailored to the individual," says the Director of NIH's National Centre for Advancing Translational Sciences (NCATS).

SCIENTIFIC RIDDLES

-Srikanth P
1st Year BMS

I have no voice, but I can speak to you. I have no life, but I can evolve. I have no eyes, but I can show you the world.

BOOK

The Hidden Life Invisible to the naked eye, I roam everywhere. In your food, on your skin, even in the air. What am I?

BACTERIA

The Invisible Laborer In silence, I toil, unseen but vital, Turning sunlight into a survival manual. What am I, that feeds both flower and tree, Breathing life into earth's tapestry?

PHOTOSYNTHESIS

The Unseen Shield I ward off invaders, seen and unseen, A vigilant guardian, though I've never been seen. In a liquid red field, I fight unseen wars, What am I, that keeps you safe from scores?

IMMUNE SYSTEM

The Twisted Ladder I am a ladder, twisted and tight, Holding the code that gets you just right. In every cell, I lay my claim, What am I, known by a three-letter name?

DNA

The Silent Messenger I travel unseen, without a sound, Carrying messages, bound and round. Connecting life's dots, I play my part, What am I, the body's art?

NEURONS

The Invisible Force I am not seen, but felt within, A force that makes the living spin. Breath to breath, I am the cause, What am I, without pause?

METABOLISM

The Breath of Life I'm invisible, you see, But without me, you wouldn't be. I rise and fall with every breath, What am I, defying death?

OXYGEN

The Tiny Architect but mighty, I work out of sight, Building your world, with all my might. From the tip of your nose to the curve of your toes, What am I ?

CELLS

CANCER IMMUNOTHERAPY STRATEGIES

-Farhana Yasmeen Zahrah M
2nd Year BMS

Cancer has long been a word wrapped in fear, marked by painful treatments, uncertainty, and emotional suffering—for patients and families alike. Just a few decades ago, cancer treatment mostly relied on surgery, chemotherapy, and radiation—often with harsh side effects and limited long-term success. These methods targeted both healthy and cancerous cells, making treatment grueling. Over time, scientific advances have led to more precise strategies, and now immunotherapy is at the forefront, offering targeted and often less toxic options. While not a universal cure, it has proven significantly more effective for certain cancerslike melanoma, leukemia, and lung cancer— turning what were once grim diagnoses into manageable or even treatable conditions.

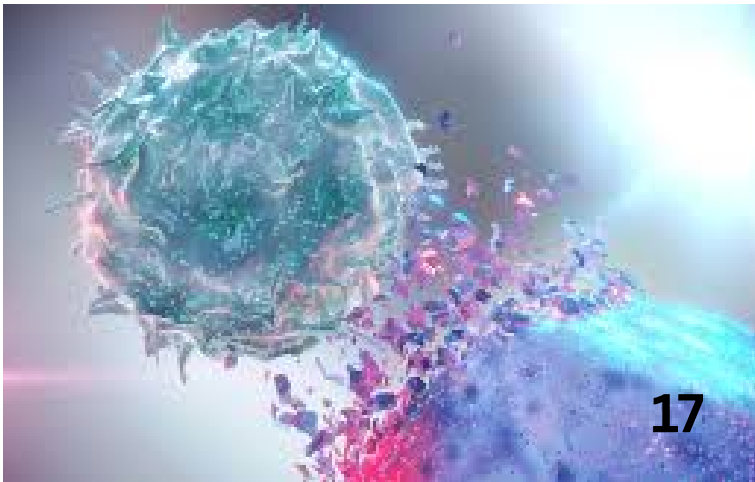
The roots of cancer immunotherapy trace back to the 1890s when physician William Coley injected bacterial toxins into sarcoma patients to stimulate their immune systems—a bold idea that laid the groundwork for today's cutting-edge treatments.

Today, cancer immunotherapy is transforming oncology by empowering the immune system to identify and eliminate cancer cells. Unlike chemotherapy and radiation, which can damage healthy tissue, immunotherapy leverages the body's natural defenses for a more precise and often gentler approach. Approaches include adoptive cell therapy, such as CAR T-cell therapy, where T-cells are engineered to fight cancers like leukemia. Cancer vaccines, such as Sipuleucel-T for prostate cancer, train immune cells to recognize specific tumor antigens. Cytokine therapy uses molecules like interleukin-2 to boost immune cell activity and has been effective in kidney cancer and melanoma.

Immune checkpoint inhibitors block signals (e.g., PD-L1, CTLA- 4) that tumors use to hide from T-cells—drugs like nivolumab and pembrolizumab have shown success in treating lung cancer and melanoma. Monoclonal antibodies, such as trastuzumab and rituximab, bind to cancer-specific targets to inhibit growth or flag cells for destruction. Oncolytic virus therapy—an exciting innovation—uses viruses like T-VEC (talimogene laherparepvec) to infect and lyse tumor cells while stimulating immunity.

FUTURE DIRECTIONS:

Nanoparticle therapy uses tiny, targeted particles to deliver drugs directly to cancer cells, improving precision and reducing side effects—especially in solid tumors. Liposomal doxorubicin, for instance, treats breast and ovarian cancers with fewer heart-related issues. While immune checkpoint inhibitors and CAR T-cell therapy remain highly effective, particularly in melanoma, lung, and blood cancers, nanoparticle therapy is emerging as a strong complement. No single method suits all cases; personalized, combination-based, and immune-boosting treatments are the future of cancer therapy. Despite its promise, immunotherapy still faces hurdles like resistance and toxicity, driving ongoing research into more refined and personalized approaches.



இளம் சுற்றுச்சூழல் பாதுகாவலர் - லீஷா சபர்வால்

உலகத்தைக் காக்கப் பல இளம் சுற்றுச்சூழல் ஆர்வலர்கள் போராடி வருகின்றனர். அவர்களுள் மிகவும் இளையவர் லீஷா சபர்வால். டெல்லியைச் சேர்ந்த இந்தச் சிறுமி, தனி ஒரு படை போலச் சுற்றுச்சூழல் பாதுகாப்பு விழிப்புணர்வுப் பணிகளில் ஈடுபட்டு வருகிறார்.

லீஷா சபர்வால் பற்றிய சில முக்கிய தகவல்கள்:

வயது-சொந்த ஊர்; 10- டெல்லி.
படிப்பது; டெல்லி அருகே நொய்டாவில் உள்ள பாத்வேஸ் பள்ளி.
நிறுவனர்; 'பூமியை காப்போம் சங்கம்'

நோக்கம்; நாம் வாழும் பூமியில் எப்படி எல்லாம் தீங்கு இழைக்கிறோம் என்ற விழிப்புணர்வைப் பரப்புவதும், பூமியைக் காக்க ஒவ்வொருவரும் சிறிய முயற்சிகளையாவது மேற்கொள்ள வேண்டும் என்ற பிரச்சாரத்தை மேற்கொள்வதும் லீஷாவின் நோக்கம்.

செயல்பாடுகள்: முடிந்தவரை ஆட்களைத் திரட்டி மரக்கன்றுகள் நடுவதற்கு லீஷா முக்கியத்துவம் கொடுக்கிறார். "நாம் நடும் ஒவ்வொரு மரமும் பூமியைப் பசுமையாக்கும்" என்கிறார் அவர்.

சாதனை: சர்வதேச சுற்றுச்சூழல் ஒலிம்பியாட் போட்டியில் வெற்றி பெற்றுள்ளார்.

நூலாசிரியர்: இளம் சுற்றுச்சூழல் பாதுகாவலரான லீஷா, ஓர் இளம் நூலாசிரியரும் கூட. இவர் இதுவரை மூன்று நூல்களை எழுதியுள்ளார்.

பெருமிதத் தருணம்: குடியரசுத் தலைவர் திரௌபதி முர்முவை சந்தித்தார். பூமியைப் பாதுகாக்க தான் செய்துவரும் பணிகளையும், அனைவரும் செய்ய வேண்டியவை குறித்தும் குடியரசுத் தலைவரிடம் தைரியமாகப் பகிர்ந்து கொண்டார். இவரைப் பார்த்து மேலும் பல இளம் சுற்றுச்சூழல் ஆர்வலர்கள் உருவாவது பெரிய உத்வேகமாகும்.

லீஷாவின் முழக்கம்: "மனிதர்களாகிய நாம் தற்போது பூமியில் வாழும் முறையை மாற்றாவிட்டால் பேரழிவைத்தான் சந்திக்க நேரிடும். எனவே, பூமியைக் காக்க அனைவரும் ஒன்றிணைந்து உழைப்போம்."

-நிவேதா சி
நான்காம் ஆண்டு

VOICES THAT SHAPED OUR VISION

From the Frontlines of Discovery, Biomed Futura has welcomed some truly inspiring voices — trailblazers whose work reshaped how we see biology, technology, and the future of healthcare. These events weren't just talks — they were moments of deep connection, spirited debate, and visionary exploration. Below is a curated look at the brilliant minds who joined us this semester, each one adding a new lens to our evolving journey

Dr.R.RAJARAM
PROFESSOR
DEPARTMENT OF MARINE SCIENCE
BHARATHIDASAN UNIVERSITY, TRICHY
TOPIC: METAL FLOW IN POLAR FOOD WEBS -ARTIC PERSPECTIVES
DATE:10.09.2024

Dr.D.KANADAVEL
ASSOCIATE PROFESSOR
DEPARTMENT OF BOTANY
GOVT. ARTS COLLEGE FOR MEN(Autonomous),CHENNAI
TOPIC:TIPS FOR ACING THE JOINT "CSIR-UGC NET"EXAM
DATE: 18.09.2024

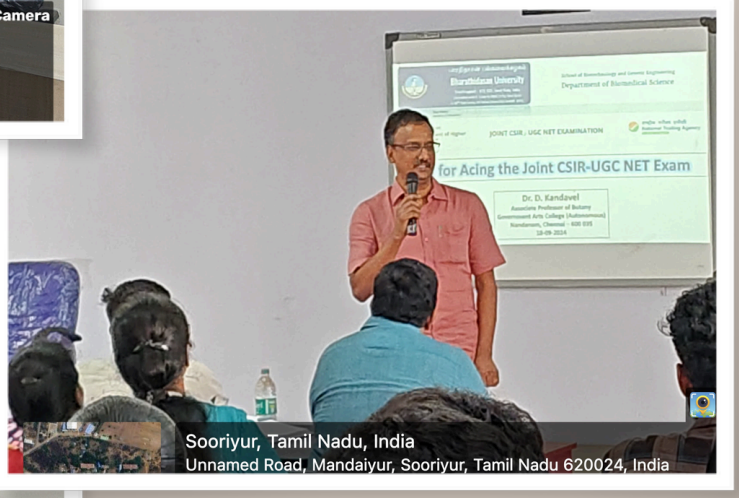
Dr.A.PURATCHIKODY
PROFESSOR
DEPARTMENT OF PHARMACEUTICAL TECHNOLOGY
ANNA UNIVERSITY, TRICHY
TOPIC: INTEGRATED BIOINFORMATICS APPROCHES TO IDENTIFY DETECTIVE MARKERS FOR DIABETES AND GLAUCOMA
DATE:24.09.2024

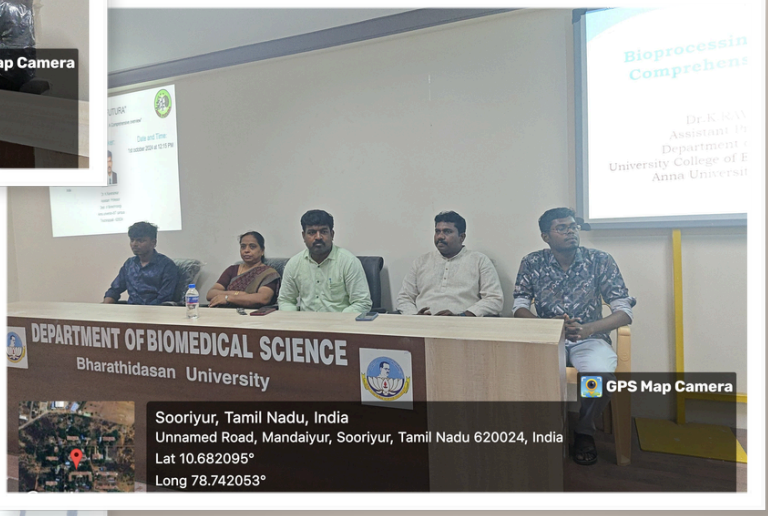
Dr.K.RAVISHANKAR
ASSISTANT PROFESSOR
DEPARTMENT OF BIOTECHNOLOGY
ANNA UNIVERSITY, TRICHY
TOPIC:BIOPROCESSING ESSENTIAL:A COMPREHENSIVE OVERVIEW
DATE:01.10.2024

Dr.M.MANICKAVASAGAM
ASSOCIATE PROFESSOR
DEPARTMENT OF BIOTECHNOLOGY
BHARATHIDASAN UNIVERSITY,TRICHY
TOPIC:GENETIC ENGINEERING IN AGRICULTURE
DATE:18.02.2025

Dr.M.MUTHUSELVAM
ASSOCIATE PROFESSOR
DEPARTMENT OF BIOTECHNOLOGY
BHARATHIDASAN UNIVERSITY,TRICHY
TOPIC:MICROBIAL BIOPROSPECTING SUSTAINABLE DEVELOPMENT
DATE:25.02.2025

LECTURE EVENTS





Medical Breakthrough: Neuronal Glycogen as a Hidden Energy Reserve

-Thirumugeshwaran V
4th Year BMS

BACKGROUND

For years, neuroscience held that glycogen, the brain's energy reserve, existed only in glial cells—mainly astrocytes—not neurons. Astrocytes were seen as metabolic support cells, storing glycogen and supplying neurons with energy substrates like lactate. Neurons were thought to lack the enzymes for glycogen synthesis and were considered highly dependent on constant glucose and oxygen from blood, making them vulnerable to energy shortages.

THE BREAKTHROUGH

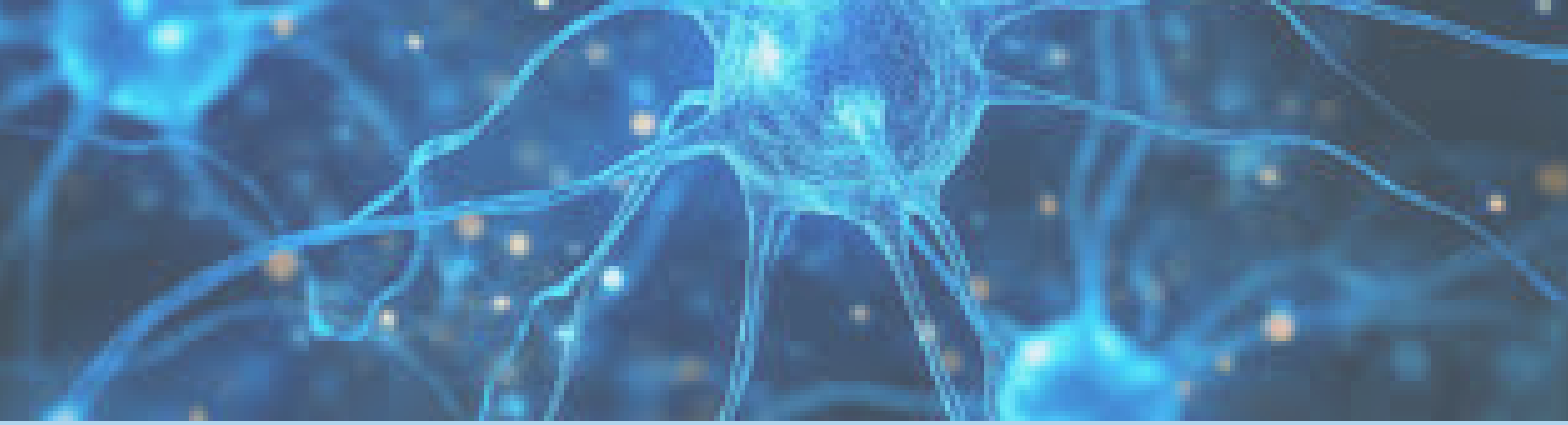
A landmark 2025 study conducted by researchers at Yale University overturned the long-standing belief that glycogen storage was exclusive to glial cells, revealing that neurons are capable of autonomously storing and metabolizing glycogen. Using advanced imaging, molecular tagging, and metabolic assays, the study demonstrated that neurons not only express the necessary enzymes for glycogen synthesis and breakdown, but also mobilize these stores in response to metabolic stress, such as hypoxia or glucose deprivation.

THE SCIENCE

In this study, researchers used super-resolution fluorescence microscopy, electron microscopy, and genetically encoded biosensors to detect glycogen granules in neurons and their associated enzymes, including neuronal glycogen synthase. Functional analysis through metabolic flux assays, ATP/lactate measurements, and live-cell imaging during oxygen-glucose deprivation (OGD) showed rapid glycogen breakdown, sustaining ATP levels and delaying neuronal death. These findings reveal a and quot-backup battery and quot-mechanism, where neuronal glycogen provides emergency energy during metabolic stress.

EVIDENCE

Live-cell imaging demonstrated how glycogen levels in neurons change dynamically, especially under metabolic stress Metabolic tracing experiments confirmed that neurons actively convert glucose into glycogen, proving their ability to synthesize and store this energy reserve. In ischemia models simulating oxygen deprivation, neurons with higher glycogen content showed increased survival times, highlighting glycogen's protective role during energy failure.



LIMITATIONS & NEXT STEPS

Understanding how neuronal glycogen storage is controlled is crucial for learning how neurons manage energy during stress. It's also important to study the long-term safety of increasing glycogen to avoid harmful effects on brain function. Research into how neuronal glycogen affects diseases like stroke, Alzheimer's, and Parkinson's could reveal new ways energy metabolism impacts neurodegeneration. Priority areas include developing safe drugs or gene therapies to adjust glycogen levels, finding biomarkers to measure glycogen in living brains, and running clinical trials to test treatments targeting glycogen metabolism in stroke and neurodegenerative conditions.

IMPACT

This discovery challenges the astrocyte-neuron lactate shuttle theory, showing that neurons can store and use glycogen independently, giving them a more active role in brain energy metabolism. It helps explain neuronal resilience during ischemia, as glycogen delays energy failure and cell death. The findings also open new therapeutic possibilities for stroke, Alzheimer's, Parkinson's, and brain aging by targeting neuronal glycogen metabolism to boost energy resilience.

CONCLUSION

Neurons are now seen as metabolically resilient, with their own glycogen "backup battery" for energy.
This challenges the view that they rely solely on external sources.
Harnessing these internal reserves could lead to groundbreaking treatments for stroke, neurodegenerative diseases, and brain injuries.

Ion Protein Channel Comic

-Harsha Varthini L
2nd year BMS

This comic illustrates a humorous take on the biological concept of ligand-gated ion channels, using a narrative style inspired by fantasy and adventure themes.

Panel 1:
[Character 1]: We're never going to get past this ion protein channel!

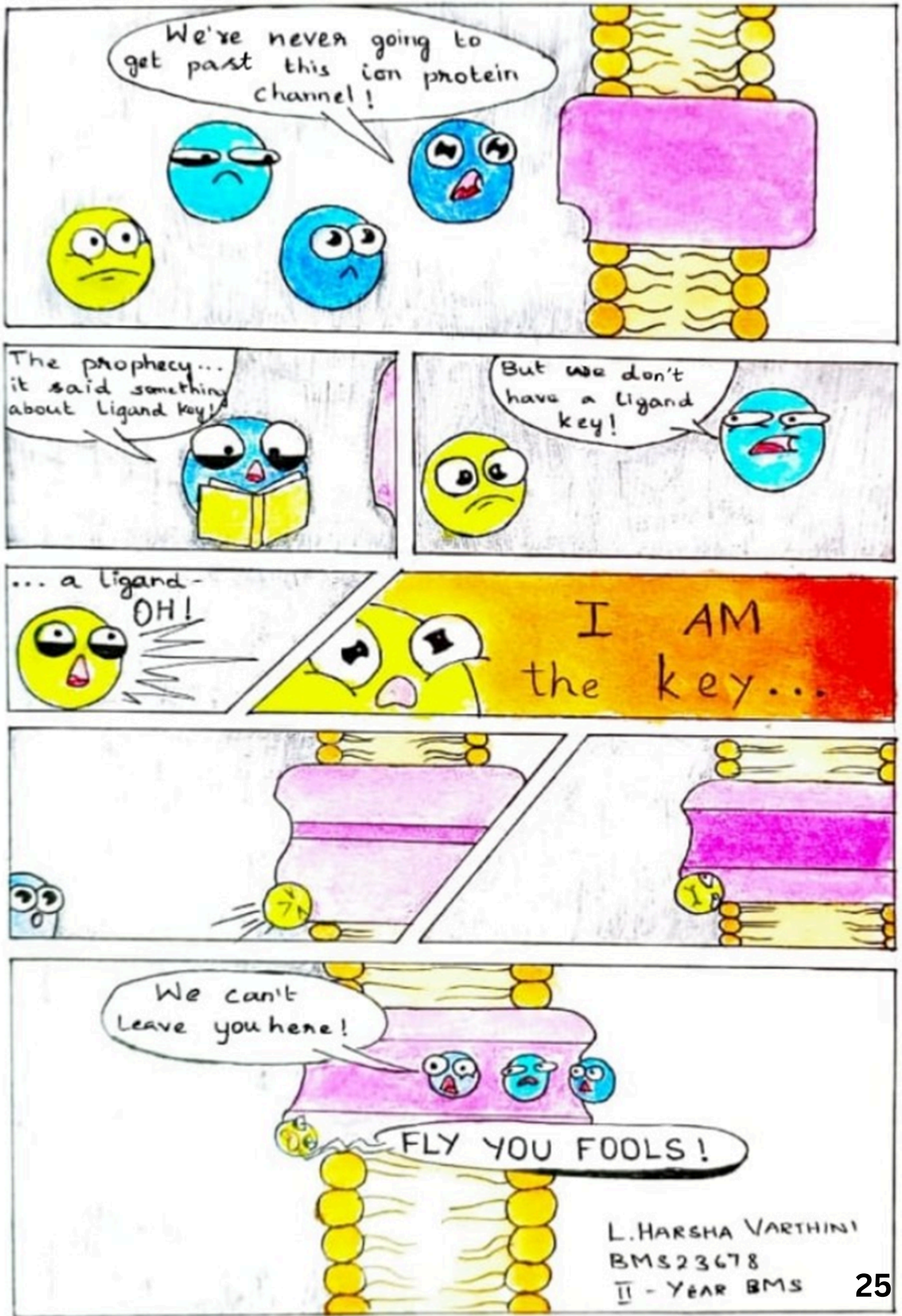
Panel 2:
[Character 2 reading a book]: The prophecy... it said something about a ligand key! [Character 3]: But we don't have a ligand key!

Panel 3:
[Character 4]: ...a ligand—OH!

Panel 4:
[Character 4, dramatically]: I AM the key..
.

Panel 5:
[Character 4 enters the channel]

Panel 6:
[Character 1]: We can't leave you here!


We're never going to get past this ion protein channel!
The prophecy... it said something about Ligand key!
But we don't have a Ligand key!
... a ligand-
OH!
I AM the key...
We can't leave you here!
FLY YOU FOOLS!
L. HARSHA VARTHINI
BMS23678
II - YEAR BMS

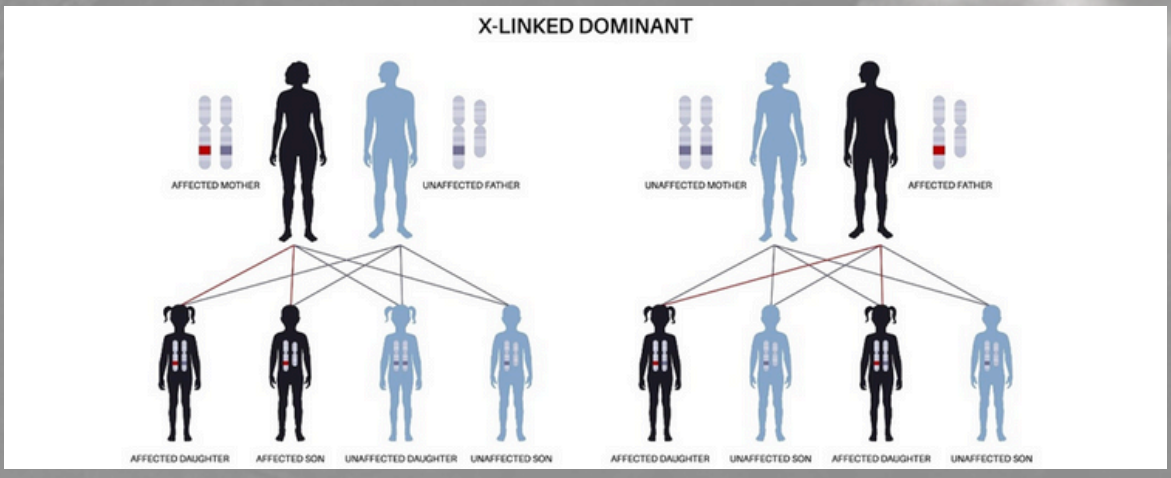
THE BRUNNER SYNDROME FAMILY STUDY

-Solaimanikandan S
4th Year BMS

One of the most widely investigated case study related to the "Serial killer gene" (MAOA gene) and its impact on behavior is that of a Dutch family investigated by H. G. Brunner and colleagues in the early 1990s. In 1993, a study detailed a large Dutch family with a history of abnormal violent behavior exhibited by several males across multiple generations. This family provided compelling evidence for a direct link between a specific genetic mutation affecting MAOA activity and a predisposition to severe aggressive behavior. It was one of the first human studies to demonstrate a clear genetic basis for a behavioral disorder, highlighting the role of the MAOA gene in regulating aggression and impulse control. The behaviors included aggressive outbursts, arson, attempted rape, and other violent crimes. Researchers identified a specific genetic defect in the affected males is a point mutation in the MAOA gene on the X chromosome. This mutation led to a virtually complete absence of functional MAOA enzyme in these individuals. Since MAOA breaks down neurotransmitters like serotonin, dopamine, and norepinephrine, its absence resulted in abnormally high levels of these neurotransmitters in the brain.

More case studies involved investigating low-activity variants (MAOA-L) of the MAOA gene. Studies, notably the Dunedin Multidisciplinary Health and Development Study (Caspi et al., 2002), have shown that these low-activity variants significantly increase the risk of antisocial and violent behavior, but primarily when combined with adverse environmental factors, such as childhood maltreatment or abuse. This concept of gene-environment interaction is crucial because the gene alone doesn't predetermine violence, but it can make individuals more vulnerable to environmental stressors that then trigger aggressive behavior.

This Dutch family case study laid the groundwork for much of the subsequent research into the "warrior/serial killer gene" and the complex interplay between genetics and environment in shaping human behavior.



Reference: Caspi A, McClay J, Moffitt TE, Mill J, Martin J, Craig IW, Taylor A, Poulton R. Role of genotype in the cycle of violence in maltreated children. Science. 2002 Aug 2;297(5582):851-4. doi: 10.1126/science.1072290. PMID: 12161658.

CANCER IMMUNOTHERAPY STRATEGIES

ONCOLYTIC VIRUS THERAPY

Modified viruses are used to infect and kill only cancer cells, simultaneously activates the immune system. T-VEC, based on a herpes virus, is one such example used in melanoma treatment.

CAR-T CELL THERAPY

Doctors collect a patient's immune cells (T-cells), modify them in the lab for specific target of cancer cells, then place them back in the body. These supercharged cells are so helpful, especially for blood cancers like leukemia and lymphoma.

MONOCLONAL ANTIBODIES

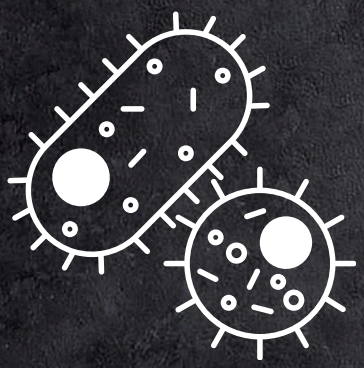
These lab-made proteins attach to cancer cells block their growth, trigger immune attacks. Sometimes deliver chemo directly. Trastuzumab is one such antibody used in HER2-positive breast cancer.

ADOPTIVE CELL TRANSFER

This involves collecting tumor-fighting immune cells from the patient, multiplying them in the lab, and reintroducing them to help the body fight back more stronger than before. A common form is TIL (tumor-infiltrating lymphocyte) therapy

IMMUNE CHECKPOINT INHIBITORS

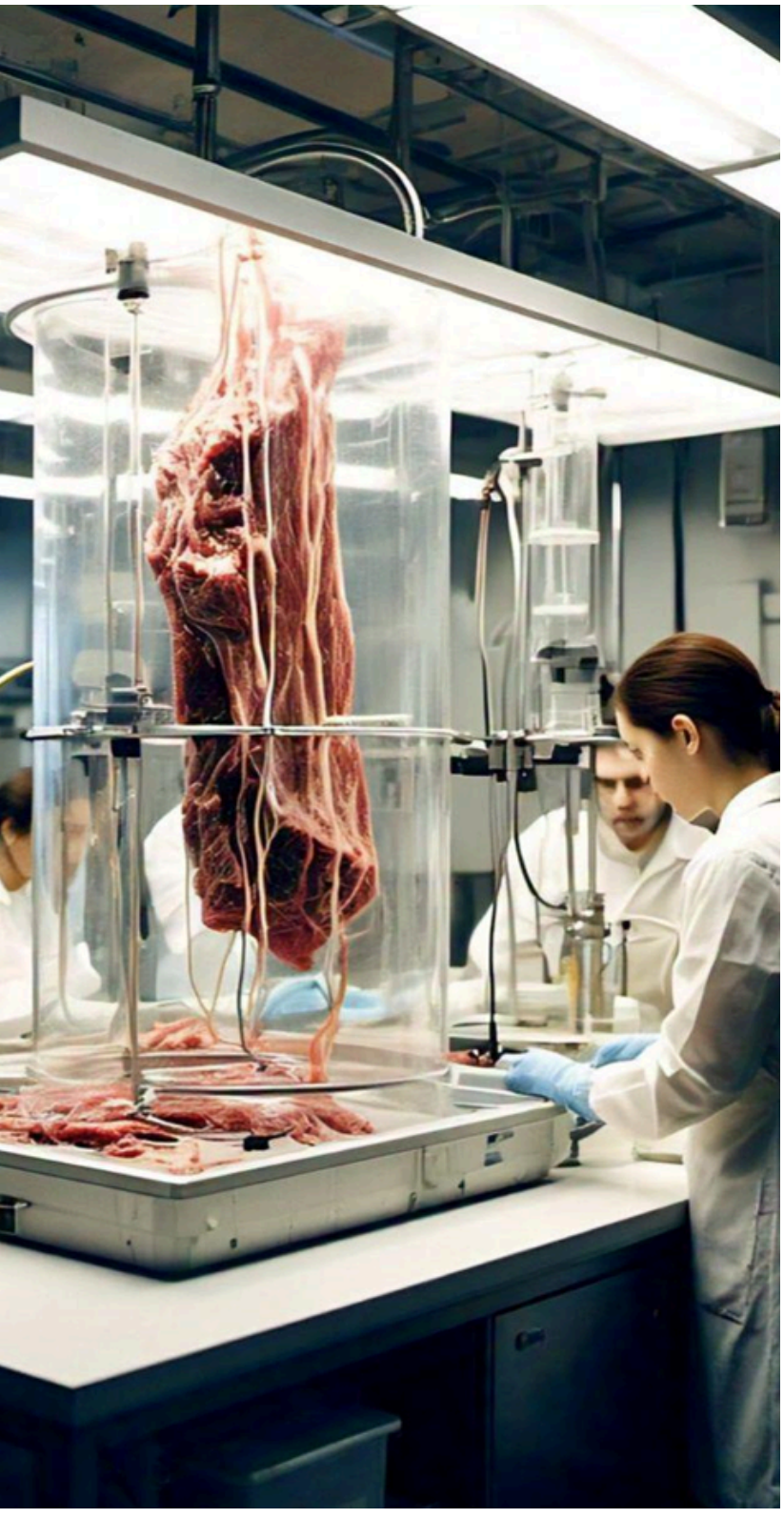
Cancer cells can use "off-switch" proteins to hide from the immune system. Drugs like nivolumab and pembrolizumab block these proteins (PD-1, PD-L1, CTLA-4), helping the immune system recognize and destroy the cancer cells. They've been effective in melanoma, lungs, and kidney cancers.



-Anbarasan K
3rd Year BMS

LAB GROWN MEAT : THE FUTURE SUSTAINABLE ALTERNATIVE TO MEAT OR A NOVEL FUNCTIONAL FOOD?

-Nisha Evangeline A
4th Year BMS



The rising world population is expected to reach 9.5 billion by 2050, exerting pressure on global resources for food production. Traditional meat production is associated with environmental degradation, health concerns, and animal welfare issues. The livestock sector is a significant contributor to greenhouse gas emissions, deforestation, and water pollution.

Lab-grown meat, also known as clean meat or cultured meat, is a promising alternative to traditional meat production. It involves culturing animal cells in a controlled environment, providing a potential solution to environmental, health, and animal welfare concerns. The production process involves cell culture technology, using stem cells and growth media to produce meat.

The benefits of lab-grown meat are numerous. It reduces greenhouse gas emissions, land use, and water consumption compared to traditional livestock farming. Lab-grown meat also offers improved public health benefits, reduced antibiotic resistance, and enhanced food safety. Additionally, it provides an opportunity to address global food security challenges.

As of 2024, lab-grown meat has gained several regulatory approvals in various countries, with a projected industry value of $25 billion by 2030. The University of California, Davis, has conducted significant research on lab-grown meat, including a study on its potential environmental impact. Lab-grown meat has been approved for consumption in several countries, including Singapore, the United States, Israel, and the Netherlands.

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References:

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· Tuomisto, H. L., & de Mattos, M. J. T. (2011). Environmental impacts of cultured meat production. Environmental Science & Technology, 45(14), 6117-6123.
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RIDDLES

-Maha Bhavadharani N
2nd year BMS

1. Which virus is a common cause of gastroenteritis ?

2. Name the virus which has characteristic symptom of muscle paralysis ?

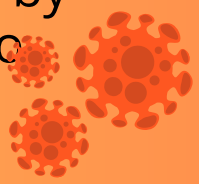
3. Which viral disease is caused by the bacterium Vibrio cholerae?

4. What type of virus was SARS-CoV-2, which spread rapidly worldwide?

5. What is the name of the virus that causes AIDS (Acquired Immune Deficiency Syndrome)?

6. What type of virus cause the flu ?

7. What is a common childhood illness characterized by swelling of the parotid glands, potentially leading to complications like orchitis or meningitis?



8. Which disease is transmitted by the Aedes mosquito ?

9. Which of the virus is a DNA virus?

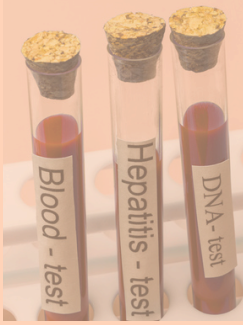
10. Which virus can lead to liver damage, cirrhosis, or liver cancer if left untreated?

ANSWERS

1.NORO VIRUS 2.POLIO 3.CHOLERA 4.CORONA 5.HIV
6.INFLUENZA 7.MUMPS 8.DENGUE 9.HERPES
10.HEPATITIS

CASE STUDY THROWBACKS

-Keerthika M
4th Year BMS



CHIEF COMPLAINT:

The patient eyes are yellow for two days.

HISTORY OF PRESENT ILLNESS:

Mrs.Salco is a 36 year old unemployed attorney who presents with yellow discoloration of her eyes which she noticed two days ago while washing her face. At first she thought the colour was due to the lighting in her bathroom, she thought her hands looked yellow; Mrs. Salco further admits to feeling & sick and tired for the past 2 -3 weeks. She has lost her appetite and feels weak a chill; In morning she awoke after a restless night with pain and a sensation of fullness in the right upper abdomen. She also vomited twice.She denies having joint pain or skin rash.

Mrs. Salco is a chronic alcoholic who has been hospitalized on several occasions for alcohol related problems, including a psychiatric admission . Since that time she had consumed approximately every day.

PHYSICAL EXAMINATION:

She is skinny and shows prominent cheek bones.
She appears much older than her stated age.
Vital signs: Blood pressure in right arm 104/60 mmHg, Heart Rate110/minute and regular, Respiratory Rate 18/minute, Temperature 38.90 C.

TREATMENT-PHARMALOGICAL THERAPY

Jaundice treatment targets the cause rather than the symptoms.

The following treatments are used :
Anemia induced jaundice may be treated by boosting the amount of iron in the blood by either taking iron supplements or eating more iron – rich foods .
In some rare cases of Jaundice Blood transfusion may be necessary.

Hepatitis - induced jaundice requires antiviral (Acyclovir) or steroid medications.

A THIRD PERSON HAS RECEIVED A TRANSPLANT OF A GENETICALLY ENGINEERED PIG KIDNEY- MEDICAL BREAKTHROUGH

-DURGA DEVI D
4th Year BMS

Introduction:

A 53-year-old woman, Towana Looney, became the third person to receive a genetically engineered pig kidney at NYU Langone Health. The organ, modified with 10 gene edits to prevent rejection, has been functioning normally. This breakthrough offers hope to thousands on transplant waiting lists. It marks a major step forward in xenotransplantation to address the organ shortage.

Methodology:

The methodology involved genetically engineering a pig kidney with 10 specific gene edits to enhance compatibility and reduce rejection risks. The transplant surgery was performed at NYU Langone Health on a patient with high antibody levels, making human donor matches difficult. Post-surgery, the patient was closely monitored to assess kidney function and overall health. The successful outcome demonstrated the viability of pig-to-human organ transplantation

Early trials and outcomes:

Richard Slayman and Lisa Pisano were among the first and second recipients of genetically engineered pig kidneys, but both faced complications and died within a few months, with no signs of organ rejection. Towana Looney, who had kidney failure and struggled to find a compatible human donor, became the latest recipient of a pig kidney transplant under the FDA's compassionate use program. These cases highlight the potential of pig organs as alternatives for patients with no other options,despite challenges like organ rejection and complications.

Two individuals who received heart transplants from genetically engineered pigs at the University of Maryland died within two months. The latest recipient, Looney, developed kidney failure after donating a kidney to her mother in 1999.
Due to sensitization from previous pregnancies and transfusions, she struggled to find a suitable kidney match and spent nearly eight years on dialysis before receiving a transplant.

Results and evidences:

The transplants showed successful kidney function without immediate rejection, proving the effectiveness of genetic modifications. The third attempt confirmed improved compatibility, supporting xenotransplantation as a potential solution to the organ
shortage. However, long-term monitoring is required to ensure safety and effectiveness.

Implications and applications:

Pig kidney transplants offer a potential solution to the organ shortage and new hope for patients. They could lead to wider clinical use, but further research is needed to confirm long-term safety.

Challenges and limitations:

Challenges of pig kidney transplants include potential immune rejection, ethical concerns, and uncertainties about long-term safety. Further research is needed to address these issues and ensure successful clinical application.

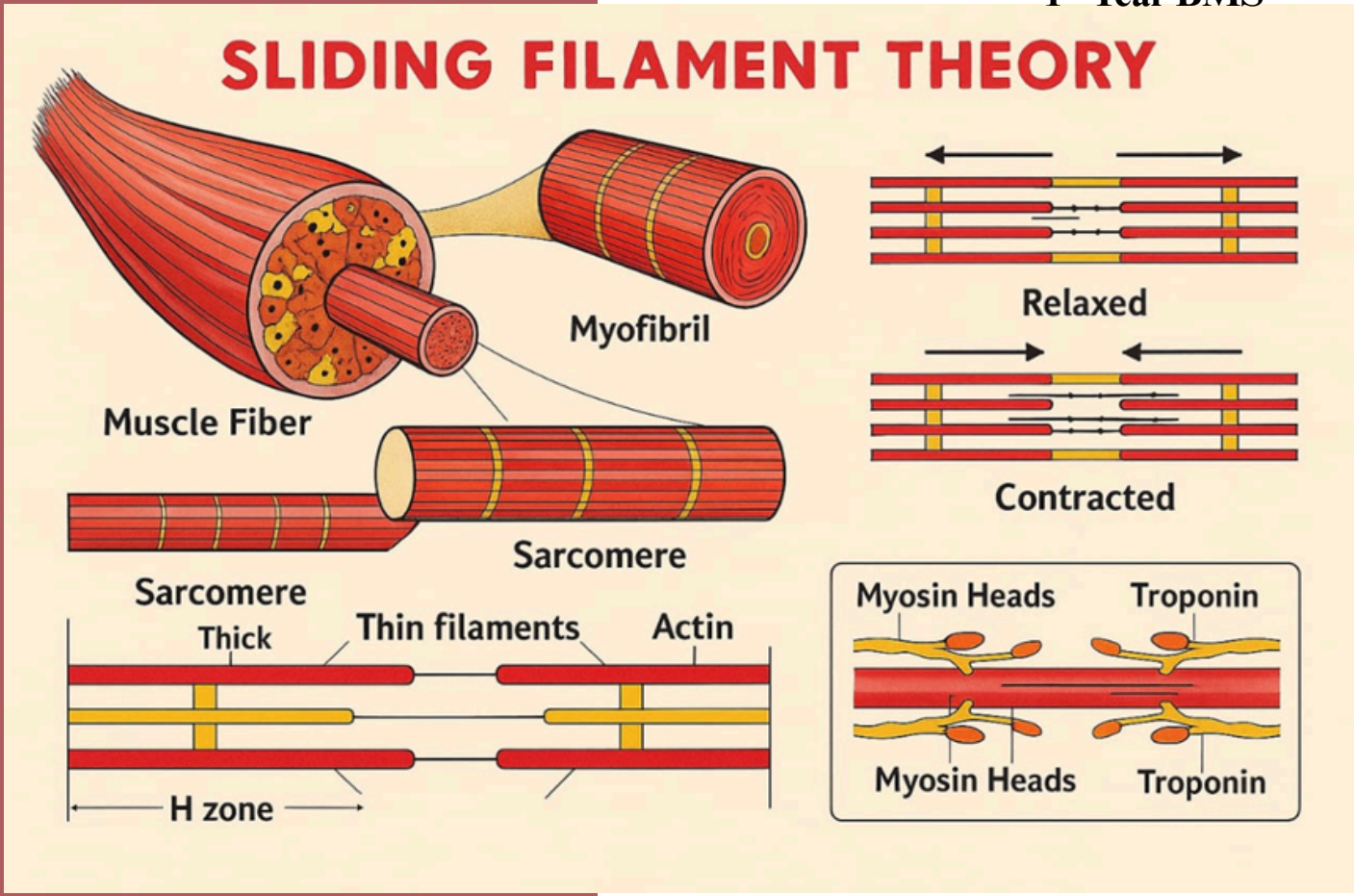
Conclusion:

Pig kidney transplants represent a promising solution to the organ shortage, but challenges like immune rejection and long-term safety must be addressed. Continued research is crucial for their successful clinical use.

SCIENTIFIC ILLUSTRATION

SLIDING FILAMENT THEORY

-Sarmi S
1st Year BMS



The sliding filament theory explains muscle contraction at the molecular level. It states that muscles contract when actin (thin) and myosin (thick) filaments slide past each other, shortening the sarcomere.

Key Steps:

- Muscle Stimulation: Calcium ions are released, exposing binding sites on actin.
- Cross-Bridge Formation: Myosin heads attach to actin.
- Power Stroke: Myosin heads pivot, pulling actin toward the sarcomere center.
- Sliding Filaments: Repeated cycles cause actin to slide past myosin, shortening the muscle.

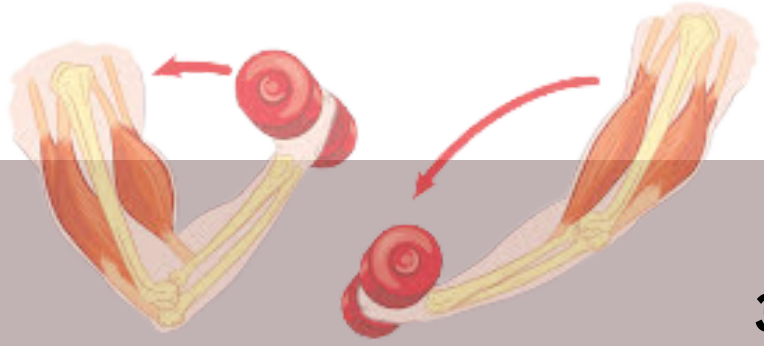
This process results in muscle contraction through the coordinated sliding of filaments.

Important Aspects:

1. ATP Hydrolysis: ATP is required for muscle contraction, as it fuels the myosin head's power stroke and detachment from actin.
2. Cross-Bridge Cycle: The repeated binding and release of myosin heads to actin filaments drives muscle contraction

Significance:

1. Muscle Contraction: The sliding filament theory explains the fundamental mechanism of muscle contraction.
2. Movement and Locomotion: Understanding muscle contraction is essential for understanding movement, locomotion, and muscle function.



ARTIFICIAL INTELLIGENCE IN HEALTHCARE TRANSFORMING SURGERY WITH THE DA VINCI SYSTEM

-Suvetha Devi V
4th Year BMS

Artificial intelligence (AI) is revolutionizing the field of medicine. They aim to impersonate human cognitive functions and in recent years, they play a major role in diagnosis, patient's medical imaging data analysis and interpretation, treatment, surgical intervention and personalised medicine. As AI technology rapidly evolves, the **Da Vinci surgical robot** stands as a key player in robot-assisted surgery, significantly improving efficiency, precision, and ultimately, patient outcome by leveraging advanced AI capabilities. In 2000, the da Vinci Surgical System became the first robotic surgical platform commercially available in the United States to be cleared by the FDA for use in general laparoscopic surgery. This robot helps surgeons to execute intricate medical interventions with unprecedented precision and minimum invasiveness because to the AI algorithms built into the device, which also enable real-time 3D imaging, motion scaling, and tremor reduction. It is a three component based system which has surgeon console, patient cart and vision cart which will help inperforming the surgical procedure. More than 775,000 procedures worldwide have been done via the da Vinci surgical robot. These are performed for a wide range of conditions in specialties including cardiac, urologic, gynecologic, pediatric and general surgery.

As a result, patients have seen shorter recovery periods, less complications, and better surgery results. Such AI-powered robotic devices are anticipated to improve surgical outcomes and results, significantly contributing both patient safety and operational efficiency. As technological advancement continues, the Da Vinci surgical system plays a pivotal role in shaping the future of minimally invasive surgery.

Artificial Intelligence in Early Breast Cancer Detection

-Yesu Arokiya Raja J
4th Year BMS

Breast cancer is the most prevalent cancer among women globally, with early detection being crucial for improving survival. However, challenges such as human error, variability in radiological interpretation, and limited access to skilled radiologists hinder effective screening. Recent advancements in artificial intelligence (AI), particularly deep learning, have shown significant potential in improving diagnostic accuracy and reducing radiologist workload.

The Breakthrough:

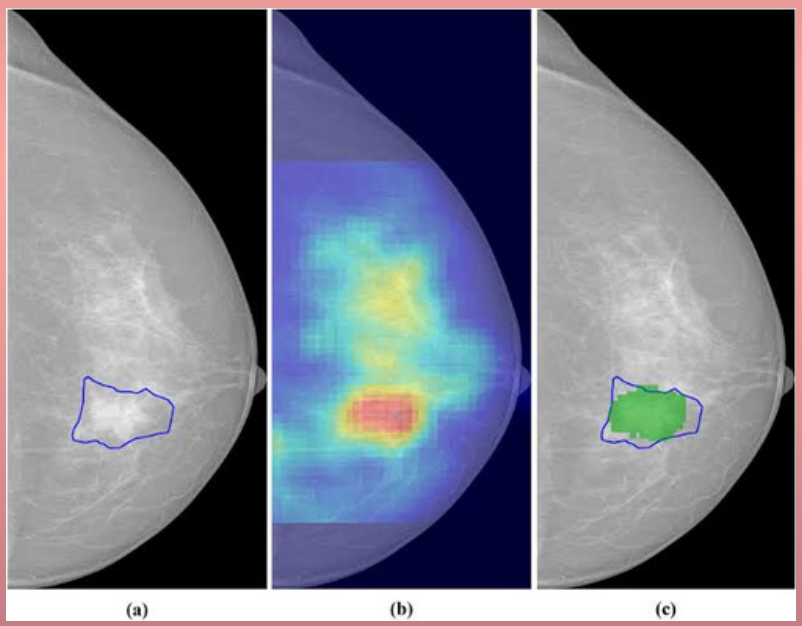
Deep learning-based convolutional neural networks (CNNs) trained on thousands of annotated mammograms. The key players behind this breakthrough were:

- Google Health (DeepMind)
- MIT & Massachusetts General Hospital
- Lunit (South Korea)
- Kheiron Medical Technologies (UK)

In a landmark study published in Nature (2020), Google Health's AI model demonstrated superior performance compared to human radiologists in detecting breast cancer from mammograms.

How Does It Work?

- The AI model is trained on large datasets of de-identified mammograms with known outcomes.
- Once trained, the system analyzes new mammograms to identify suspicious lesions, classify risk levels, and prioritize cases.
- AI does not replace radiologists but serves as a second reader, flagging potential cancers that may be missed and reducing false positives.



(a) Mammogram with a manually segmented lesion. (b) Saliency map for an AI system. (c) Relevant region (in green) obtained by thresholding the saliency map in (b).

SOURCE:
https://images.app.goo.gl/tmQA4

Clinical Impact and Significance:

The AI system reduced false positives by 5.7% in the US and 1.2% in the UK, and reduced false negatives (missed cancers) by 9.4% (US) and 2.7% (UK); Radiologists using AI tools reported shorter interpretation times and improved confidence in their decisions.Improves early detection, especially in dense breast tissue where cancers are harder to spot, and Enhances radiologist support, particularly useful in low-resource settings with few experts.

Ethical and Social Consideration:

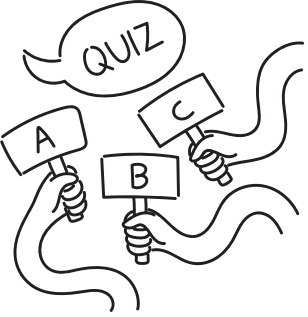
Use of patient imaging data must be governed by strict ethical and legal standards, and Models must be validated across diverse populations to prevent healthcare disparities. Decisions aided by AI must be transparent and interpretable.

Conclusion:

The integration of AI into breast cancer screening represents a transformational advancement in medical diagnostics. By improving accuracy, consistency, and efficiency, AI is not just augmenting clinical decision-making but redefining the future of early cancer detection and health care.

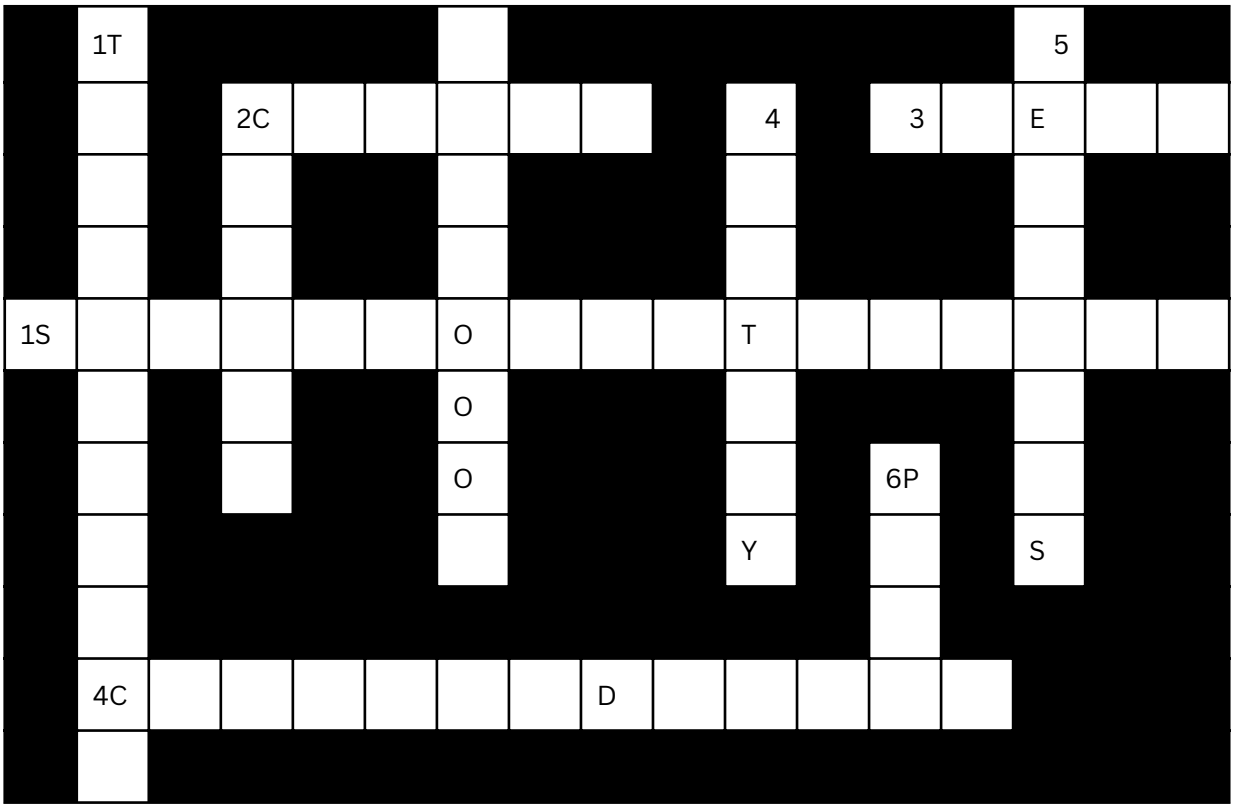
REFERENCE:

Citation:* Pertuz S, Ortega D, Suarez É, Cancino W, Africano G, Rinta-Kiikka I, Arponen O, Paris S, Lozano A. Saliency of breast lesions in breast cancer detection using artificial intelligence. Sci Rep. 2023 Nov 23;13(1):20545. doi: 10.1038/s41598-023-46921-3. PMID: 37996504; PMCID: PMC10667547.



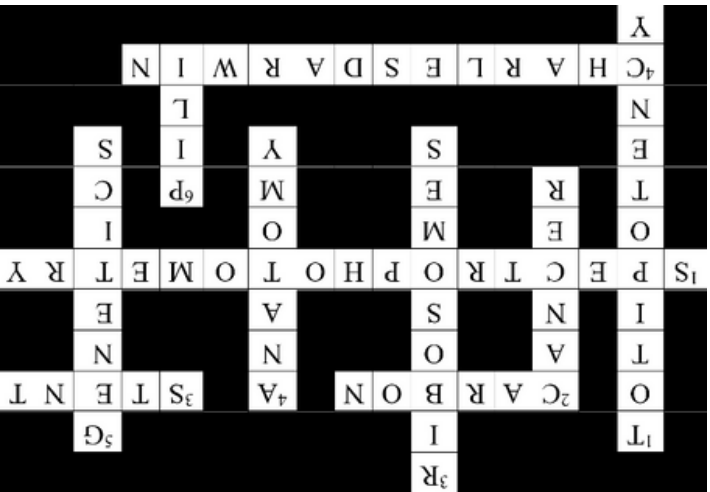
CLUE QUEST!

-Raghav V S
1st Year BMS



Across:
1.A technique that measures how much light a substance absorbs.
2. An important organic element in most biological compounds.
3.A small, expandable tube that's inserted into a blood vessel
4.Architect of the theory of Evolution.

Down:
1.The ability of a single cell to develop into any cell or tissue in an organism, or to become a complete organism.
2.Disease that occurs when cells in the body grow abnormally and spread uncontrollably.
3.Cell organelles that help in protein synthesis.
4.Study of structure of living organisms
5.Study of Genes.
6.Short, hair-like structures that protrude off the surface of many bacteria



DOWN: ACROSS:
1.Totipotency 1.Spectrophotometry
2. Cancer 2.Carbon
3. Ribosomes 3.Stent
4. Anatomy 4.Charles Darwin
5. Genetics
6. Pili

STEM Quiz

-Vedha valli T
4th year BMS

1. I copy things more than a lazy classmate.

2. I'm the reason you forget why you walked into a room.

3 . I remember every bad date (pathogen) and never forgive.

4.I'm the twin you didn't ask for but got at fertilization.

5. I'm the reason blood gets a B+ on its report card.

6. I copy things for a living and still never get accused of plagiarism.

7. I'm a drug that's 90% active, 10% mystery, and 100% metabolized by the liver.

8. I release feel-good chemicals, but also made you buy 12 things off Amazon at 2 AM.

9. I don't even have DNA, but I'll still ruin your day.

10.Who's the cell that sounds the alarm during infections?

ANSWERS:
1.PCR 2. Hippocampus 3. Memory-cell 4. Allele 5. Hematocrit
6. Polymerase 7. Prodrug 8.Dopamine 9. Prion 10. Mast cell

Traditional Wisdom Meets Modern Science
A Review of *Evolvulus alsinoides* in treating Epilepsy

-Janani R
4th Year BMS

ABSTRACT:

Epilepsy and neurodegenerative diseases represent significant global health challenges, characterized by debilitating symptoms and often inadequate long-term management with conventional pharmacotherapy. Traditional medicine systems, particularly Ayurveda and Siddha, have historically utilized a rich array of herbal remedies for neurological disorders. Among these, Evolvulus alsinoides (commonly known as Shankhapushpi or dwarf slender morning glory) stands out as a revered brain and nervine tonic. This review synthesizes current scientific understanding of Evolvulus alsinoides's anti-epileptic and neuroprotective properties, with a particular focus on a recent study utilizing a pentylenetetrazole (PTZ)-induced mouse model. Preclinical evidence suggests significant anticonvulsant effects, dose-dependent seizure reduction, and a favourable safety profile. While promising, clinical trials and standardized preparations are crucial to translate these findings into evidence-based therapies.

INTRODUCTION:

Epilepsy is a chronic neurological disorder affecting millions worldwide, characterized by recurrent, unprovoked seizures that significantly impair quality of life. While conventional pharmacotherapies exist for managing epilepsy, they often come with limitations, including adverse side effects, drug resistance in a substantial portion of patients, and the inability to provide a complete cure. This review highlights the critical need for exploring alternative and complementary therapeutic strategies.

Traditional medicine systems, like India's Ayurveda and Siddha, offer a vast repository of medicinal plant knowledge for neurological and psychological ailments. Evolvulus alsinoides, belonging to the Convolvulaceae family, is an esteemed herb in traditional Indian medicine known by Shankhapushpi, it has been traditionally revered as a "Medhya Rasayana" – a substance that enhances intellect, memory, and overall mental well-being. Its traditional applications specifically extend to conditions like Apasmara (epilepsy), anxiety, and nervous debility. This review aims to consolidate the scientific evidence supporting the traditional use of Evolvulus alsinoides specifically for epilepsy, emphasizing preclinical studies and outlining future research directions.

PHARMACOLOGICAL EVALUATION OF EVOLVULUS ALSINOIDES IN EPILEPSY MODELS

Preclinical research has validated the traditional anti-epileptic use of Evolvulus alsinoides using a pentylenetetrazole (PTZ)-induced seizure model in mice. PTZ, a GABA-A receptor antagonist, induces seizures mimicking absence and myoclonic types. Oral administration of methanolic extracts of E. alsinoides showed a dose-dependent anticonvulsant effect, including increased seizure latency and complete suppression of tonic-clonic seizures at higher doses. The extract also demonstrated low toxicity, with an LD_{50} above 5000 mg/kg. These results suggest that E. alsinoides holds promise as a safe, natural anticonvulsant agent.

CONCLUSION

Evolvulus alsinoides, a venerable herb in traditional Indian medicine, holds significant promise as a natural intervention for epilepsy. Preclinical studies, particularly those utilizing PTZ-induced seizure models, provide compelling evidence for its anticonvulsant properties, demonstrating its ability to delay seizure onset and reduce seizure severity in a dose-dependent manner. Its additional neuroprotective, anxiolytic, and cognitive-enhancing effects further underscore its potential for holistic support in epilepsy management. However, realizing its full therapeutic potential necessitates a concerted effort in conducting rigorous, standardized clinical trials to validate these findings in humans. Bridging the gap between traditional wisdom and modern scientific evidence will pave the way for Evolvulus alsinoides to potentially offer a valuable complementary or alternative therapeutic strategy in the challenging landscape of epilepsy management.

REFERENCE:

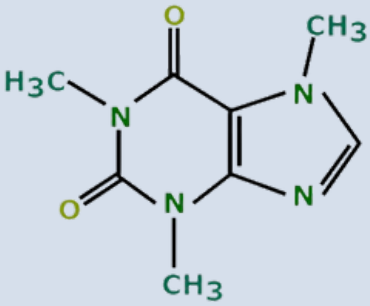
Venkatesan, P. S., Eswarya, M., & Madhavaselvi, M. (2024). Evaluation of anti-epileptic properties of Evolvulus alsinoides by pentylenetetrazole-induced mouse model. International Journal of Basic & Clinical Pharmacology, 13(5), 673–678.

IN VITRO ASSESSMENT OF RUTIN AND CAFFEINE FOR GLYCEMIC CONTROL: ROLE OF ALPHA AMYLASE INHIBITION

- Harishavarthini S H
4th Year BMS

The management of glycemic control remains a cornerstone in the treatment and prevention of diabetes mellitus, a chronic metabolic disorder characterized by elevated blood glucose levels. Among naturally occurring bioactive compounds, **Rutin**—a flavonoid with potent antioxidant and enzyme inhibitory properties and **Caffeine**—a central nervous system stimulant known to enhance metabolic activity and insulin sensitivity have individually demonstrated beneficial effects on glucose metabolism. Recent research has focused on the potential synergistic interaction between these two compounds, hypothesizing that their complementary mechanisms may result in enhanced glycemic control when combined. Rutin's inhibition of key carbohydrate-hydrolyzing enzymes, particularly α-amylase and α-glucosidase, slows the breakdown of complex carbohydrates into glucose, thereby reducing postprandial hyperglycemia. Caffeine, on the other hand, promotes glucose uptake and increases energy expenditure. To assess their combined potential, the α-amylase inhibition assay is a critical in vitro method used to evaluate how effectively a compound can inhibit α-amylase activity.

A) Caffeine



B) Rutin

https://naturalpoland.com/en/products/products-for-the-pharmaceutical-and-medical-industry/dietary-supplement-additives/rutin/.

In this assay, the enzyme is incubated with a starch substrate in the presence and absence of test compounds, and the amount of reducing sugar released usually measured calorimetrically using reagents like DNSA (3,5-dinitrosalicylic acid)—indicates the extent of enzymatic activity. A reduction in sugar release reflects enzyme inhibition. This assay serves as an essential early screening tool for identifying antidiabetic agents by quantifying their ability to interfere with starch digestion. When applied to rutin and caffeine, the assay provides foundational evidence of their potential to regulate glycemia through enzyme inhibition. To fully validate their therapeutic value, further pharmacological evaluations including in vivo glucose tolerance tests, insulin sensitivity assays, pharmacokinetics, and safety profiling are necessary. Ultimately, understanding the interplay between rutin and caffeine through tools like the α-amylase assay may support the development of novel nutraceuticals or adjunct therapies for effective diabetes management.

Reference:

Song, Xinjie, et al. “Caffeine: a multifunctional efficacious molecule with diverse health implications and emerging delivery systems.” International Journal of Molecular Sciences 25.22 (2024): 12003.

Oboh, Ganiyu, et al. “Comparative effect of quercetin and rutin on α-amylase, α-glucosidase, and some pro-oxidant-induced lipid peroxidation in rat pancreas.” Comparative Clinical Pathology 24.5 (2015): 1103-1110.

Bhosale, Hemlata, Pooja Sonsale, and Uzma Shaheen. “IN VITRO STUDIES ON ALPHA AMYLASE INHIBITORY ACTIVITY OF INDIAN MEDICINAL PLANTS.”

iSCIB1 + DNA Vaccine (Melanoma cancer)

UNDER UK NHS TRIALS....,

What is iSCIB1?

- A **DNA-based melanoma cancer vaccine** developed by Scancell Holdings, a UK biotech company

What does it target ?

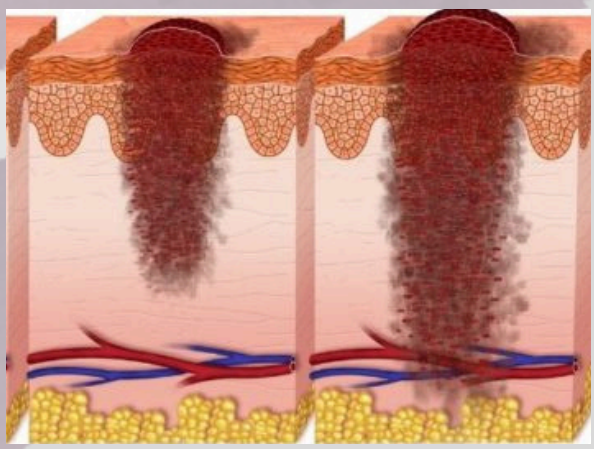
- Two tumor- associated antigens such as **TRP-2 and gp100** that are found as immune targets on the surface of melanoma cells

UK NHS Trials

- iSCIB1 **Phase I trials** conducted in **2013** and followed by **phase II trials** in **2024** and still under study

Why is it special ?

- It's non-invasive, **using needle-free** technology.
- Unlike chemotherapy or traditional vaccines, it's highly targeted, triggering a **precise immune attack** with **minimal systemic side effects.**
- Has shown potential to **delay or stop tumor progression** even in advanced melanoma.



How does it work?

- The DNA vaccine enters skin cells, prompting them to produce **melanoma-related proteins**. These proteins appear on the cell surface, **triggering a T cell immune response** that targets and **destroys melanoma cells** carrying the same markers.

Thirumugeshwaran.V
Vedha Valli .T - 4th Year BMS

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Focus Areas: Cancer Research | Infectious Disease | Bioinformatics
Cancer & Infectious Disease Research Internships

1. ACTREC – Tata Memorial Centre (Mumbai)

Focus: Cancer biology, nanotheranostics, molecular oncology

Opportunity: 6-month Dissertation/Trainee positions

Eligibility: M.Sc. Biomedical Science, Biotechnology, Life Sciences

Highlight: Hands-on lab experience in translational cancer research

2.National Institute for Research in Tuberculosis (NIRT – Chennai)

Focus: Tuberculosis, respiratory infections, public health

Opportunity: Dissertation / internships (6 months) or short-term observational visits (15 days)

Eligibility: Students from UGC/MCI/AICTE-recognized institutions

3. National Centre for Disease Control (NCDC – Delhi)

Focus: Epidemiology, virology, antimicrobial resistance, HIV/AIDS

Opportunity: Internships across 14 divisions (2–6 months)

Eligibility: M.Sc. Biomedical Science, Microbiology, Biotechnology, MPH

Highlight: Structured calendar with January/July intakes

4.Institute of Health Sciences – Presidency University (Kolkata)

Focus: Stress-associated miPEPs, therapeutic applications

Opportunity: Project Internships (SERB-DST funded)

Eligibility: M.Sc. Biomedical Science or related fields

Highlight: Molecular biology meets plant therapeutics

Bioinformatics & Industry-Linked Internships

1.Biotech Industrial Training Programme (BITP – Pan India)

Focus: Bioinformatics, genomics, proteomics, biotech industry exposure

Opportunity: 6-month hands-on training in industry settings

Eligibility: M.Sc. in Biotechnology/Bioinformatics; recent graduates preferred

Highlight: Skill-building for industry careers

2.DRDO – Defence Research Laboratory (Tezpur, Assam)

Focus: Life sciences, infectious disease diagnostics, biodefense

Opportunity: Student internships in government labs

Eligibility: M.Sc. Biomedical Science, Life Sciences

Highlight: Exposure to national-level research infrastructure

3.Oracity Life Sciences (Nagpur)

Focus: Quality control, pharmaceutical biotech

Opportunity: 1-year internship with post-internship placement potential

Eligibility: M.Sc. Life Sciences, Pharmaceutical Sciences

Highlight: Industry-aligned training with salary support

Additional Value Exams and courses

COVER ART:

VEDHA VALLI T

4th YEAR BMS

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The future of medicine lies in decoding biology with technology–where circuits meet cells, and code meets cure.