



SCINION

**VOL
3**

The more you know, the more you realize how much you don't know."

- Aristotle

BLOGS

SOCIAL MEDIA
POSTS

COMIC STRIPS

POSTERS

INFOGRAPHIC

VIDEOS

ARTWORK

**AUGUST 2023
ISSUE 1**

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Preface

Seasons, ecosystems, the fundamental laws of nature, and life are all as old as time itself. What has changed is our perception of these actualities from fearing to worshipping, to understanding, to altering, and eventually birthing the impossible, we have come a long way. Essentially, science has come a long way and still has an eternity of development ahead.

The world presented its mysteries and we uncovered them. We devoted ourselves to scientific brilliance as its disciples. So what are we? We believe ourselves to be the 'minions of science' and proudly so!

Science has unfailingly kept us seeking answers, ever since humans first set foot on earth and still has us perplexed about countless unanswered questions, offering a multiverse of potential progress. We unanimously feel an overwhelming sense of gratitude and awe for witnessing and learning about the universe's marvels and all hail be to science!





And as history would have it, the world has had several occasions of 'accidental' discoveries that have turned the world around!

This only goes to show that science doesn't always come from learned or prodigal masters of their subjects. Sometimes, amateur enthusiasts, too, have bewildered the world with their revolutionary innovations and scientific prowess!

Groundbreaking instances like these ignite hope in us and this very idea of 'science for all' was largely our inspiration during the conception of the magazine. Communicating and propagating science among not just the scientific community, but also among enthusiasts and, even, among science-deprived folks assumes the central endeavour of our team.

Sadly, however, learning science isn't always very compelling. Thus, we fixated our attention on making the contents of the magazine comparable to a sci-fi movie! We picked some of the best submissions from the course 'Scientific Communication'—a part of the curriculum of the School of Biosciences and Bioengineering, and classed them into sections like infographics, illustrations, and comics! Blended our designers' and editors' blood and sweat, under the meticulous supervision of Dr. Surabhi Sonam, into the symphonious third volume of SCINION—Minions of Science.





We continued the legacy left behind by Scinion's first edition, by reserving the centre stage for science and its conveyance and imparting the due peripheral attention to making it irresistible to our readers, with our best efforts directed towards perfecting the layouts, designs, ideas, and of course, the selection of gripping and interesting scientific, specifically biological, domains.

Besides the retention of invaluable elements from the previous edition, the birth of a new edition called for a spritz of novelty. Thus, we were proud to welcome new teams of proficient editors and designers, incorporate a unique theme, and introduce diverse subjects talked about in the magazine.

All said and done, the making of this edition wasn't exactly a cinch. The final magazine was shaped after multiple rounds of revising the textual contents by the team of editors and weeks of exhausting ideation, creative efforts, and countless design improvisations by the designers.

After invioluted months of hard work, we present to you the third volume of Scinion.

We earnestly hope that you enjoy every bit of the magazine!

Team Scinion



Vice Chancellor's Desk

"I have always believed in scientific research and development to make an impact on society and the nation. But all of this fails to reach the larger masses for impact if it is not communicated well in the language of common people. With this in mind, I started writing blogs and also participated in starting a YouTube Channel "Science Wience".

During the development of Technology Vision 2035 also I had strongly emphasized on using different forms of communication to reach out to both the policymakers and the public at large. I am glad to see that the students of DYPIU have also begun to communicate the nitty-gritty of science and technology using different forms of communication. I am deeply elated to see the varied subjects that Scinion has covered this time. It is wonderful to see that all of this work has been done by the young blood of DYPIU and I am proud to see how fast Scinion has moved ahead in only three years.

DYPIU is focused on the digital future from day one. Like all forms of communication, Science communication is also impacted by the use of technology. I am confident that Scinion would explore newer developments in technology to reach out to the masses and be instrumental in helping science break its shackles and reach out to all stakeholders."

Prof. Prabhat Ranjan



Dean's Desk

"I am privileged to get a peek into the world of Scinion before it gets out, what a delight it is! Creativity at its peak!

Putting science in simpler words is no game, putting science in toons and illustrations is another level of craft, and here our students DO it with elan. Captivating, unputtable down third issue of Scinion with many topics of interest.

Trust me it is not the science you will like to shirk away from, it is the science presented in a way you had like to know and prompt you to say—what next?

Storytelling a serious scientific concept has caught my lingering fancy, hope I can put it to practice to serve you things so simply. A big applause to the team. Thanks for teaching me!"

Prof. Shashi Singh



Mentor's Desk

CARBON

The architect of life's grand scheme,
In structures intricate, a cosmic dream,
From diamond's sparkle to charcoal's embrace,
In myriad forms, you find your place.

In living beings, you weave your tale,
Carbon, the backbone, you prevail,
In molecules complex, you dance and play,
From DNA's helix to night and day.

In forests green, you capture light,
Photosynthesis, day into night,
A cycle endless, a delicate thread,
Carbon's dance, where life is spread.

Graphene sheets, a marvel thin,
Carbon's wonders, science's win,
Conductor, insulator, secrets unfold,
In your lattice, mysteries are told.

In the air, as carbon dioxide,
You shape climates, where oceans ride,
A delicate balance, in ecosystems' sway,
Carbon's influence, night and day.

Oh, carbon, element of life's grand art,
From beginnings humble to every part,
In the tapestry woven, you find your place,
A molecule of wonder, a foundation's grace.

Dr. Surabhi Sonam





Acknowledgement

We would like to express our special thanks to our Vice Chancellor, Professor Prabhat Ranjan, and Director, Professor Shashi Singh, for their moral guidance and constant support that inspired us to build the 3rd volume of SCINION's E-magazine. With this joyful event we would also like to thank our faculty advisors of the School of Biosciences and Bioengineering for helping and guiding us tirelessly in making this E-Magazine a successful one. Last but not least, we would like to express our appreciation to every student who contributed their lovely submissions to make our E-magazine dream a reality. Thank you very much to everyone who is reading! We hope you will enjoy this journey of the E-magazine.

*Regards,
Editorial Team*



Editorial Statement

To Hit That Problem: Not An Uphill Battle

As a part of team Scinion, science communication has always been the cornerstone in all of our undertakings. Events curated by the team—Sciverse and Ink & Think—have been the embodiment of our vision of furthering science and technology. Every creation we've included in the magazines, every discussion we've sparked, and every idea pursued, was guided by the desire to solidify peeps' scientific inclination and the limitless fascination that science and technology inspire. All this to drive the immediate surroundings encapsulating us, to a world where science is never dismissed. To think of it all, it's quite beyond words. Yet, as we reflect upon the genesis of it all, our minds journey back to a distant memory—a moment when a question arose, a botheration shared by the founding members: “Do folks today care enough about keeping up with science masterworks and adopting the scientific way to their lives?”



And there, a stroke of inception touched those minds—something that was to soon birth Scinion. Prompted by a blend of curiosity and doubt, it was taken that the world could benefit from a few more people around us, being enthused by science and its magnetism.

To phrase it all rather simply, a problem worth solving, was identified. To provide a more precise label for this undertaking, a half-baked 'problem statement' was arrived at. Yet, in contemplating this, one might ask: What exactly constitutes a problem statement? A problem statement is a concise and clear description of an issue or challenge that needs to be addressed. It defines the gap between the current state of affairs and the desired or optimal state. A well-formulated problem statement serves as the foundation for

any research, project, or problem-solving effort. It outlines the scope, context, and significance of the problem, guiding subsequent actions and decisions. It might feel like a simple something is convoluted into another thing far more complicated, to call it a problem statement. So, is it really important to establish a problem statement? Well, a refined problem statement ushers in focus and clarity, helps align the efforts of individuals and teams with a common purpose, assists in evaluating different options and choosing the most appropriate solution, aids in allocating resources—time, budget, personnel, or materials—efficiently, is measurable, thus facilitating the assessment and accountability for achieving the desired outcomes, reduces the risk of pursuing irrelevant or misguided solutions, and...gosh, need one say more?



Whether one is in need of identifying a problem to derive a structured statement from, or desires to bring about a change in any sphere of activity, devising a robust problem statement reigns supreme over all other means of a fresh kickoff. Zeroing in on an issue can vary in difficulty depending on several factors, including the complexity of an issue one wishes to address, familiarity with the matters being considered, the availability of relevant information, and their experience with problem-solving. An initial approach to commence the journey toward identifying a fundamental problem could involve narrowing down one's considerations to a specific domain that aligns with their primary areas of interest.

Once a domain is singled out, one may research the current state of affairs in the chosen domain, i.e., identifying any existing challenges, inefficiencies, gaps, or pain points that need addressing. This is, perhaps, a surefire way to help one frame their problem statement within a real-world context. But, before treading any further, it must be ensured that the problem one chooses to address hasn't already been extensively studied and solved. Conducting a literature review to ensure the problem statement to be defined is still relevant and hasn't already been addressed will do just the job and possibly, add to one's perspective, too. Next, narrowing down one's focus to a specific aspect or subset of the larger problem can help.





After all, a well-defined problem statement should be specific and manageable. Moving forward, clearly articulating the negative consequences or implications of the problem is a must to aid in assessing the potential benefits that could result from solving it.

It appears that by adhering to the outlined steps, one could potentially arrive at a viable problem. Nevertheless, the journey doesn't conclude there; the next crucial step involves crafting their magnum opus—the problem statement. Now, one can comfortably bet their last penny on starting out by adhering to the "SMART criteria" when it comes to formulating a problem statement. Specific, Measurable, Achievable, Relevant, and Time-bound—abbreviated as SMART!

Following this helps ensure one's problem statement is clear and actionable. Another key effort to be essayed is identifying the key stakeholders who are affected by or have a vested interest in solving the problem. Understanding their perspectives can provide valuable insights into the nuances of the issue. Finally and indispensably, one must share their problem statement with colleagues, mentors, or experts in the field to gather feedback. Their insights can help to refine and improve the clarity and effectiveness of the statement. And, voila! One now has a fine and dandy problem statement up their sleeves! Here, it's simply fit to allow the formed problem statement to serve as a roadmap for starting off work, guiding one's research, analysis, and eventual solution development.



With everything in place, it must be remembered that a viable problem statement evolves as one's understanding of the problem deepens. So, leaving reservations aside, revision and refinement of one's statement as more information and insights are gathered will be vital. With this, it's hoped that a quick read has armed you with the power to stock potent problem statements in your arsenal.

Suzanne Mondal
Chief editor



MEET THE TEAM



(from left to right)

Suzanne: Chief editor | Dr. Surabhi Sonam: Mentor | Lisa: Chief administrator, editor

Editors: Manushree, Yeshesweeni, Riya

Designers: Riddhi, Sanjana, Moyuri, Hemadurga, Shweta

Editors: Keshwam, Sakshi | Pratiksha: Designer, social media manager | Dhruv: Social media manager

REMEMBER, YOU ARE UNIQUE

no, but biologically and quite literally

AT THE START OF MEIOSIS I: DIVISION IN BOTH NUMBER AND GENETIC CONTENT.

HEY WHATSUP, I HEARD
WE'RE GETTING SHUFFLED
AGAIN

YEAH X AND Y BOTH
SAID WE'RE COMPLETELY
GETTING SEPERATED. I
DON'T WANT TO GET
SEPERATED THOUGH.

TWO CHROMATIN FIBRES

THERE'S NO WAY X AND Y
CAN KNOW THAT. THEY'RE
JUST MAKING ASSUMPTIONS.
ITS OKAY GET YOURSELF
TOGETHER.

THE VARIATION THAT OCCURS IS
UNPREDICTABLE UNDER 3 MENDELIAN LAWS:
LAW OF DOMINANCE, LAW OF
SEGREGATION, LAW OF INDEPENDENT
ASSORTMENT.

THE GENETIC CONTENT OF A HUMAN CONSTITUTES $22+XY$ (MALES) OR $22+XX$ (FEMALES) CHROMOSOMES. EACH CHROMOSOME IS MADE FROM SUPERCOILED CHROMATIN FIBRE. DURING MEIOSIS I, THE REPLICATED AND SUPERCONDENSED HOMOLOGOUS CHROMOSOMES UNDERGO PROPHASE I, WHERE CHROMOSOMES UNDERGO RECOMBINATION WHERE GENETIC MATERIAL IS EXCHANGED BETWEEN HOMOLOGOUS, NON-SISTER CHROMATIDS DURING PACHYTENE ALONG WITH THEIR CONSEQUENT TERMINALIZATION AND DISJUNCTION IN ANAPHASE I, IN ORDER TO INCLUDE VARIATION IN THE GENETIC PROGENY.

HEY WOULD YOU LIKE TO
TRADE SOMETHING SO WE CAN
REMEMBER EACH OTHER?

OH SURE! LET ME JUST CALL
RECOMBINATION NODULE, I'M SURE
HE'D HELP.

THE RECOMBINATION NODULE CONTAINS
3 ENZYMES:

ENDONUCLEASE: I CUT THE NON-SISTER CHROMATIDS

RECOMBINASE: I EXCHANGE THE NON-SISTER CHROMATIDS

DNA LIGASE: I REJOIN THE TWO STRANDS OF NON-SISTER CHROMATIDS

THESE HELP IN THE PROCESS OF CROSSING OVER AT THE CHIASMATA.

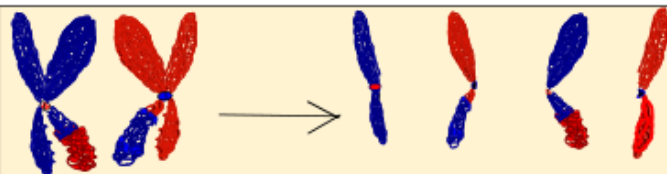
HOMOLOGOUS CHROMOSOMES

SYNAPTONEMAL
COMPLEXES

RECOMBINATION
NODULE ON
CHIASMATA

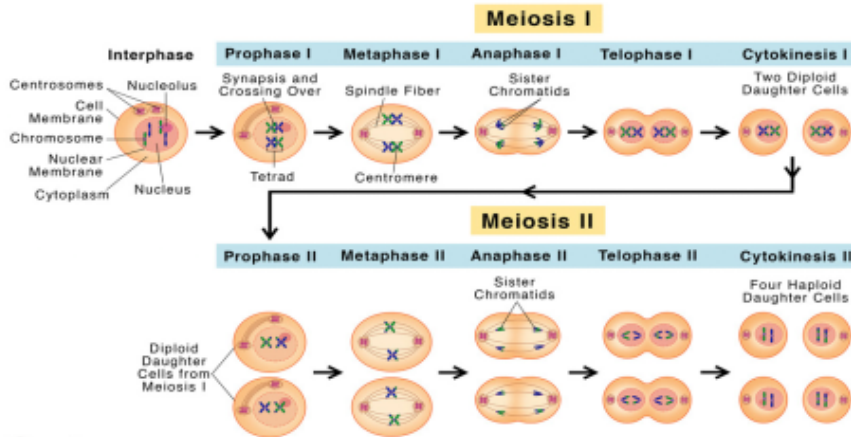
AFTER
ANAPHASE I

AFTER MEIOSIS II: ONLY GENETIC CONTENT IS HALVED



EACH OF THESE 4 CHROMOSOMES ENTERS ONE CELL EACH AT THE END OF MEIOSIS, ALONG WITH THE SAME PROCESS TAKING PLACE FOR THE REMAINING HOMOLOGOUS CHROMOSOMES. THE 23 CHROMOSOMES HENCE GET DIVIDED INTO 4 CELLS WITH RANDOM COMBINATIONS OF GENETIC INFORMATION IN EACH OF THE FOUR DAUGHTER CELLS.

Meiosis



	DNA CONTENT	NUMBER OF CHROMOSOMES
AFTER S PHASE (REPLICATION)	4C	2N
AFTER MEIOSIS I	2C	2N
AFTER MEIOSIS II	C	N

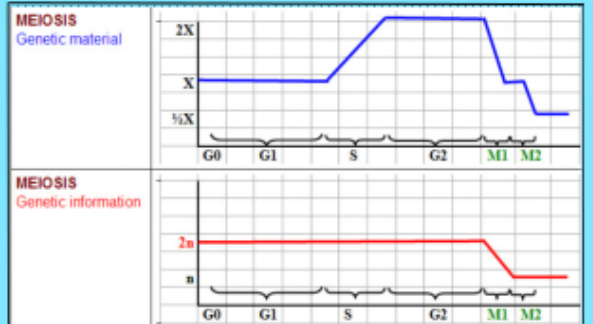
AFTER FERTILISATION, THE NORMAL DIPLOID NUMBER IS RE-ESTABLISHED BY THE FUSION OF THE EGG AND SPERM NUCLEUS.

THERE ARE 8,324,608 POSSIBLE COMBINATIONS OF 23 CHROMOSOME PAIRS.

NUMBER OF COMBINATIONS: $2^N = 2^{23} = 8,324,608$

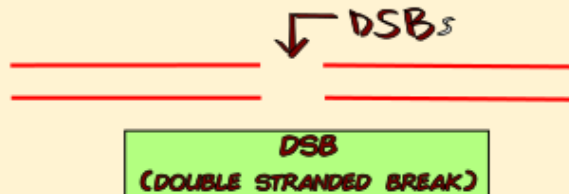
N = NUMBER OF CHROMOSOME PAIRS

AS A RESULT, TWO GAMETES VIRTUALLY NEVER HAVE EXACTLY THE SAME COMBINATION OF CHROMOSOMES. EACH CHROMOSOME CONTAINS DOZENS TO THOUSANDS OF DIFFERENT GENES. THE TOTAL POSSIBLE COMBINATION OF ALLELES FOR THOSE GENES IN HUMANS IS APPROXIMATELY 70,368,744,177,664.



THE PROGRESSION OF GENETIC MATERIAL ($C=2X$) AND GENETIC INFORMATION (PLOIDY LEVEL/ NO. OF CHROMOSOMES) IN THE CYCLE OF CELL DIVISION INCLUDING THE FOLLOWING PHASES: GAP1, S, GAP2, MEIOSIS I AND MEIOSIS II.

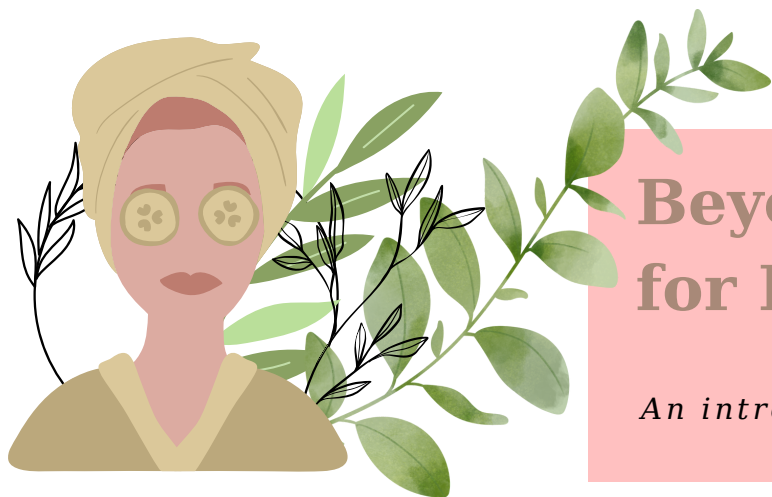
VARIATIONS ARE BROUGHT ABOUT BY SEVERAL FACTORS DURING THE PROCESS OF MEIOSIS. THESE INCLUDE THE RECOMBINATIONAL INTERACTIONS WHICH ARE THEMSELVES INFLUENCED BY SPATIAL ARRANGEMENTS OF HOMOLOGOUS CHROMOSOMES, BIPOLAR ALIGNMENT OF THE SAME AND THEIR SUBSEQUENT SEGREGATION DURING BOTH MEIOSIS I AND II.



I CONTROL THE POINT OF RECOMBINATION AND DECIDE THE POINT OF CROSSING OVER.

MEIOSIS AS WE DECIPHERED IS A SOPHISTICATED PROCESS WITH A MANIFOLD OF DEVICES TO MAKE SURE THAT WE DONOT RESEMBLE ANOTHER HUMAN COMPLETELY. UNLESS OFCOURSE YOU HAVE AN IDENTICAL TWIN.

THESE ENTHRALLING EVENTS, WHICH UNDERLIE THE FUNDAMENTAL PROCESS OF SEXUAL REPRODUCTION, PROVIDE FRUITFUL GROUNDS FOR FUTURE STUDY AND CONSEQUENT EXPLORATIONS.



Beyond Vanity: Skincare for Health and Happiness

An introduction to skincare, and why it's taking over the world.

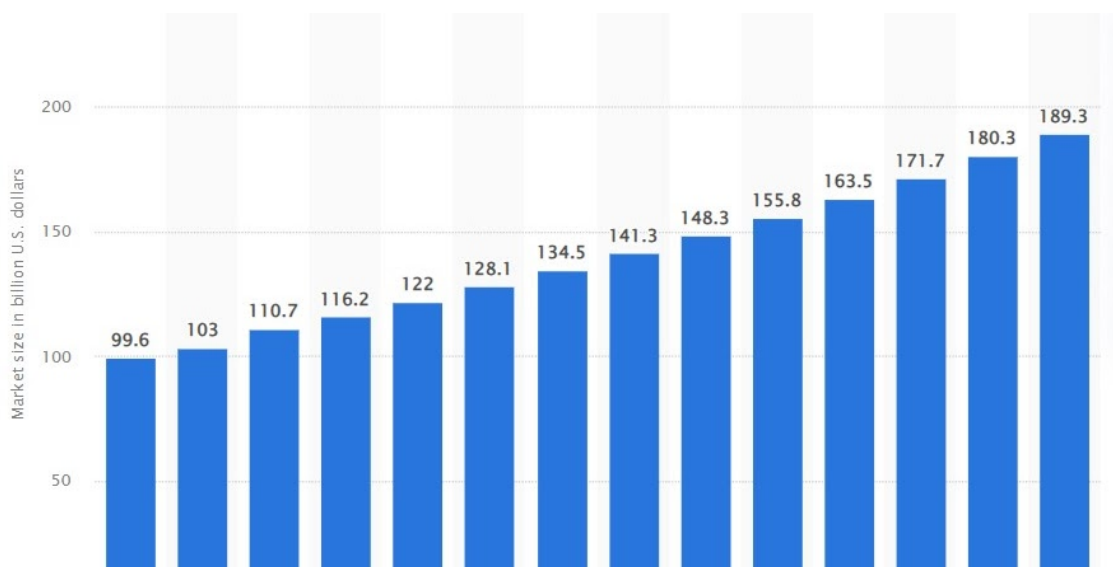
-By Lisa Fernandes

Have you ever found yourself wondering 'What's the point of this?' while reaching for your expensive serum? Or questioning why you're placing cucumbers on your eyes instead of having them as a refreshing midday snack.

The simplest answer is 'to take care of your skin'. But why has there been such an uproar about skincare lately? In fact, the global skincare market size has steadily increased with the global skincare market estimated to be 189.3 billion U.S. dollars by 2025 [1].

We often don't credit our skin enough. It aids in temperature regulation, immunity, and vitamin production. It acts as a barrier, protecting us from UV radiation, germs, and toxins. With the skin being the largest organ of the body, it is imperative one must take good care of it.

However, most websites tend to prioritize product placement rather than actual reasoning on why skincare requires so much attention. Rest assured, there are logical reasons why skincare should play an important part in our daily routine.



Size of the global skin care market from 2012 to 2025 (in billion U.S. dollars) [1]

Physical aspect:

A skincare routine isn't just a choice, it's a lifestyle. An effective routine allows us to take care of our body, inside and out. Skincare prevents acne, smoothes wrinkles, and brings a youthful glow. The skin on our faces is more delicate compared to the rest of our bodies. The harsh chemicals present in body soaps and creams cause dryness and allergies, which is why an entire line of products dedicated to facial skin is manufactured. A typical routine consists of cleanser, moisturizer, and SPF, twice daily. Applying skincare products adds to the skin's integrity by topically supplying a multitude of organic compounds, from vitamin A to zinc. It also soothes pre-existing skin conditions such as rosacea and eczema. The American Academy of Dermatology recommends the use of sunscreen for the prevention of skin cancer[2].

If you're someone who isn't bothered by appearances, you probably don't think twice about your acne, but did you know it is a gateway to underlying conditions? A butterfly rash is one of the first signs of lupus. Acanthosis nigricans or velvety plaques point toward diabetes.

Essentially, healthy skin indicates a healthy body. Of course, this is to be taken with a grain of salt. That zit on your cheek doesn't mean you've only got a week to live, but it doesn't hurt to be more aware of your skin's needs and wants.

Psychological aspect:

The very idea of a spa day relaxes us. It shouldn't be a surprise that tending to our skin positively affects our emotional well-being. Skincare allows us to dedicate a few moments in our busy schedules to ourselves. Following a skincare routine boosts our self-image and gives us energy. A study conducted by Zhang et al., 2020 reported that after twenty-eight days of using commercially available skincare products, the test groups showed significant improvement in feelings of empowerment, happiness, and self-esteem. These quality-of-life improvements continued even after



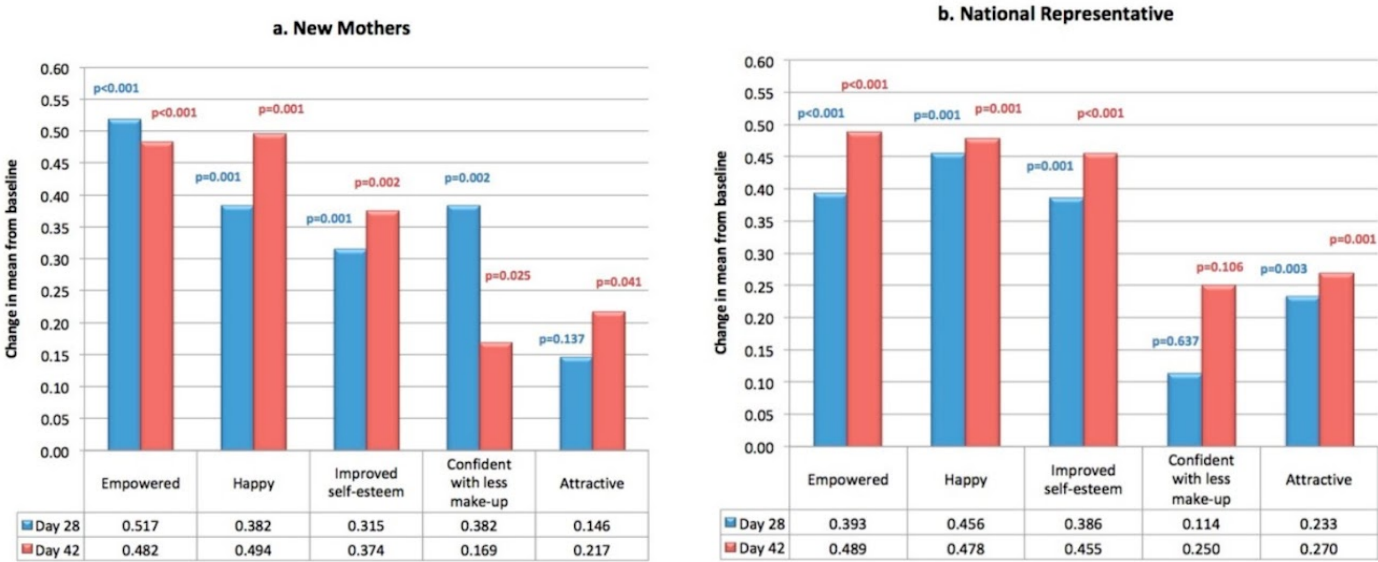
two weeks of product withdrawal [3].

Due to the pandemic, all of us experienced a rough transition in our daily lives. Dalgona coffee was discovered, toilet paper sales skyrocketed and routines were jilted. Researchers found a direct correlation between an inconsistent routine and bipolar disorders, suffering from depression, and mood swings [4].

Dedicating time to this personal activity provides a much-needed sense of stability.

Skincare can be confusing, and it's perfectly valid to be intimidated at first. Whether you want to get rid of stubborn acne, or hop onto the latest skincare trend an influencer is talking about, there's a routine for everyone.

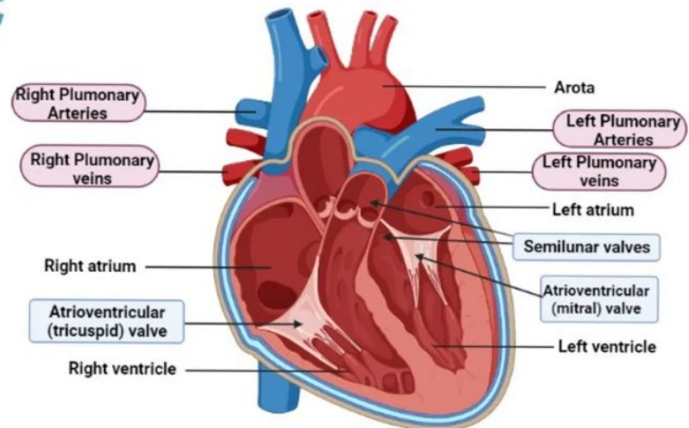
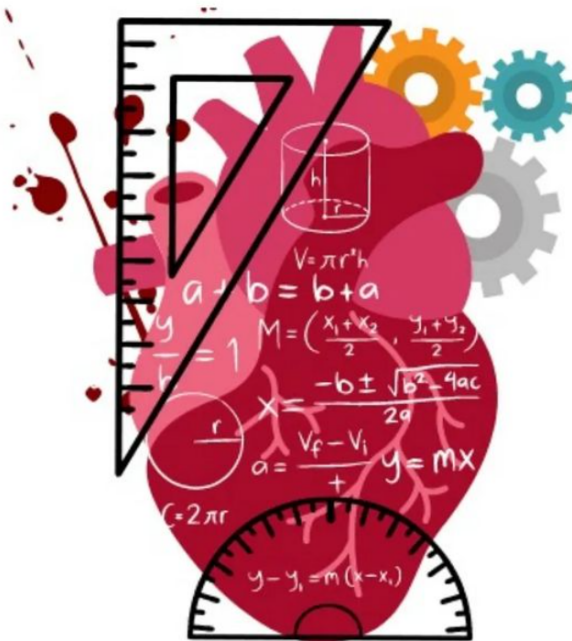
"The internet told me to." is a good enough excuse to start boosting your confidence. However, skincare isn't just slapping some products on your face and calling it a day. It's important to understand the factors affecting our skin, and what products we put on our face. If you're interested in learning about what routine you should follow, check out this [article](#)!



In a study of a three-part skin care regimen, participants were asked to fill out a Skin Care Module consisting of five questions that were included as a part of the FQoL™ instrument. Mean scores for each item were determined at three time points: before study commencement (i.e., baseline), after a 4-week usage period (day 28), and after 2 weeks of product deprivation (day 42). The 28- and 42-day mean changes from baseline are shown. The change in the response for each individual item was evaluated for statistical significance using a non-parametric Wilcoxon signed rank test. The 2-tailed p values are reported. (a) New Mothers group, and (b) The National Representative group [3].



sanju .uwu . Follow



Sanjana Chavan Artificial Heart

Your heart is like an engine in your body that keeps everything running. Basically, the heart is a muscular pump that maintains oxygen and blood circulation through your body and lungs. In a day, 2,000 gallons of blood is pumped by your heart. Like any engine, if the heart is not well taken care of it can break down and pump less efficiently, a condition called heartfailure.

As the number of patients suffering from heart diseases have increased over the years, so has the need for heart transplants. Unfortunately, not everyone who needs a heart transplant will receive a matching donor heart in time, the supply of donor hearts remains limited. Recognizing this need for an effective and immediately available alternative, research for total artificial hearts established.

First completely self-contained artificial heart is the AbioCor Implantable Replacement Heart by Abiomed. Doctors in Louisville, Kentucky treat first AbioCor patient-Robert Tools with the first totally implantable artificial heart in 2001.

For more info check out my blog at

<https://medium.com/@20210901059/artificial-heart-b651faf02ad3>

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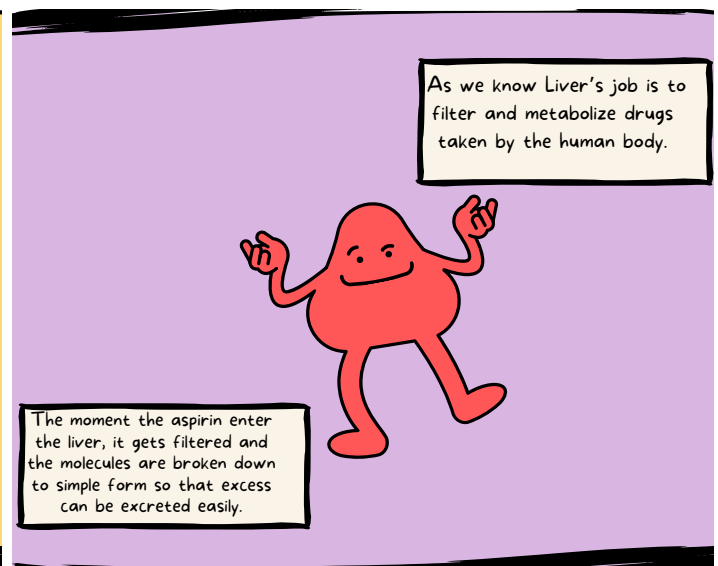
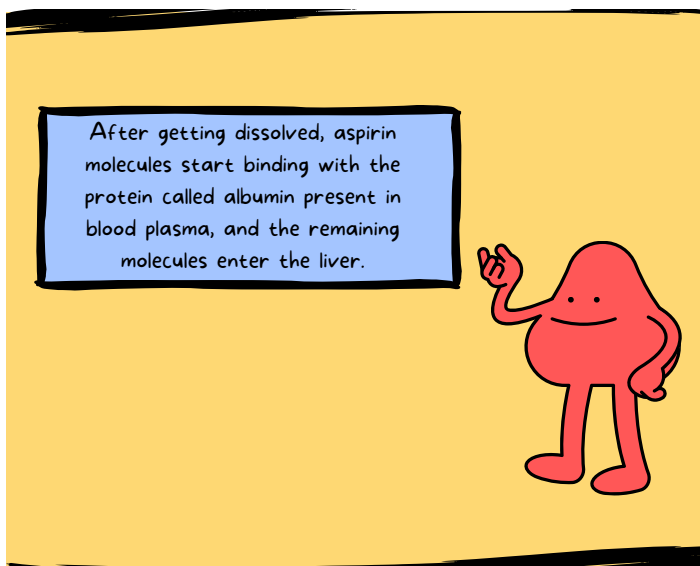
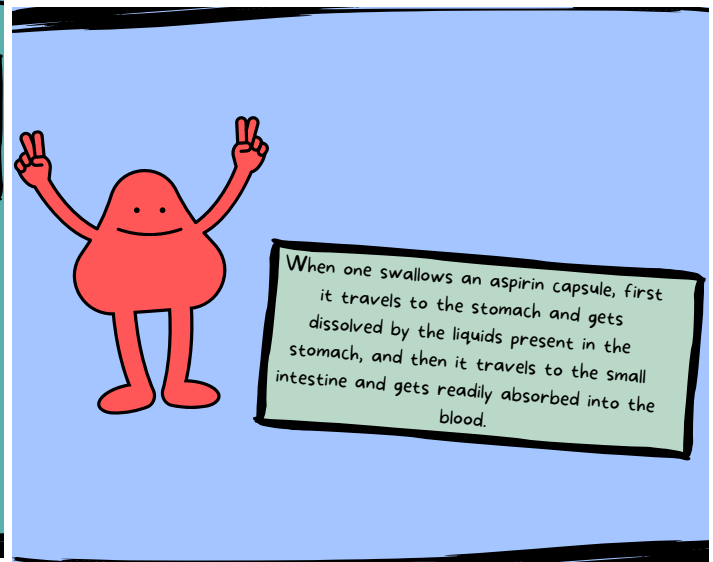
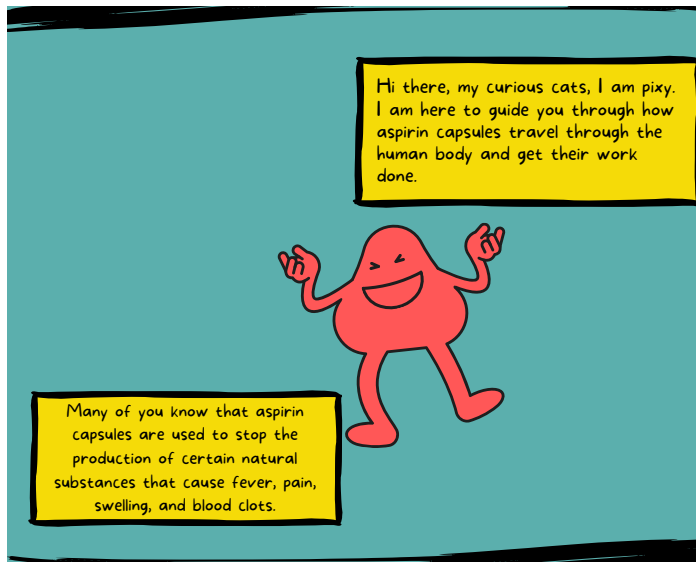
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May 1, 2022

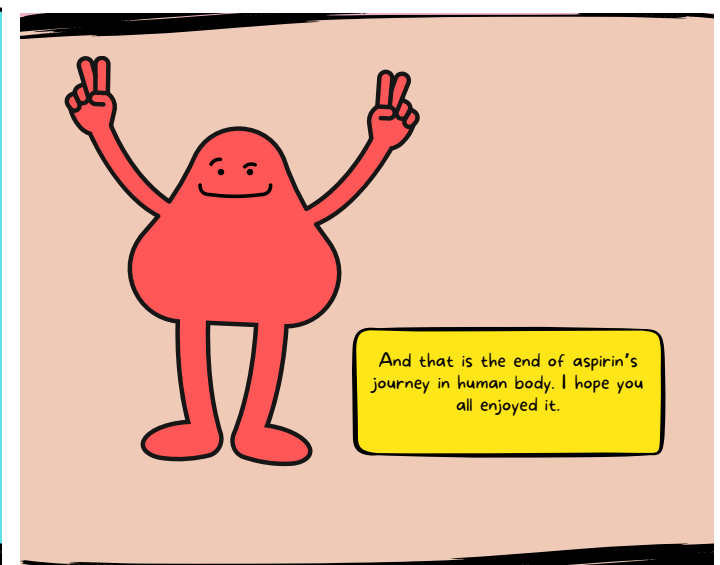
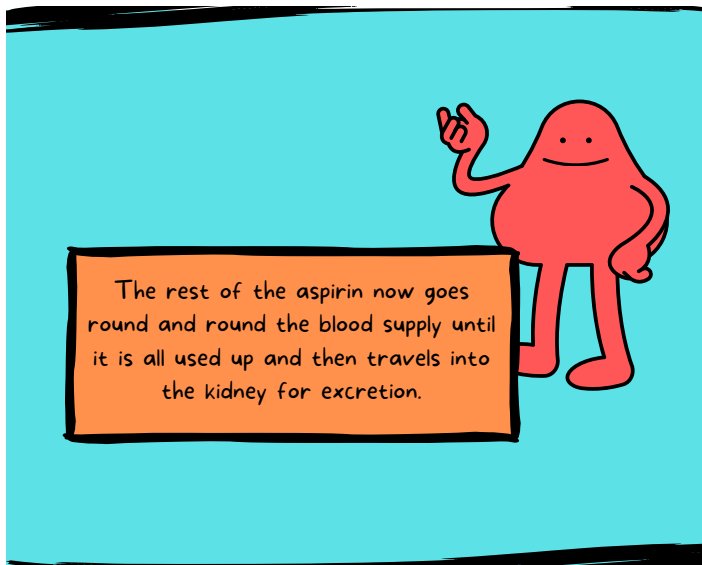
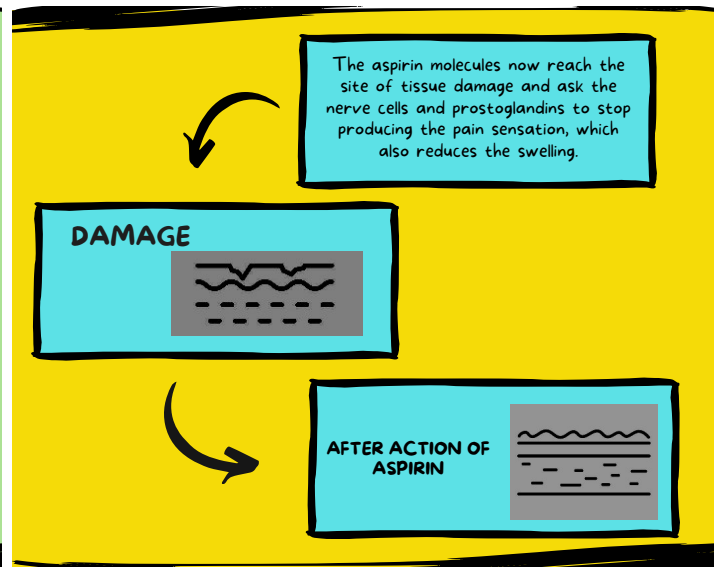
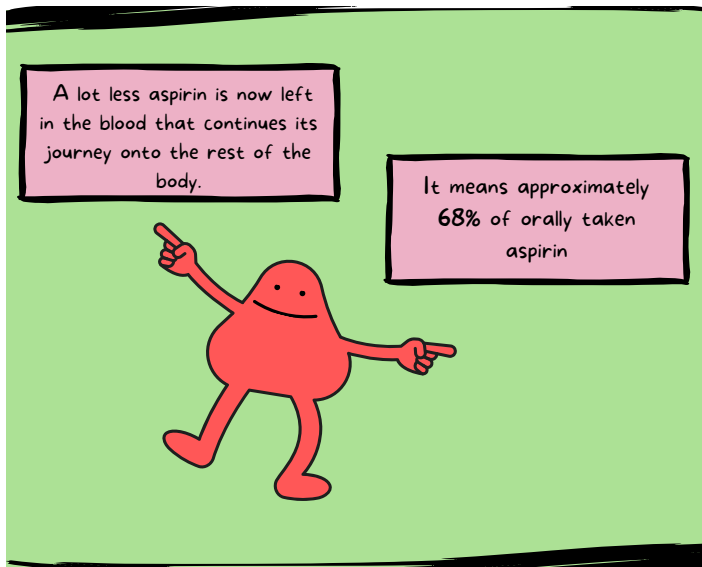
Journey of Aspirin

In human body

-By Khushi Sonawane



Edited by: Suzanne Mondal



THE END

SMART CLOTHING: A NEW LIFE

-By Anagha Pandey



Smart wear is the idea of weaving electronic devices into shirts, blankets, bandages, knitted hats, or trousers to perform specific patient care functions. Smart clothing and electronic textiles (e-textiles) as a whole are still in their infancy and have few practical applications used in hospitals and other care facilities. Smart clothing is seen as a way to revolutionize health care applications. Smartwear incorporates nanoscience, 3D manufacturing, electrical stimulation, and whole-body monitoring technologies.

Introduction

Smart material" the term was first defined in Japan in 1989. Textiles that can sense and react to environmental stimuli and adapt to them by integrating features into textile structures are called as smart textiles. Stimulations and reactions can be electrical, thermal, chemical, magnetic, or of different origins.

E-Textiles need to feel comfortable on the skin, but at the same time they need to be functional. These smart fabrics consist of traditional fabrics woven from conductive fibers and electronic elements such as biomedical sensors, microcontrollers, fiber optics and other devices. Nowadays these types are clothing are widely used in biomedical fields.



Types of Smart Clothes

- Smart Shirt for charging of ipod during walking or running.
- Motion Detecting pants
- Heart Monitoring Shirts and bra
- Networked Jackets
- Nano-fibres Knitted Shirts
- Biosensor Underwear
- iPod Watch
- Smart Running Shoes
- Neural Headset

Challenges

Concerns about the price and durability of smart clothing and technical issues such as the amount and complexity of unstructured data are some of the challenges faced.

- **Price and Durability**- The cost of embedding sensors in garments increases the cost of manufacturing garments and makes them expensive. Smart clothes need sensors to work, and washing can break them down. To increase the durability and reliability of smart wear, it should be incorporated into a waterproof device.
- **Sensor Accuracy**- There are many different types of sensors that can be embedded in smart ware, but their accuracy cannot be determined before they are used. Replacing the sensors after being embedded in the garment to test accuracy means tearing the garment and recreating them. This means that the failure or inaccuracy of a single component of smart garment can cause failure of the entire garment and increase manufacturing costs.
- **Battery Issues**- Most wearables have a charging function because the battery is completely unreliable. Again, if the battery is embedded, this causes durability issues. Battery life depends on various factors such as DOD effect, temperature effect and so on. When the battery life is shortened due to these factors, the functional life of smart clothes is also shortened, and smart clothes are changed to ordinary clothes.

Gadgets used

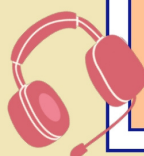
Various kinds of devices used in smart wear:

- 'Preg Sense' is a "life belt" use to monitor the health of both mother and the fetus.
 - Washable stocking to measure and monitor changes in leg volume with patients suffering from edema.
 - Smart shirt is developed for electrocardiography (ECG) cardiac monitoring with lung function and activity monitoring.
 - T-shirt to relieve chronic back pain, a shirt with a strain sensor to monitor the respiratory rate of patients with chronic lung disease, and a soft abdominal band all day to monitor pregnant women's uterine contractions and fetal heart rate.
- Pressure monitoring stockings for use by diabetics, or even shirts that shock patients with serious heart problems are some of the gadgets used in smart clothing.



Applications

- **Healthcare**- As other smart devices, smart wear helps to track a person's physical activity and monitor vital functions. Wearing smart clothes allows people to monitor their health actively and take care of themselves, eliminating the need for frequent clinic visits. Also during pregnancy, sensor monitoring is very useful.
- **Military and Defense**- Area around war zone is polluted with dangerous gases released by shootings and bomb explosions. sensors in smart clothing can determine the presence and amount of dangerous gases in the environment, allowing the military to effectively ease the damage caused by dangerous gas. Smart wear can also detect the degrees of minor injuries and blood loss from the body.
- **Sports wear**- Sports enthusiasts have long used sensors around their arms and legs to monitor fitness and other health parameters. Now a days smart wear is embedded in regular wear, eliminating the need for additional sensors on a person's body. Smart clothing also enhances the comfort of sportswear.



Smart T- Shirt: Monitors ECG, lung functions and other activities

Future Aspects

In the future, clothes will be more smarter as compared to the present. With built-in sensors and miniaturized electronics, this smart garment is a desirable alternative to traditional passive garments because it can communicate seamlessly with phones, computers, cars and other devices. Smart clothing also checks the health and seeks help in the event of an accident. Also, things will get better with e-textiles and better information can be obtained.





Pranjal Praful Waghmare

Student at DY Patil International University
1y

Health benefits of laughter

"Laughter is the best medicine." This statement has been around for a long time, but what does it really mean and how important is it to our health? Check out my blog by clicking on the link below to learn more:

<https://lnkd.in/ddRjZGHb>



Photo credit: Canva



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TREATMENT OF ACHILLES TENDONITIS

-By Lisa Fernandes and Ritwika Sen

An Introduction to Chronic Achilles Tendonitis

Chronic Achilles Tendonitis (AT) is a condition caused by overuse of the Achilles tendons, which connect the heel bone to the calf muscles. Early treatment is essential to reduce inflammation. It typically involves high doses of corticosteroids and extensive therapeutic activity, but these can have significant long-term side effects.

Abstract

This research proposes the use of an injectable hydrogel system called polyorganophosphazene (PPZ) to treat tendonitis. The hydrogel contains celecoxib (CXB) nanoparticles (PCNP) embedded in its structure, which provides long-lasting anti-inflammatory effects. PCNP is created by incorporating hydrophobic CXB into the hydrophobic core of PPZ at 4°C. The PCNP is then injected into the affected area, allowing for sustained release of the medication for the treatment of tendonitis.

Results

In Vivo defected Achilles tendon regeneration

Defective Achilles tendons were generated using collagenase to study in vivo tendon regeneration. Hematoxylin and eosin (H&E) (Fig. 1a-f) and Masson's trichrome (MT) (Fig. 1g-i) staining data showed complete damage to the tendon by collagenase in Fig 1b, h. Fig. 1i, j indicates that the group with three CXB doses per week showed more collagen regeneration compared to the group with one CXB dose/week. Compared to the CXB solutions, fig 1e-l indicates PCNP treated tendons exhibit increased collagen regeneration, with almost complete recovery of the tendon.

Release of CXBs from the hydrogel

Fig. 2 documents the release rate of CXB in order to analyse the mass loss of the PCNP hydrogel after injection. The PCNP hydrogel maintained a near-constant release rate over 28 days, even during the occurrence of high swelling. The release rate of PCNP with 1mg of CXB was higher compared to PCNP with 4mg of CXB since the higher CXB concentration offered an increase in hydrophobic interactions.

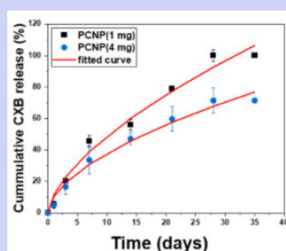


Figure 2 [1]

An Informative Poster

Lisa Fernandes
Ritwika Sen

Methods Applied

1. PNP Synthesis and Characterisation

Under a dry N₂ atmosphere, IleOEt-HCl (10.38 g, 53.06 mmol) was dissolved in dry THF. The reactor was stirred in a dry ice bath and 50 mL of dried TEA was added. Poly(dichlorophosphazene) (5.00 g, 43.14 mmol) was dissolved in dried THF and the reaction temperature was set to 50°C for 24h, and further reacted via the addition of ethanalamine (0.91 g, 15.1 mmol) and AMPEG (13.59 g, 18.12 mmol) for 48h. FTIR was conducted to characterize the presence of CXB and PNP in the PCNPs using the FTIR spectrometer.

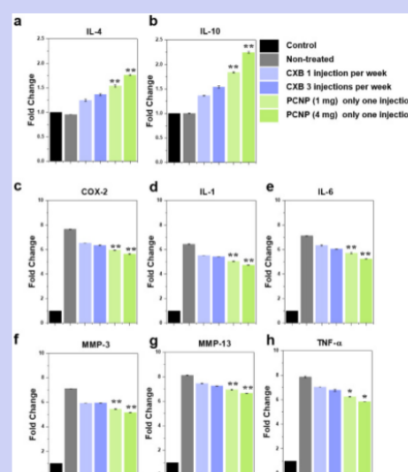


Figure 1 [1]

Anti-inflammatory effect of the PCNP hydrogel on the defected tendon

CXB has been found to increase the expression of anti-inflammatory cytokines (Fig. 3a,b) while reducing the expression of pro-inflammatory cytokines (Fig. 3c-h). These properties of CXB reduces inflammation and pain, allowing the regeneration of damaged Achilles tendons. The levels of anti-inflammatory and pro-inflammatory cytokines were measured using RT-PCR (Fig 3). The data suggests the PCNP hydrogel generates higher anti-inflammatory effects compared to treatment with CXB solution alone.

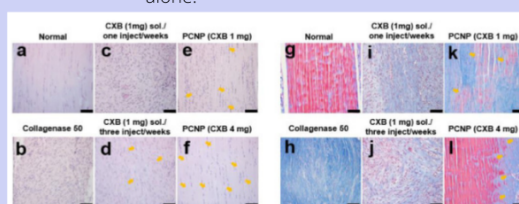


Figure 3 [1]

Affiliation

D. Y. Patil International University,
Pimpri-Chinchwad, India

2. Cell Viability Test

NIH3T3 fibroblast cell lines and PNP hydrogels were seeded and cultured for 24h in an incubator, supplemented with 10% fetal bovine serum and 1% penicillin/streptomycin. Dimethyl sulfoxide was added and the viability of the NIH3T3 cells was determined by measuring the absorbance of the test and control groups.

3. Rheology and DLS Test

The rheometer was used with 25.0 mm parallel plates and a 0.5 mm zero gap. The modulus was measured under oscillating stress at a frequency of 0.8 Hz and 10% strain and varied temperatures. A frequency sweep test was also performed under 10% shear strain at 37°C. For DLS Test, nano particles were dissolved in phosphate-buffered saline at 0.1 wt% concentration and the particle sizes of PNP, CXB, PCNP was measured over two cycles at 5, 25, 37, 45°C.

4. In Vivo Tendon Regeneration Test

Collagenase (50 µL) was injected into a 9 week-old rat, which was left for one week before the defective tendon was treated by injecting a CXB solution in DMSO at a concentration of 1 or 4 mg (100 µL). The PCNP (CXB 1 mg) and PCNP (CXB 4 mg) hydrogel were prepared by stirring 1 mg or 4 mg of CXB in 100 µL of a 10 wt% PNP hydrogel at 4 °C. The PCNP hydrogel was then injected into the defective tendon model.

Conclusion

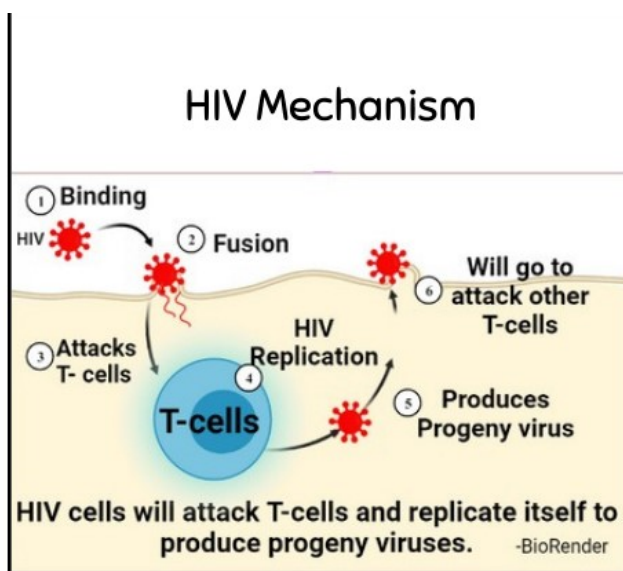
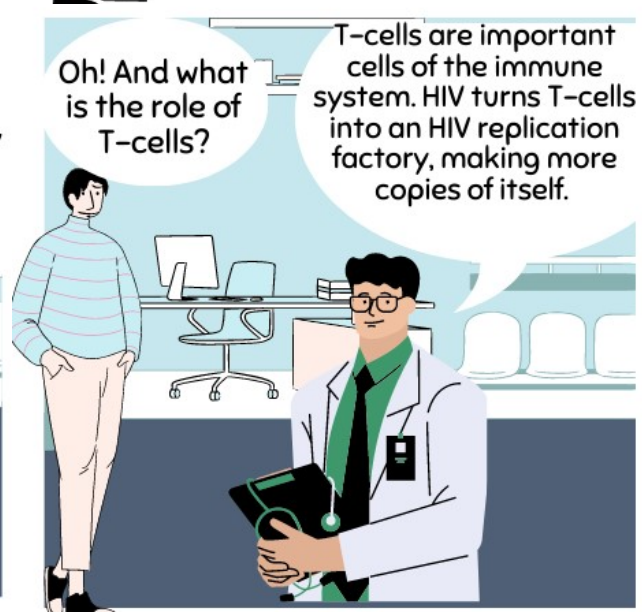
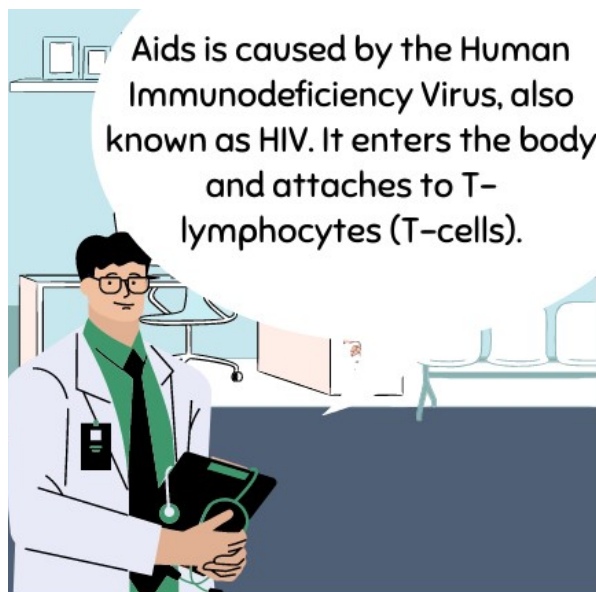
PNP is an amphiphilic hydrogel that, upon simple mixing with hydrophobic CXB molecules, forms a PCNP hydrogel. The PCNP hydrogel is a minimally invasive treatment. This hydrogel displays higher anti-inflammatory effects compared to conventional NSAIDs, such as Celecoxib. This is especially beneficial for the long term treatment of chronic Achilles tendonitis, as well as other diseases that induce inflammation.

Citations

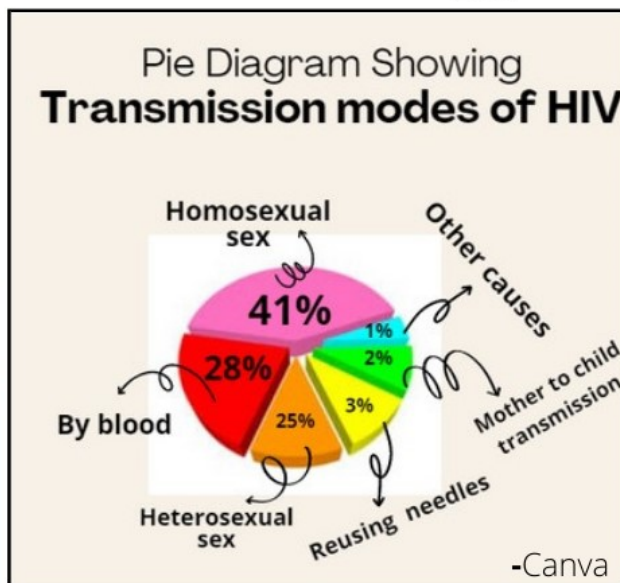
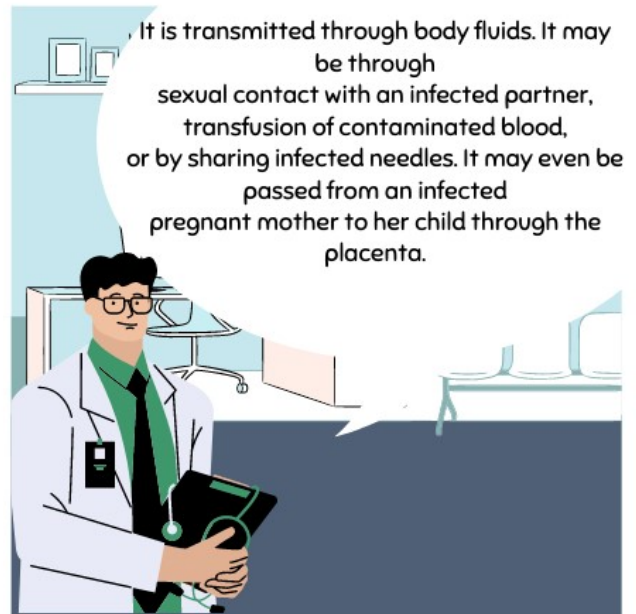
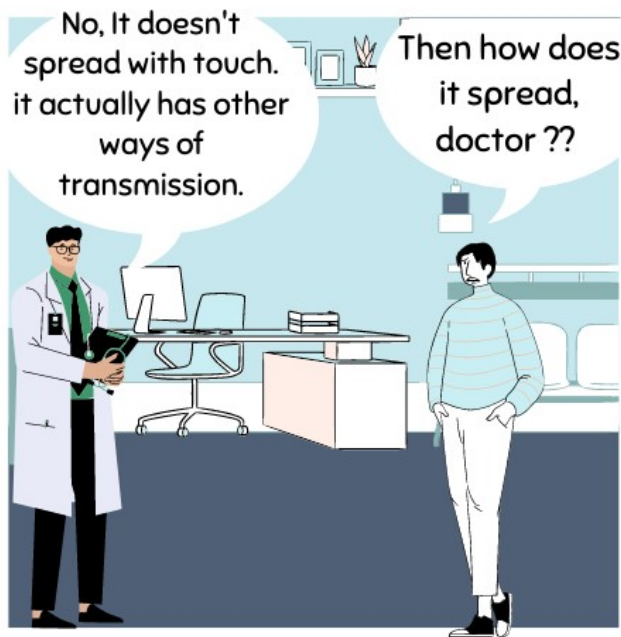
1. Jun Kim, Bo-Bae Seo, Ki Hyun Hong, Sung Eun Kim, Young-Min Kim, Soo-Chang Song, Long-Term Anti-Inflammatory effects of injectable celecoxib nanoparticle hydrogels for achilles tendon regeneration., Acta Biomaterialia, 2022, ISSN 1742-7061, <https://doi.org/10.1016/j.actbio.2022.03.033>

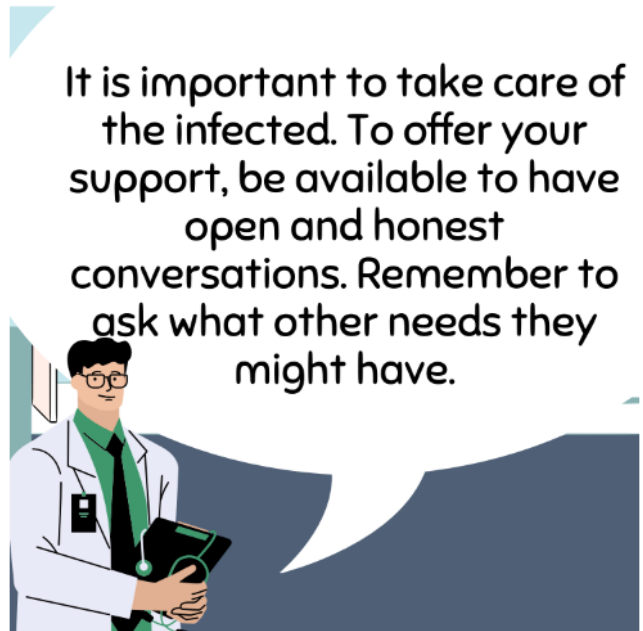
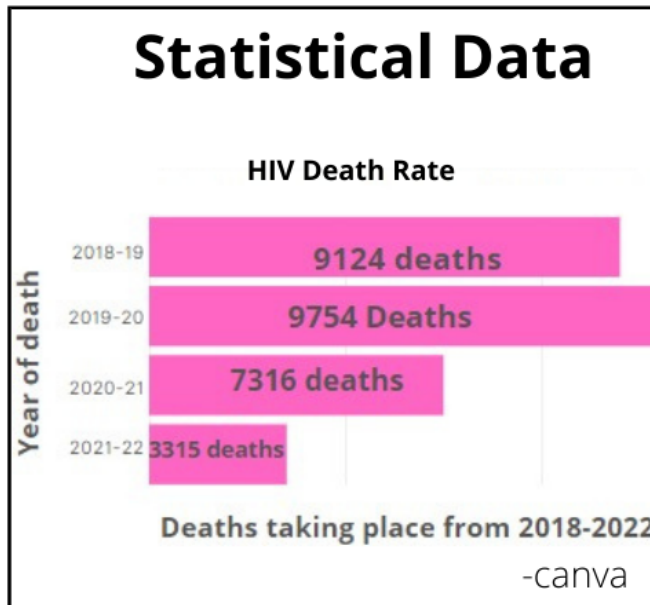
ACQUIRED IMMUNO DEFICIENCY SYNDROME

-By Raisa Floyd Lobo



Edited by: Lisa Fernandes







From Hoax to **Miracle**: Exploring Wonders of Music Therapy

And Scientific Evidence that harmonizes with it

-By Nishka Kaushal

Introduction

You'd probably think that music therapy is either a hoax or a once-in-a-lifetime miracle. This article intends to convince you that music therapy is neither a hoax nor a sudden God-gifted miracle. It is a prolonged and extensive process that can be explained by a simple topic we call, Science.

An anonymous "John Doe" was admitted into a nursing home in a semi-comatose state he was in, totally unresponsive to external stimuli. He was connected to feeding tubes, and ventilators and led a very low quality of life. A music therapist named Charles used to work in the same nursing home and went into John's room thrice every week and worked with John. When Charles sensed a slight movement in John's eyes, he immediately reported it to the authority concerned. Since people tend to overlook minute occurrences, the occurrence was said to not be a voluntary action

and was ruled aside. But Charles was adamant. A few weeks later, after another session with John, Charles was leaving the room and said "Have a good day and I'll see you next week". Just as Charles was about to leave, he turned around to look at John Doe, and to his surprise, John had turned to Charles and showed him a thumbs up. After a few more weeks of multiple physical and speech therapists working with John, he was able to eat, drink and speak and significantly improve his quality of life.

The **Historic** Front



Credits: Pexels - Gabriela Custódio da Silva

A widely used yet questionable treatment method, music therapy emerged as early as Aristotle and Plato. Its earliest known reference appeared in 1789 in an unsigned article titled "Music Physically Considered". But to appreciate the idea more deeply, we must dive into a much more historic swim.

Music evolved from much older times when it was given paramount importance. In civilizations as old as the Mayans or the Native Americans, music was the portal used to communicate and connect one with gods, nature, and their environment. It was an age-old belief to come together as a tribe to chant and heal tribal members.

The Emotional Front

Music as we all know is a very sentimental topic humans have made use of as an escape both from and into our emotions. And you don't need to experience music therapy to understand the benefit of music therapy in the emotional aspect, even in the most basic sense, it incites happiness, anger, sorrow, fear, euphoria, satisfaction, or jealousy (such as in the Olivia Rodrigo song), even feelings we can't explain.

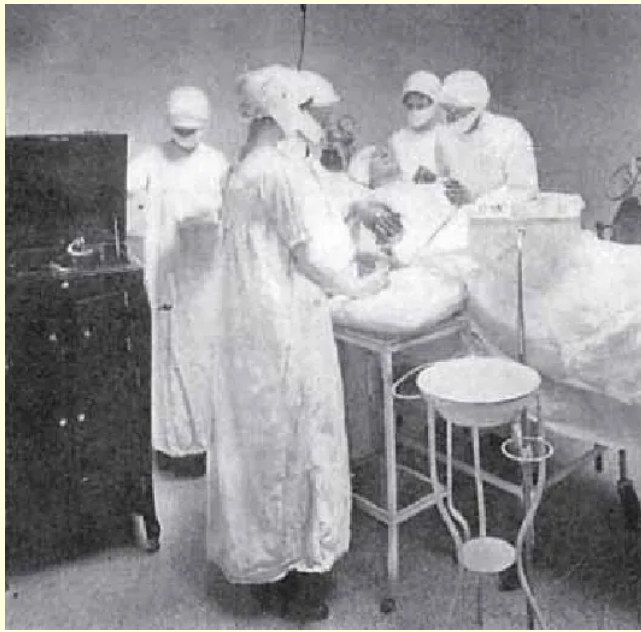
Drawing your thoughts a bit more on the works behind the scenes, we know 2 hormones revolving around

the topic are endorphins and dopamine.

- Dopamine: Popularly called the Reward Hormone, this chemical is known to be released while listening to music. It is observed to be released when we feel good and pushes us to seek out activities helping us attain the same feeling.
- Endorphins: The hormone also called Runner's High is one that gives us a sense of euphoria. It is known to be a great natural pain reliever and aids greatly in pain-blocking by stopping pain receptors by transmitting the message of pain throughout the body.



The Medical Front



Credits: researchgate.net: Use of Phonograph during an operation under local anaesthesia in Kane Hospital

In the 20th century, a report published by Evan O'Neil in regard to a surgery in 1914 where the use of a phonograph in an operation room was documented, gained widespread attention. The study showed that patients' anxieties were notably reduced before surgery when an anaesthetic introduction was performed along with the music.

More documentation took place even after this article and during the Second World War, music therapy had found its voice.

Studies found that listening to and even playing music increased the number of Immunoglobulin A and Natural Killer Cells produced in one's body. Immunoglobulin A (Ig A) are antibodies that make up about 10% of the total number of antibodies in a healthy body.

One of its kind, Ig A is a dimer, meaning it is made up of 2 units of antibodies that make up its whole structure. Natural Killer Cells, on the other hand, are an exceptional type of lymphocyte. Exceptional because these are granular lymphocytes while lymphocytes are categorically known to be under agranular WBCs, they confer the ability to target and kill atypical cells. These two complexes are critical to conforming innate immunity and maintaining immune homeostasis within our bodies.

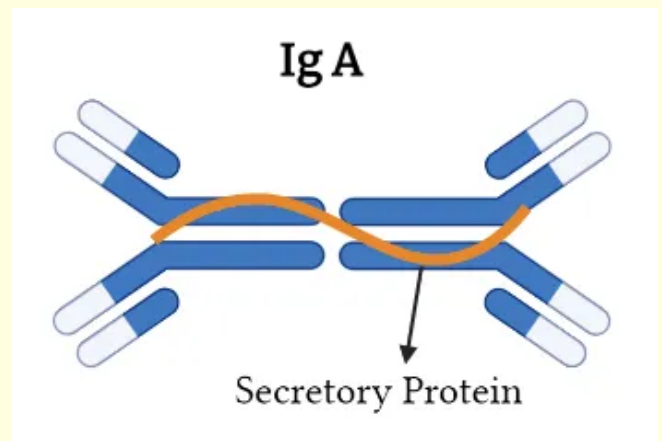


Fig: Immunoglobulin A

Calming music has also been shown to drastically reduce blood pressure, pulsating heart rate, and the level of cortisol in our bodies. Now cortisol is an interesting hormone because in higher quantities is known to cause mood swings, anxiety, and quick exhaustion also better known as "burnout", much like my generation faces on a daily basis.

While in lower quantities it has proven to alleviate stress and anxiety, so much so that it does this better than anti-anxiety meds.

Not only this, but music physiotherapy is also a category that has branched out of the overall idea, finding its use in motor and gait training, movement disabilities, strength, endurance, and much more.

In a study at the University of Edinburgh, led by Dr. Katie Overy, 30 right-handed volunteers were divided into two groups and given the task of learning a new movement using the non-dominant, left hand. One group learned the task to musical cues while the other group practiced the task without music.

The study showed that participants who practiced a primary movement task to music showed increased structural connectivity between the regions of the brain that process sound and control movement.

"The study suggests that music makes a key difference. We have long known that music encourages people to move. This study provides the first experimental evidence that adding musical cues to learning new motor tasks can lead to changes in white matter structure in the brain."

- Dr. Katie Overy

Composing It All Together

Music Therapy has proven to be of extensive use in a multitude of fields including those of Mental Health, Physiotherapy, Palliative care, Hospitals, Neuro Care and Programs. It is truly a miraculous form of therapy that has the potential to help our body without the use of traditional medicine. It has paved the way for much more scientists to research and unlock many more benefits, uses, and secrets of Music Therapy.





hemadurga

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hemadurga A Unique Solution To The Plastic Pollution, Ooho-Edible Water Bubble!

Most people have realized that the health of the ocean is also our health. Many attempts have been made to address the ever-increasing problem, as we continue to dump almost 8 million tons of plastic into the ocean every year.

Have you ever wondered about an alternative for plastic water bottles? We're entering a post-plastic world where the edible water bubble-Ooho (a droplet-like water container made of sodium alginate gel) provides a unique solution to plastic pollution.

To know more, check out my blog. Link in bio.

Image source: Pinterest

[#science](#) [#plasticpollution](#) [#blogger](#) [#pollutionfree](#) [#sustainability](#) [#scienceblog](#) [#ooho](#) [#saveenvironment](#)

View 36 comment

May 1, 2022

Rethinking education with Dr. Pavel Kabat

Dr. Pavel Kabat is the Secretary-General of the Human Frontier Science Program Organization (HFSPO) and co-recipient of the Nobel Peace Prize 2007. As a hydrologist and mathematician, he has worked in the field of earth system sciences since the early 1980s.

Designed by: Moyuri Yein
Transcribed by: Lisa Fernandes, Keshwam Pandey

66

"99% of the experiments in biology, they are not successful. 1% is. You never hear about this 99%."

"I think we need to erase from our vocabulary, [the] terminology of the basic and applied sciences, I think it doesn't make any sense at all."

Scan the QR code to watch the conversation unfold and read the full interview!



The Art Of Medical DIY

-By Sanjana Chavan

This video aids in learning about interesting medical conditions, terms, cases, and diagnoses featured in the show 'The Good Doctor'. In the video, the creator talks about the jugular vein, venous distension, paradoxical chest movement, traumatic pneumothorax, ECG - Echocardiogram, DIY makeshift chest drain, and pericardial effusion.

The video was created for enhancing the creator's learning experience while enrolled in one of her academic courses, 'Scientific Communication'. She trusts you will find it, both, informative and enjoyable!

Link: [The Art of Medical DIY](#)

Edited by: Suzanne Mondal

Designed by: Moyuri Yein



Coronary Artery Disease

-By R.K. Hemadurga

The inspiration for making the video stemmed from the fascination arising from the thought of something as small as fat or cholesterol can result in a heart attack when unregulated, take the form of a widespread epidemic, and take away lives of millions. Conclusively, too much of anything is not good for health.

The video explains the process the complications occurring in the coronary artery. A bypass surgery, where an artery from another part of the body is used to connect the heart to other parts, is fascinating and has been spoken on, in the video.

Link: [Coronary Artery Disease Animation](#)





STARRY NIGHT

-by Nishka Kaushal

—

This artwork was the "Starry Night", as seen through the eyes of a student keenly interested in the connections between us and the universe surrounding us.

—

As a Bioengineering student who has loved painting since I could hold a brush, this is my interpretation of one of the most renowned artworks to exist, using components of our bodies. For that added oomph, I utilized fluorescently imaged photographs, in which samples are labelled/stained with a fluorescent material such as a dye/antibody/protein, allowing images to have contrast. It is a non-invasive method for imaging and visualising various interior elements of our body, such as biological activities or structures. The hippocampus, tiny intestine portions, and the artwork's hidden gem, astrocytes, were the key components used here.

The hippocampus, as funny as the word sounds, is a complex part of the brain that has major roles in memory retrieval and long-term memory. Various parts of the artwork are made using the hippocampus, utilizing its undulated meanders and curves to best mimic components of the actual painting. Coming to one of the components that hold a direct relation with the section of the painting that they depict, is astrocytes. These glial cells of the brain get their name from the fact that they are quite literally star-shaped. Seemingly a perfect use, I had to include these as the bright stars within the sky.



H

ead Hijack

-By *Natasha Bisen*

How much do you know about MIGRAINE??

Migraine is a disorder inherited in families diagnosed via way of means of incidence of moderate-to-extreme headache, most usually unilateral and normally related to feeling of sickness, inclination to vomit and increased light/sound sensitivity.

Migraine is a common cause of incapacity and lack of work. Migraine assaults are a complicated brain events that unfolds over hours to days, in a recurrent matter.



Classification of migraine according to the Headache Classification Committee of the International Headache Society:

1 Migraine with aura

- Start gradually over five minutes and continue up to an hour.
- Dizziness and temporary blindness are common.
- Headaches can be severe to mild.



2 Chronic Migraine

- Occurs on 15 or more days in a month for more than 3 months.
- Headaches, nausea and vomiting often occur.
- A feeling of spinning and numbness



3 Migraine without aura

- Start gradually over five minutes and continue up to an hour.
- Dizziness and temporary blindness are common.
- Headaches can be severe to mild.

4 Menstrual Migraine

- Occurs on 15 or more days in a month for more than 3 months.
- Headaches, nausea and vomiting often occur.
- A feeling of spinning and numbness



TREATMENTS:

Some behavioral treatment have been seen to reduce the migraine frequency

Relaxation training:

Daily relaxation practice can help you achieve a state of mental and physical calm and reduce migraine attacks.



Biofeedback

training: provides instant feedback so you can monitor and modify your body's response to stress.



By improving your regular lifestyle- by upgrading the following: hydration, diets, sleep routine, medication, exercises and yoga, including psychotherapy.

Cognitive behavioural

therapy: This teaches you how to break this cycle for a better outcome.

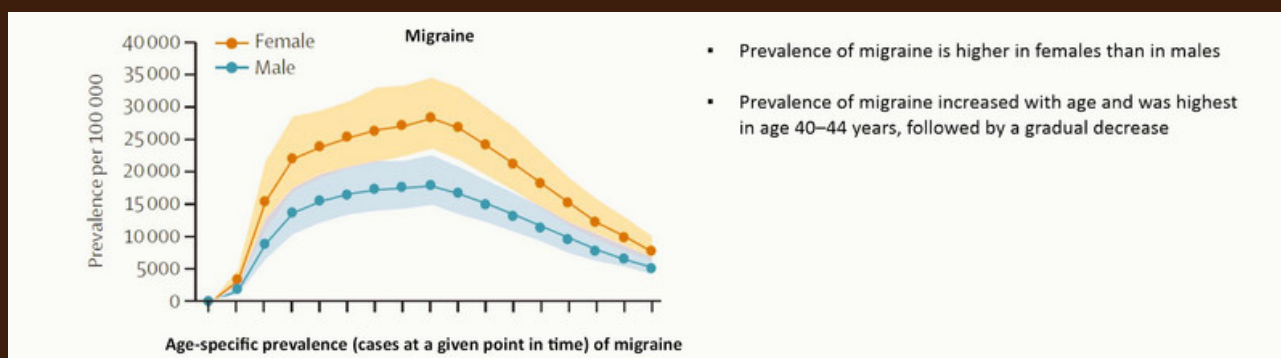
For example, in the situation you're running late, not having time to eat, or waking up late; this leads to catastrophization (where your core beliefs and thoughts force you to think worse), the results of which begin as feelings of stress and anxiety, and a migraine attack. Basically, this therapy leads to better results.

MIGRAINE IN INDIA

Migraine is a chronic neurological disorder that affects approximately 15% of the adult population worldwide. Although migraine is a very common headache disorder and a major public health concern. It is still poorly understood and underdiagnosed. It clearly underscores the urgent need for immediate efforts to raise awareness of the condition and implement migraine public health policies to reduce the burden of the disease in India. Many neglect their symptoms such as stress, depression, or even menstruation on occasions, dismissing the pain as "just a regular headache".

Another area of concern is general healthcare providers, who face obstacles in diagnosing this disorder due to the minimal information they receive about headache disorders during medical training. There is a clear need for educational programs for healthcare professionals on the diagnosis and treatment of migraine.

Epidemiology is also the issue that matters, migraine receives less research funding than any other disease in the world and the same goes for our country. There is a lack of local and epidemiological research in India (the data available are from studies involving a widespread assessment of headache disorders and neurological disorders). There is need to promote India-unique migraine studies to reinforce our information of nearby danger elements and making sure powerful remedy of migraine patients.



Citations:

[Migraine Headache - National Institute of Health, USA](#)

[Current and emerging evidence-based treatment options in chronic migraine: a narrative review - The Journal of Headache and Pain](#)

[Effective Migraine Care: Gaps and Barriers - Hindustan Times](#)

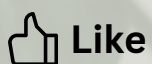


Moyuri Yein

Student at DY Patil International University - India
1y

'Ayurveda' means the science of life. It is one of the oldest medical systems which comprise physical, ethical, psychological, philosophical and spiritual health. In recent years scientist has been studying about different herbs and have recognized many medicinal benefits. Want to know more about this natural system of medicine? Check out this link to read the full blog:

<https://lnkd.in/gY3QDRbz>



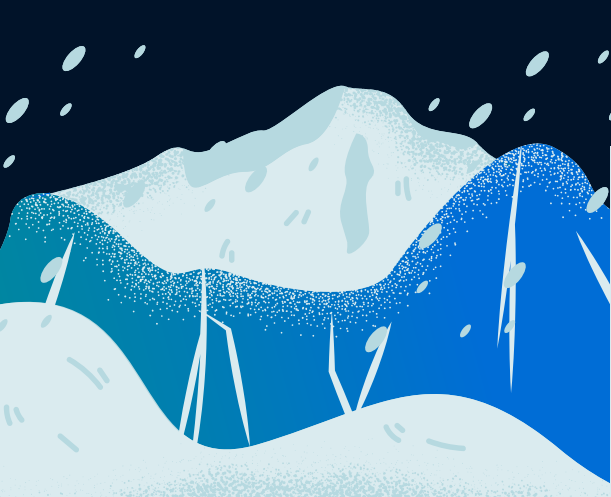
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THAWING GUARDIANS OF THE PLANET:

Why We Should Care About Vanishing Ice and Rising Seas

-By Natasha Bisen

We recently celebrated Earth Day! There is no doubt that earth has changed a lot globally, that too in a negative way, resulting in multitude factors affecting the Earth. We have been discussing about our earth and environmental changes extensively. Specifically, we should be focus on new and forthcoming titles that discuss the impact of human activity on environmental changes. One of these topics is the melting of ice caps (glaciers), which is very responsive to discuss.



Glaciers, the great guardians of the stability of the planet's climate:

Throughout most of the last century and currently, planet Earth is warming. Our planet is heating up largely because human activities are injecting increasing amounts of greenhouse gases like carbon dioxide into the atmosphere. The last five years (2014-2018) have been the warmest in the modern record, as global temperatures continue to soar. We often discuss melting of polar ice, but it is important that it is strongly and completely linked to other processes.

The polar regions, particularly the Arctic and Antarctic Peninsula, are experiencing intense and rapid warming. Arctic peoples have noticed changes in the behavior of Polar bears, Seals, Walruses and Reindeer, which in turn affects in their hunting and herding lifestyles.

Trees tilt at weird angles like drunken sailors as permafrost thaws. Highways buckle, and buildings sag and collapse, hampering construction, transportation and development. Ice shelves surrounding much of Antarctica's islands, that normally hold ice sheets and maritime glaciers in check, have begun to thin and weaken.

Many ice shelves fringing Antarctica have started to thin, especially in the Amundsen Sea Sector of West Antarctica. Even the massive ice sheet itself is not immune. For roughly the past twenty years, the Antarctica Ice sheet has been losing more ice than it has gained. Less summer sea ice leads to more open ocean water, which leads to ice-free broad expanses of open water reflecting less sunlight and instead absorbing more of the sun's heat. Consequently, more sea ice melts, enabling escape of more heat and moisture into the atmosphere. A warmer atmosphere, in turn, causes even more sea ice to melt.

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amounts of greenhouse gases like carbon dioxide into the atmosphere. The last five years (2014-2018) have been the warmest in the modern record, as global temperatures continue to soar. We often discuss melting of polar ice, but it is important that it is strongly and completely linked to other processes.

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A new study, released just a few days ago, reveals that glaciers have lost enough ice since 1961 to raise global sea level by 27 millimeter. Within the last decade, losses have increased to nearly 1 millimeter per year, close to a third of the global total sea level rise.



Melting glaciers and ice sheets contribute significantly to global to sea level rise, which impacts tens of millions of people living in coastal areas around the world. Ice sheet losses, along with diminishing glaciers, already account for nearly two-thirds of the observed sea level trend of roughly 3 millimeters per year since 1993, and this share is likely to grow in the future. Thus, it becomes critical for us to gain a clearer understanding of the future behavior of the sheets.

It is increasingly accepted that the melting of polar ice-caps is happening rapidly, is likely to continue, and may do so at an increasing rate. However, analysis of ice cores shows a strong link between CO2 level and beginning of the decrease, although the lag time may be long. Melting is also likely to slow down once the less wide and thicker coastal ice disappears.



Why should we care about vanishing ice and snow?

Melting ice is not only harmful to our Earth, but it also has detrimental effects on us humans. And we have already witnessed the effects of this, which makes us think. In the aforementioned study, the **college** of Zurich **discovered** that glacial melting has **extended during the last 3** decades. The **loss of** ice has already reached 335 billion tones **consistent with** year, which is 30% of the **present day** rate of ocean growth. Some main consequences are:

- Sea level rise:

Melting glaciers have helped raise sea level by 1 inch (2.7 centimeters) since 1961. In addition, the world's glaciers contain enough to raise sea levels by nearly half a meter.

- Decreased freshwater availability:

The disappearance of glaciers also means less water use for the population, less capacity to generate hydroelectric power, and reduced water available for irrigation.

- Disappearance of species:

It will also lead to the extinction of numerous species, as glaciers serves as the natural habitat for a number of animals, both on land and in the water.



We do still have time to save the glaciers!

- Combine Artificial icebergs:

Indonesian architect Faris Rajak Kotahatuhaha won a souvenir for project that consists of collecting water from melted glaciers, desalinating it, and refreezing it to form massive polygon ice blocks because of their shape, there icebergs may then be combined to create frozen masses.

- Increase their thickness:

The University of Arizona proposed a seemingly simple solution of manufacturing more ice. Their proposal consists of collecting ice from below the glaciers through pumps driven by wind power and spreading it over the upper ice caps, allowing it to freeze and strengthen the consistency.

- Slow down the Erosion:

The scientific journal Nature suggested building a 100- meter-long dam in front of Jakobshavn Glacier (Greenland), which the worst affected by Artic melting, to contain its erosion.



Action of panax ginseng root's extract against cisplatin-induced blood toxicity

-By Suzanne Mondal, Shreya Khole, and Vaishnavi Makude

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Poster created by:

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*B.Tech, BioEngineering; First year

Abstract

Cisplatin is an anticancer drug. The focused work aimed to study the effects of Ginseng extract against blood toxicity induced by Cisplatin in rats. A total of 60 male albino rats to be tested, were equally divided into six groups. A significant increase in serum cholesterol, triglycerides, GPT, GOT, urea, creatinine, & uric acid levels was observed in the Cisplatin group when compared with the control group. In contrast to the former observation, a significant decrease in HDL, calcium, potassium, albumin, and total protein levels was observed in the Cisplatin group when compared with the control group. Treatment of Cisplatin with ginseng alleviated the blood toxicity induced by Cisplatin. We can conclude that co-treatment with Ginseng has beneficial properties and can reduce the blood toxicity induced by Cisplatin.

Introduction

Cisplatin (CP) is a drug that acts against proliferating and resting cells; it is used in the treatment of multiple solid tumors & cancers. However, it's clinical usage is restricted due to some undesirable side effects, such as hepatotoxicity, nephrotoxicity, etc. Mechanisms of obtaining its anticancer effects include formation of DNA adducts and production of reactive oxygen species (ROS). The innate human defense mechanisms may not be enough to withstand severe or continued oxidative stress. Panax ginseng has the most potent multiple pharmacologic actions for anticancer, antihypertensive, and anti-nociception effects and for improving weak body conditions. The main objective of the present work was to explore the protective battery of the aqueous extract of *Panax ginseng* against Cisplatin-induced blood toxicity through certain biochemical and physiological measurements in blood.

Materials & Methods

Animal Treatments: The rats were randomly and equally divided into six groups (10 animals each).

G1: Control group- animals did not received any treatment.

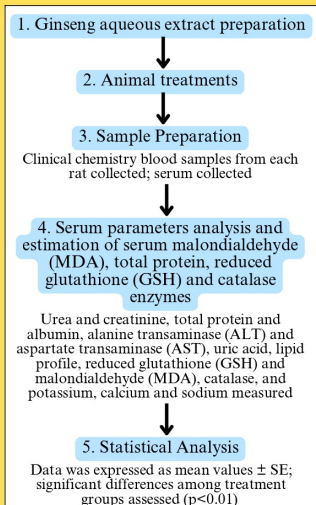
G2: Ginseng or positive control group- animals received ginseng orally for four weeks.

G3: Cisplatin (CP) group- rats were injected intraperitoneally with Cisplatin administration for four weeks.

G4: Co-treated group- animals were injected intraperitoneally with Cisplatin administration and also received ginseng orally for four weeks.

G5: Post-treated group- animals injected intraperitoneally with Cisplatin administration for four weeks and then treated orally with ginseng for another four weeks.

G6: Self-treated group- animals were injected intraperitoneally with Cisplatin administration for four weeks and self treated without drugs for another four weeks.

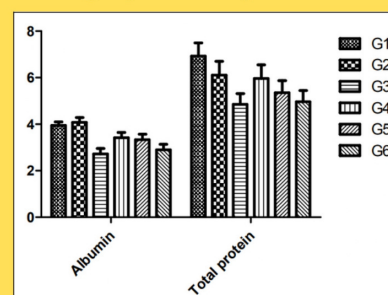


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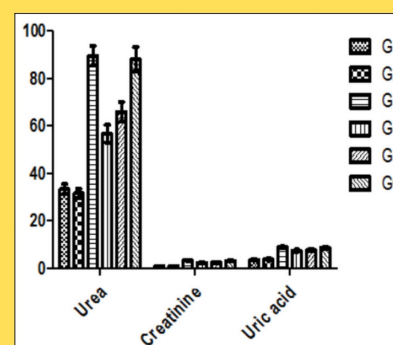
Beneficial role of Panax ginseng root aqueous extract against Cisplatin induced blood toxicity in rats; Basuony, M., et al.; American Journal of Biological Chemistry 2015; 3(1): 1-7

Results & Conclusion

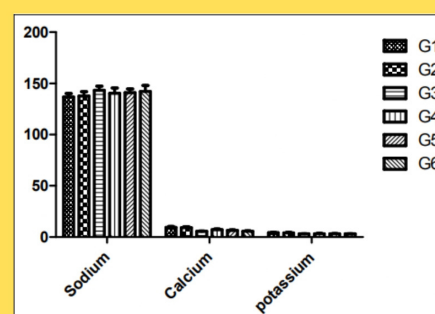
1. Changes in serum total protein (mg/dl) and Albumin (mg/dl) levels in different groups under study.



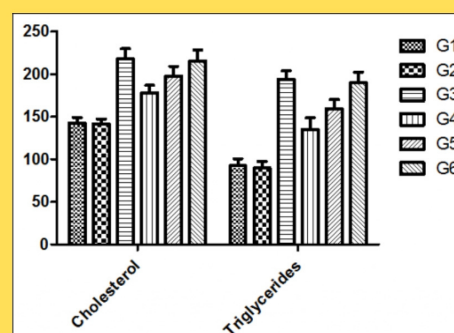
2. Changes in serum urea (mg/dl), creatinine (mg/dl) and uric acid (mg/dl) levels in different groups under study.



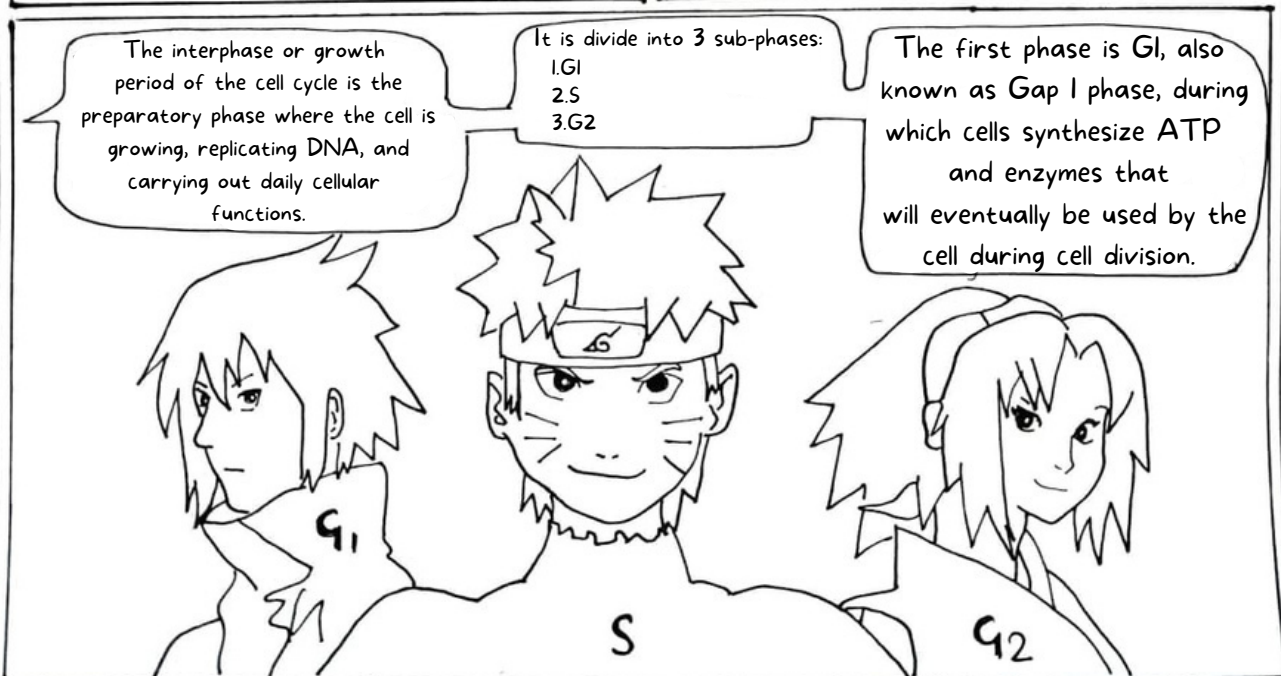
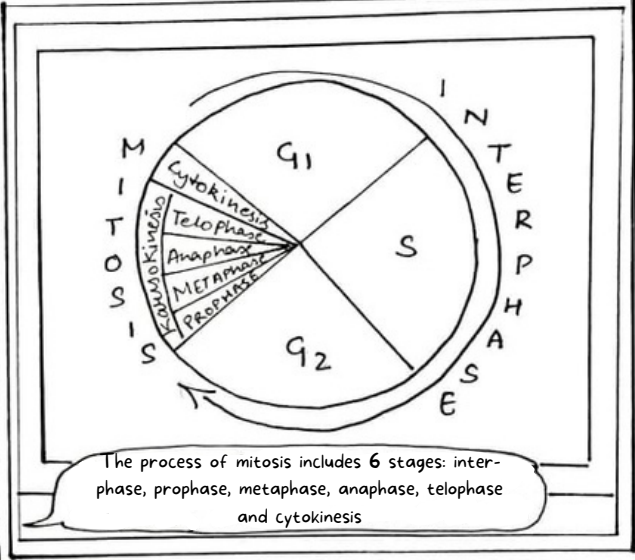
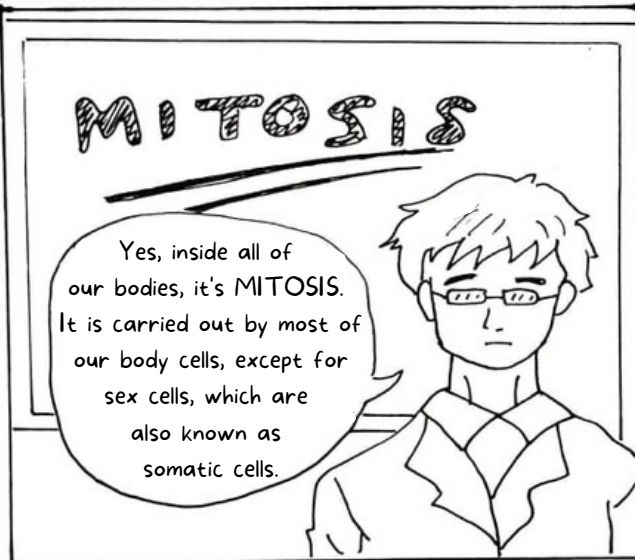
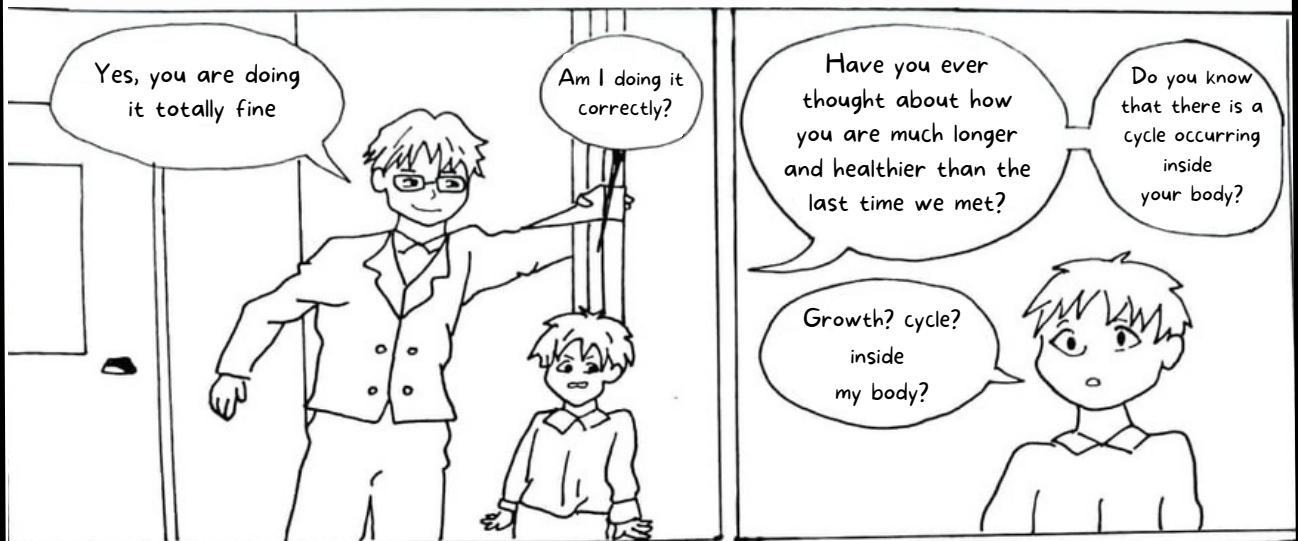
3. Changes in serum sodium (mmol/L), calcium (mmol/L), and potassium (mmol/L) levels in different groups under study.

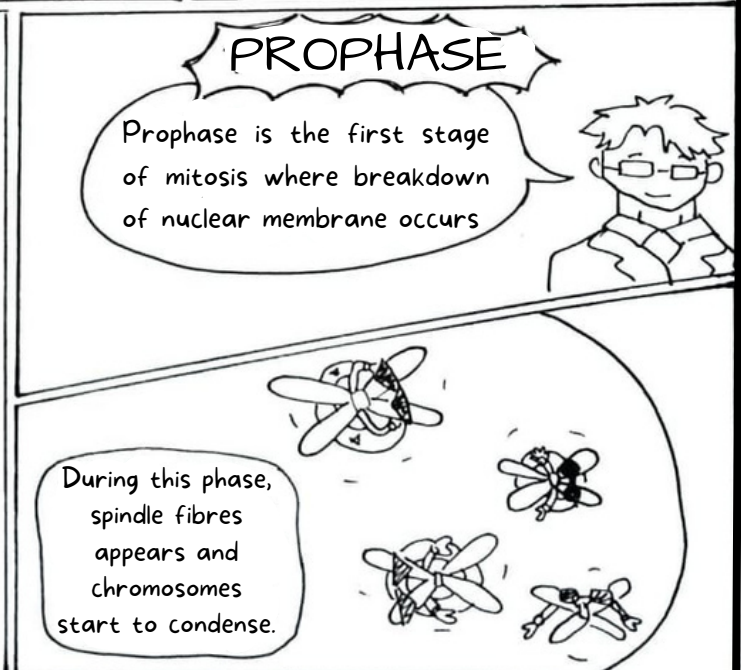
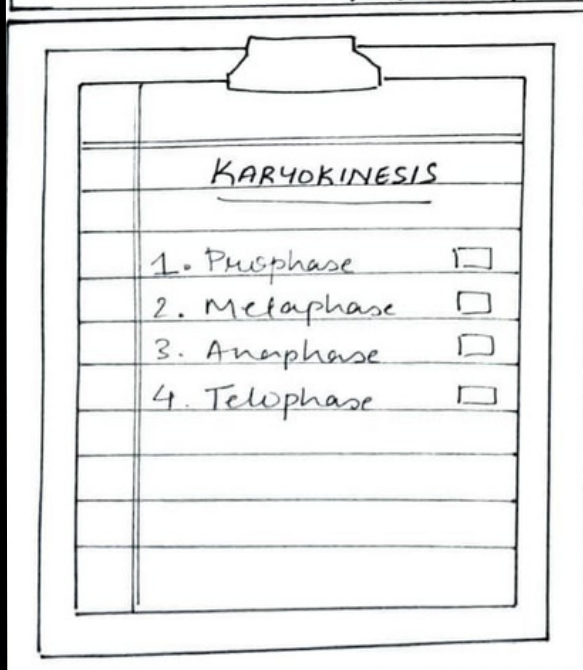
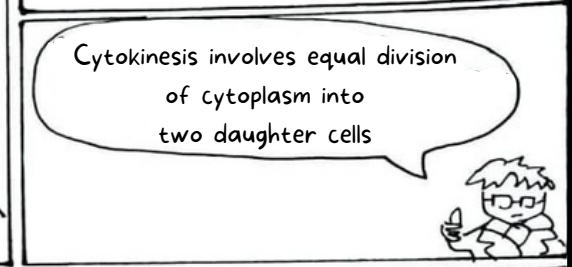
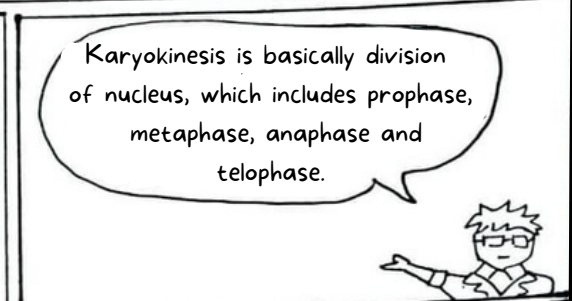
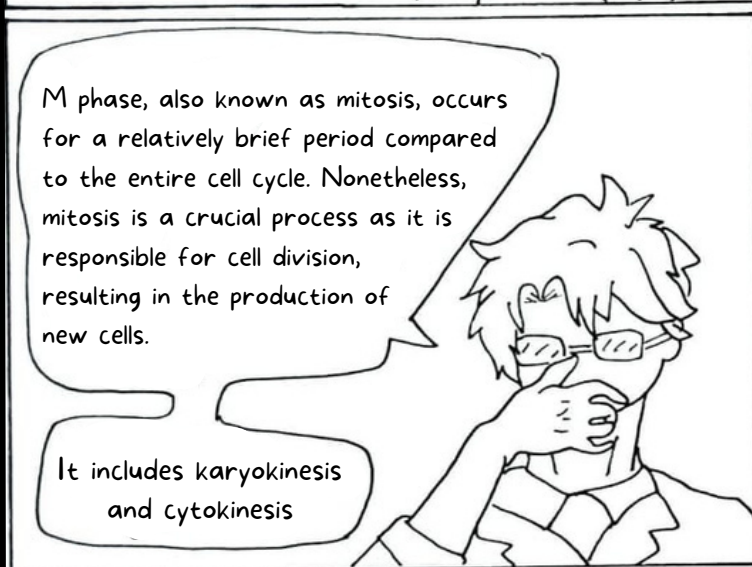
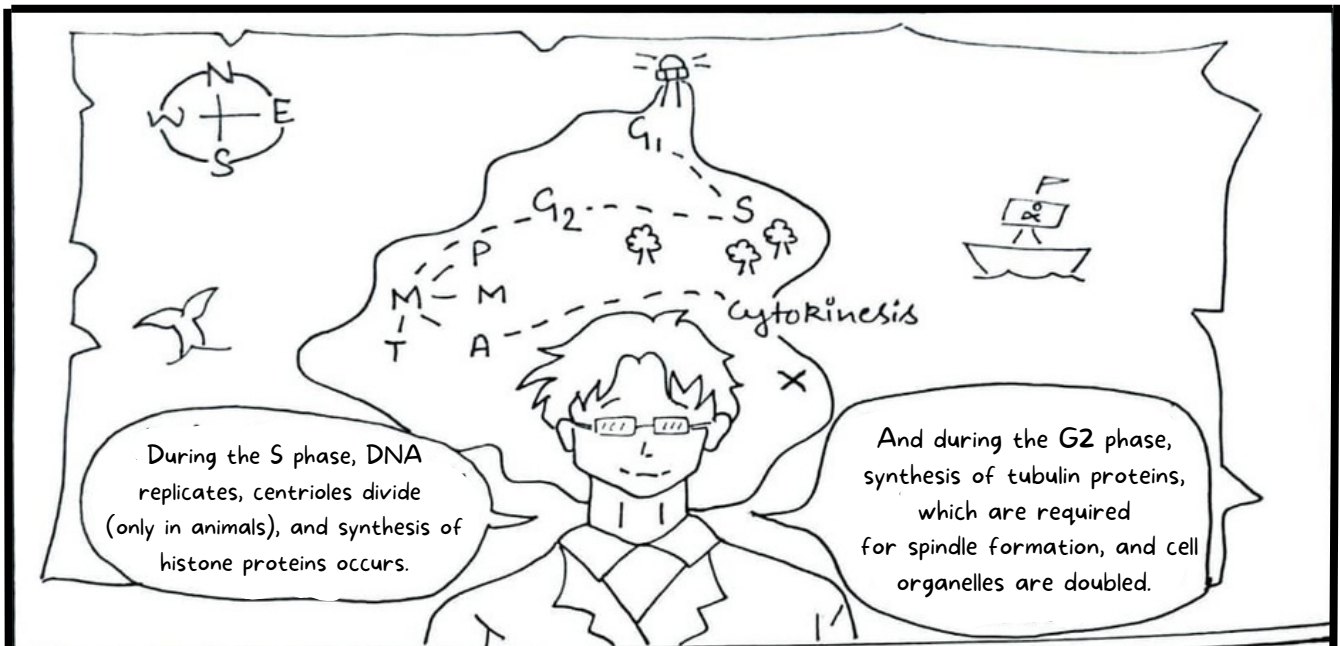


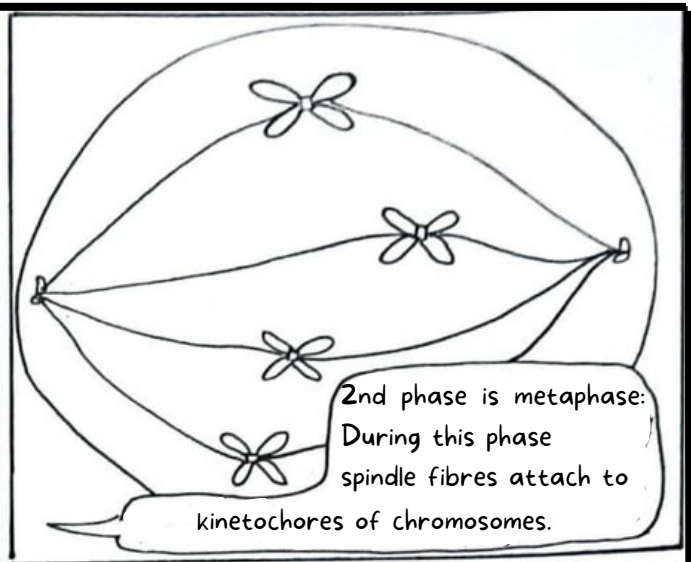
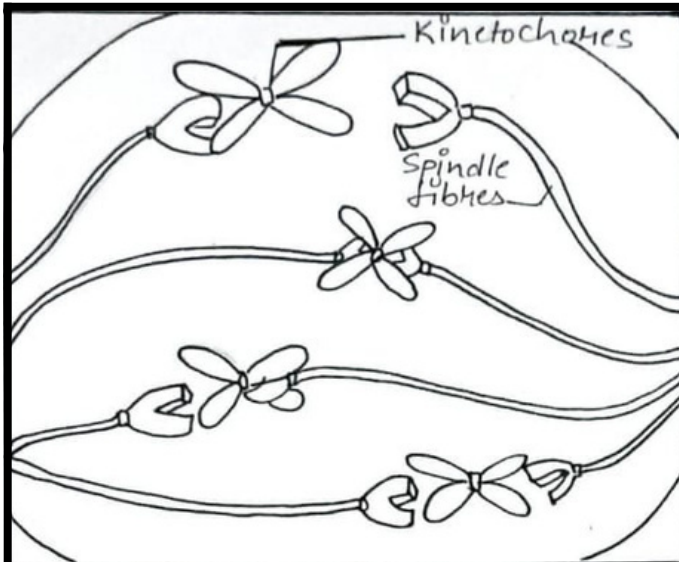
4. Changes in serum total cholesterol (mg/dl) & triglycerides (mg/dl) levels in different groups under study.



ONE MONDAY MORNING MR. KAMAL WAS MEASURING RAJ'S HEIGHT

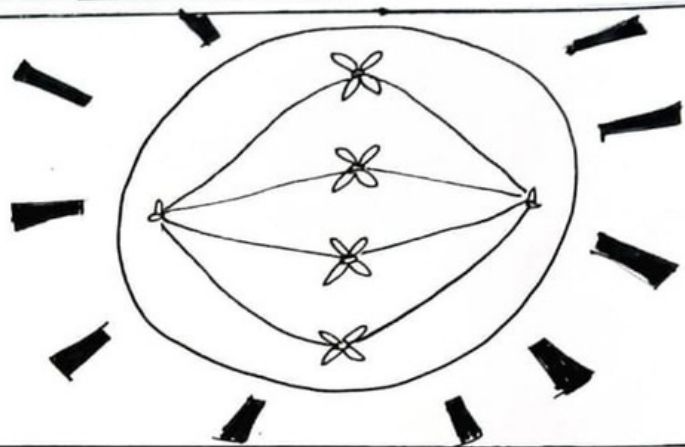




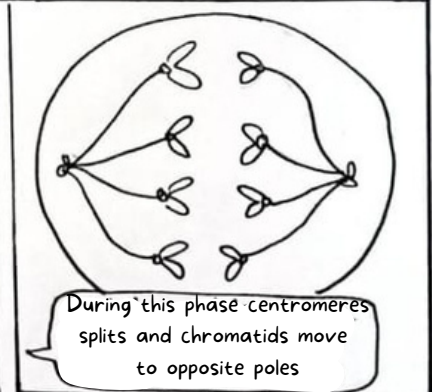
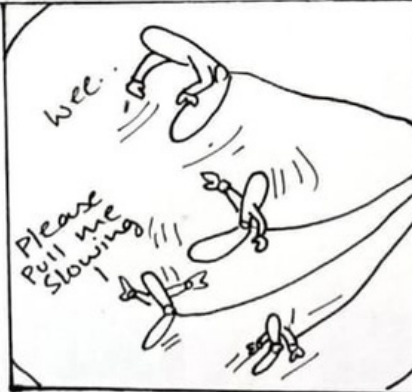
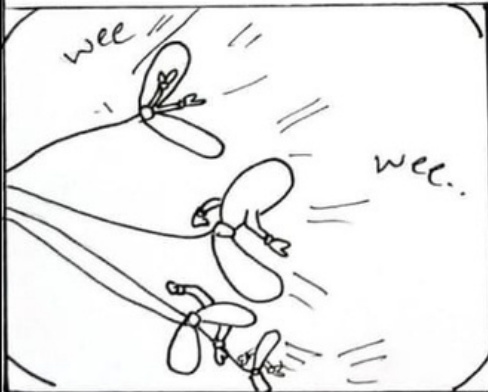


METAPHASE

Chromosomes are moved to
the spindle equator and aligned
along the metaphase plate by
spindle fibers



ANAPHASE



TELOPHASE



Chromosomes cluster,
and the nuclear envelope
assembles around them.

CYTOKINESIS

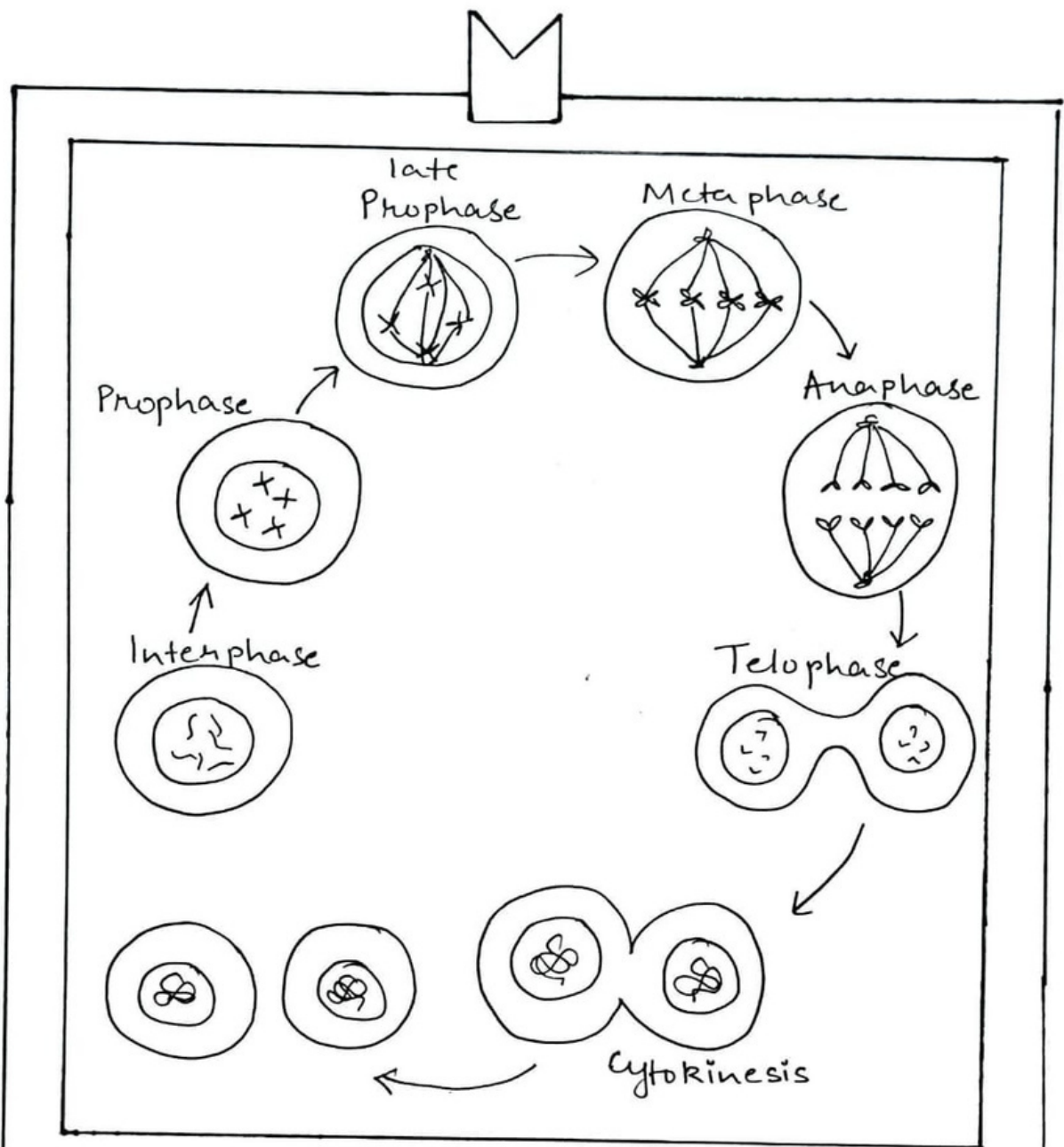


The cytoplasm
undergoes equal
division, resulting
in the distribution
of cytoplasm, nuclei,
cell organelles, and
the cell membrane into
two daughter cells.

In animal cells,
furrow formation
occurs, which joins
in the center, dividing
the cell cytoplasm
into two.

In plant cells, wall
formation occurs from
the inside to the outside,
resulting in the formation
of a cell plate and the
division of the cytoplasm
into two.

THE STAGES OF MITOSIS



Mitosis







Millets: The underutilized source of nutrition

-By Dr. Surabhi Sonam

Having been part of India's diet for millennia, millets were historically fundamental to the country's agricultural landscape, serving as a primary source of sustenance for many communities. They find mentions in texts like the Vedas. These nutrient-rich grains – pearl millet, finger millet, and more – were staples, offering sustenance, cultural significance, and health benefits. During the era of the 'Green Revolution', when India turned its focus on high-yielding rice and wheat varieties, the gradual decline of millet cultivation began. In the heartland of India's diverse agricultural landscape, a paradox unfolded – the underutilization of millets, a group of nutrient-rich, climate-resilient grains that have been an integral part of the country's food culture for centuries. This shift not only weakened the resilience of agricultural systems but also contributed to dietary monotony and a loss of indigenous knowledge.

In recent times, the lack of food diversity and availability raised concerns about both food security and sustainable agriculture. Despite their immense potential, millets continue to be marginalized, pointing towards a complex interplay of factors that hinder their rightful place in the agricultural and dietary fabric of India. From a nutritional standpoint, millets are powerhouses of essential nutrients. They are rich in dietary fiber, vitamins, and minerals, making them an excellent choice for combating malnutrition and lifestyle-related diseases.

Incorporating millets into daily diets can contribute to a balanced and diverse nutritional intake, particularly among vulnerable populations. Moreover, the low glycemic index of millets is a boon for managing diabetes, promoting weight loss, and maintaining steady energy levels.

Moreover, the revival of millets carries a plethora of ecological and economic benefits. Firstly, these crops are hardy and require significantly less water and chemical inputs compared to traditional cereals. As water scarcity becomes an escalating concern, the cultivation of millets can contribute to conserving this precious resource. Additionally, millets are less susceptible to pests and diseases, reducing the need for chemical interventions, thereby promoting natural pest control and reducing the environmental impact of farming.

Despite offering solutions to malnutrition, sustainable farming, and climate challenges, the sidelining of millets in India is a complex issue that stems from a combination of factors, including limited awareness, policy gaps, market challenges, and the changing agricultural landscape. Addressing these challenges requires a multi-pronged strategy that involves consumer education, policy reforms, research and development, and improved market linkages.

By unlocking the potential of millets, India can not only enhance its food security but also foster a more resilient and sustainable agricultural system that aligns with the demands of a changing world. The journey to realizing the value of millets is not just about reinvigorating a forgotten grain; it's about reshaping the future of agriculture and nutrition in India.

Turning the tide on millet underutilization requires a comprehensive approach that engages multiple stakeholders. Raising awareness about the nutritional benefits of millets through campaigns, educational programs, and culinary initiatives have begun to change the consumer perception and market dynamics. With the recent developments in the understanding of its nutritional values, millets have started to shed their outdated image as 'poor man's food' and be positioned as nutritious, sustainable, and gourmet ingredients. This can further be accelerated through innovative marketing strategies, culinary workshops, and collaborations with renowned chefs to create delectable millet-based dishes that resonate with modern tastes.



As the world grapples with issues of climate change, food security, and nutritional well-being, a significant shift has been observed towards sustainable and locally-sourced food choices. In the Indian context, the resurgence of millets as a staple and the declaration of a "Year of Millets" marks a crucial step towards addressing these concerns. This shift in thought in India symbolizes a profound movement towards sustainable agriculture,

better nutrition, and food security. By embracing these ancient grains, India is not only embracing its agricultural heritage but also crafting a more resilient and healthier future for its citizens and the planet. The revival of millets showcases the power of tradition and innovation coming together to address contemporary challenges, offering a lesson that extends far beyond the realm of agriculture and nutrition.



Long term follow up of bradycardia in elite athletes

-By Anagha Pande and Juhi Landge

LONG TERM FOLLOW UP OF BRADYCARDIA IN ELITE ATHLETES



RESULTS

Of the 157 athletes, 122 were men and 35 were women. Their average age on entering high competition sports was 17 ± 4.6 years and the average age when they retired from elite sport was 30 ± 7.4 years. Average age at follow-up was 47 ± 5.9 . The most frequently performed sports were long distance running (42%) and swimming (22%). The average number of years in high competition was 12 ± 7.4 and the average number of hours' training during that time was 19 ± 7.4 hours per week. Sinus bradycardia in the initial ECG, all participants had marked sinus bradycardia (less than 50 beats/min, in accordance with the inclusion criteria). Of these, 14% had sinus bradycardia of less than 40 beats/min. In the follow-up study, ECGs showed that 64% continued to present sinus bradycardia and 18% continued to have marked bradycardia. Fig. 1 compares ECGs from the two phases of the study. No sinus bradycardia symptoms were described in any case.

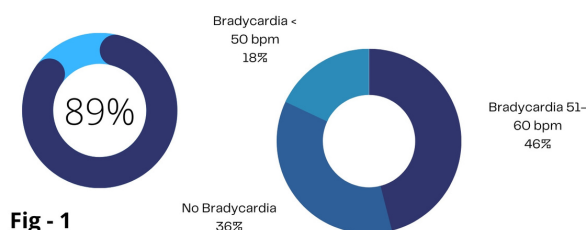


Fig - 1

Variable	OR	Sig	CI 95%
Regular physical exercise after retirement	3.7	0.007	1.43 - 9.51
No. of years in high-level competition	1.12	0.001	1.04 - 1.20

Table -1

Multivariate analysis showed that regular physical exercise after retirement (OR 3.7; 95% CI 1.43 - 9.51) and number of years in high-level competition (OR 1.12; 95% CI 1.04 - 1.20) were significantly ($p < 0.001$) related to sinus bradycardia (Table 1). Neither age, sex, hours of weekly training during competition periods, sport modality nor the number of years since retirement from competition were related to persistence of sinus bradycardia at follow-up.

INTRODUCTION

The aim of the study was to examine the hypothesis that when former high-level athletes retired from competition, bradycardia would vanish. ECG changes and factors possibly related to the persistence of bradycardia were investigated. We performed a longitudinal follow-up study in 157 former elite athletes who had records of bradycardia < 50 bpm when they were active in high-level competition

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OBJECTIVE

The aim of this longitudinal study in elite athletes was to test the hypothesis that sinus bradycardia disappears when former high-level athletes retire from competition. We investigated the potential factors (age, sex, hours of weekly training during competition periods, years participating in high-level competition, sport modality, years since retirement from competition, and regular physical exercise) related to the persistence of sinus bradycardia and also the related electrocardiographic changes.

METHODOLOGY

- Study Population** - The study group consisted of 157 former elite athletes who had undergone training for high-level competition for at least five consecutive years between 1960 and 1990.
- Inclusion Criteria** - moderate: 41 - 50 bpm; and severe < 40 bpm. In the present study, moderate and severe sinus bradycardia participants were grouped together and defined as "marked" bradycardia.



DISCUSSION

Ventricular repolarization changes in athletes are relatively frequent but they are generally mild. They are commonly seen in right precordial leads. Their origin is unknown but their presence is related to intense physical training. Ten athletes in the present study showed changes in ventricular repolarization in the initial ECG. These were located in the precordial leads in nine participants and in the inferior leads in one. In the follow-up ECGs, after retirement from high-level competition, we observed 15 cases (9.6%): 8 in right precordial leads and 7 in inferior leads. All 15 of these athletes continued to participate in a regular training program. The increase of cases with repolarization alterations after high performance training suggests that there are other factors at their origin

SUMMARY

IN A LARGE COHORT OF ELITE ATHLETES WHO PRESENTED SINUS BRADYCARDIA WHILE ACTIVE IN HIGH-LEVEL COMPETITION, WE OBSERVED THAT SINUS BRADYCARDIA PERSISTED IN THE MAJORITY FIVE YEARS AFTER SPORTING RETIREMENT. THERE WAS NO CLINICAL EVIDENCE OF ARRHYTHMIAS IN ANY CASE. FUTURE STUDIES INVESTIGATING THE MECHANISM UNDERLYING THE PERSISTENCE OF BRADYCARDIA AND RELATED FACTORS IN ATHLETES FROM SPECIFIC SPORTING MODALITIES MAY BE OF INTEREST.

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<https://www.thieme-connect.com/products/ejournals/abstract/10.1055/s-2008-1038602>

Dark Matter: The Invisible Sentinel of the Universe

How has the marriage of galaxies with gravity lasted so long?

-By Suzanne Mondal

Dark matter has kept humans in the dark for scores of decades. Owing to the poor understanding of this entity, dark matter started with it being recognized as “missing mass”! Unfortunately, the name still befits this elusive reality.

Galaxies rotate at such speeds that the gravity generated by the observable matter could not possibly hold them together; they should have torn themselves apart long ago. Furthermore, the universe has been expanding for eternity, and theoretically, gravity was certain to slow down the expansion with time.

Surprisingly, however, the rate of expansion has been non-uniformly accelerating ever! This trend simply did not make any sense. Hence, it led scientists to believe in the existence and involvement of an unknown entity that might be causing the observed discrepancies, rendering galaxies the extra mass needed for them to stay intact.

Unlike normal matter, dark matter does not interact with electromagnetic force.

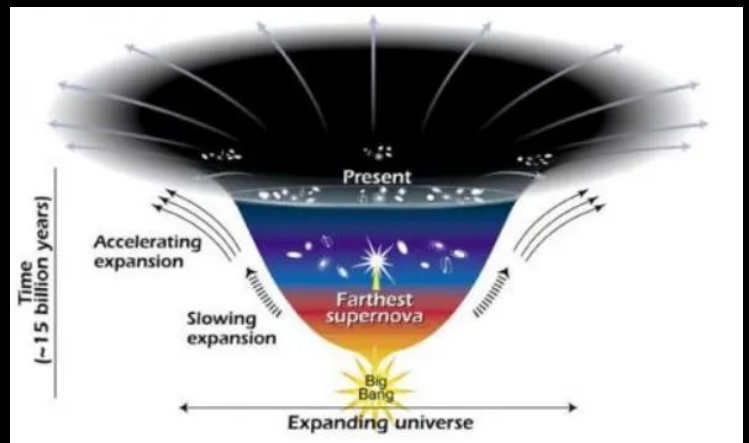


Dark matter in the centre of a galaxy . . . sike! 🙄 You can't really see dark matter, this is just a representation

Thus, it does not emit, reflect or absorb EM waves, adding to its enigmatic identity and making it difficult to detect. In other words, it is a component of the universe, whose presence is discerned from its gravitational attraction rather than its luminosity. By fitting a theoretical model of the composition of the universe to the combined set of cosmological observations, scientists have estimated the composition as ~68% dark energy, ~27% dark matter and ~5% normal matter.

So the infinite expanses of the universe that we see, make up for only 5% of everything?!

And, hold up, what's dark energy? Well, it is believed to be another component of the universe. Albert Einstein pioneered the hypothesis that maybe empty space is not empty, after all. A version of Einstein's gravity theory makes the prediction: "empty space" can possess its own energy. Because this energy is a property of space itself, it would not be diluted as space expands. With more space getting added to the universe, dark energy would soar concomitantly. As a result, this form of energy would cause the universe to expand increasingly faster!



This illustration reveals the changes in its rate of expansion since the universe's birth. The curve changes noticeably about 7.5 billion years ago. Astronomers theorize that the faster expansion rate is due to a mysterious, dark force that is pulling galaxies apart.

Illuminating dark matter again, how did humanity perceive the existence of dark matter, after all?

The expected observation, upon examining spiral galaxies, is finding the systems at the centre of the galaxy, moving at higher speeds than the entities in proximity to the galaxy's circumference. On the flip side, scientists discovered that the stars at both the loci moved at the same velocity!

Huh?!

But, for stars undergoing Keplerian motion, the closer the star is to the

gravitational center (center of the galaxy), the faster it moves, right? A possible explanation for this intriguing phenomenon could be that there must be extra gravity in the outskirts of galaxies. Since gravity comes from mass, this meant there was an extra matter in the outskirts. But since we couldn't see anything out there, researchers assumed that it must be dark. And so dark matter was discovered.

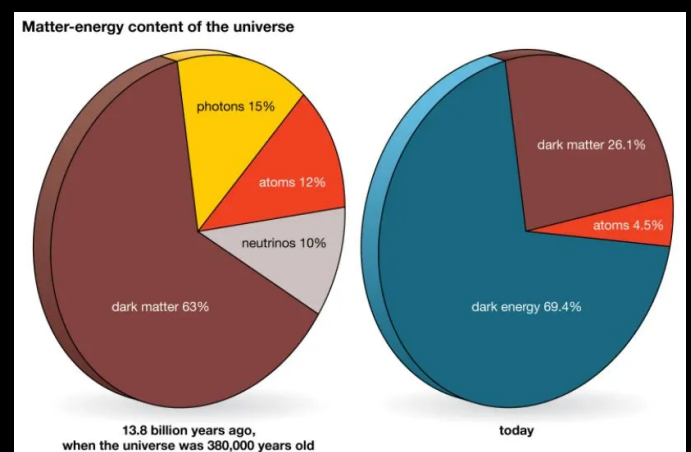
So, **what could dark matter be composed of?**

Visible matter (a.k.a. baryonic matter) consists of baryons (particles like protons, neutrons, and electrons). Dark matter could be composed of baryonic matter if it were all tied up in brown dwarfs or small, dense chunks of heavy elements. These possibilities are called massive compact halo objects, or "MACHOs".

However, the most favored belief is that dark matter is not baryonic at all, but that it is made up of other, more exotic particles like axions or WIMPS (Weakly Interacting Massive Particles).

Substantiating the mysteriousness of dark matter, **how and what do scientists study dark matter?**

There are two approaches to learning more about this cryptic actuality. As for how scientists study dark matter, they may study its distribution in the universe, by looking at the clustering of material and the motion of objects in the universe. Particle physicists, on the other hand, generally venture off on a quest to detect the fundamental particles making up dark matter.



Matter Energy content of the Universe

Lastly, what does dark matter hold for the future?

Dark matter candidates arise frequently in theories that suggest supersymmetry and extra dimensions.



Lastly, **what does dark matter hold for the future?**

Dark matter candidates arise frequently in theories that suggest supersymmetry and extra dimensions. One theory suggests the existence of a “Hidden Valley”, a parallel world made of dark matter having very little in common with the matter we know!

If one of the theories is ever confirmed, it'd be a massive leap in our understanding of the universe and its composition, and especially how the marriage of galaxies and gravity stands unwithered even after billions of years of togetherness.





shivansh mahajan



Follow



shivansh mahajan Bioplastic - Go green, plastic is obscene!

Traditional plastic is made from raw materials derived from petroleum (non renewable source) which is contaminating and non-biodegradable. Whereas, Bioplastics which are made from biodegradable sources is a viable alternative.

Right now, bioplastics are clearly more environmentally friendly compared to the traditional plastics but it still has a lot of disadvantages and when the aspects of life cycle are considered. However, as researchers around the world work to develop greener varieties and more efficient manufacturing processes, bioplastics show promise in their growth to reduce plastic pollution and our carbon footprint even more.

For further information check out my blog. Link in my bio.

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May 1, 2022



What is the Mandela Effect?

-By Khushi Sonawane

Have you ever felt like a particular event happened and a lot of people believed the same, but when you searched for it, the event didn't really happen? If yes, then this means you have experienced the Mandela Effect.

The Mandela effect describes a situation in which a person or group of people has a false memory of an event. Fiona Broome coined the term over a decade ago when she created a website detailing the memories of former South African President Nelson Mandela, who died in prison in the 1980s. Nelson Mandela did not die in prison in the 1980s.

After spending 27 years in prison, Mandela was President of South Africa from 1994 to 1999 and died in 2013. Despite these facts, Broome claimed she remembered clips of his funeral being broadcast on TV. She even found others who have almost the same memories of Mandela's death in the 20th century.

Broome explains the Mandela effect via hypothetical theories. She claims that when an individual time travels or comes into contact with the parallel reality, minute changes arise, causing these differences. She also claimed that the reality we live in is probably a matrix and that these effects are a glitch in the matrix. However, while these theories are appealing to many, they cannot be scientifically tested.

What is the science behind the Mandela Effect?

Psychologists explain the Mandela effect in terms of memory and social effects, especially false memory.

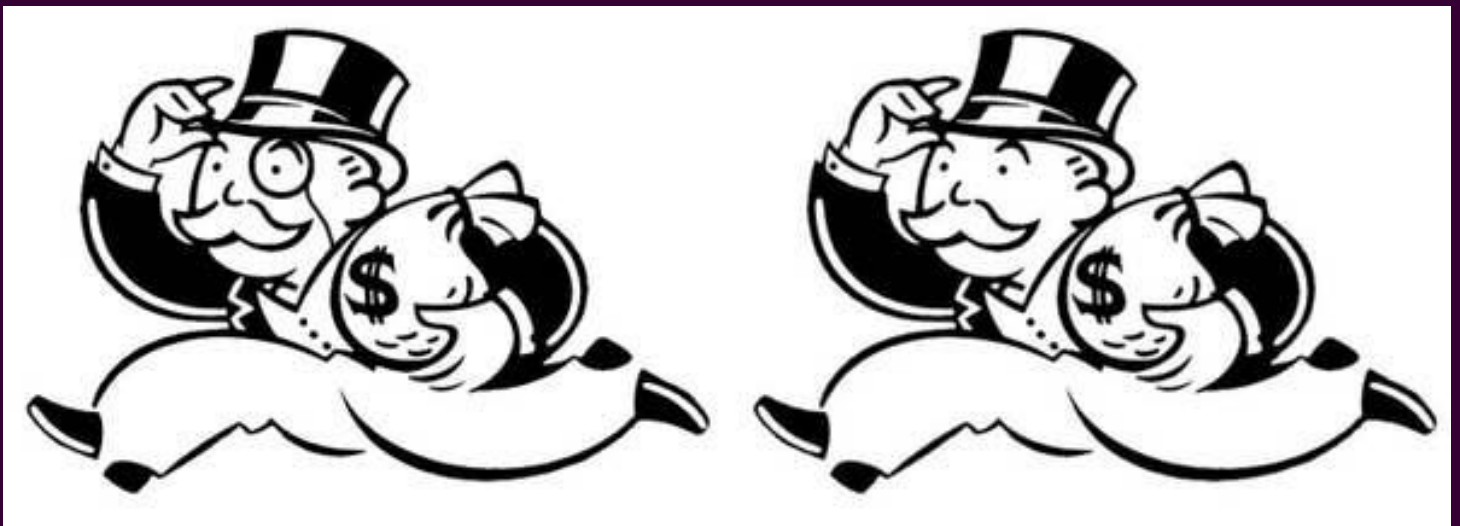


This is a false recollection of an event or experience that did not occur or a distortion of existing memory. The unconscious generation of misinterpreted memory is called confabulation. Confabulation is relatively common in everyday life. Confabulation is a common symptom of neuropathy that affects memory, such as Alzheimer's disease and other forms of dementia. When people with dementia confabulate, they are not lying or trying to deceive. They simply do not have the information or awareness needed to accurately recall a particular memory or event.

Jim Coan, a professor of psychology in the United States, showed how easy this is with the "Lost in the Mall" procedure.

This led Coan to give his family a short narrative of childhood events. One was that his brother got lost in the store. Coan's brother not only believed that the event happened, but also added details.

When cognitive psychologists and human memory expert Elizabeth Loftus applied this technique to a larger sample, 25% of participants were unaware that the event was incorrect.



Memory inaccuracies can also be caused by so-called "source monitoring errors." These are cases where people cannot distinguish between real and imagined events.

Many examples of the Mandela effect can be traced back to so-called "schema-driven errors." Schemas are organized "knowledge packets" that drive memory. As you can see, the

schema makes the material easier to understand, but it can cause distortion. Frederick Bartlett outlined this process in his 1932 book, *Remembering*. Bartlett read the Canadian Native American folk tale “War of Ghosts” to the participants. He found that the listeners omitted unfamiliar details and transformed the information into something more understandable.

This process is called “meaningful effort” and can occur in real situations as well. For example, research shows that when participants recall the contents of a psychologist’s office, they tend to recall consistent items such as bookshelves, and omit inconsistent items such as picnic baskets. Schema theory explains why previous studies have shown that when a group of people were asked to draw a clock based on their memory, the majority of participants mistakenly draw IV instead of IIII. Clocks usually use I as it is more attractive. Another example of the Mandela effect is the misconception that Uncle Penny Bag (Monopoly Man) wears a monocle and in the product title, KitKat contains a hyphen (Kit-Kat).

The Mandela effect continues to be hotly debated, despite sufficient evidence that parallel universes of all kinds are not working and are explained by human memory errors.

Of course, we don’t know everything. As the number of Mandela effect cases increases, perhaps more research on its origin will shed light on the cause.

Summary

The Mandela effect is a phenomenon in which a person or group of people has false or distorted memories. Some believe that the Mandela effect is another proof of reality, while others blame human memory errors.



NEW CONTINENT IN FORMATION

-By Sanya Jain

NEW CONTINENT IN FORMATION?!



A large crack, stretching several kilometres, made a sudden appearance recently in south-western Kenya tear, which continues to grow, and caused part of the Nairobi-Narok highway to collapse.

A COMPLEX GEOLOGICAL PROCESS

Scientists say that the tear will eventually cleave Africa in two and create a new ocean basin millions of years from now.

The rifting process may be happening at a glacial pace, but researchers say there are clear signs that this transition is taking place. As the plates peel apart, material from deep inside Earth moves to the surface and forms oceanic crust at the ridges



A part of the world map with a split in the African continent



The present-day African continent

The three plates- The three plates — the Nubian African Plate, Somali African Plate and Arabian Plate — are separating at different speeds. The Arabian plate is moving away from Africa at a rate of about 1 inch per year, while the two African plates are separating even slower, between half an inch to 0.2 inches per year, according to a report.

In the past 30 million years, the Arabian Plate has been gradually moving away from Africa, which has already led to the creation of the Red Sea and the Gulf of Aden.



shrutea9



We've all witnessed the comeback of film cameras and smartphone apps like huji, but have you ever seen an actual film camera in action? Ever wondered how cameras have worked throughout centuries! check out my blog to know more !

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