





# **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 2nd 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.*



# **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 for answers, ever since humans first set feet 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 second edition 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, present a new logo, 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 involuted months of hard work, we present to you the second edition of Scinion.**

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



# From The 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 two 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*



# From The DEAN'S DESK

"I am privileged to get a peek into the world of Scinions before it gets out, what a delight it is! Creativity at its peak! Putting science in simpler word 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 Second issue of Scinions 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?

Covid is still lurking and we have become so complacent about it so here covid prevention is illustrated and a thought about the rescuers and the disease itself explained in diffeent sections. Story telling a serious scientific concept has caught my lingering fancy, hope I can put it to practice to serve you things so simply.

Equally amazing is the concept of podcasts weaved into the journal. A big applause to the team. Thanks for teaching me!"

*Prof. Shashi Singh*





# From MENTOR'S DESK

## *Synergy*

Who am I, if not the color of the tree  
Who am I, if not the bird, Oh! So free.  
Who am I, if not the fish of the sea  
Who are they, if not a part of me.

Who am I, if not the soil on the ground  
Who am I, if not the air all around  
Who am I, if not the hill and the mound  
Who are they, if not my honest rebound.

Who am I, if not the flower in the pot  
Who am I, if not the weather terribly hot  
Who am I, if not the milieu of blue dot  
Who am I, if not an essence of what I got.

Together we enjoy, together we create  
You take one out, entire system we deteriorate  
Reinforcing and balancing is in loop, my mate!  
Synergy in sync is the path to accelerate.

*Dr. Surabhi Sonam*





# MEET THE TEAM



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# **PEEP INSIDE**

**1.INFOGATORY**

**2. ILLUSTRATORY**

**3. FACTOLOGS**

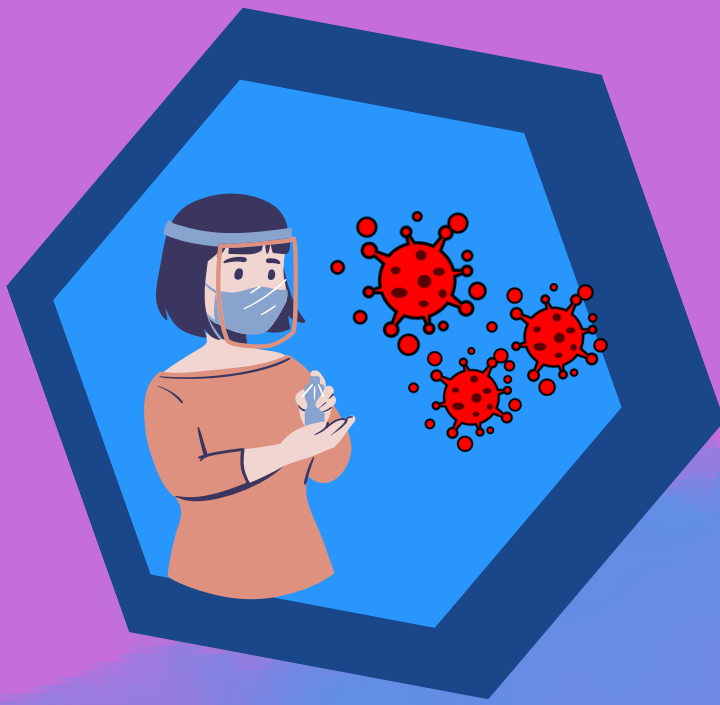
**4. SCI-FACTOMICS**

**5. SCI-FACTOCASTS**

**6. SOCIWORTORY**



# INFOGRATORY



The following section, of InfograTory, comprises of infographics- a medium of communication that is the perfect amalgamation of textual information and copious graphical data and figures!



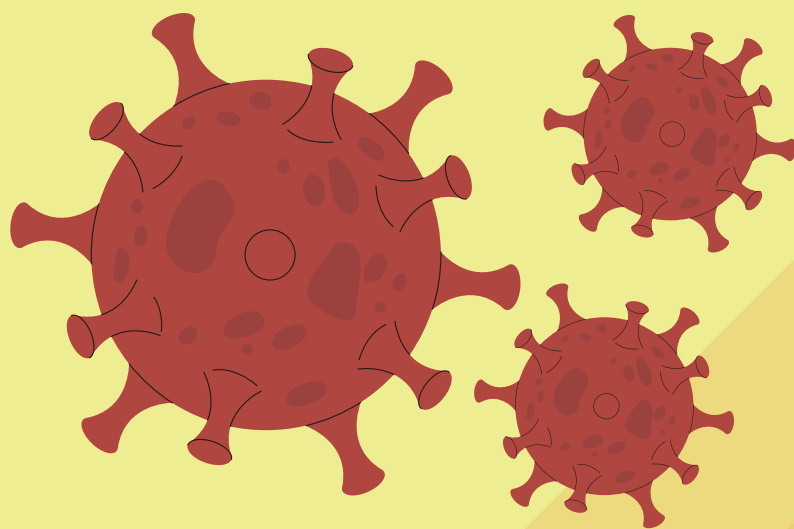


# Tips for protection against Covid-19



## OVERVIEW

The most efficient way to slow down the spread of SARS-CoV-2, the virus that causes COVID-19, is to get vaccinated. It is recommended that everyone who is eligible, including those with weak immune systems, keep up with the latest on their COVID-19 vaccines. The below infographic gives us tips to protect ourselves and others from COVID-19, as preventive measures are the primary steps to avoid contracting the virus.





# Tips for protection against Covid-19



## TIPS TO PROTECT YOURSELF AND OTHERS



### KEEP YOURSELF SANITIZED

*Wash your hands often  
and well with soap and  
water or alcohol-based  
sanitizer.*



### WEAR A MASK

*Wear a mask to avoid  
the transmission of  
infected droplets in the  
surroundings.*



### AVOID GATHERINGS

*Maintain social  
distancing, prefer to  
stay at home with  
your family.*



### MAINTAIN A FAMILIAR ROUTINE

*While still practicing  
physical distancing  
by staying at home,  
inculcate some new  
things and activities.*



### MAINTAIN A WELL BEING

*Exercise or meditate at  
home to keep yourself  
fresh and energetic.*



### KEEP YOURSELF UPDATED

*Listen to local  
authorities for other  
directions and advice  
on how to stay safe.*



# Stem cell Therapy: Treatment for cancer




## OVERVIEW

The infographic below describes stem cell therapy. Basically, the raw (undifferentiated) cells of the body are known as the stem cells– the cells that give rise to all other cells with specialized functions. Under the right conditions, stem cells divide to form daughter cells in the body or in a laboratory. The infographic sheds some light on cancer stem cells (CSCs), applications of stem cells (in tissue regeneration, gene therapy, and as cellular delivery agents), the procedure and the stages of stem cell therapy and the procedure's merits and demerits.






# Stem cell Therapy: Treatment for cancer



**D.Y. PATEL  
INTERNATIONAL  
UNIVERSITY**  
Surat, India

## Stem Cell Therapy: Treatment for Cancer Cure

D.Y. Patel International University



**D.Y. PATEL  
INTERNATIONAL  
UNIVERSITY**  
Surat, India

### Introduction

(1).The use of stem cells to treat or prevent a disease or condition is known as stem-cell therapy.

(2).Hematopoietic stem cell transplantation is the only established stem cell therapy as of 2016.

(3).The cells are normally obtained from bone marrow transplantation, but they can also be obtained from umbilical cord blood.

### What are Cancer Stem Cells?

(1).Cancer stem cells are cancer cells that share characteristics with normal stem cells, such as the ability to produce all cell types present in a given cancer sample.

(2).CSCs are therefore tumorigenic, possibly in contrast to other cancer cells that are not tumorigenic.

(3).They live a lot longer than regular stem

### Stem Cell in Tissue Regeneration

(1).With their exceptional characteristics of self-renewal capability and the ability to differentiate into almost all forms of cells in the body, stem cells play a key role in regenerative medicine.

(2).Mesenchymal stem cells, embryonic stem cells, and induced pluripotent stem cells are all stem cells that can be used for tissue regeneration.

(3).Due to poor viability and reduced regenerative activity of transplanted cells, stem cell transplantation alone into damaged tissues had a low therapeutic efficacy.

### Stem Cells as Delivery Vehicles

The majority of stem cells are injected intravenously or intramuscularly. Stem cell therapy may provide immediate pain relief for arthritis patients. Stem cell therapies are a straightforward procedure that does not require an overnight stay in the hospital.

### Stem Cell Mediated Gene Therapy

The process of isolating stem cells (hematopoietic and nonhematopoietic) from patients with genetic disease, genetically correcting the stem cells, possibly expanding them ex vivo, and transplanting them back into patients with the goal of producing genetically corrected cells in vivo.

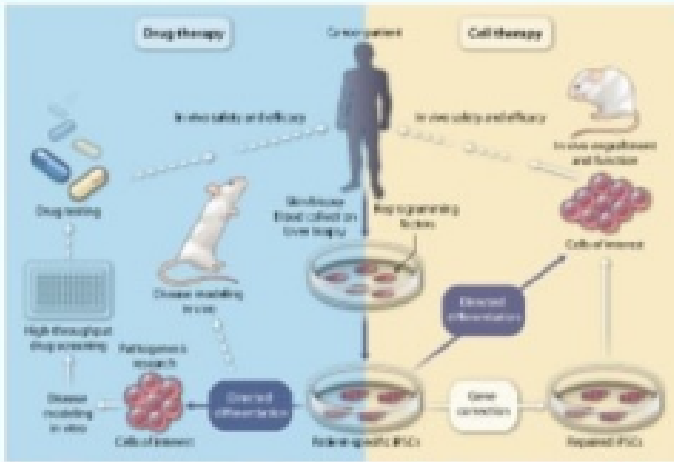
### Conclusion

**Advantages:-**

- (1).Regulate Immune System.
- (2).Re-Establish cell to cell communication.
- (3).Re-Generate Normal Blood Flow

**Disadvantages:-**

- (1).Low Blood Cell Count.
- (2).Hair and Skin Problem.
- (3).Lungs And Kidney Problems.



**Drug therapy** vs **Cell therapy**

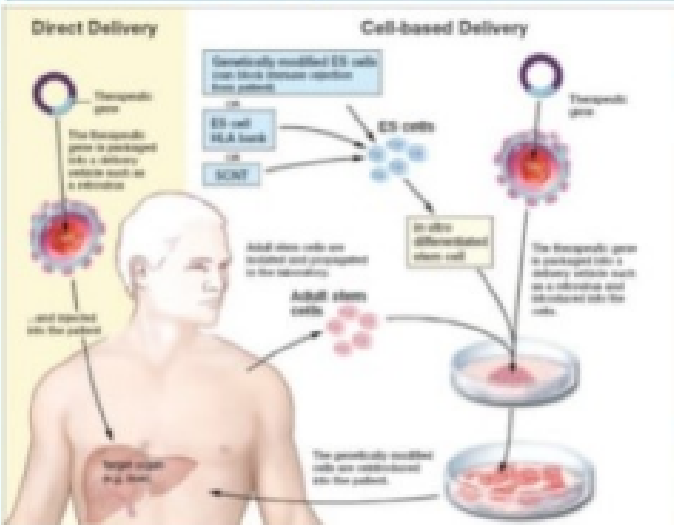
Drug therapy: Involves safety and efficacy, Drug testing, High throughput drug screening, Disease modeling in vivo, Disease modeling in vitro, Cells of interest, Overlaid stem cells, Reconstituted PSCs, Gene correction, Repaired PSCs.

Cell therapy: Involves safety and efficacy, In vivo repopulation and function, Cells of interest, Overlaid stem cells, Reconstituted PSCs, Gene correction, Repaired PSCs.

### Six stages of stem cell therapy

1. Stem cells moved from bone marrow to blood stream using chemotherapy and synthetic growth factor
2. Machine collects blood and separates out stem cells
3. Stem cells frozen ready to return to body later
4. More chemotherapy used to fully or partially wipe out bone marrow and immune system
5. Stem cells returned to body using a drip
6. Body recovers over a period of 3-6 months, sometimes longer

[mstrust.org.uk/stemcells](http://mstrust.org.uk/stemcells)



**Direct Delivery**: Therapeutic gene, The therapeutic gene is packaged into a delivery vehicle such as a retrovirus and injected into the patient, Target cancer cells, and treated with the patient.

**Cell-based Delivery**: Genetically modified ES cells can track disease progression from patient, ES cell, HLA link, or SCNT, Adult stem cells are isolated and propagated in the laboratory, The genetically modified cells are transplanted into the patient, In vitro differentiated stem cell, The therapeutic gene is packaged into a delivery vehicle such as a retrovirus and injected into the cells.

### Identification of Stem Cells

Cancer Stem Cells	Cancer Tumor Cells
Tumorigenicity	Large in Size
Sustained Proliferation	Disorganized Arrangement
Bentley	Loss of Normal Features

### The Autologous Transplant Process

1. Collection: Stem cells are collected from the patient's bone marrow or blood.
2. Processing: Dead or least number is processed in the laboratory to a unit and concentrate the stem cells.
3. Cryopreservation: Blood or bone marrow is frozen to preserve it.
4. Chemotherapy: High dose chemotherapy and/or radiation therapy is given to the patient.
5. Reinfusion: Thawed stem cells are reinfused into the patient.

**Reference:-** (1). Google  
 (2).[https://cancerbiomedcentral.com/articles/10.1186/1475-2867-7-9#:~:text=Theoretically%2C%20identification%20of%20the%20cancer,proliferative%20capability%20\(figure%203\).](https://cancerbiomedcentral.com/articles/10.1186/1475-2867-7-9#:~:text=Theoretically%2C%20identification%20of%20the%20cancer,proliferative%20capability%20(figure%203).)



# The mystery of yawning



## OVERVIEW

The infographic below explains the mystery of yawning. Yawning is a phylogenetically ancient stereotyped phenomenon that occurs in almost all vertebrates. It has many consequences as an emotional behavior and an expressive movement. Yawns help to open our eustachian tubes, which control air pressure in the middle ear.





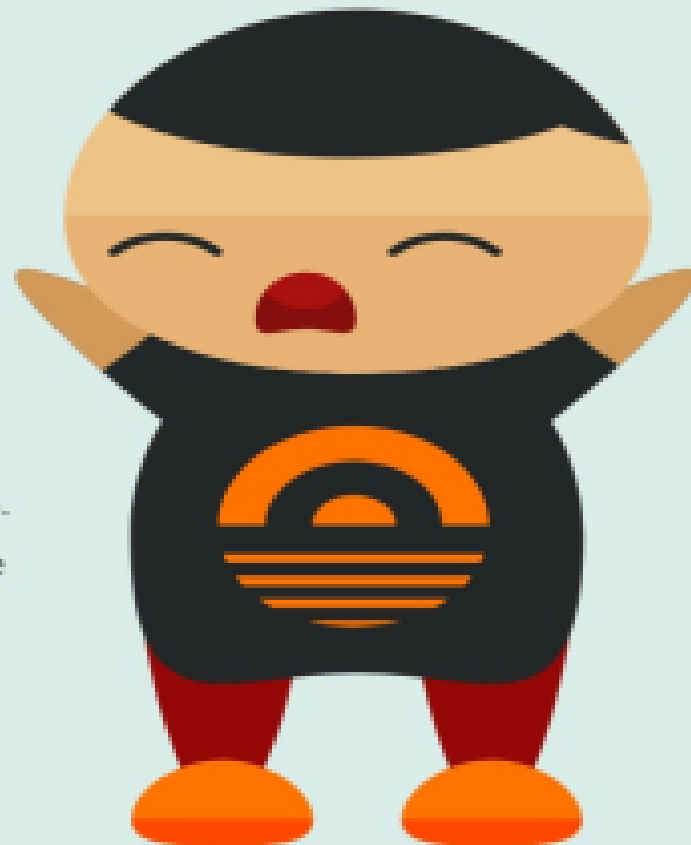
# The mystery of yawning

The yawn  
/yŏn/  
verb

## The Mystery of Yawning

Involuntarily open one's mouth wide and inhale deeply due to tiredness or boredom.







We all do it, humans and animals alike. We wake up, we yawn and straight and make strange noises. In the middle of the day, hunched over our computer monitors, typing away. At night, halfway through our Netflix show. But why do we yawn, does it have an effect on us, and what should we do if we keep yawning?



## The Many Theories

We don't have a bullet-proof answer for why we yawn. Instead, we only have a set of theories.



-  1 Yawning helps your body bring in more oxygen.
-  2 Yawning helps your body get rid of excess carbon dioxide.
-  3 Yawning is evolutionary and a form of prehistoric man intimidating predators.
-  4 Yawning was a sign that a change in activities is needed.
-  5 Yawning is a result of feeling bored.
-  6 Yawning cools the brain, allowing for clear thinking (the current theory).

## What Happens When We Yawn?



We take a very deep breath



Our muscles stretch and flex, along with our joints



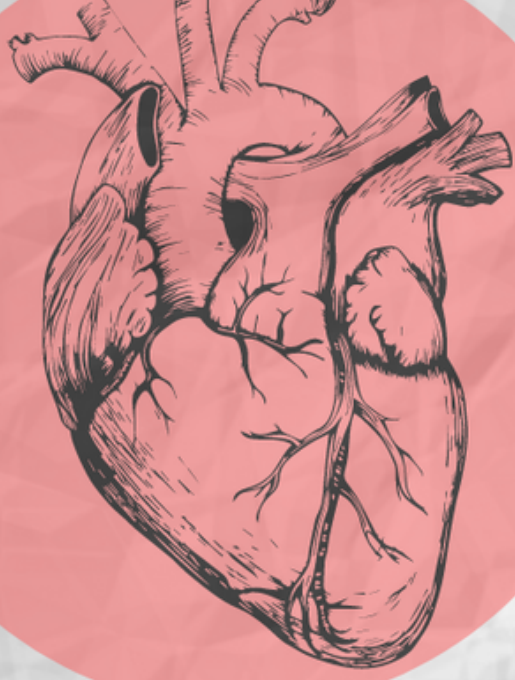
Our lungs expand, taking in a large amount of oxygen



Our facial muscles stretch, forcing more blood to flow to those areas (including the brain)



# ILLUSTRATORY



The following section, of Illustratory, comprises of illustrations– Not only does pictorial representation simplify content, but also considerably accentuates its understanding and leaves a lasting impression!







# Insulin Production using Recombinant DNA Technology

## Overview

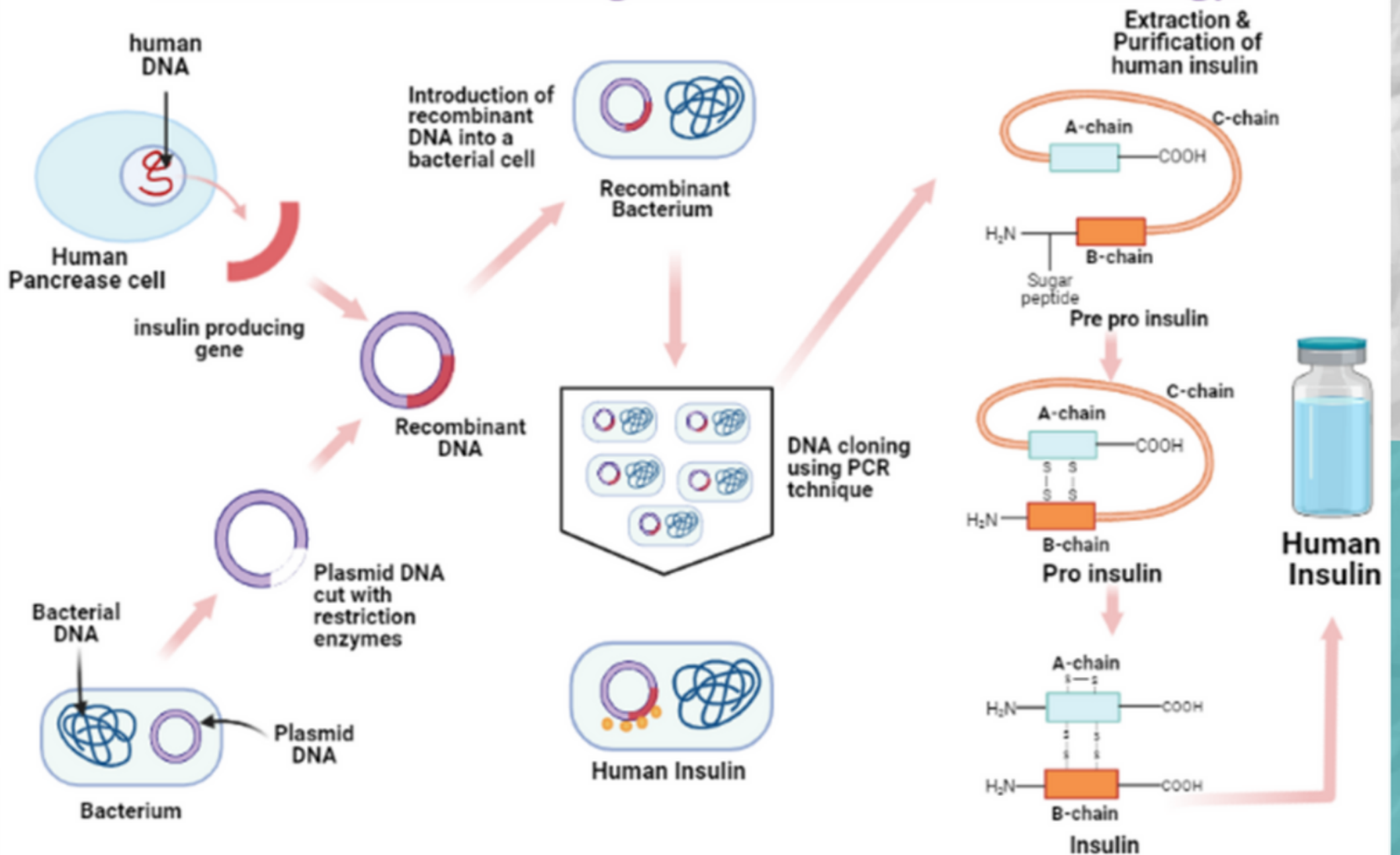
Human insulin was first produced by using recombinant DNA technology. It is a therapeutic product. The illustration presented below explains the steps involved in the process of recombinant DNA technology.

It shows that the gene responsible for the production of insulin, is extracted from a human pancreatic cell and is integrated with the genome of a plasmid isolated from a bacterial cell. The bacterial cell is then subjected to rapid replication, after which the mass produced insulin is extracted and purified into a usable form.





## Insulin Production Using Recombinant DNA Technology



Created in BioRender.com





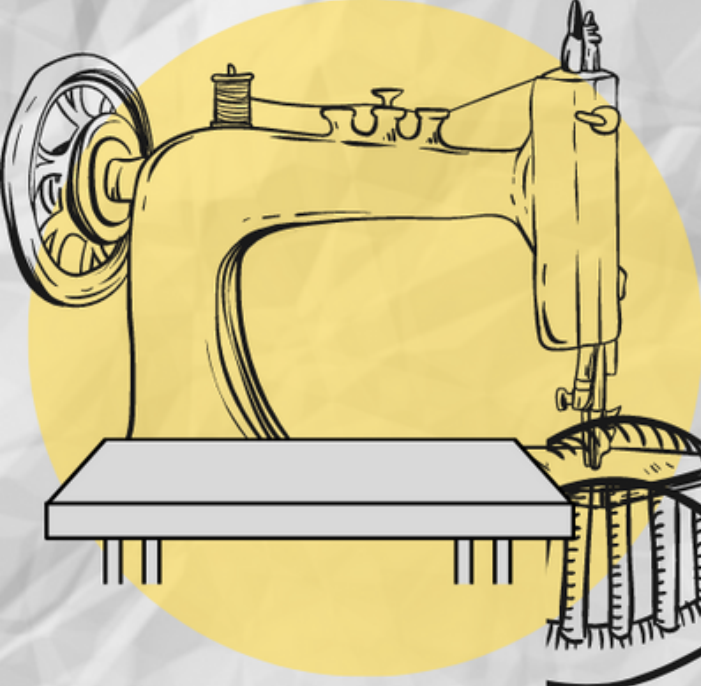
# Insulin Production using Recombinant DNA Technology

## Description

**H**uman insulin was the first therapeutic product developed by using the Recombinant DNA Technology. The gene responsible for the production of human insulin is extracted from human pancreatic cells. Then, a plasmid is isolated from a bacterial cell. Further, to start and complete the process, special restriction enzymes are used to cut the plasmid at specific sites. The gene for insulin is then inserted into the plasmid. This process is referred to as the Recombinant Technology.

The recombinant DNA is then inserted back into the host (bacterial) cell and the host undergoes cloning using PCR (Polymerase Chain Reaction). As the bacterial cells reproduce, human insulin is also replicated. Lastly, after down streaming procedures, the processed human insulin is collected and employed to perform its function in the human body.





# Semi-conservative DNA Replication

## Overview

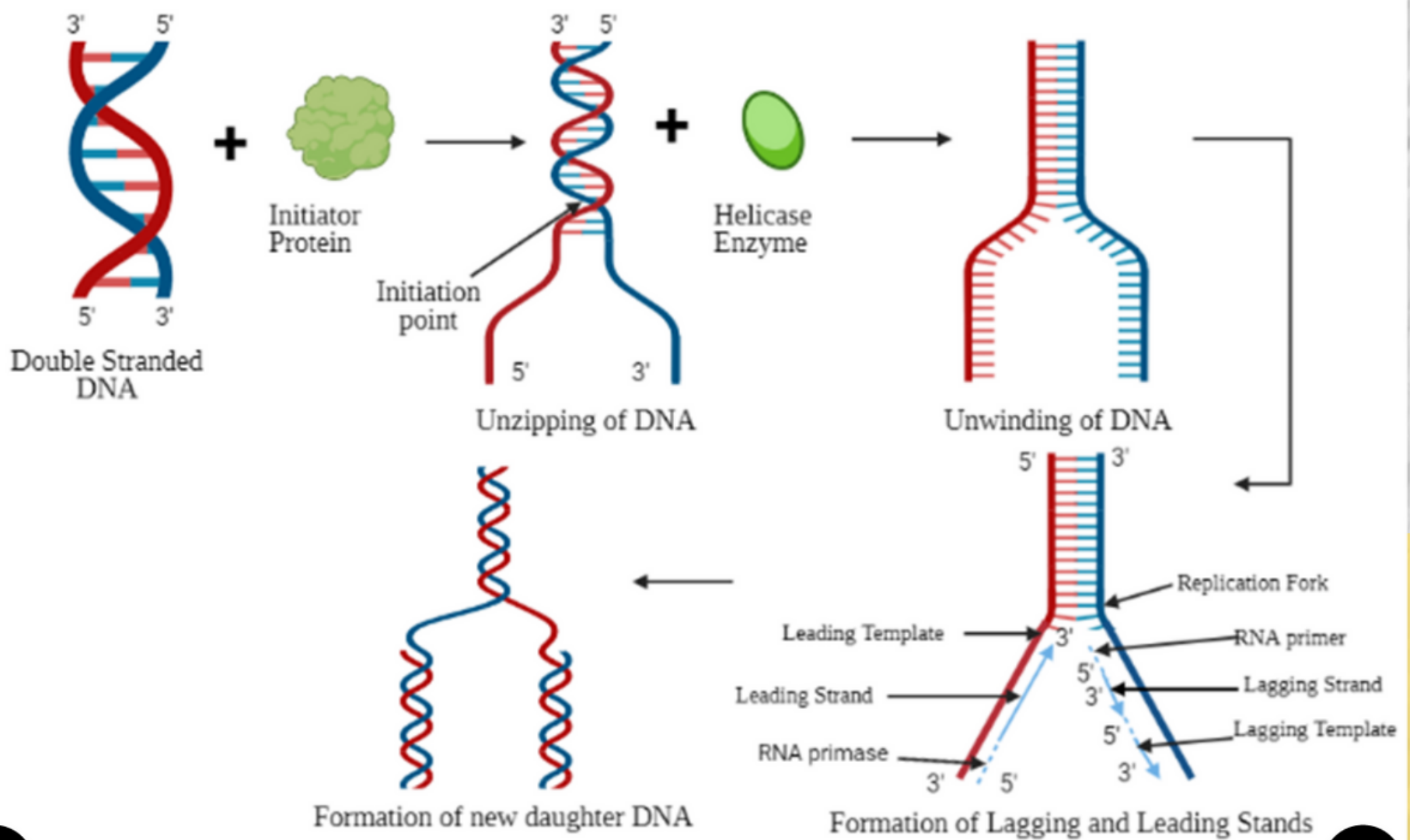
DNA serves as the primary genetic material in most organisms. When a cell undergoes division, it produces copies of its DNA for both the daughter cells to inherit identical DNA molecules. The production of copies of parental DNA is achieved by a phenomenon called semi-conservative replication.

The illustration presented below deconstructs the steps and reveals the elements involved in the semi-conservative replication of DNA.



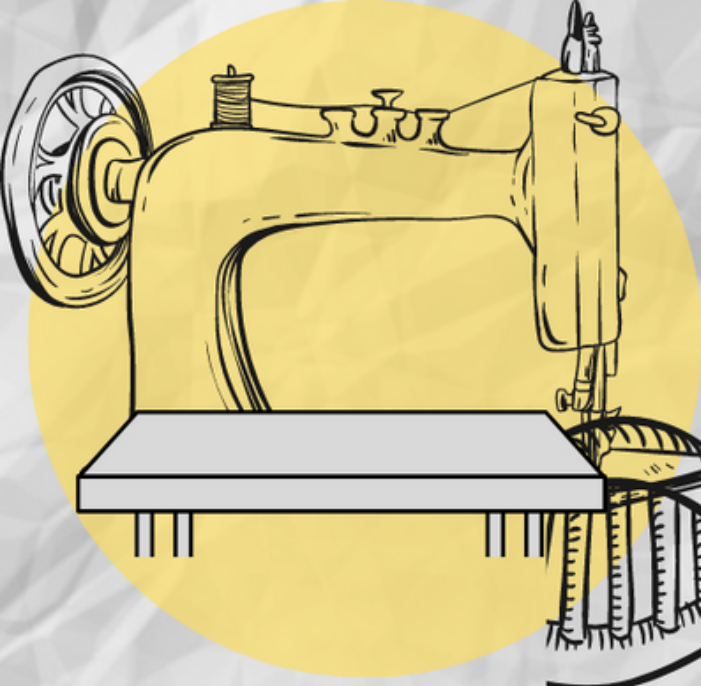


## Semi-conservative Replication of DNA



Created in BioRender.com





# Semi-conservative DNA Replication



## Description

The process in which a DNA molecule produces an exact copy or replica of itself is known as the replication of DNA.

The activation of the nucleotides is the first step of DNA replication, and then the unzipping of the DNA takes place due to the initiator proteins. Next comes the unwinding of DNA strands which takes place with the help of helicase enzymes, here the strands of DNA are free from each other but not separated.

Lastly, the synthesis of new strands takes place directing to the formation of leading and lagging strands and thus resulting in the formation of daughter DNA molecules.

After replication, each DNA molecule has one old and the other new strand, which shows that 50% part of the mother molecule is retained and 50% is newly constructed. Hence it is semi-conservative replication.







# What's Your **Blood** Group?

## Overview

The ABO blood grouping system is the famous classification of blood groups given by Karl Landsteiner.

According to this system, blood types are classified as blood groups A, B, AB or O, depending on the antigens present in an individual's red blood cells (erythrocytes).

The illustration presented below explains how an individual's blood type is determined based on the–

- presence or absence of agglutinogens A & B, and the
- presence or absence of the Rh protein on the surface a red blood cell.



# What's Your Blood Type?

The **ABO blood type system** classifies blood into 4 types: A, B, AB, and O.



Two different molecules called agglutinogens, type **A** and type **B**, are attached to the surface of red blood cells.

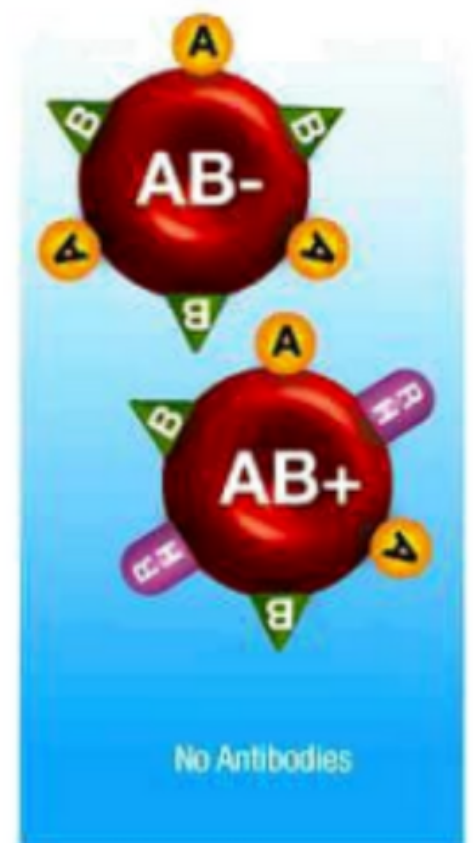
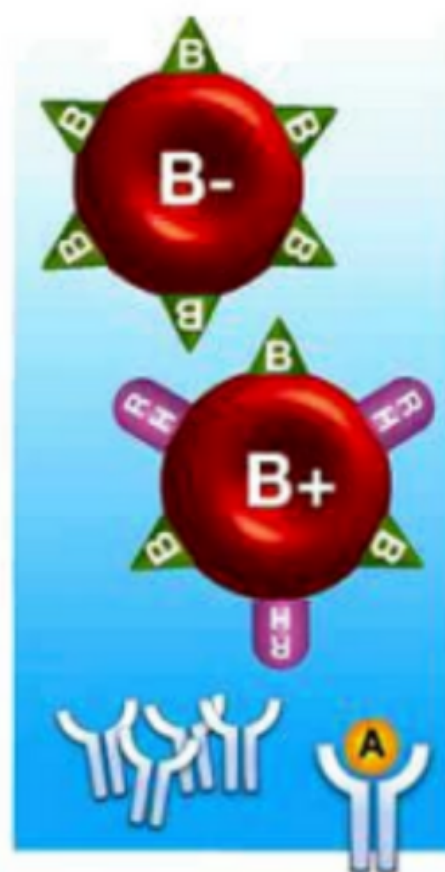
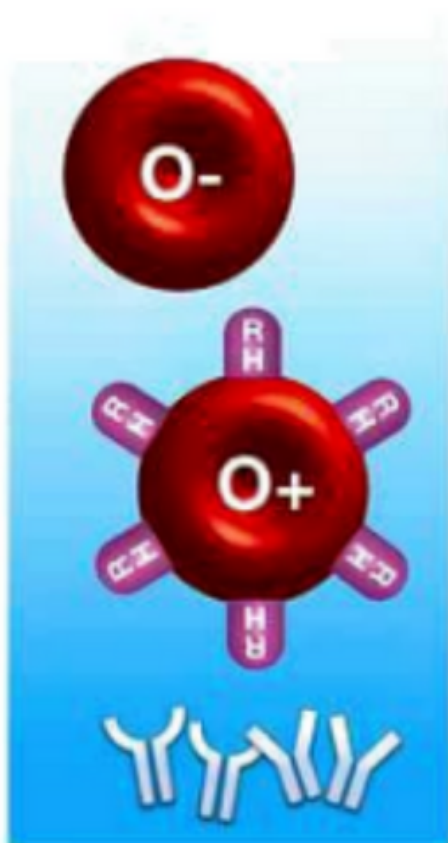
The absence of either A or B type agglutinogens determines an **O blood type**.

The presence of A type agglutinogens determines **A type blood**.

The presence of B type agglutinogens represents **B type blood**.

If both A and B agglutinogens are present, the blood is **AB type blood**.

The presence or absence of **RH** protein determines whether a type is positive (+) or negative (-).



Your body produces antibodies to protect against antigens. Antibodies in your blood recognize antigens on blood cells.

**Universal donor**



**Universal recipient**





# FACTOLOGS



The following section, of FactoLogs, comprises of blogs- arguably one of the most beloved styles of communicating in the present day- imparting boundless liberty to the writer and striking a chord with readers!





# GRANDPA TALES

T.U.M.O.R.

This is a storytelling creation that simplifies understanding the difference between normal and cancerous cells and their types- malignant and benign.

Cancer is one of the leading causes of death globally and spreading awareness about it can help many with early diagnosis.

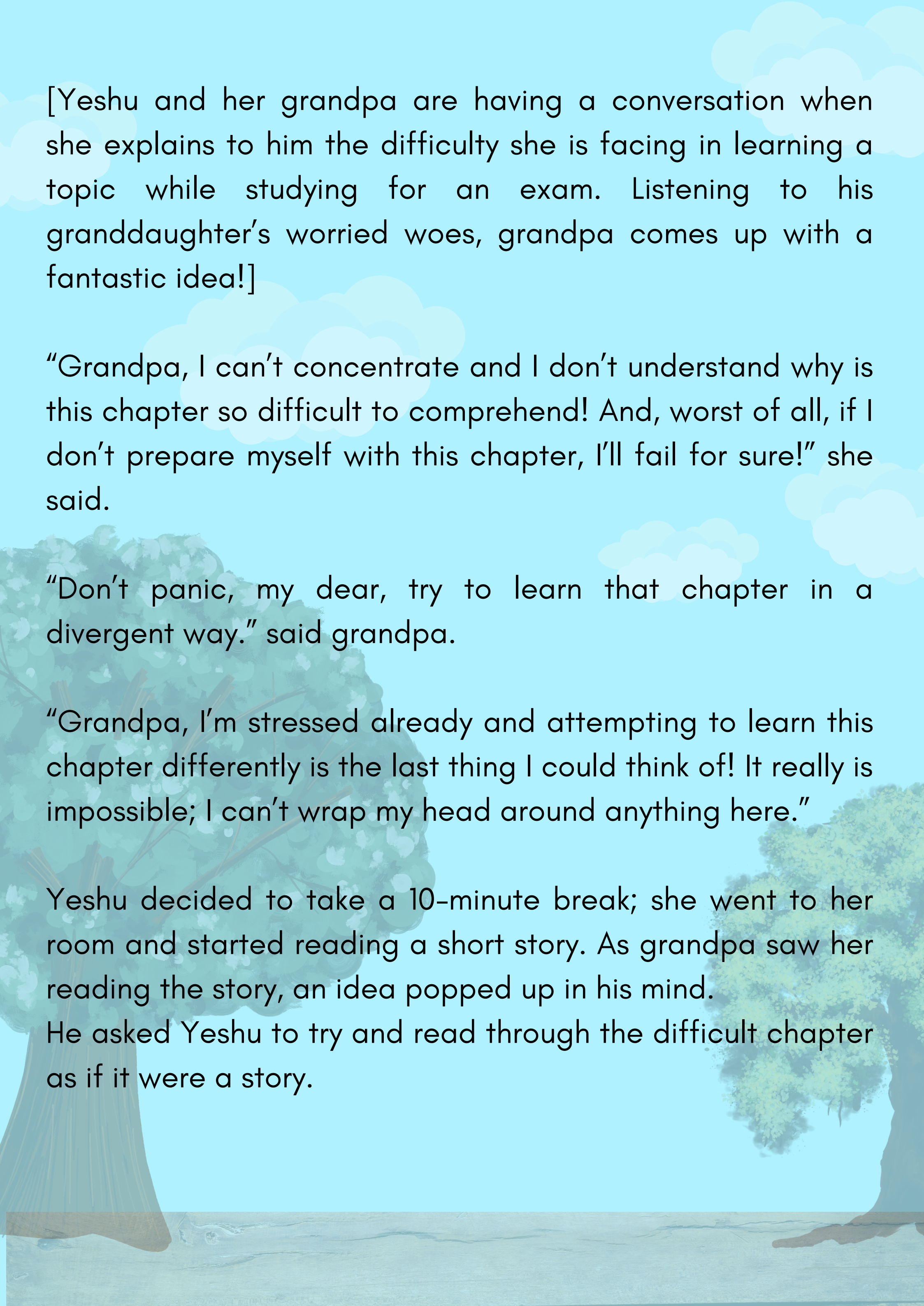
Please enjoy the conversation between a grandfather and his granddaughter that ensues.

**Lemme tell  
you a  
storrry!**

**Yayyy!!!**







[Yeshu and her grandpa are having a conversation when she explains to him the difficulty she is facing in learning a topic while studying for an exam. Listening to his granddaughter's worried woes, grandpa comes up with a fantastic idea!]

"Grandpa, I can't concentrate and I don't understand why is this chapter so difficult to comprehend! And, worst of all, if I don't prepare myself with this chapter, I'll fail for sure!" she said.

"Don't panic, my dear, try to learn that chapter in a divergent way." said grandpa.

"Grandpa, I'm stressed already and attempting to learn this chapter differently is the last thing I could think of! It really is impossible; I can't wrap my head around anything here."

Yeshu decided to take a 10-minute break; she went to her room and started reading a short story. As grandpa saw her reading the story, an idea popped up in his mind.

He asked Yeshu to try and read through the difficult chapter as if it were a story.





He then asked her, "Which topic are you struggling with, dear?"

"Cancer and tumour" she answered.

"But how will I form this topic into a story? Do you have an idea?" she questioned.

Grandpa answered, "Let me help you out with this. After all, isn't it obvious that when it comes to storytelling, we grandparents can become magicians and be your saviours?!"

"You are the coolest grandpa!" Yeshe exclaimed.

"Now, my child, carefully listen to my narration," Grandpa said.

Grandpa starts narrating the story to Yeshe.

"Once lived a boy named Chris, he was learning in an academy where he had many friends. He had a best friend named Felix. Surprisingly, these two had completely opposite personalities. Chris would always be reluctant to mingle with his friends unless someone insisted that he does so. On the other hand, Felix was extremely outgoing and would voluntarily interact with his friends. Felix started growing tired of pushing Chris to socialise and slowing their friendship withered."



One day, when Chris arrived at the academy, he was poked and ridiculed by his classmates. He figured that Felix must have started rumours of him being a sulky loner or something similar. To Chris' annoyance, these rumours were spreading like wildfire. He felt pressured, upset, and unwanted. Eventually, he started avoiding being at or near the academy."

"So grandpa, are you trying to say that Chris is the normal cell and Felix is the cancerous cell?"

"Yes, dear! See how easy that was! You sure are a fast learner and I am proud of you!"

"Thank you, grandpa! You explained to me the difference between normal and cancerous cells, but what about the different types of tumours?"

"Mmmhh....let me think about this."

After a while, grandpa comes up with a story and starts narrating it to Yeshu.

"So now, let's say Felix and his siblings were born triplets. He had twin brothers named Lee and Han. Both of his twins were mischievous and used to prank others.



When Lee teased others, he usually wouldn't hurt their feelings and would stop if they were hurt. But, sometimes his pranks would leave a lasting effect on some. While Han was apathetic and would often hurt others' feelings. However, when someone begged Han to stop, he would stop and mask his misbehaviour. After some time though, Han would reveal himself and start teasing the target again and do meaner things, until the target submits."

Yeshe then understood that malignant tumours are more dangerous than benign ones and would mostly cause death. Likewise, she understood that if a benign tumour occurs in the brain, it could be fatal.

"I hope you've now understood the concepts of cancer, tumour, and their impact, Yeshe? Nowadays we have the medical infrastructure available to detect cancer at an early stage."

"Yes, yes, I've understood everything you explained. Thank you so much, grandpa!"

"Thanking me is not enough, sweetie, I want you to treat me with delicious sweets after your exam."

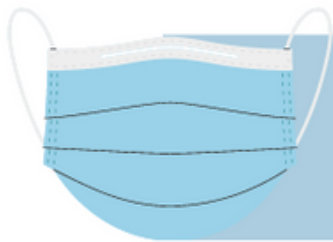




BREAKING NEWS



# **My experience with Covid -19 and opinion for the justice of the healthcare workers**



## **Overview**

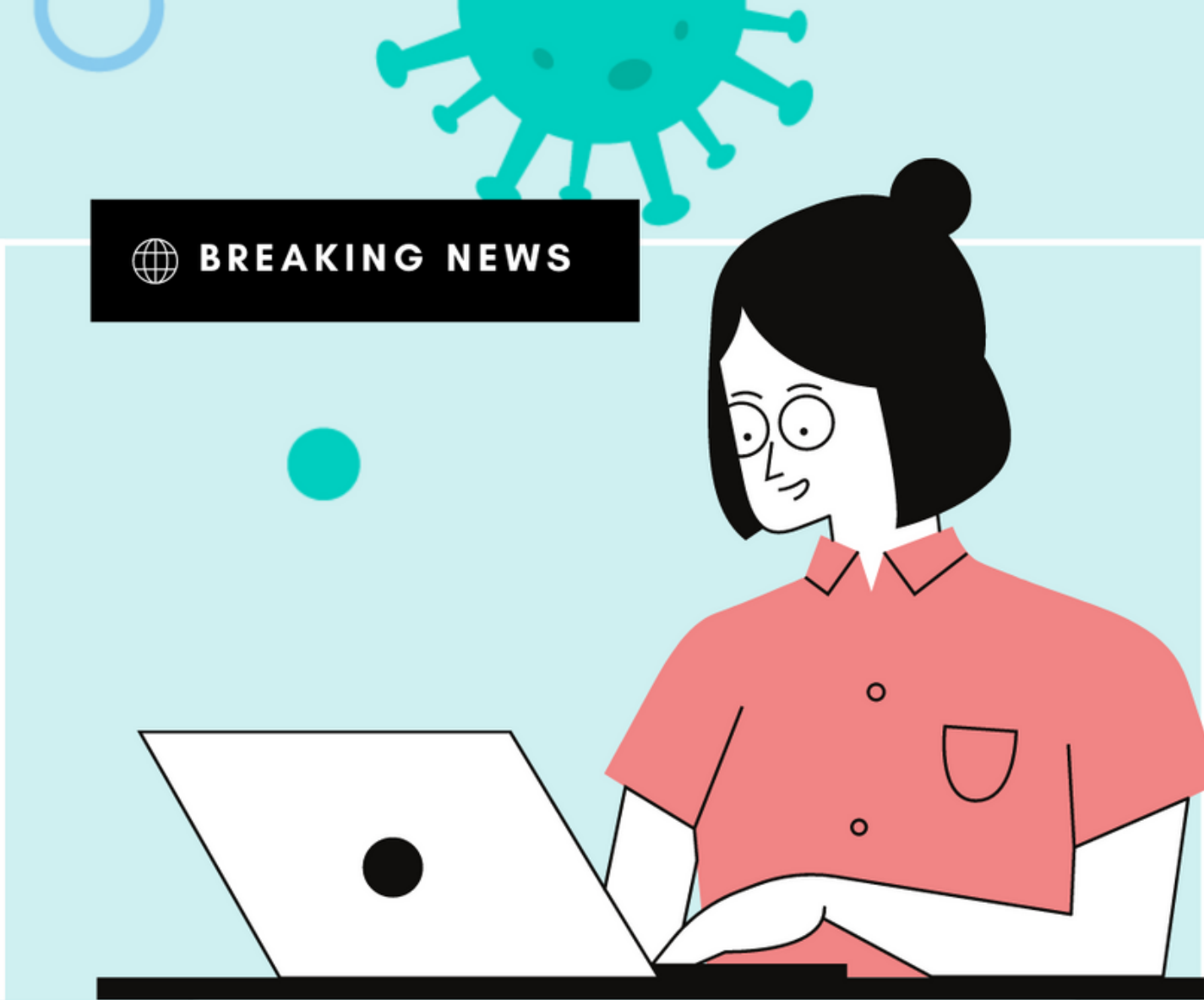
COVID-19 is a viral infection caused by the SARS-CoV-2 virus. Most people infected by the virus develop a mild to moderate respiratory illness and will recover without the need for special treatment. However, older people, as well as those with underlying medical conditions such as cardiovascular disease, diabetes, chronic respiratory disease, or cancer, are at a higher risk of developing serious illness. Being well-informed about the disease and how the virus spreads is the best way to prevent its transmission.

→ In the following blog, the writer expresses her personal experiences during the COVID-19 pandemic.





BREAKING NEWS



## **My experience with Covid -19 and opinion for the justice of the healthcare workers**

My love for writing and passion for the medicinal field has always given me a sight to look into things deeper and with a different perspective altogether, a perspective which is kinder and filled with compassion. In times like these where the world is filled with voids and collective grief, it is more important to use such minds, minds of doctors, pharmaceuticals and all the frontline workers who understand such empathetic qualities quite well.



**So, the question here arises: what happened in the world which shook it throughout? What is coronavirus and why is everyone scared of Covid 19 and the chaos it is creating around us?**

The world did experience millions of deaths in human history from heart attacks and deadly diseases such as cancers and mental illnesses such as depression which never had awareness like the awareness we want to create for the new deadly disease – Covid-19 or coronavirus. These mentioned diseases can be cured by fitting pacemakers in the heart and procedures like angioplasty and by bringing lifestyle changes, cancer patients have support groups, chemotherapy and drugs which can kill the tumour cells and mental illnesses like depression can be cured through the drugs like SSRIs, antidepressants and anxiolytic. Other than medicines, therapies help too.



# What about this new disease ?

Coronavirus is an airborne disease that the infected person can pass on to a non-infected person through sneezing and coughing. The pathogenesis of Covid-19 is – the Covid-19 virus enters through the nasal cavity and reaches the epithelial surface of the lungs. The spike protein of Covid-19 attacks ACE-2 receptors. The virus RNA uses the host cells to create new virus RNA and assemble new viral particles. These viral particles are released which attack new cells. When the SAR-Cov-2 virus binds ACE2 it prevents ACE2 from performing its normal functions to regulate ANG II signalling. Thus, ACE2 action is “inhibited”, removing the brakes from ANG II signalling and making more ANG II available to injure tissue. In this process alveoli cells are damaged and this, in turn, decreases the oxygen level in the blood due to impaired gas exchange.



Also, the neutrophils and platelets seem to activate each other and result in excessive coagulation of blood vessels which causes damage to nearby tissues. It is 14-day long disease torture and can stay longer if proper precautions are not taken care. Isolation from the outside world, being quarantined and social distancing with the mask on are important at all times.

I, with my family of 9 members, were infected by covid-19 in December 2020. It was all of a sudden, even after staying indoors and taking precautions for over a year now.

My father started to show the symptoms—fever, dry cough and breathlessness. We had educated ourselves about the symptoms so he was immediately quarantined in his room.

So the next day we got ourselves tested but by the time we could get the results the spreading of the virus in the whole family was already done, as we all started showing symptoms.

The next day it was my aunt and uncle and the day after that it was my mom and the other 2 members of the family. My grandmother and my two siblings were still safe but we could all feel the weakness. My brothers and I tried to maintain a positive environment so it won't affect the elders.





It was the 4th day after my father started to show the symptoms that his oxygen level started to drop. We immediately called the hospitals for the arrangement of the bed. December was the time when the Covid-19 cases in the country were low and luckily, we got a bed for my dad, uncle and my grandmother in the span of 2 weeks. Dad was followed by my uncle and then grandmother. Uncle was in the ICU for the first week and both were treated with plasma therapy which started to show good signs in their immunity. The day my father was admitted, I started showing symptoms, it was fever and terrible weakness where I couldn't stand. I was the last one to show all the symptoms. I had experienced stress due to some personal and academic reasons.

— “ —

**"I can tell you one thing for sure that stress and covid, do not go well together. "**

— ” —

All of us showed symptoms like loss of smell and taste followed by sore throat and fever for the first couple of days, with disturbed Cir-cardian rhythm and an increase in appetite.

— “ —

**"It is funny how we lose the ability to taste and our appetite decides to increase."**

— ” —



My elder family members are above 40, all with diseases like blood pressure, diabetes, and thyroid disease. Covid -19 gets severe with such diseases. Thus, getting them hospitalized with breathlessness issues. Covid-19 in the young generation isn't as fatal as it is for the older generation. Proper care, diet and rest make it easier to fight the battle against covid-19. We made sure to keep a tab on our fever and oxygen levels from an oximeter every 2-3 hours. The home remedies which we followed to reduce our sore throat was gargling with salt and hot water every morning and to clear the blockage in our nose and get back our sense of smell we did take steam for 15-20 minutes every 3-4 hours which is thrice in a day. We made sure we did breathing exercises twice or thrice a day to keep our lungs healthy.



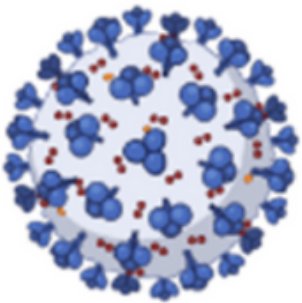
Post covid recovery care becomes an essential topic as you have fought with a very dangerous virus which can destroy your lungs. Proper care and nourishment are what we should look after with an ample amount of rest. I am thankful for the doctors and all the healthcare workers who took care of my family in the hospital. They gave hourly updates and made sure the environment around the patient is calm and neat. Moreover, the doctors who were in touch with the rest of us on call from home gave us the perfect home remedies to follow and prescribed us the medicines right on time. They did not forget to take our health updates regularly.



After so much dedication from the healthcare workers, the world seems to do injustice by performing different kinds of assaults on the doctors and their teams. It takes a lot of courage and determination to fight this deadly illness, they deserve a lot more than we can ever give them from our words. Everyone has to understand this and if they don't, humanity is to be questioned here- it is about standing united in times of crises such as this pandemic.

## Here is an illustration which shows the timeline of a Covid-19 patient.

### Symptoms and timeline of a covid positive pateint



Doctors have found the minimal tretments for the early stages of Covid-19,but have developed a small arsenal of thearapies to emply as symptoms becomes more severe. reseache continues on how and when to administer drugs,oxygen and other treatments.



Fever,cough and loss of smell and taste- advised for rest and fluids which can decrete the symptoms. check of oxygen levels. Oxygen is delvered through nasal prongs, a mask or an invasive breathing tube is crucial druing Covid-19 care.



After identification of symptoms ,the first important step is to get yourself texted and quaratined. Social distancing and wearing a mask in imp at all times. Nasaopharyngeal swab collection is one of the way to test the patient.



Doctors say vitamin C is very helpful to cure Covid-19 or to reduce its effects, and multivitamin tablets and antibiotics becomes essential too. the other care includes breathing excercies ,home remedies like gargle and steam.

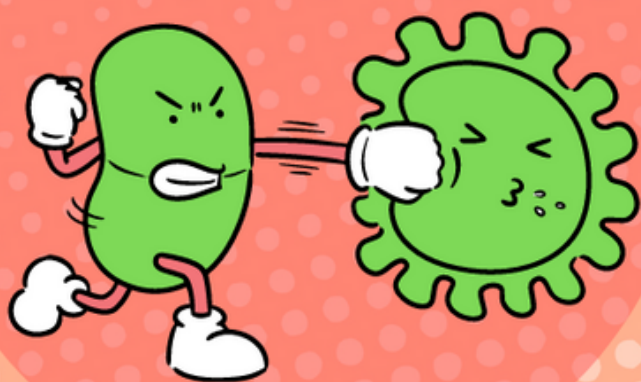


Hospitalization is necessary in severe conditions for the patients with heart conditions,,disabete,liver or lung diseases,etc.The immunosuppressant drugs have reduced mortality in large clinical trails of hospitalized patients ,showing its possible thats its possible to tame the potentially deadly inflammation that characterises severe disease. Post covid recovery is very important too

Created in BioRender.com 



# sci-factomics



The following section, of Sci-FactOmics, comprises of comics- the timeless form of narrating a story with speech bubbles and graphics that we can't get enough of!

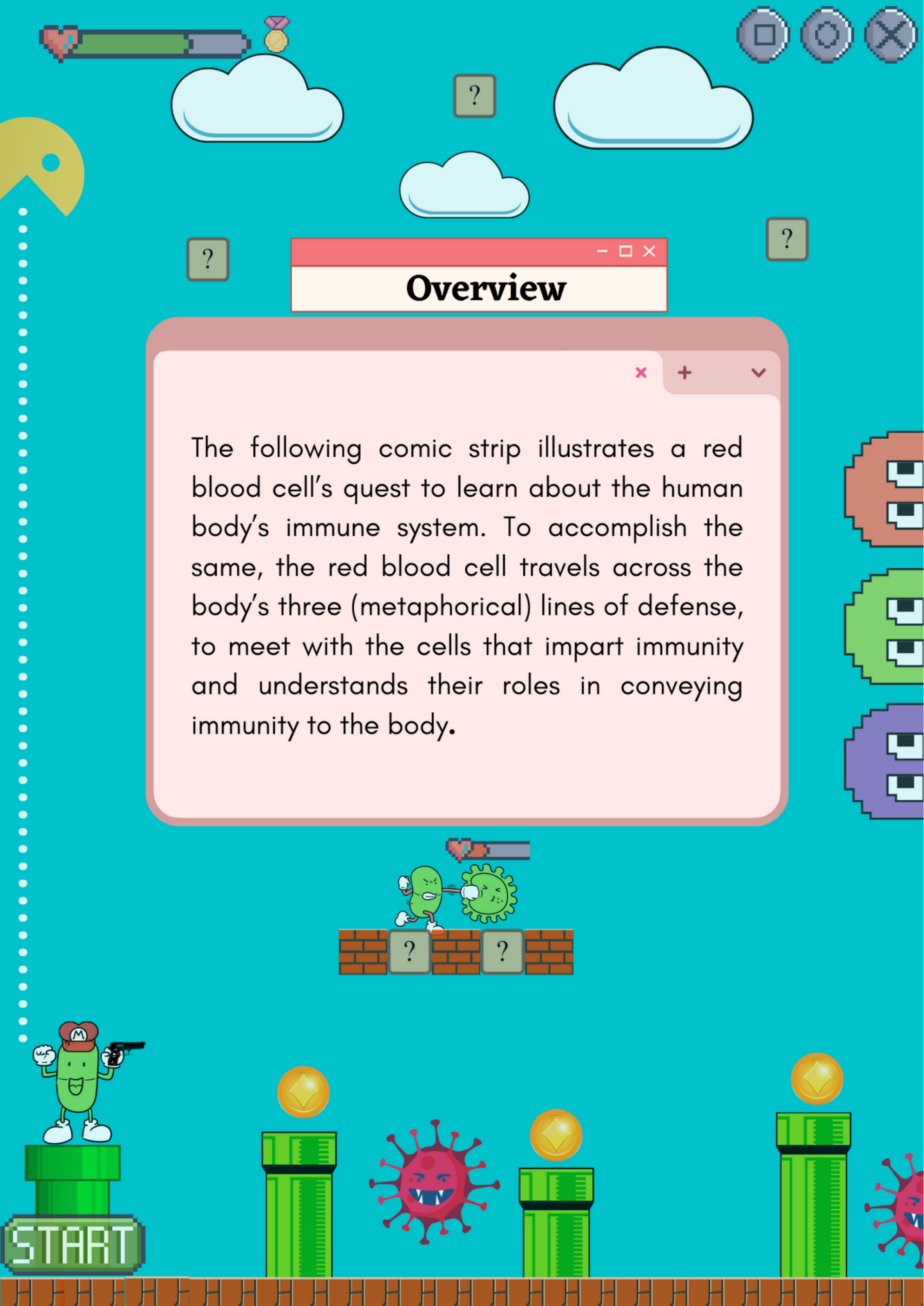




A vibrant cartoon illustration featuring five anthropomorphic immune cells. At the top, a green spiky cell and a green bean-shaped cell are boxing. Below them, a purple fuzzy cell, an orange spiky cell with pixelated sunglasses, a green bean-shaped cell, a yellow pill-shaped cell, and a red fuzzy cell are cheering with their fists raised. In the center, a cluster of grey virus-like particles is shown. The background is dark blue with white diagonal streaks and faint sketches of various cells.

# IMMUNITY WARRIORS





## Overview

The following comic strip illustrates a red blood cell's quest to learn about the human body's immune system. To accomplish the same, the red blood cell travels across the body's three (metaphorical) lines of defense, to meet with the cells that impart immunity and understands their roles in conveying immunity to the body.



HI THERE, MY FELLOW VIEWERS! I AM AN RBC;  
YOU MAY RECOGNIZE ME AS AN  
'ERYTHROCYTE' (MY SCIENTIFIC NAME). AS  
MOST OF YOU MIGHT KNOW, I TRANSPORT  
OXYGEN AND MINERALS IN YOUR BODIES. I AM  
HERE TO GUIDE YOU ABOUT HOW MY  
BROTHERS- THE WHITE BLOOD CELLS, PROTECT  
YOUR BODY AGAINST PATHOGENS. ON LARGE,  
WE'LL SEE HOW OUR IMMUNE SYSTEMS WORK!

RBC

WHILE WE, RBCS, TRAVEL  
ALONGSIDE OUR BROTHERS (WBCS),  
WE'LL MEET OUR FELLOW  
COLLEAGUES. BUT, BEFORE WE GET  
THERE, I WOULD LIKE TO DEBRIEF  
Y'ALL ABOUT HOW OUR IMMUNE  
SYSTEMS WORK.

RBC

OUR IMMUNE SYSTEM HAS 3 LINES OF  
DEFENSE-  
1. SKIN AND MUCOUS MEMBRANES  
2. MACROPHAGES (PHAGOCYTIC WBCS)  
3. B-CELLS AND T-CELLS  
(LYMPHOCYTES: SPECIFIC CLASS OF  
WBCS)

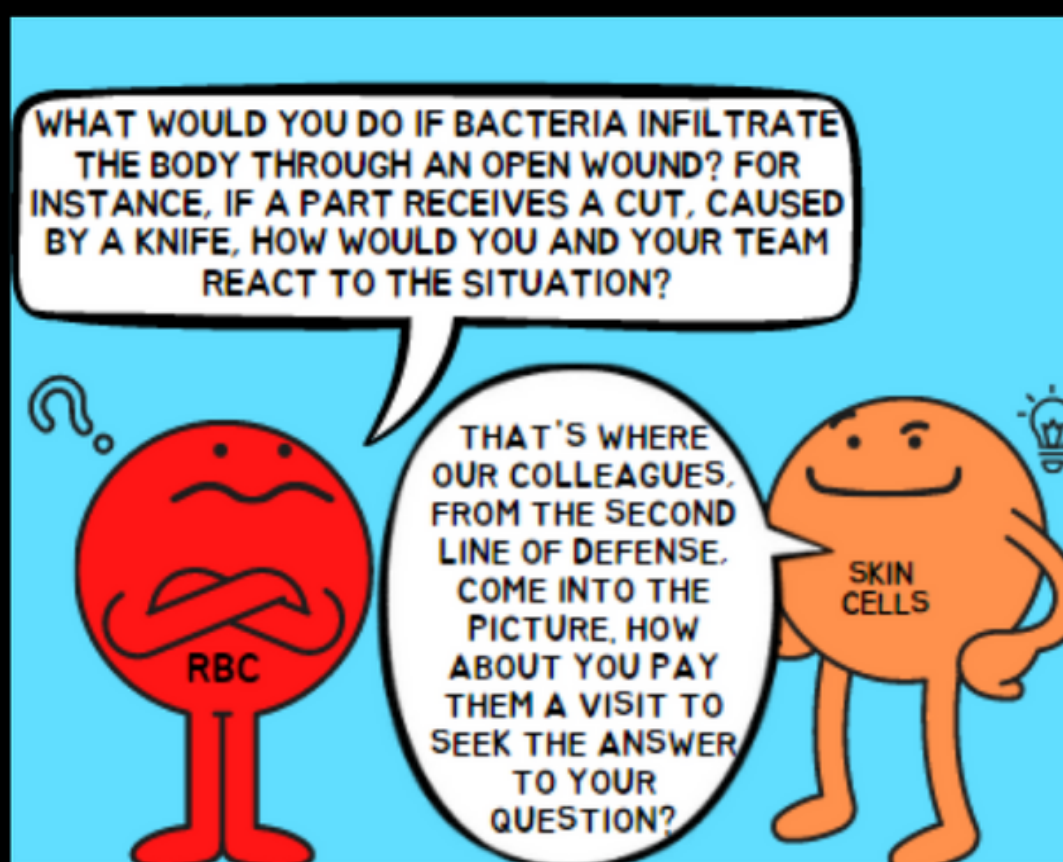
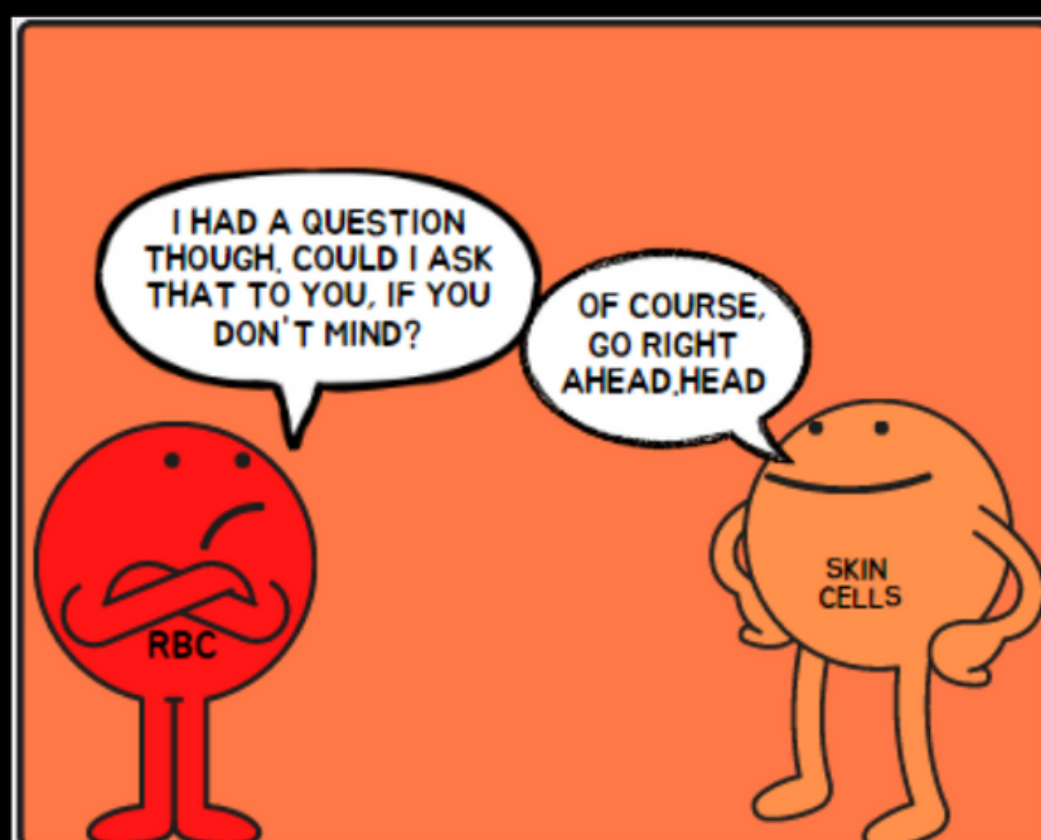
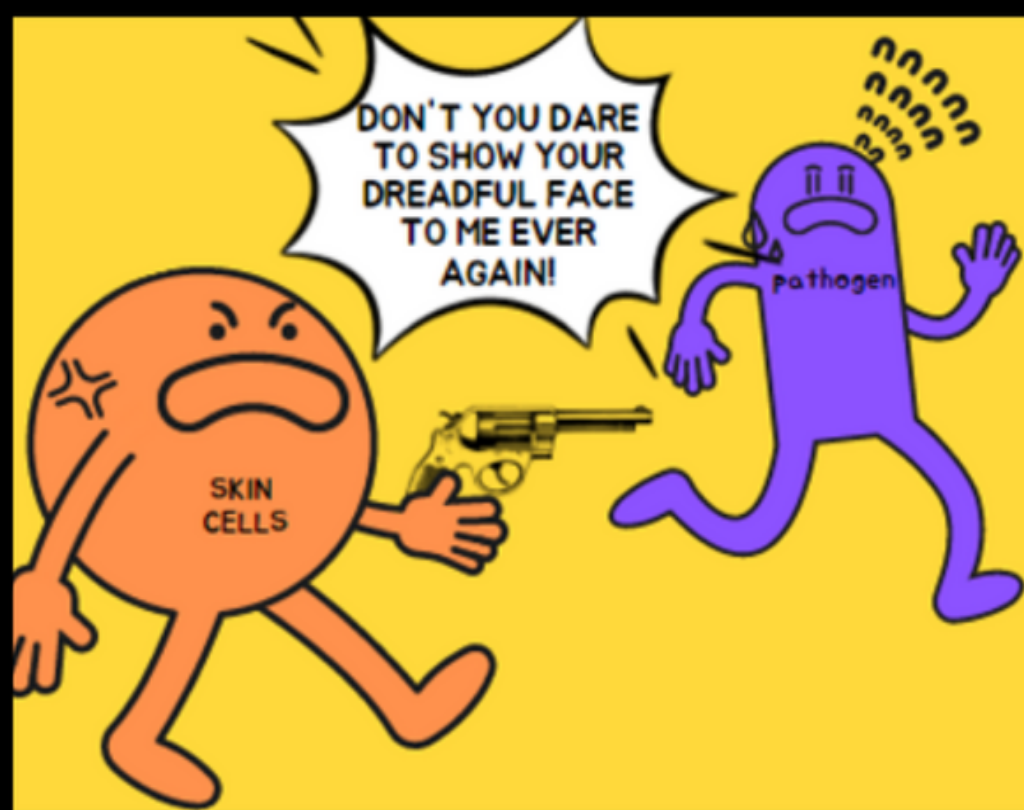
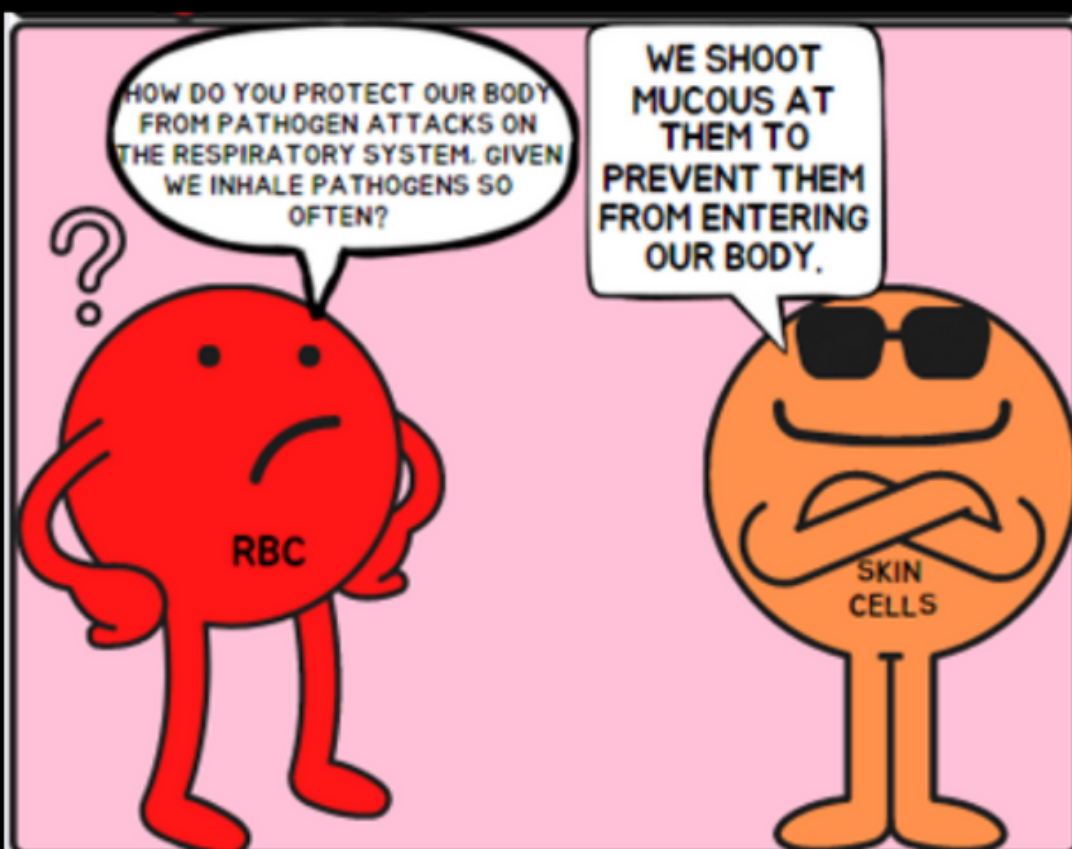
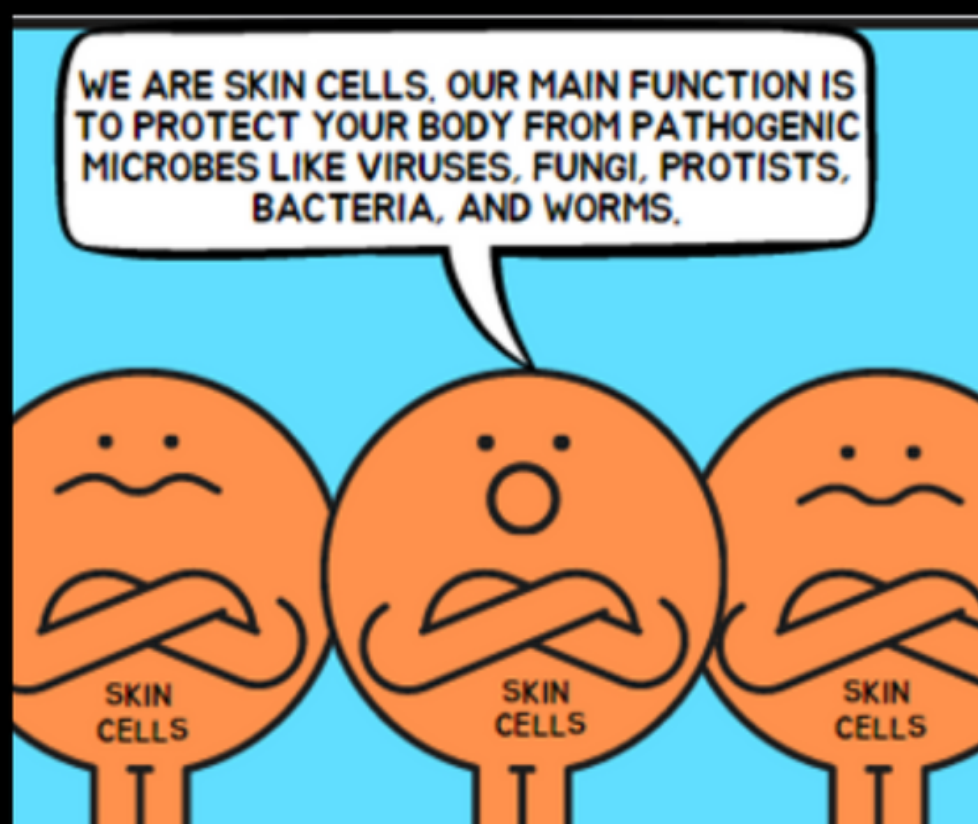
RBC



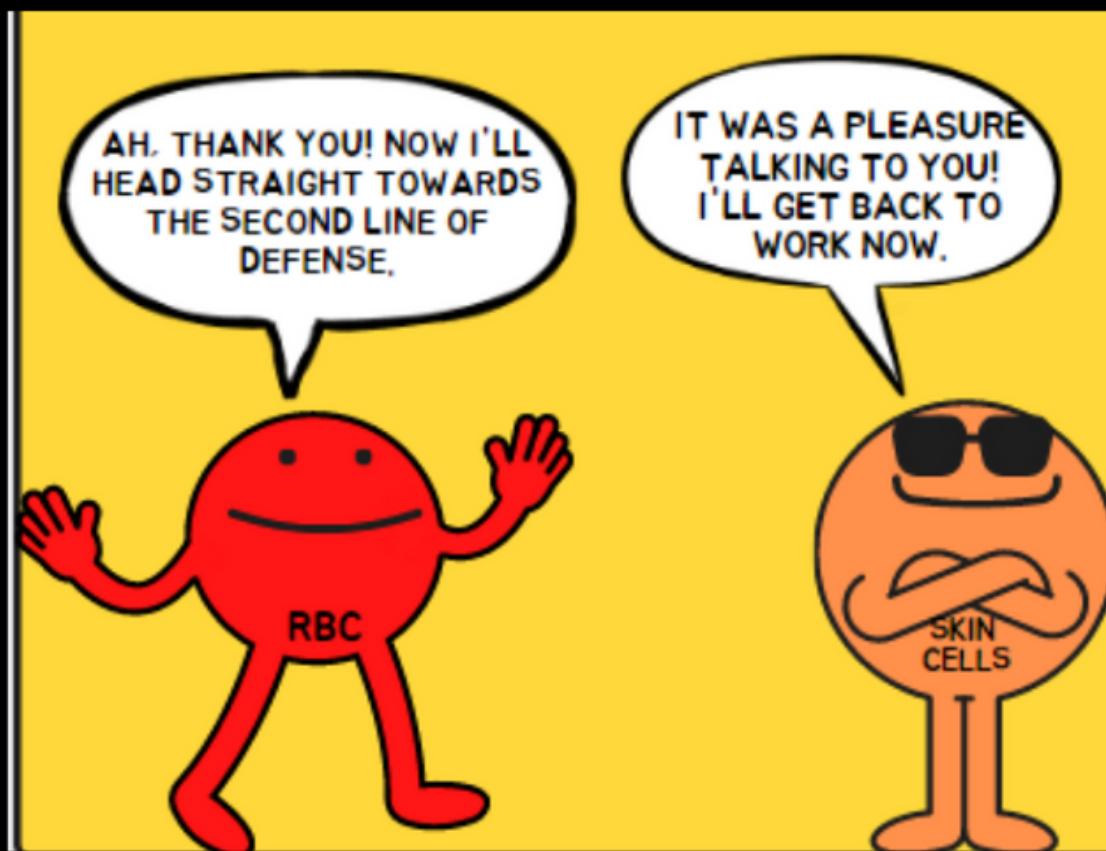
## SKIN CELLS

- ALLOW THE BODY TO RESIST INFECTIONS CAUSED BY PATHOGENS.
- IN ADDITION TO PROVIDING A PASSIVE PHYSICAL BARRIER AGAINST INFECTIONS
- THE SKIN CELLS ALSO CONTAIN ELEMENTS OF INNATE AND ADAPTIVE IMMUNE SYSTEMS, WHICH ALLOW THE BODY TO ACTIVELY FIGHT INFECTIONS.



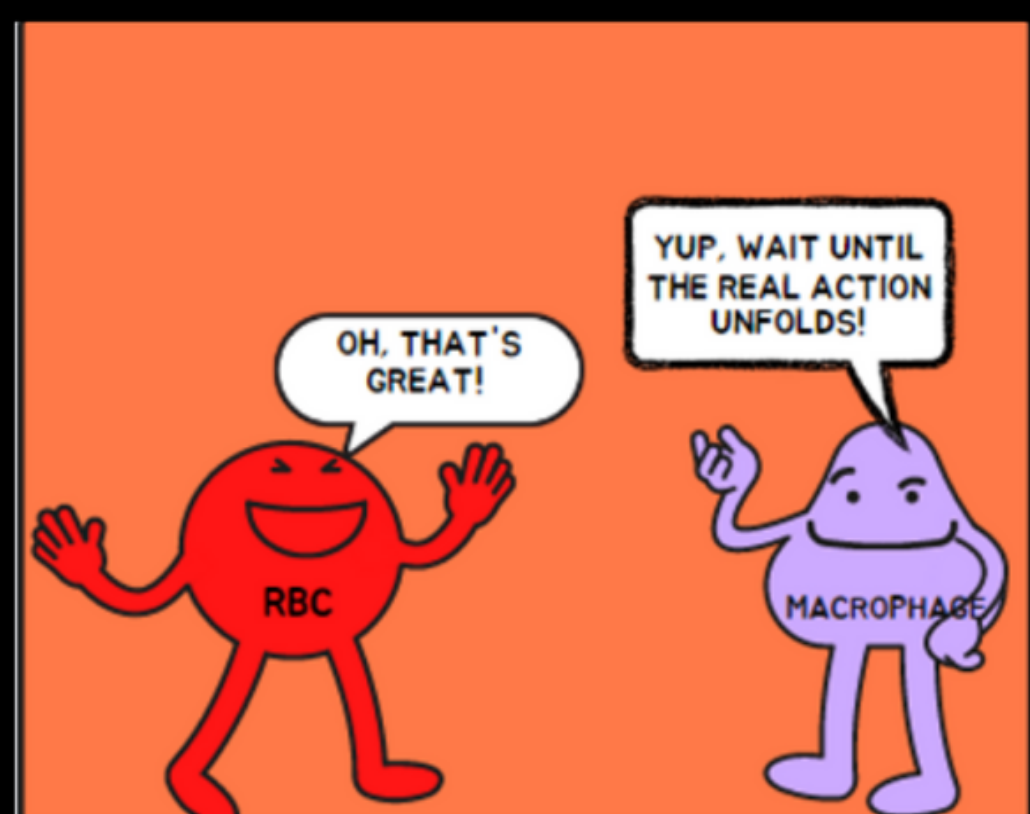
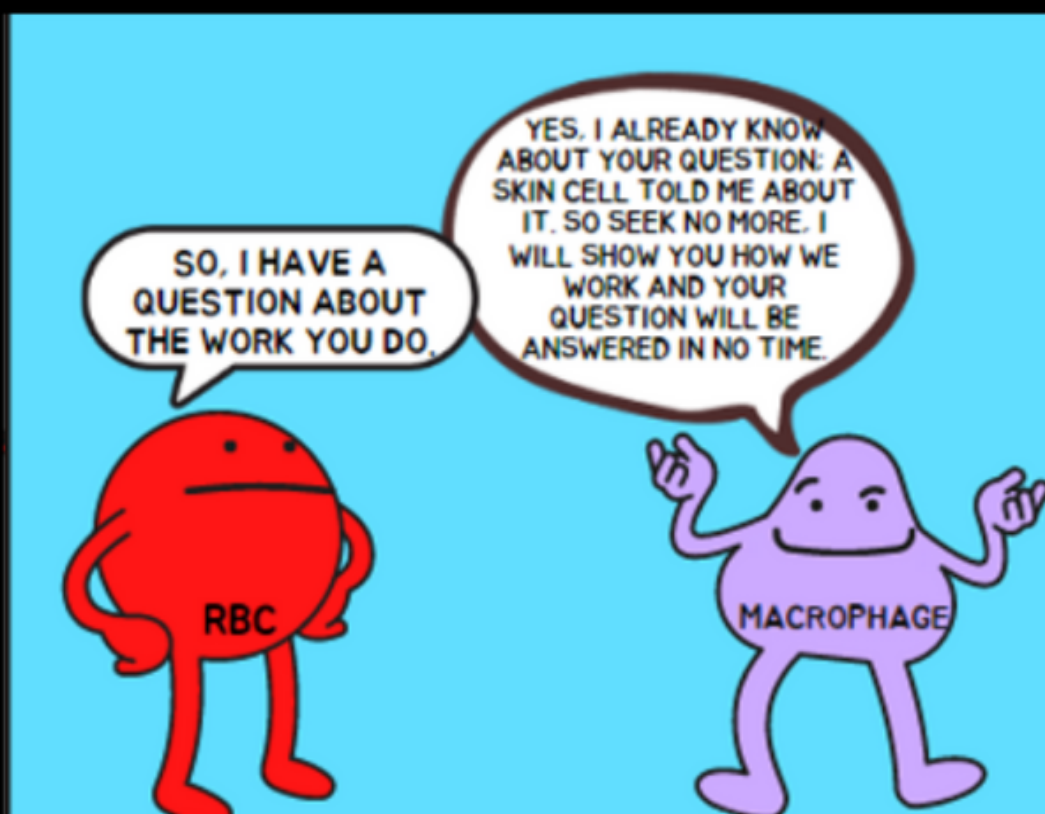
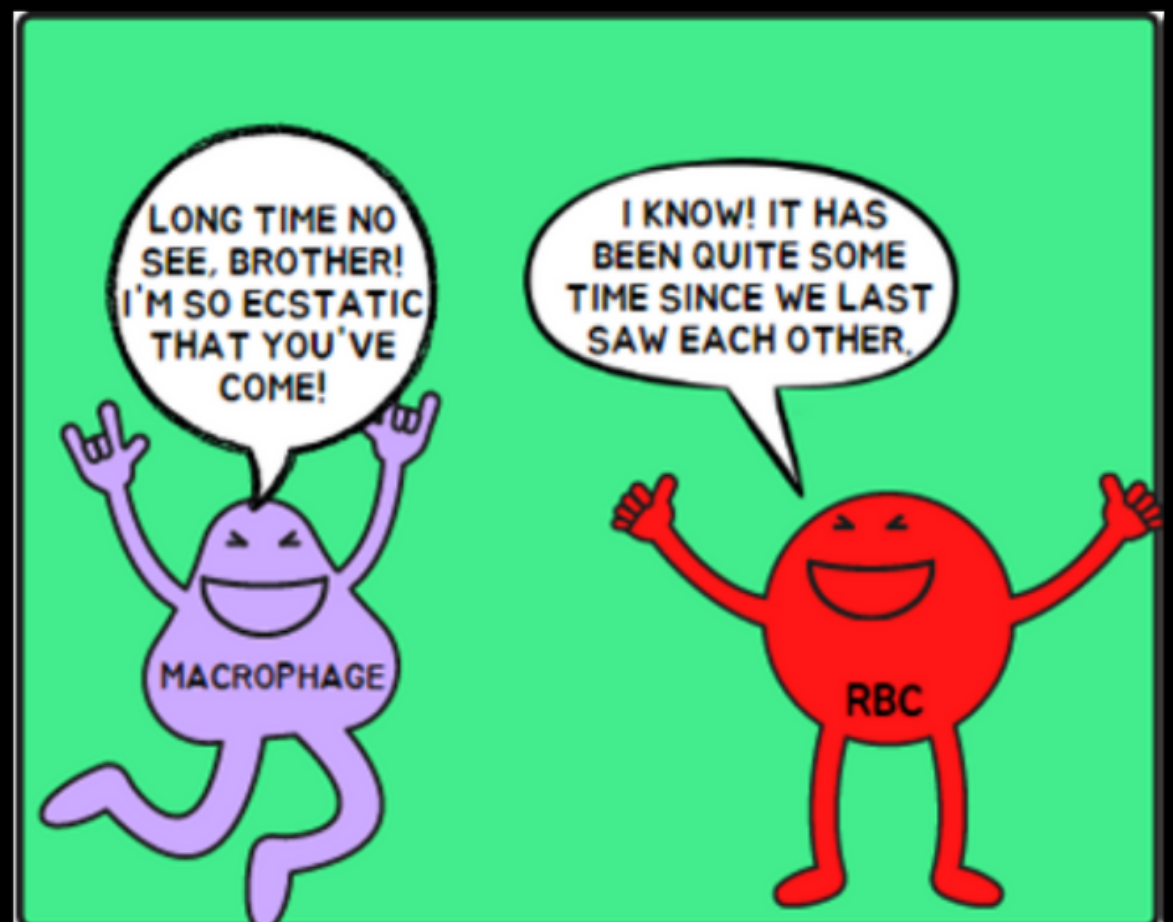






## MACROPHAGE

- ENGULFS AND DIGESTS PATHOGENS.
- PART OF SECOND LINE OF DEFENSE



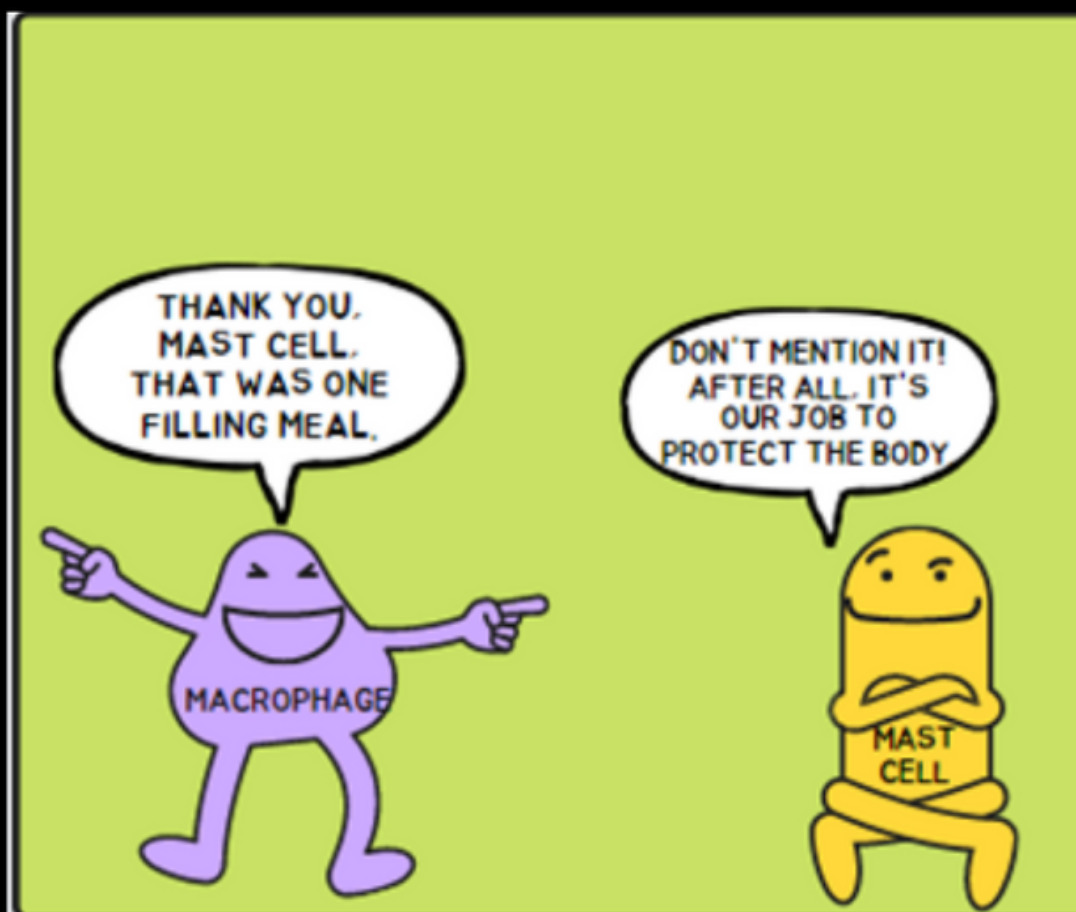
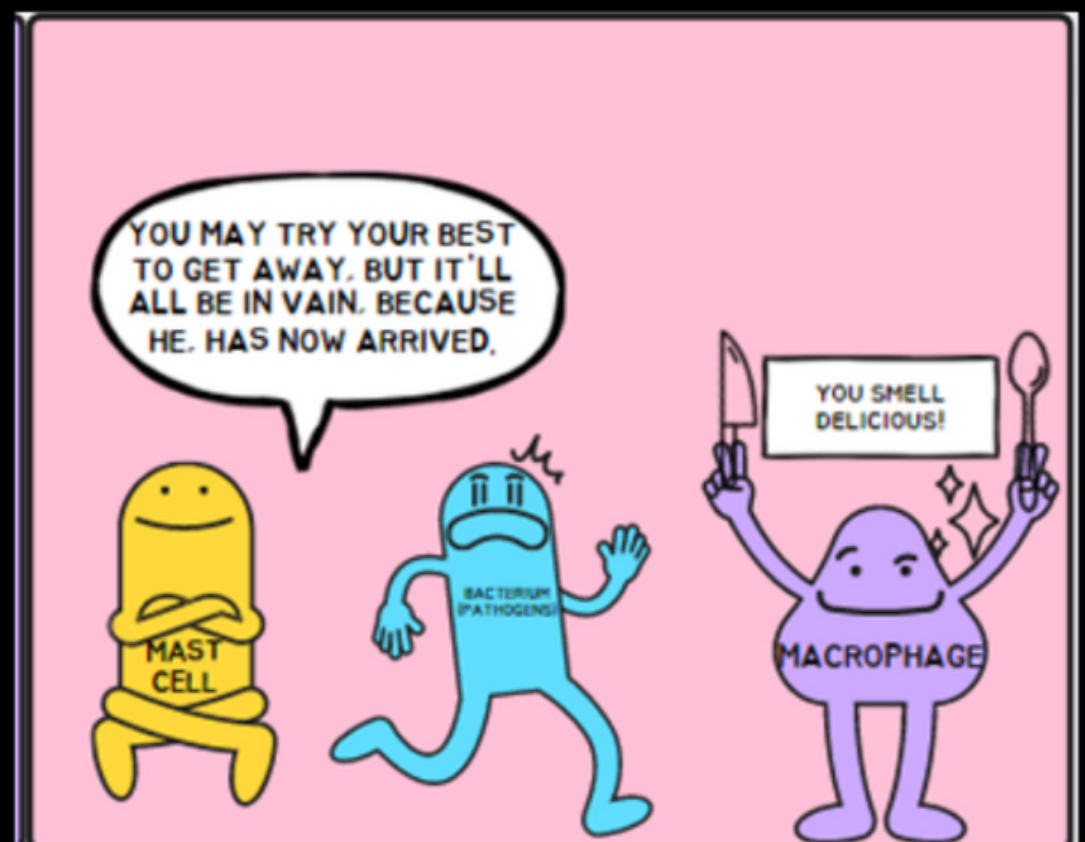
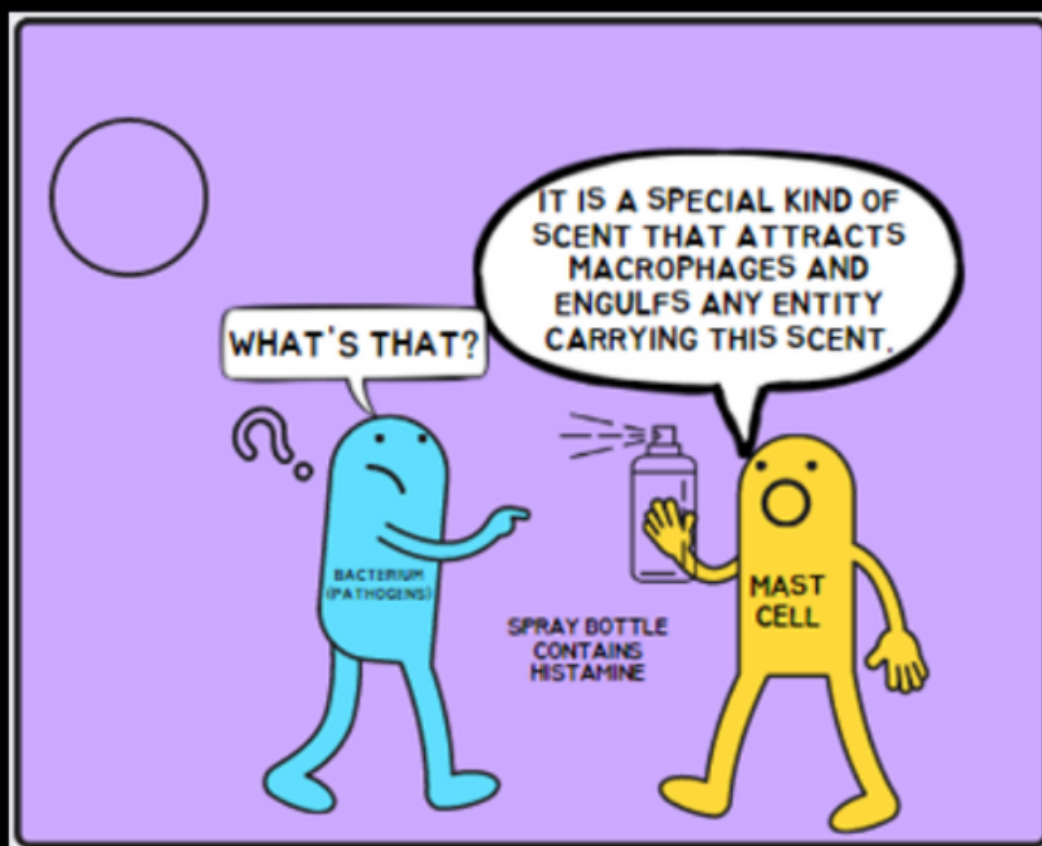


THE CIRCLE REPRESENTS A POINT OF INJURY THROUGH WHICH A BACTERIUM ENTERS THE BODY

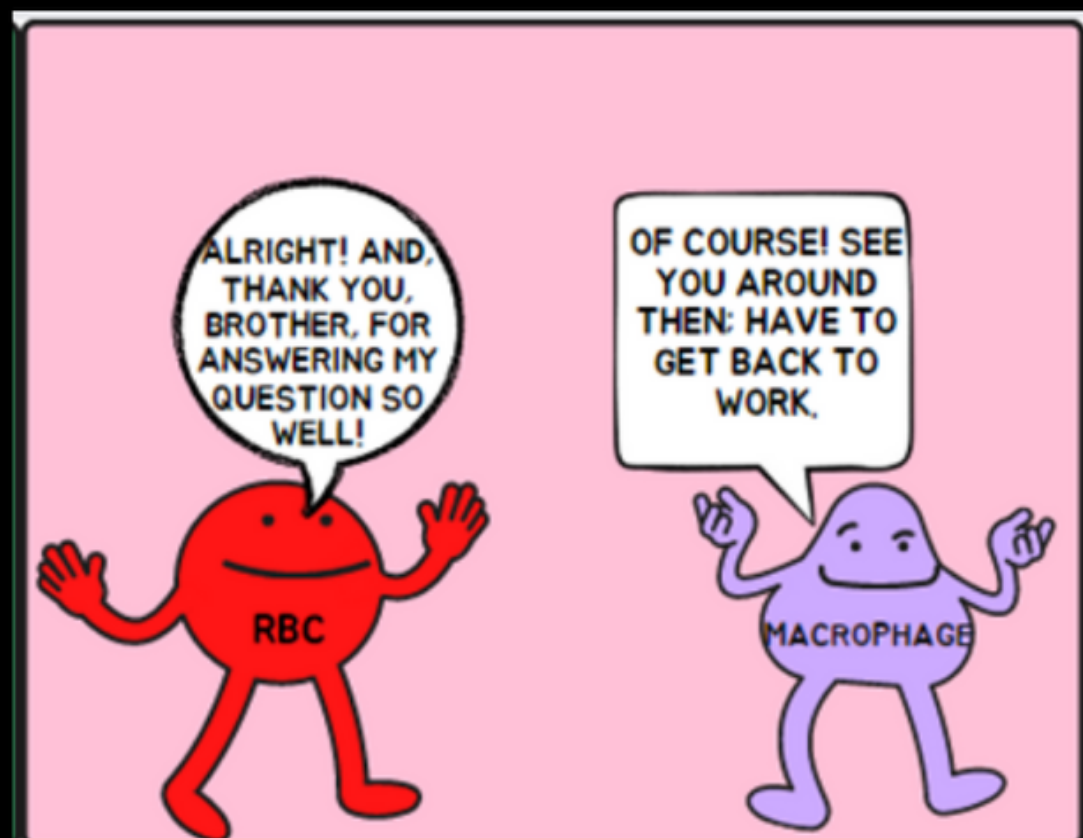
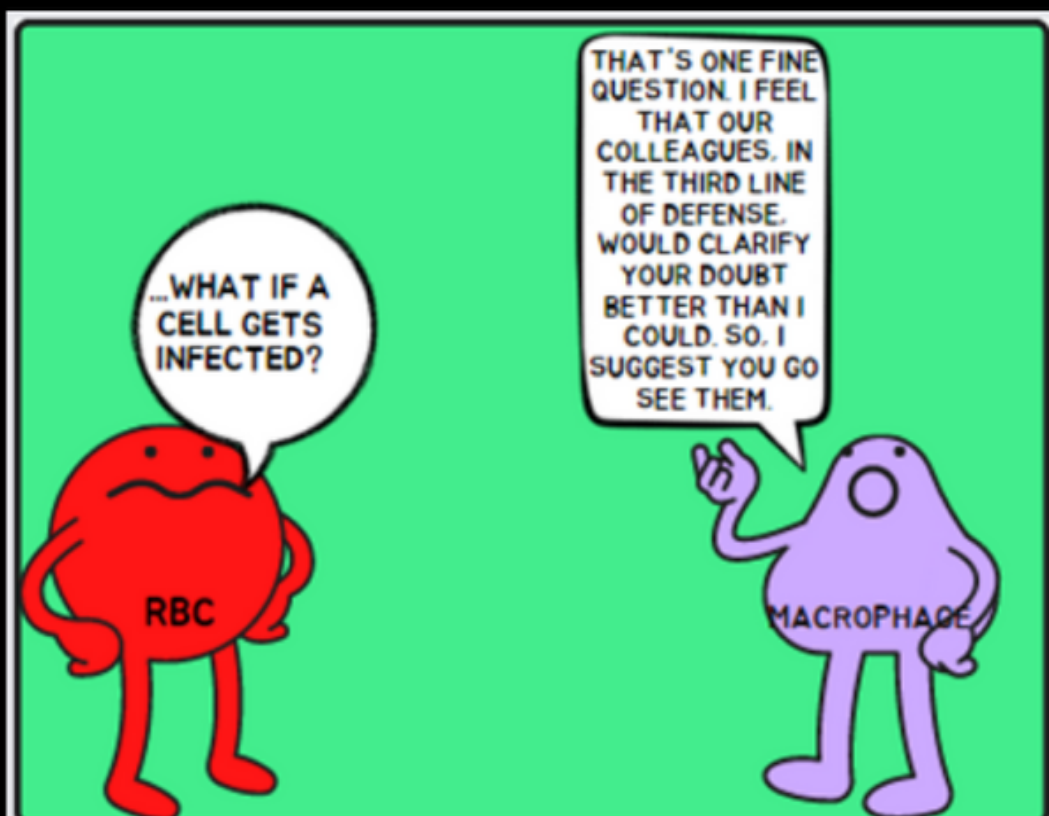


## MAST CELL

- PART OF THE SECOND LINE OF DEFENSE.
- ASSISTS IN GENERATING ALLERGIC AND INFLAMMATORY RESPONSES.
- RELEASES HISTAMINE, IN THE PRESENCE OF ANY PATHOGEN.

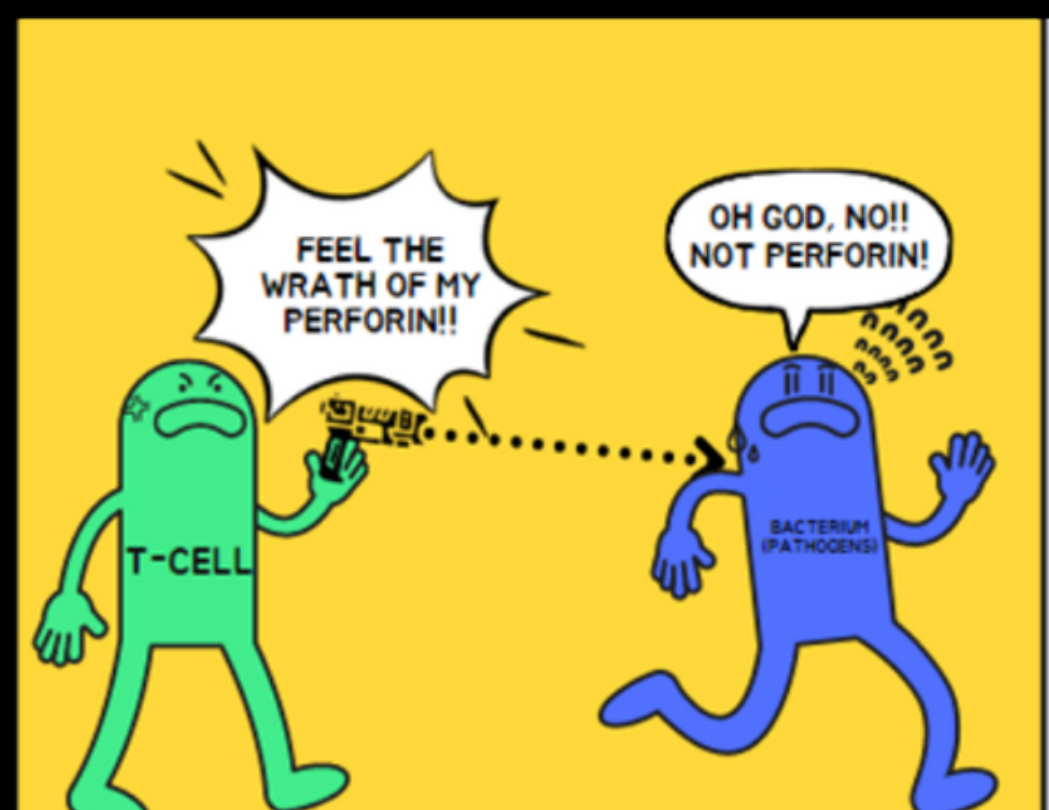
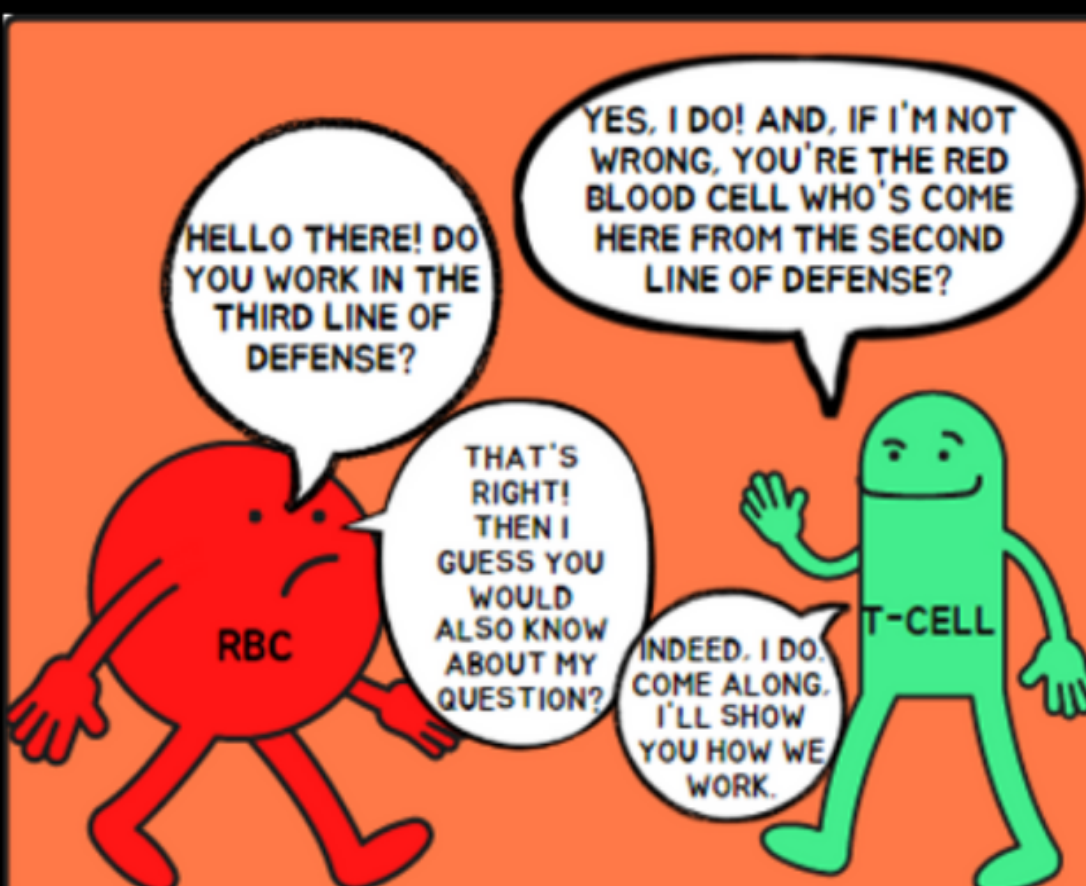
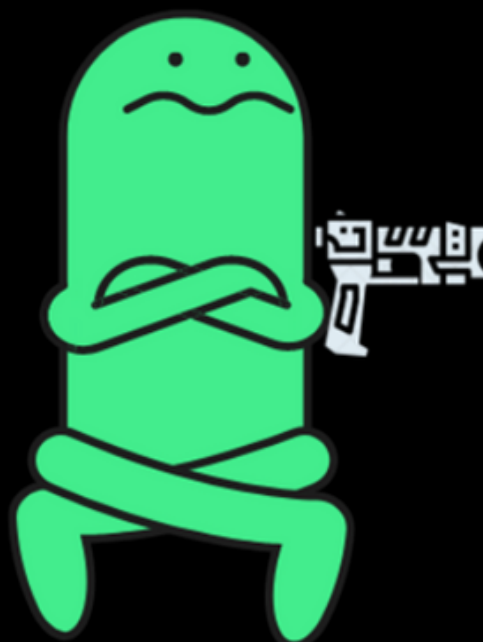




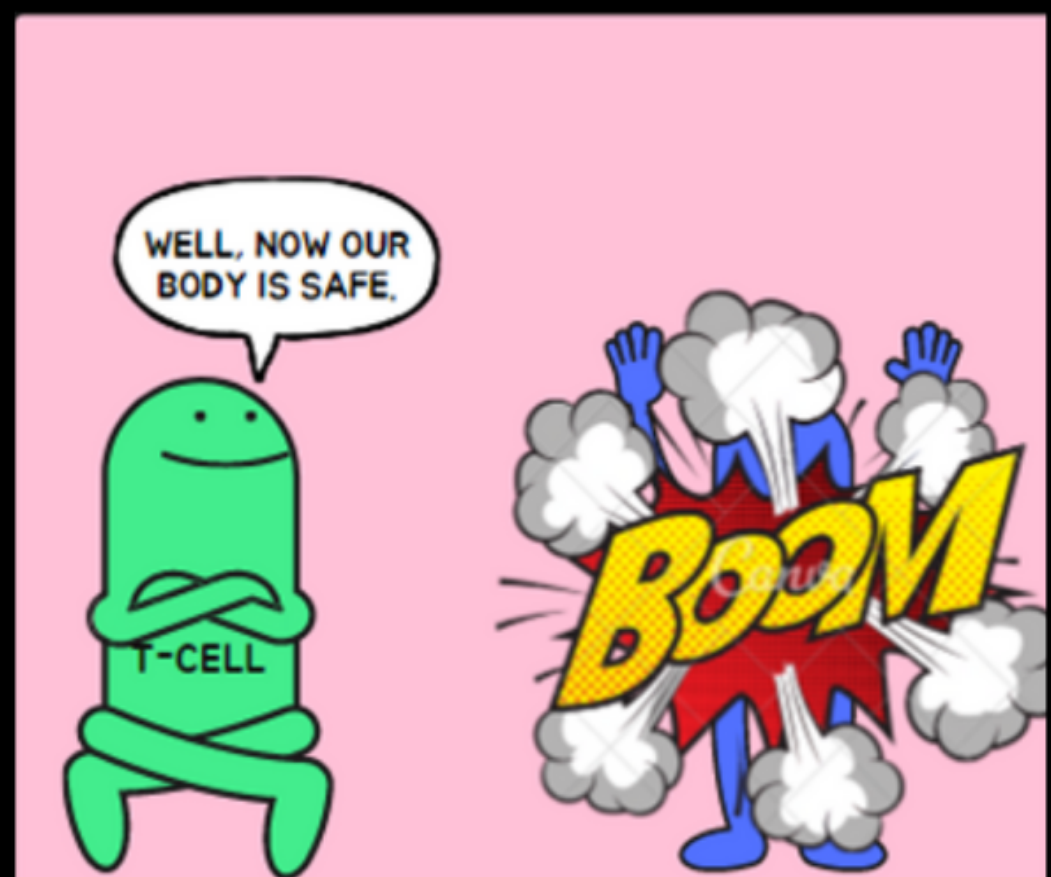
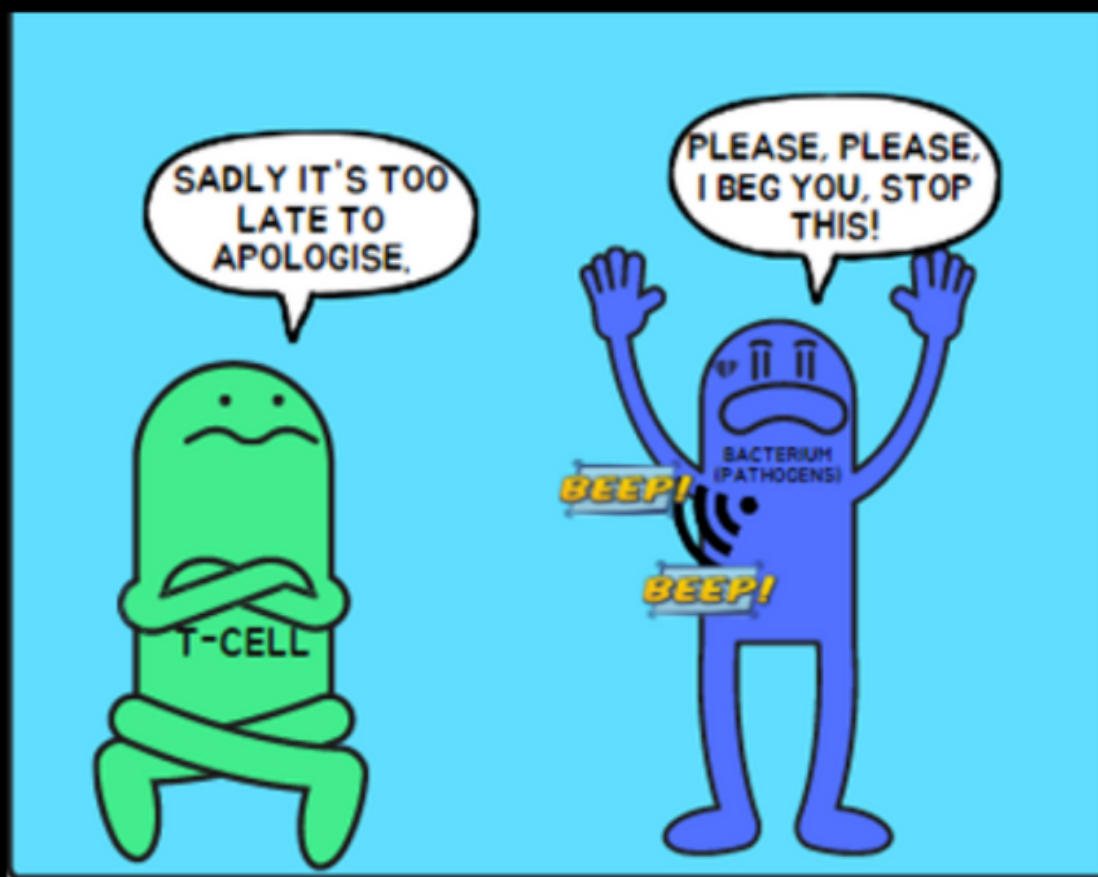


## T-CELLS

- DESTROYS INFECTED CELLS WITH THE HELP OF THE GLYCOPROTEIN 'PERFORIN'.
- WHENEVER PERFORIN IS RELEASED BY A (INFECTED) CELL, IT CAUSES APOPTOSIS OF THE CELL.
- PART OF THE THIRD LINE OF DEFENSE.

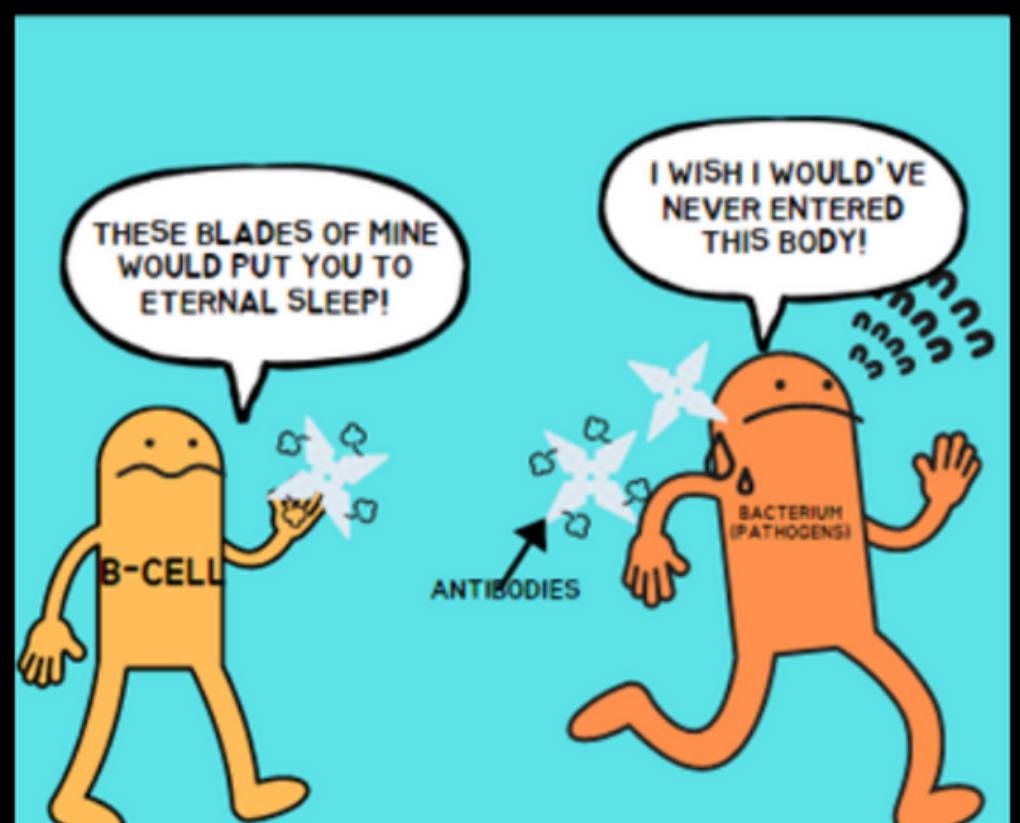
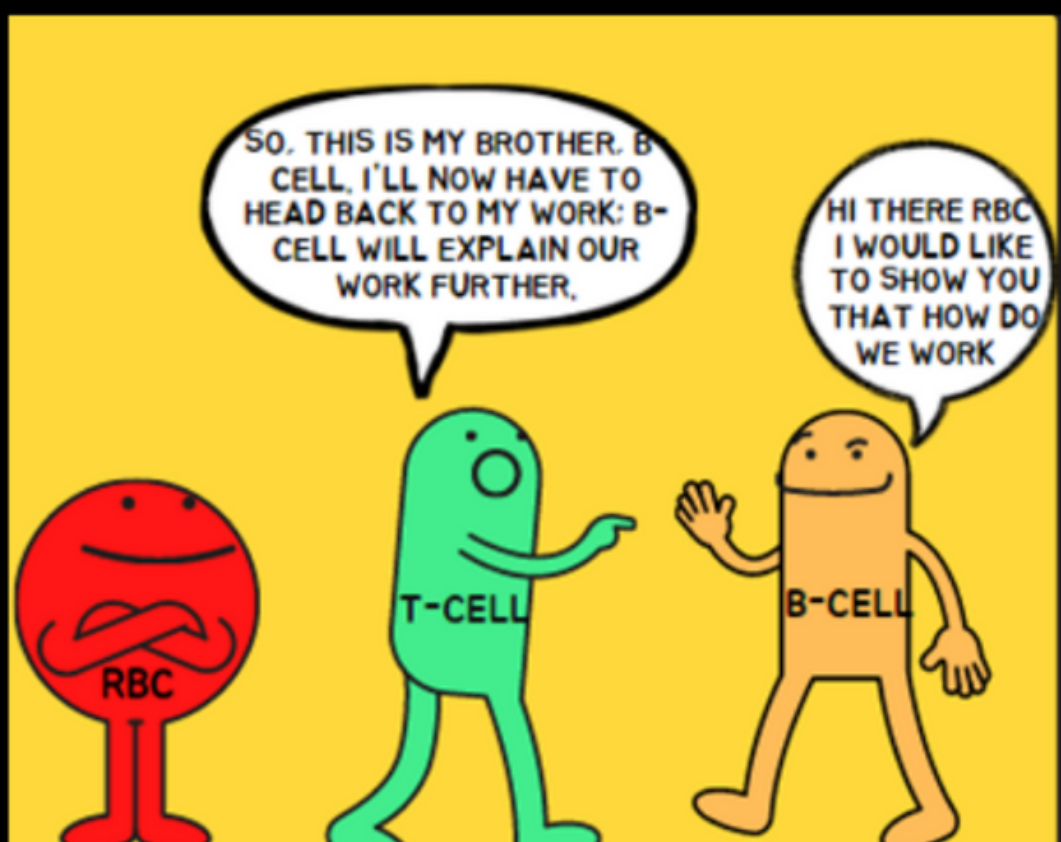
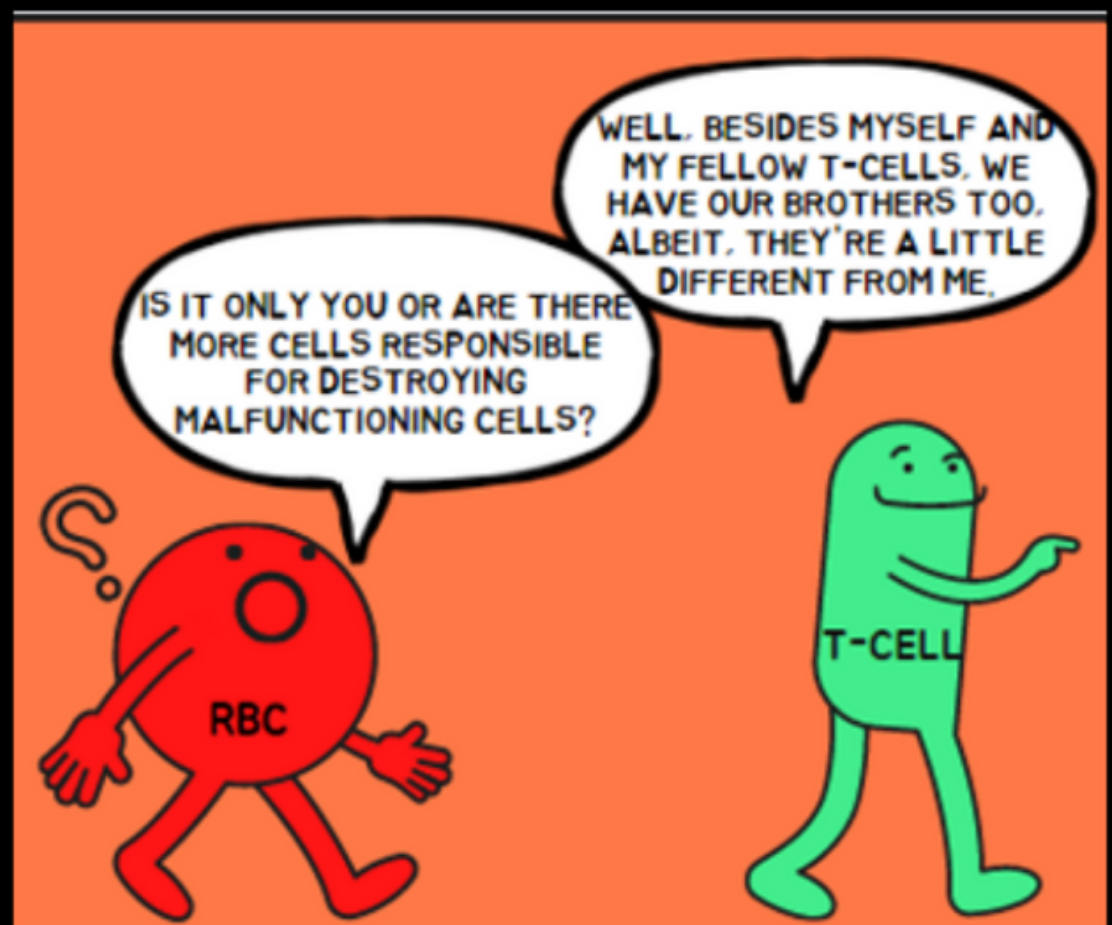




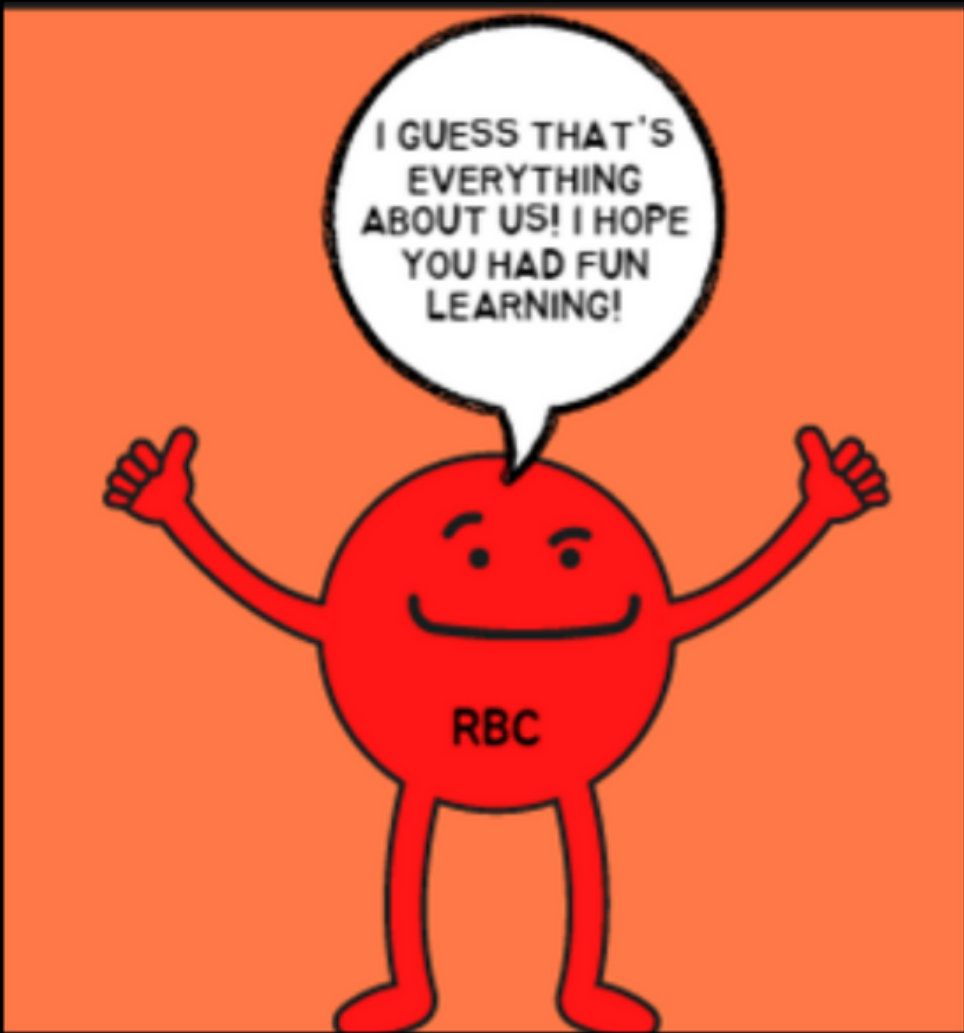
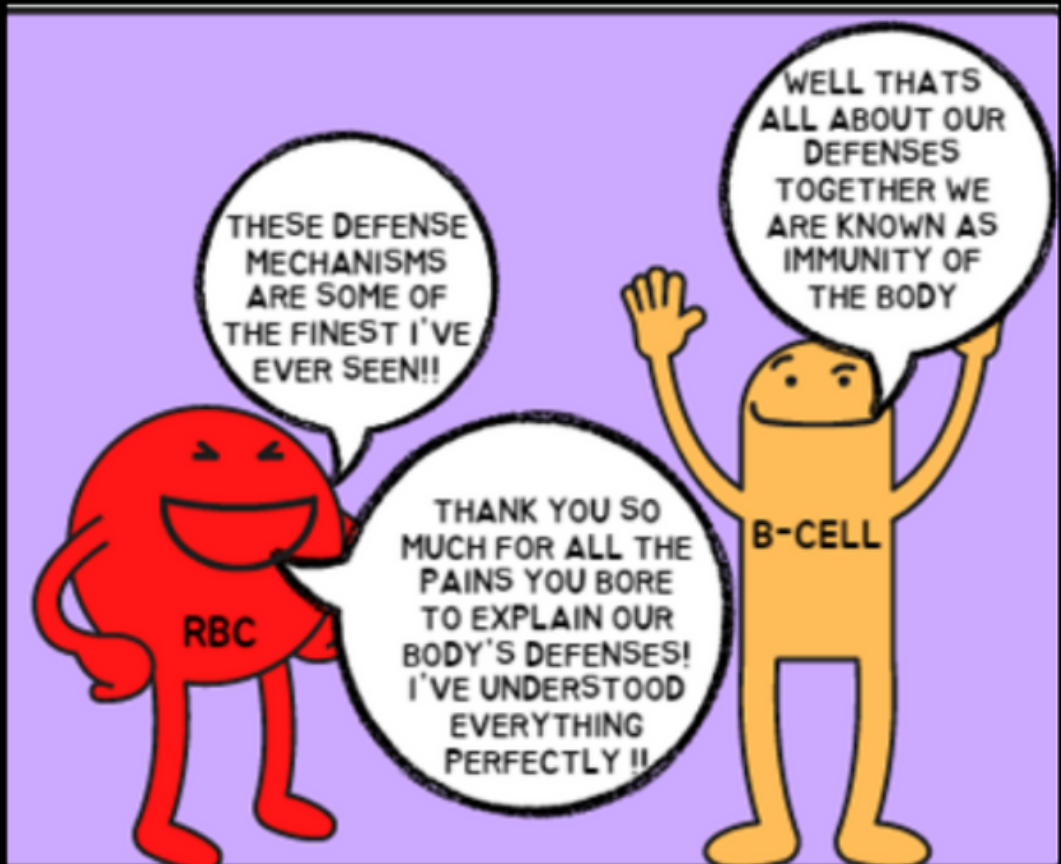
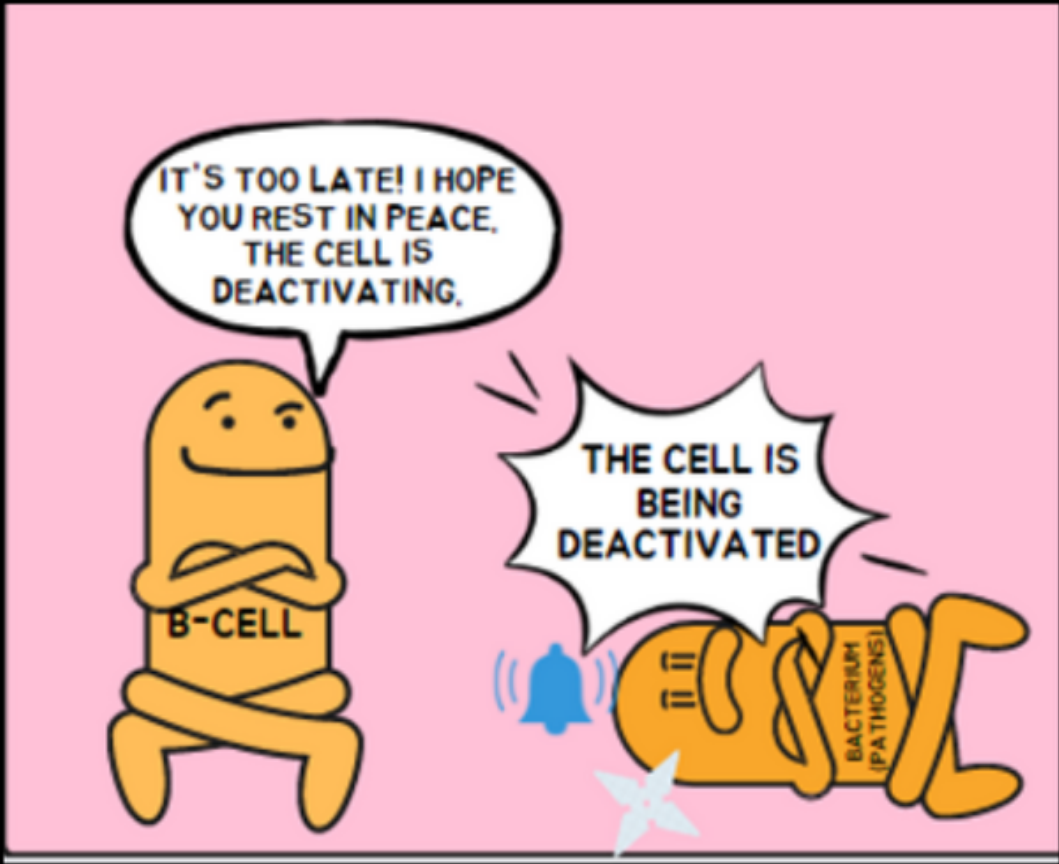


## B-CELLS

- PART OF THE THIRD LINE OF DEFENSE.
- MAKES ANTIBODIES.
- RELEASES ANTIBODIES TO COUNTER PATHOGENS OR INFECTED CELLS AND TO ELIMINATE WORN-OUT/DEACTIVATED CELLS.









MITOSIS

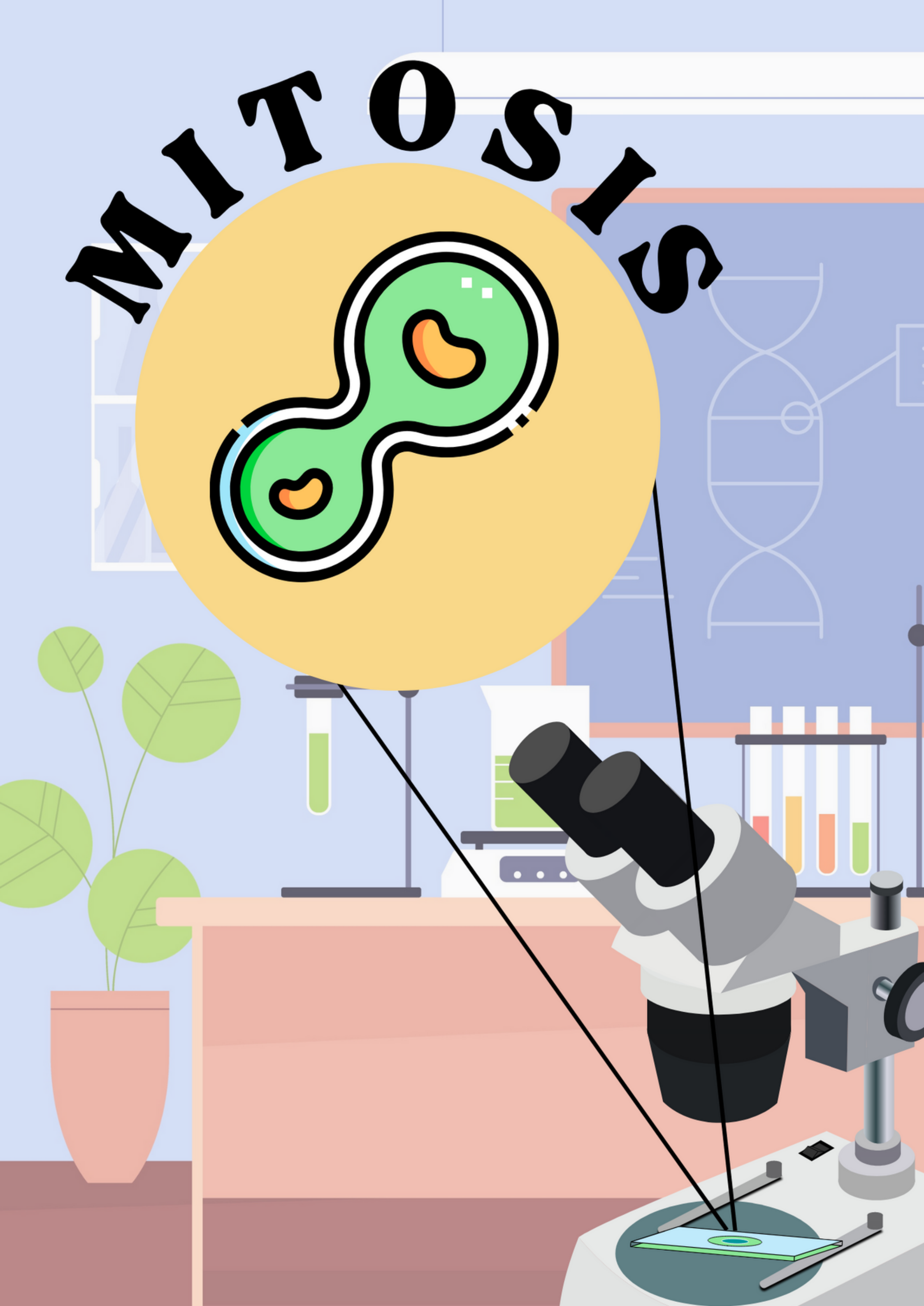
&

MEIOSIS

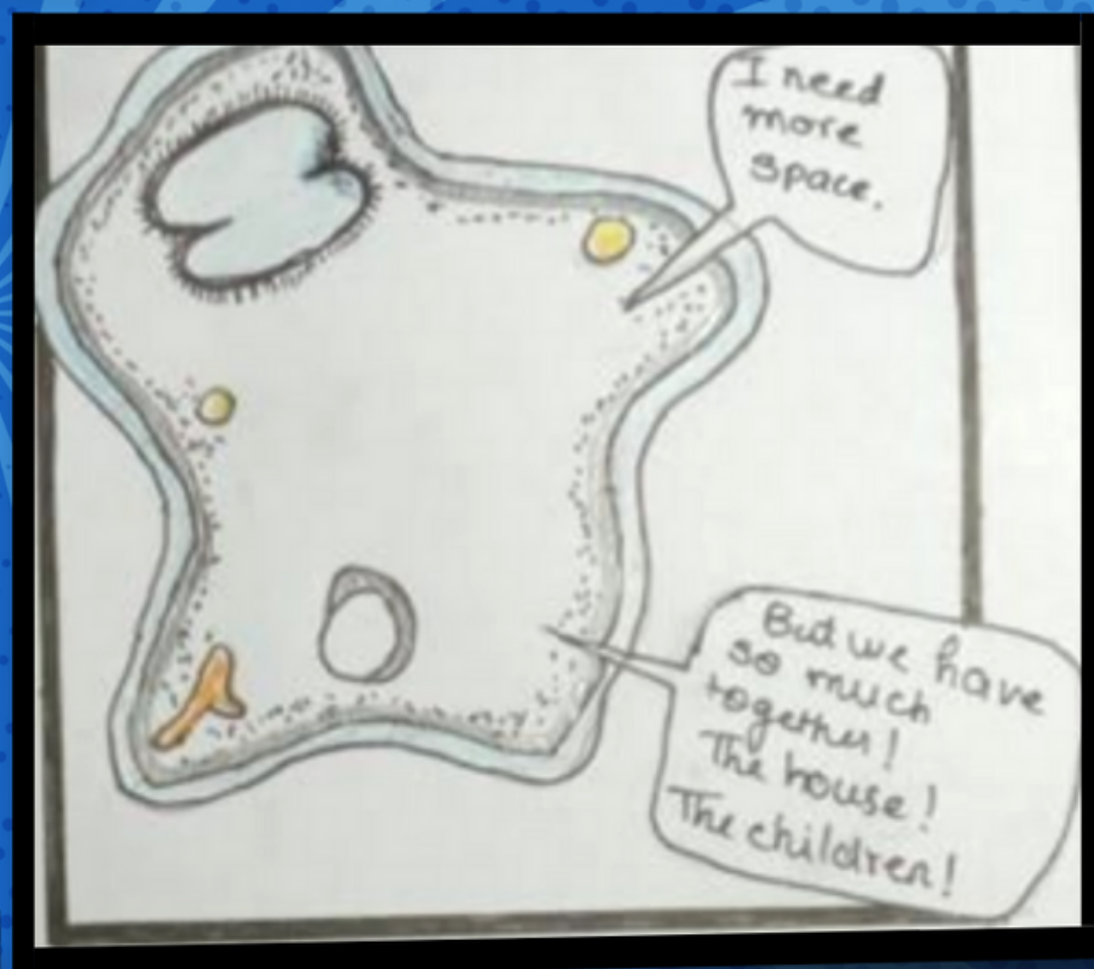




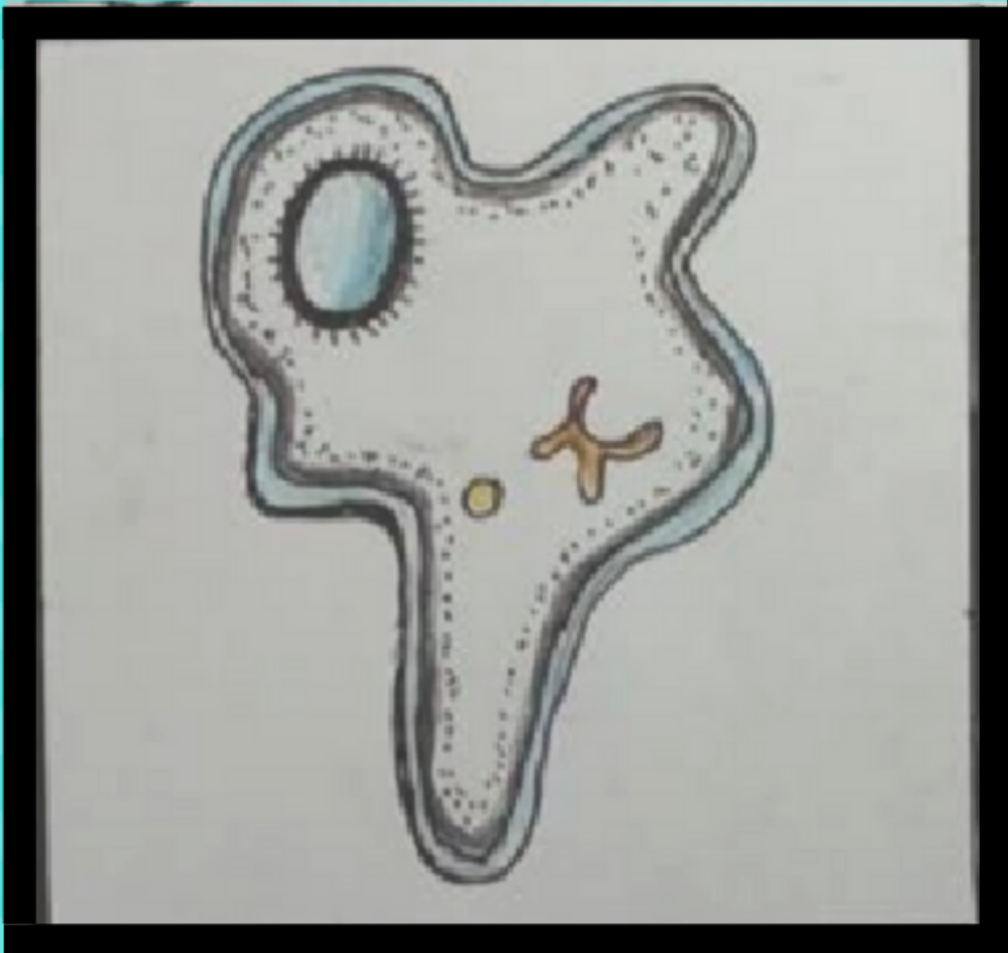
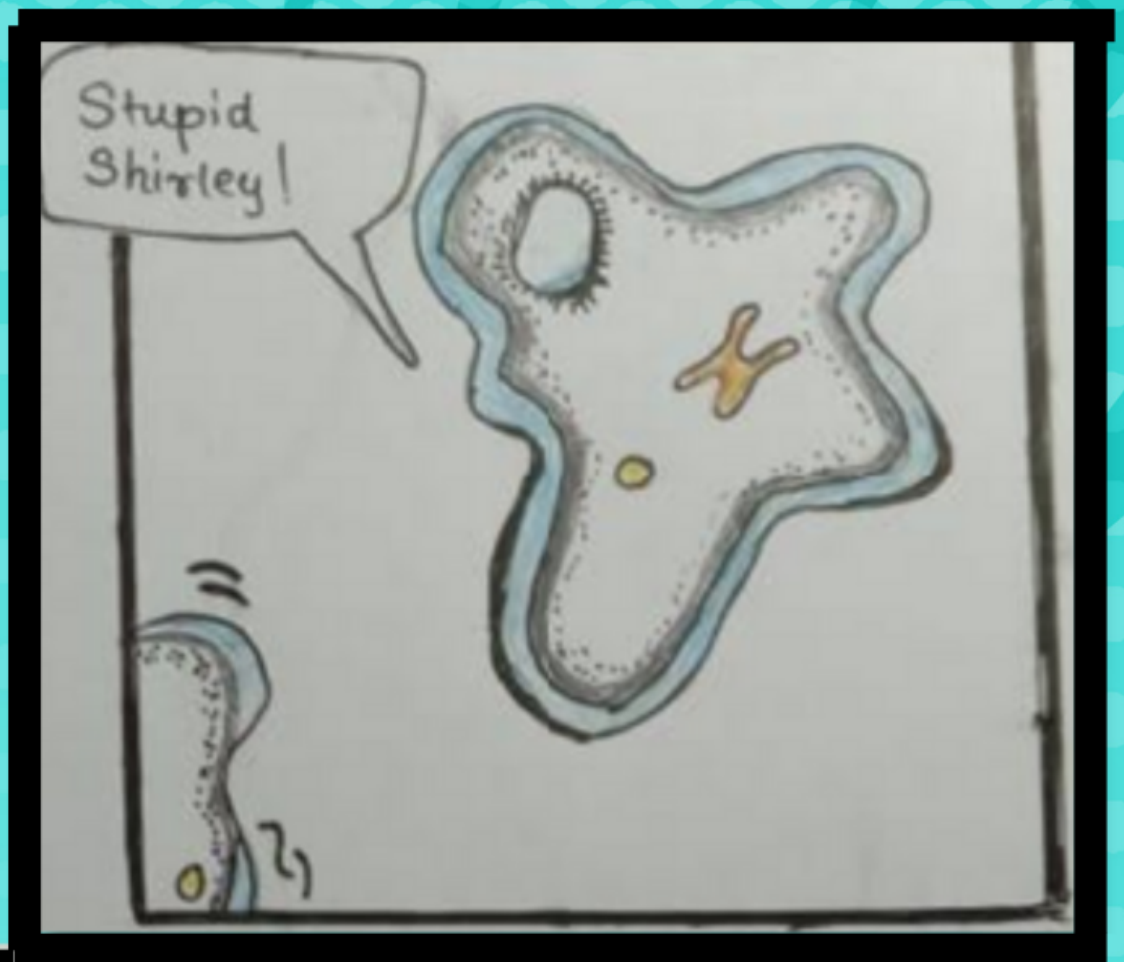
# MITOSIS





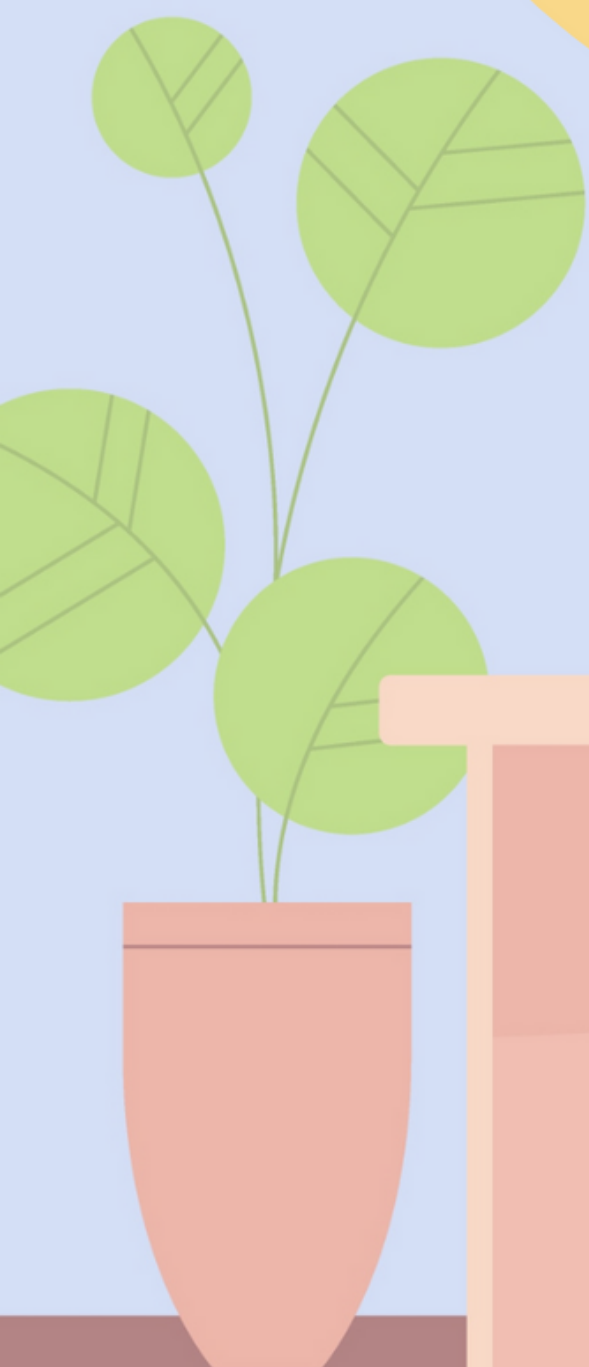




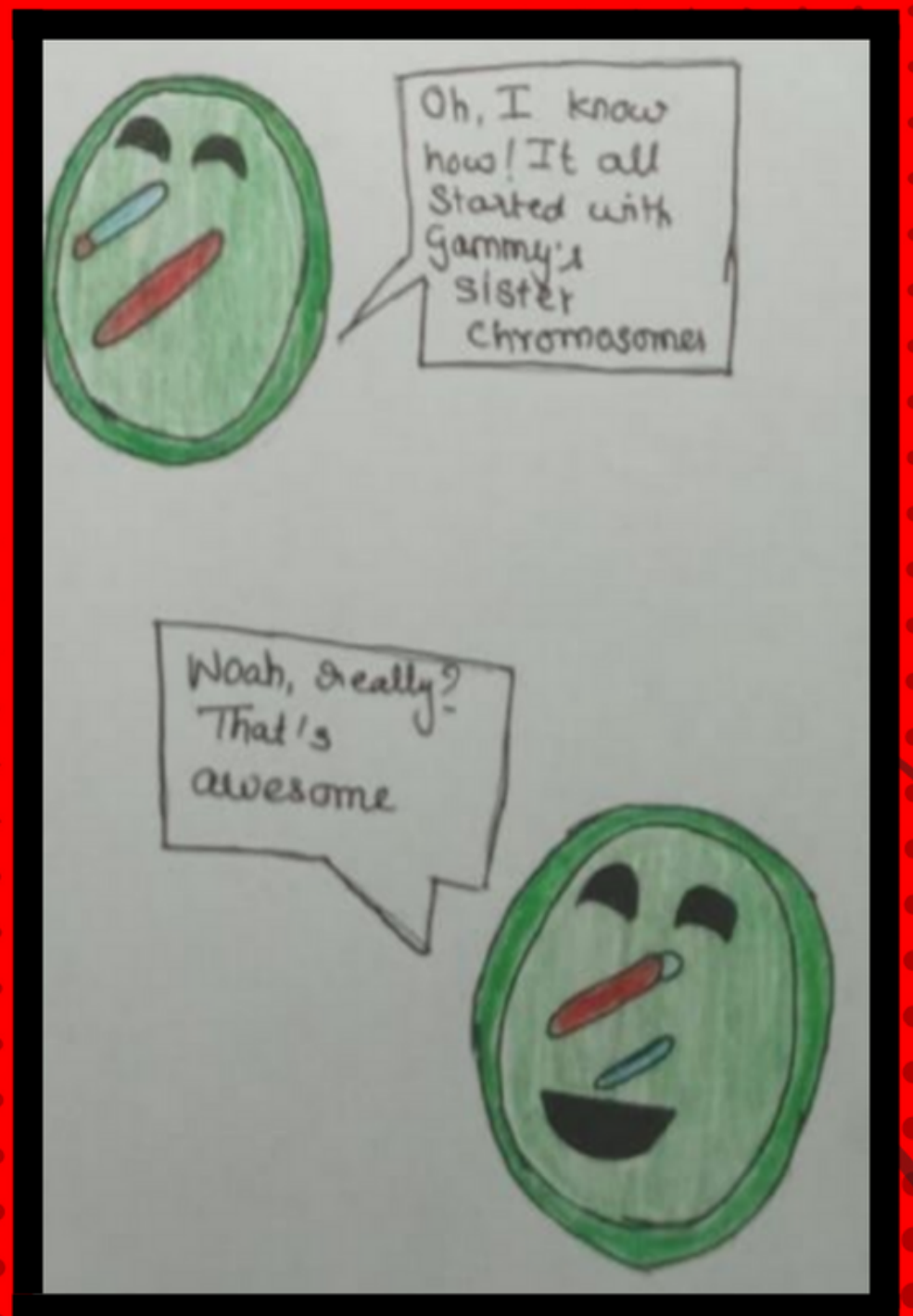
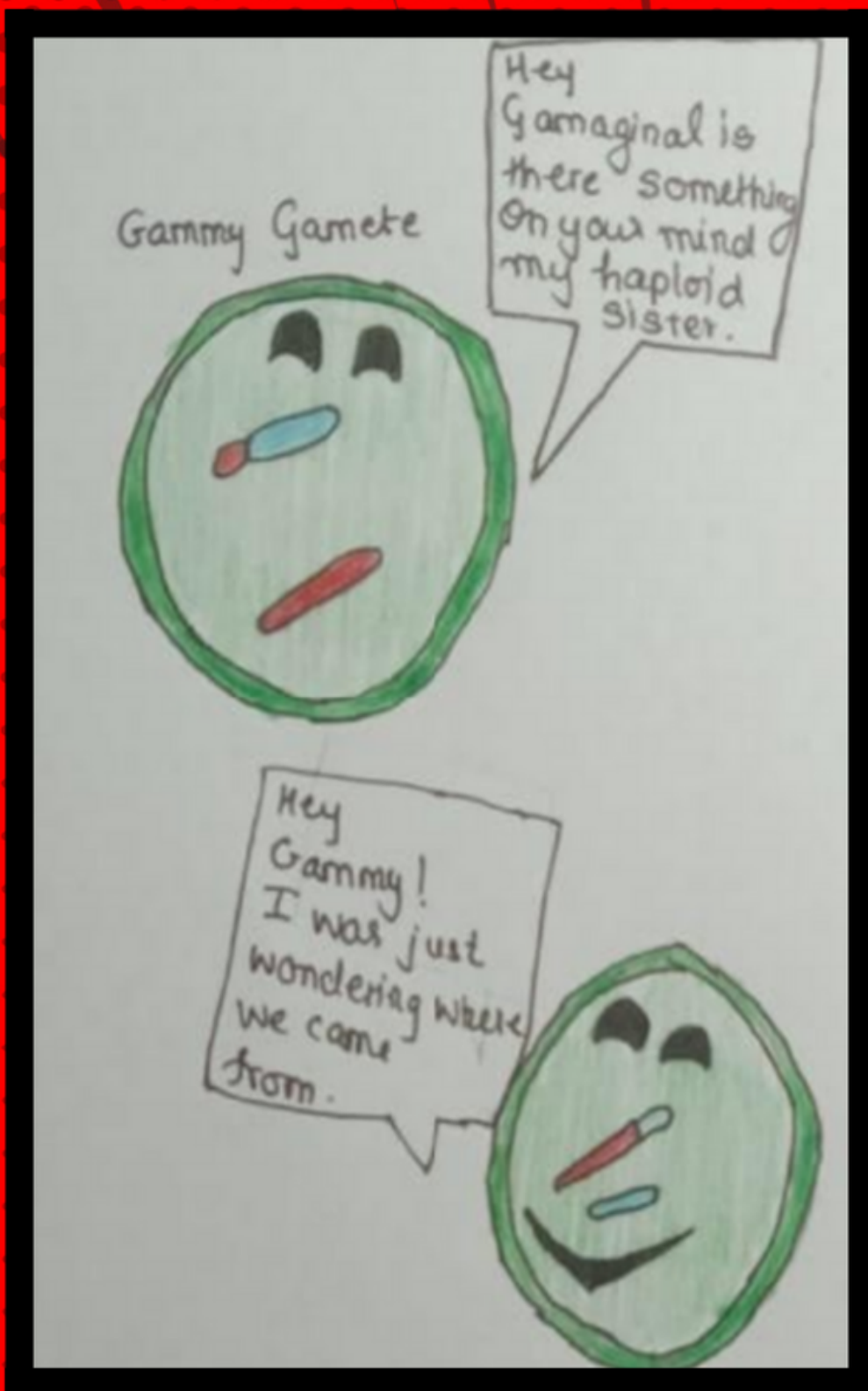




# MEIOSIS









Then the chromosomes started crossing-over in Prophase I forming non-identical sister chromatids.

Woah, why my chromatids look different?

Grammy



We sure do look different! Recombinant chromosomes formed by crossing over provides genetic variation in offspring because it provides a different combination of genes in each gamete



So we would look like clones of each other if they don't cross over?

No, we receive homologous chromosomes. One set of chromosome from each parent to split off and assort in a process called 'Independent Assortment'. This process makes it possible for genetic variation to occur without crossing over





One day, Grammy was feeling lonely and desired company

I am lonely and desire company

Grammy



Don't be sad Grammy! We Sister Chromatids know what to do!



And that's when Grammy's homologous chromosomes began Meiosis in Interphase as they multiplied to form tetrads

Grammy

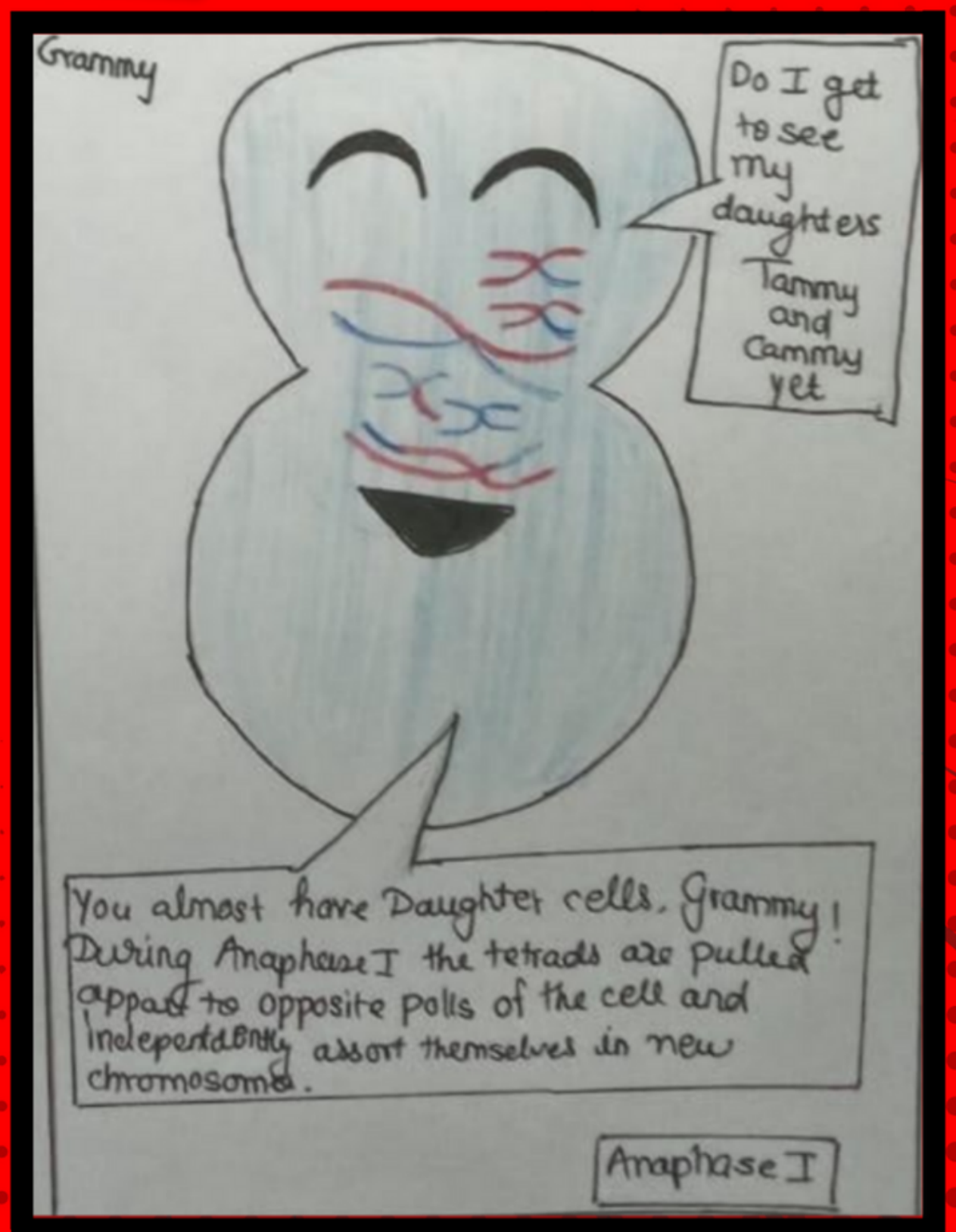
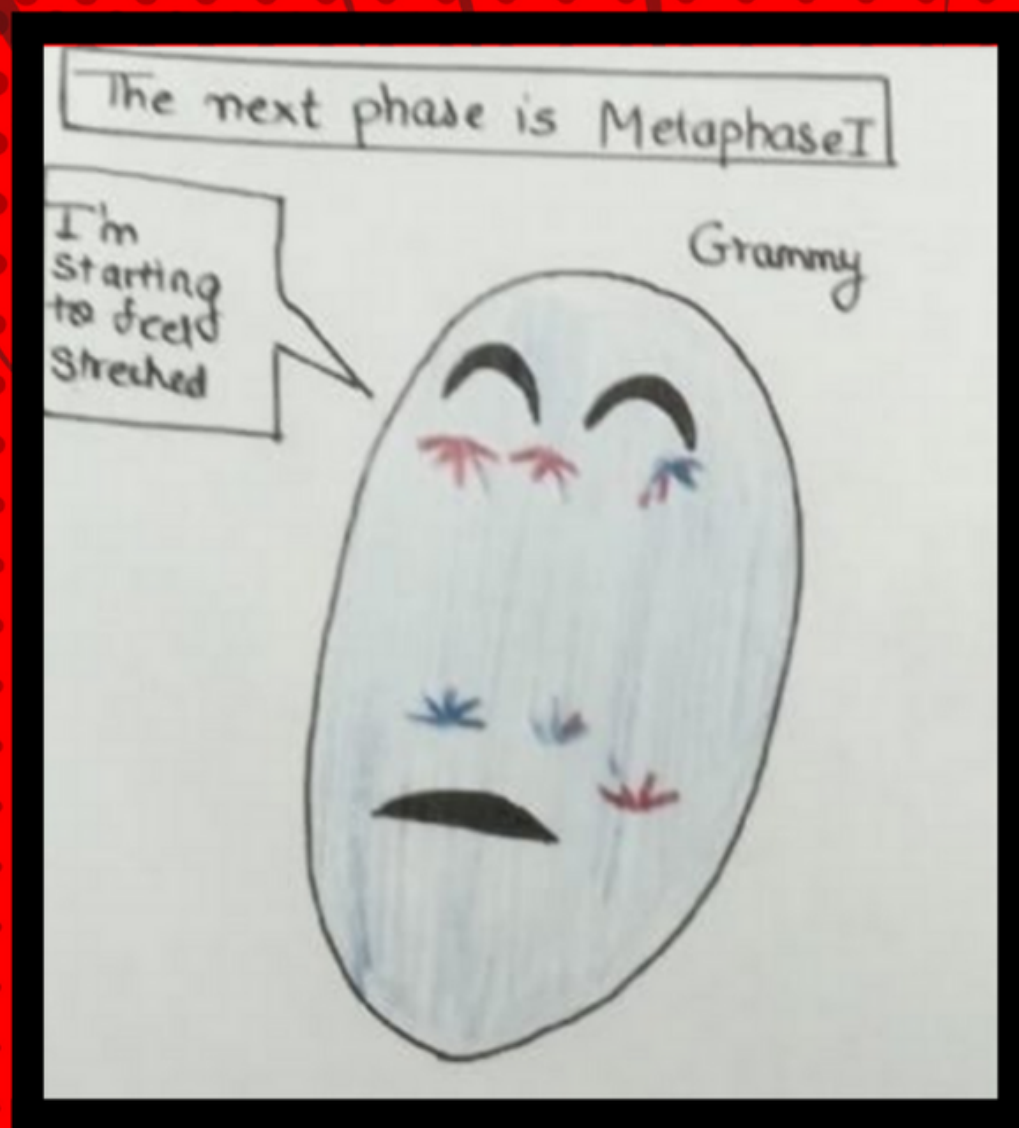
What just happened?



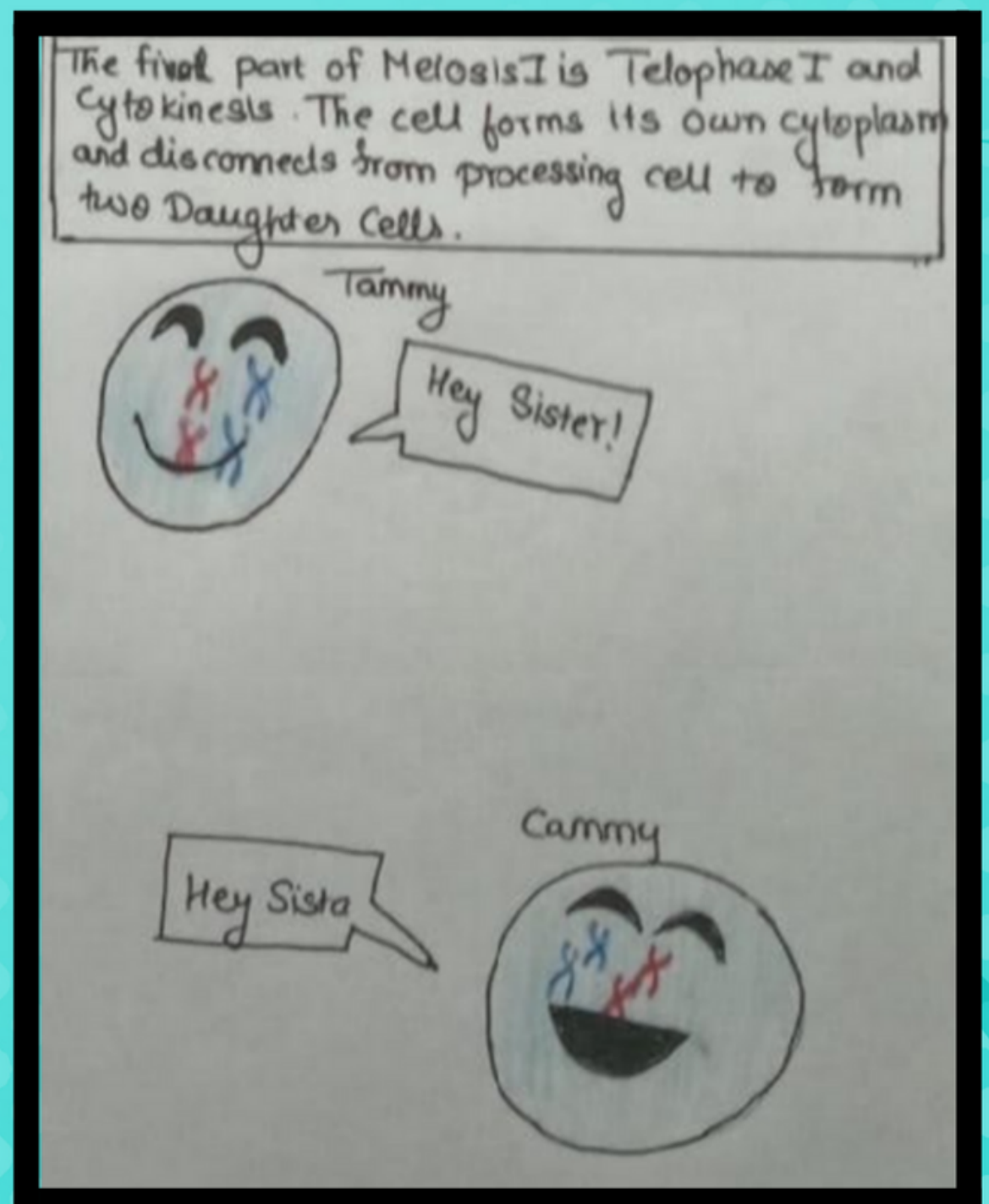
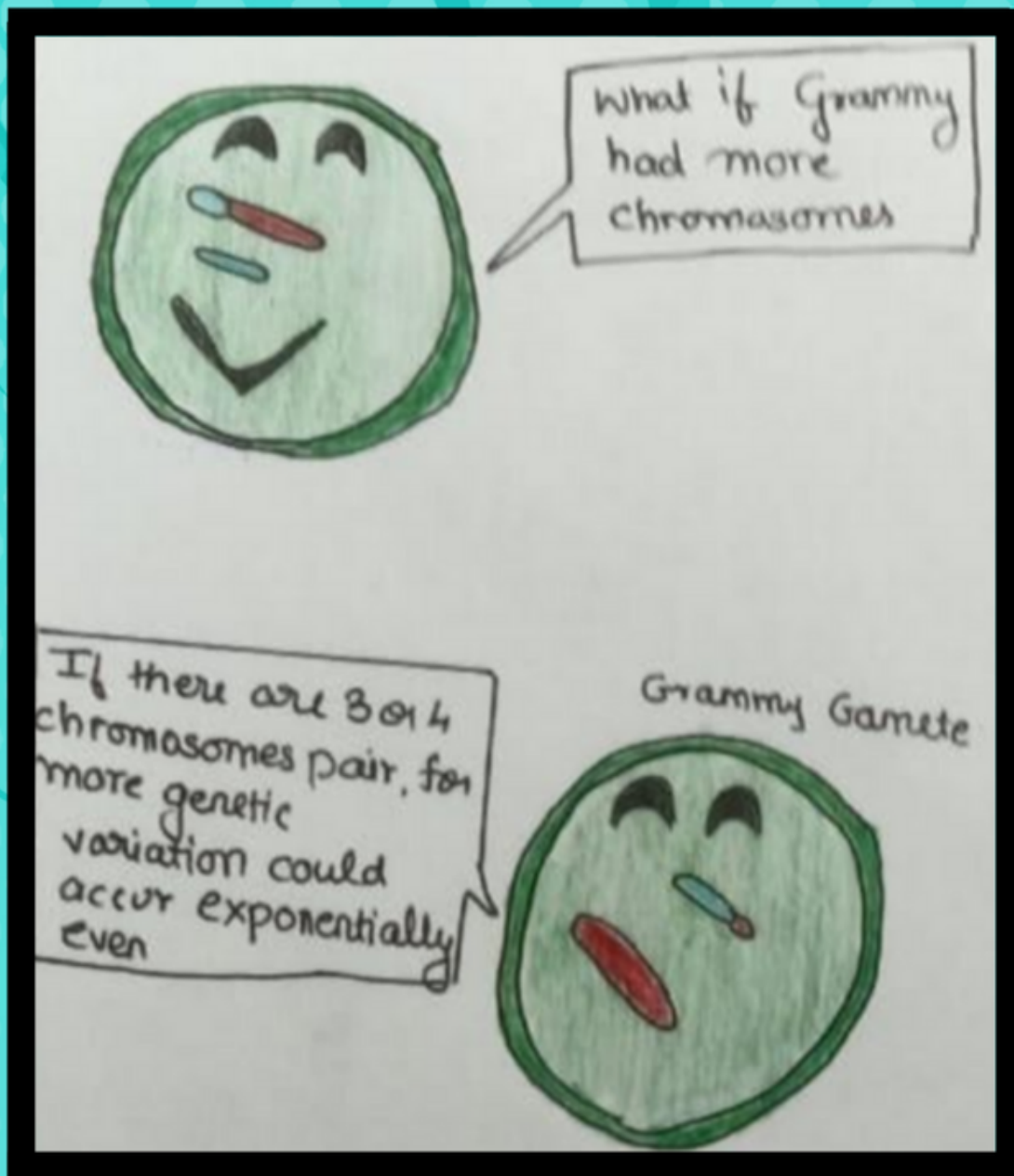
We are performing the genetic diverse sexual reproduction system known as Meiosis I. This allows for adaptation to environmental factors to manifest as all offspring will not be identical



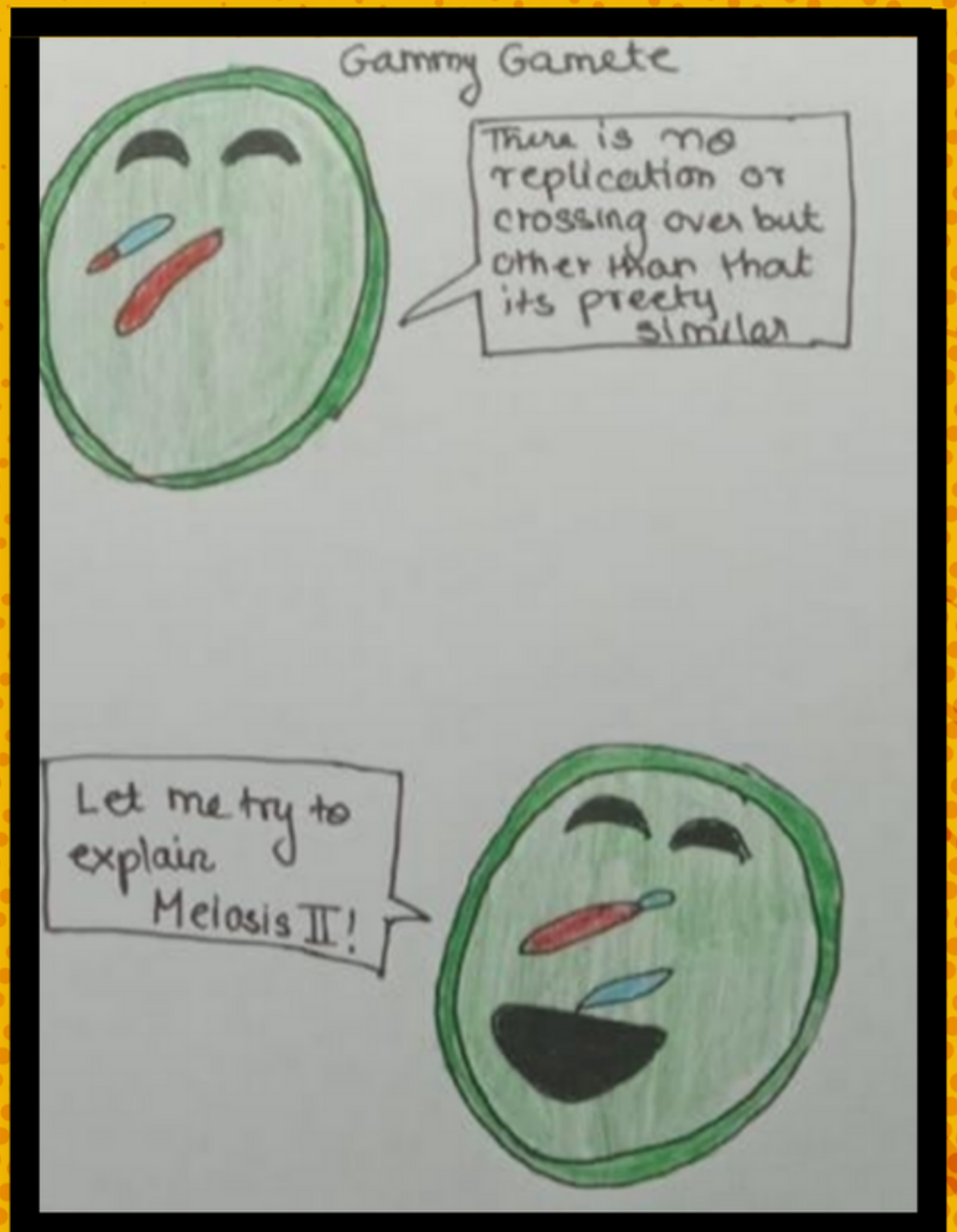
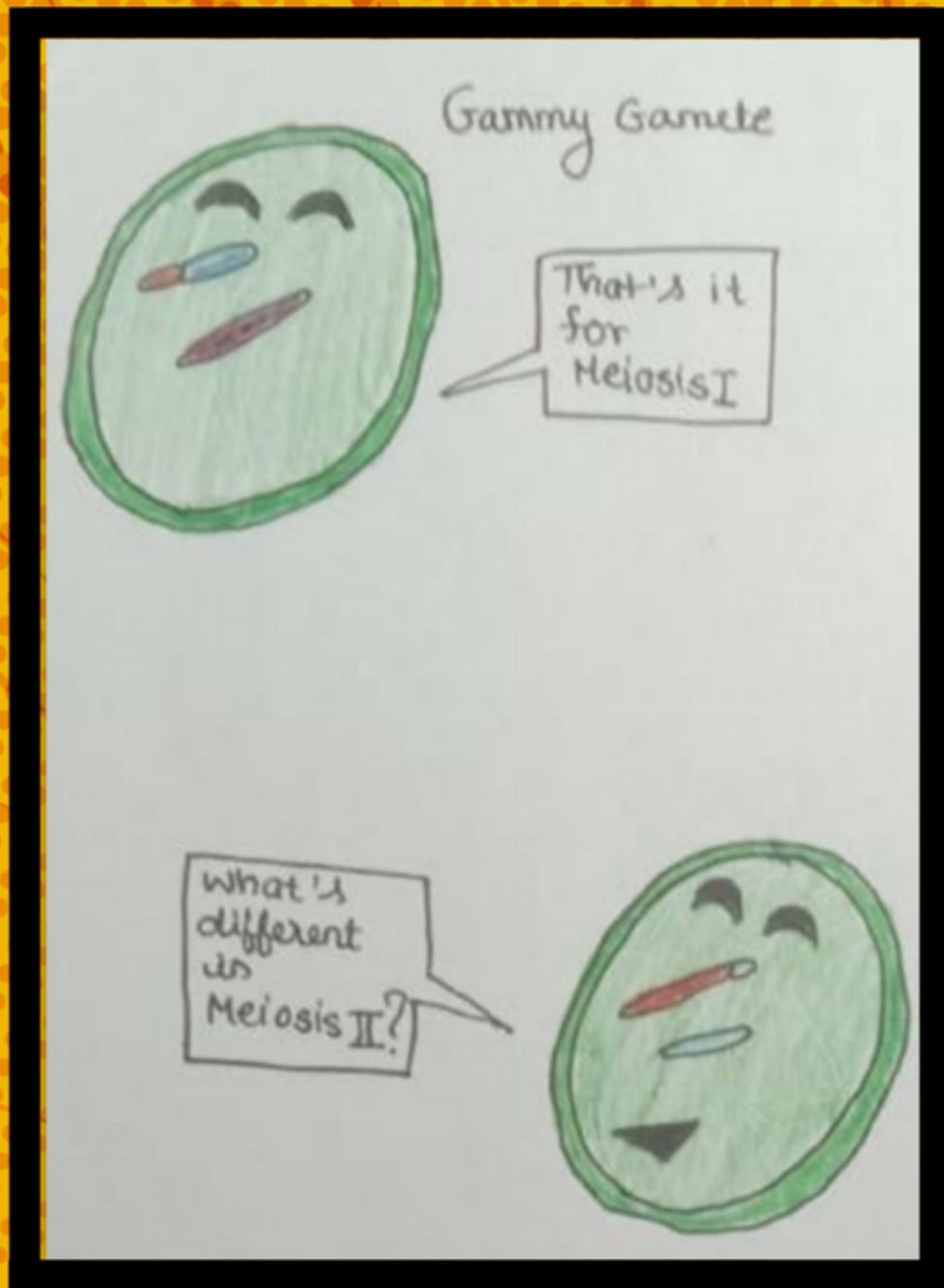














Then Metaphase II



Tammy

Wow, our chromosomes  
are lining up,  
getting ready to  
be pulled  
apart.

Just like, Grammy!  
Meiosis occurs in  
many places and  
there are so  
many variables  
that we cannot  
show

Cammy





# COMIC STRIP ON DNA REPLICATION



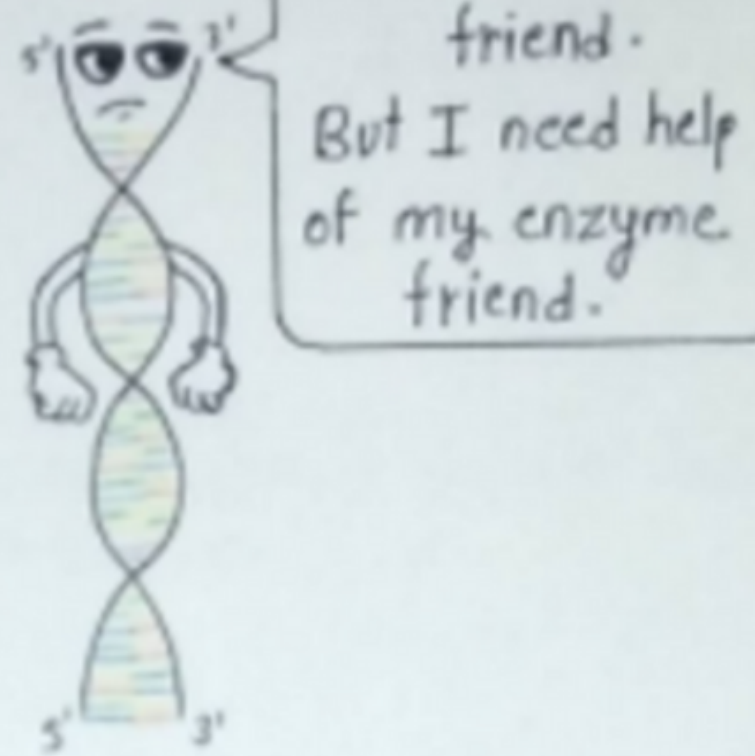
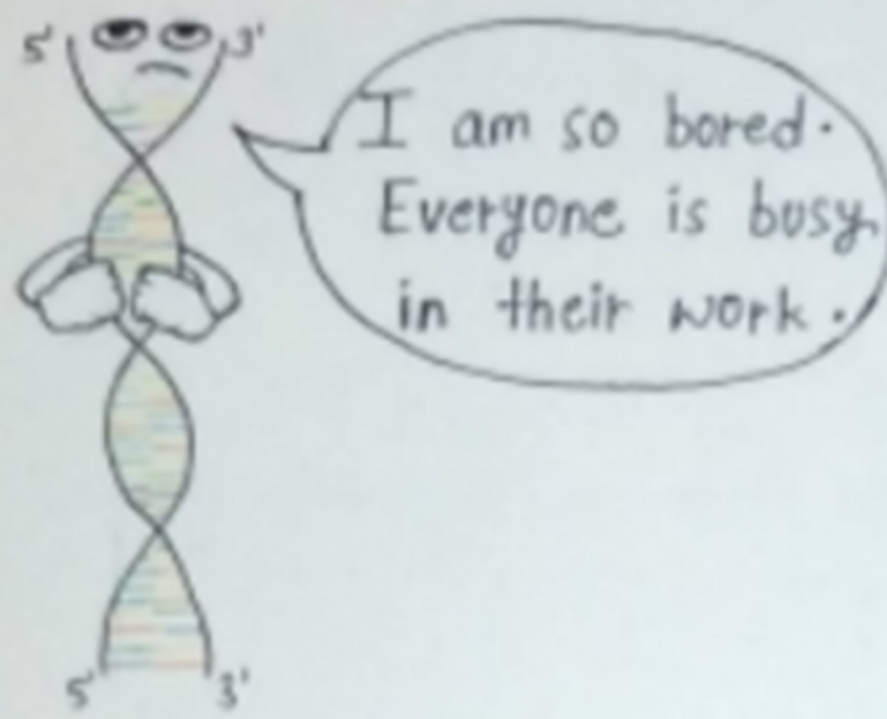


# Overview

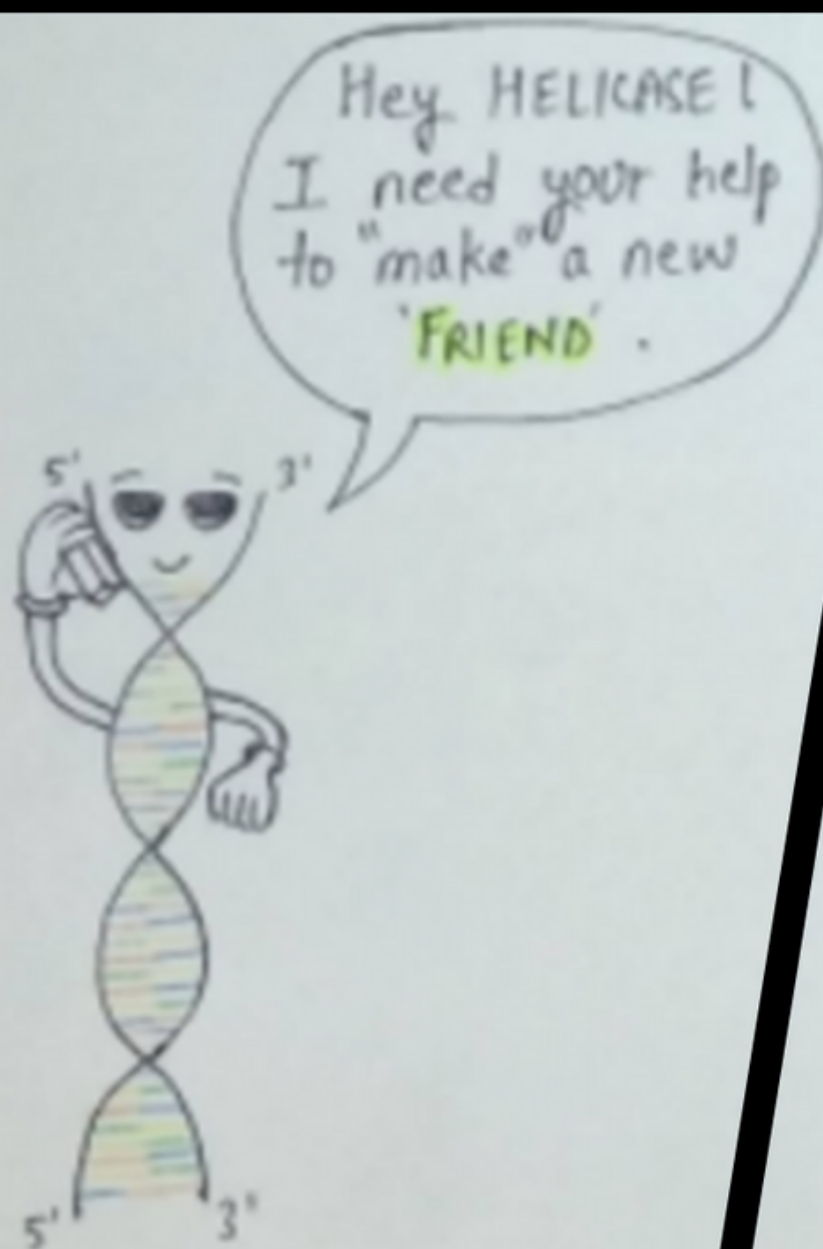
The following comic strip illustrates the process of DNA replication in eukaryotes. It begins with a lonely double-stranded DNA structure's longing for a companion and then describes its undertaking to 'birth' a new friend. The comic reveals the various enzymes necessary for a DNA strand to undergo replication and their respective functions, describes the entire process, and hints at the nature of the replication.



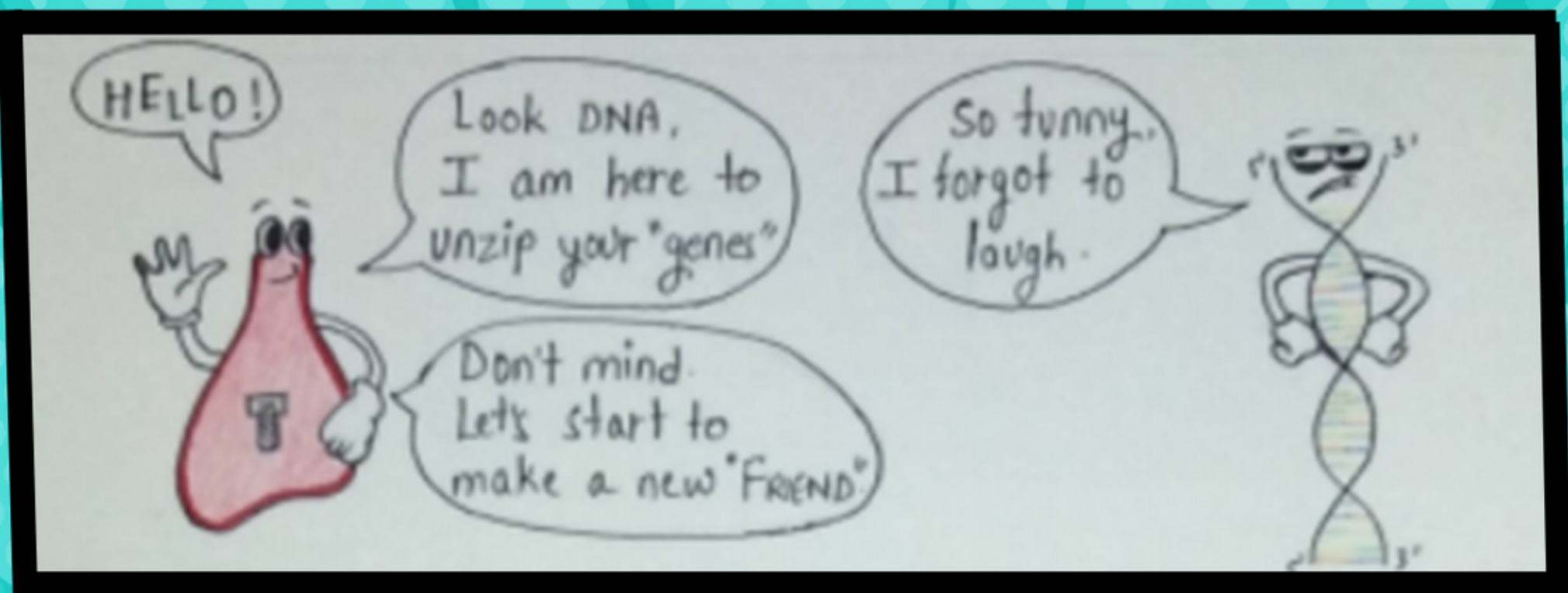
Once upon a time there lived a long DNA who was all alone and very bored.



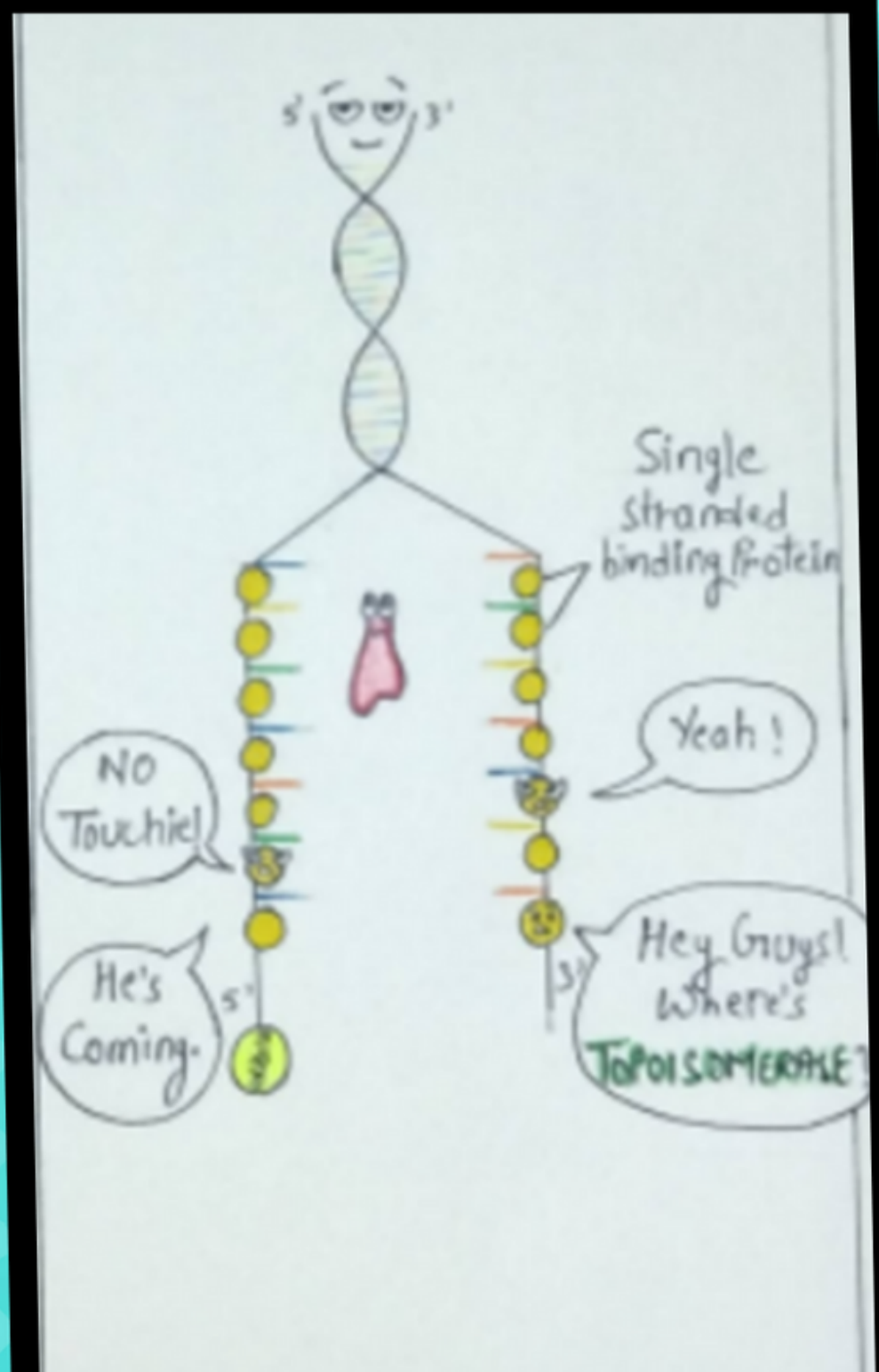
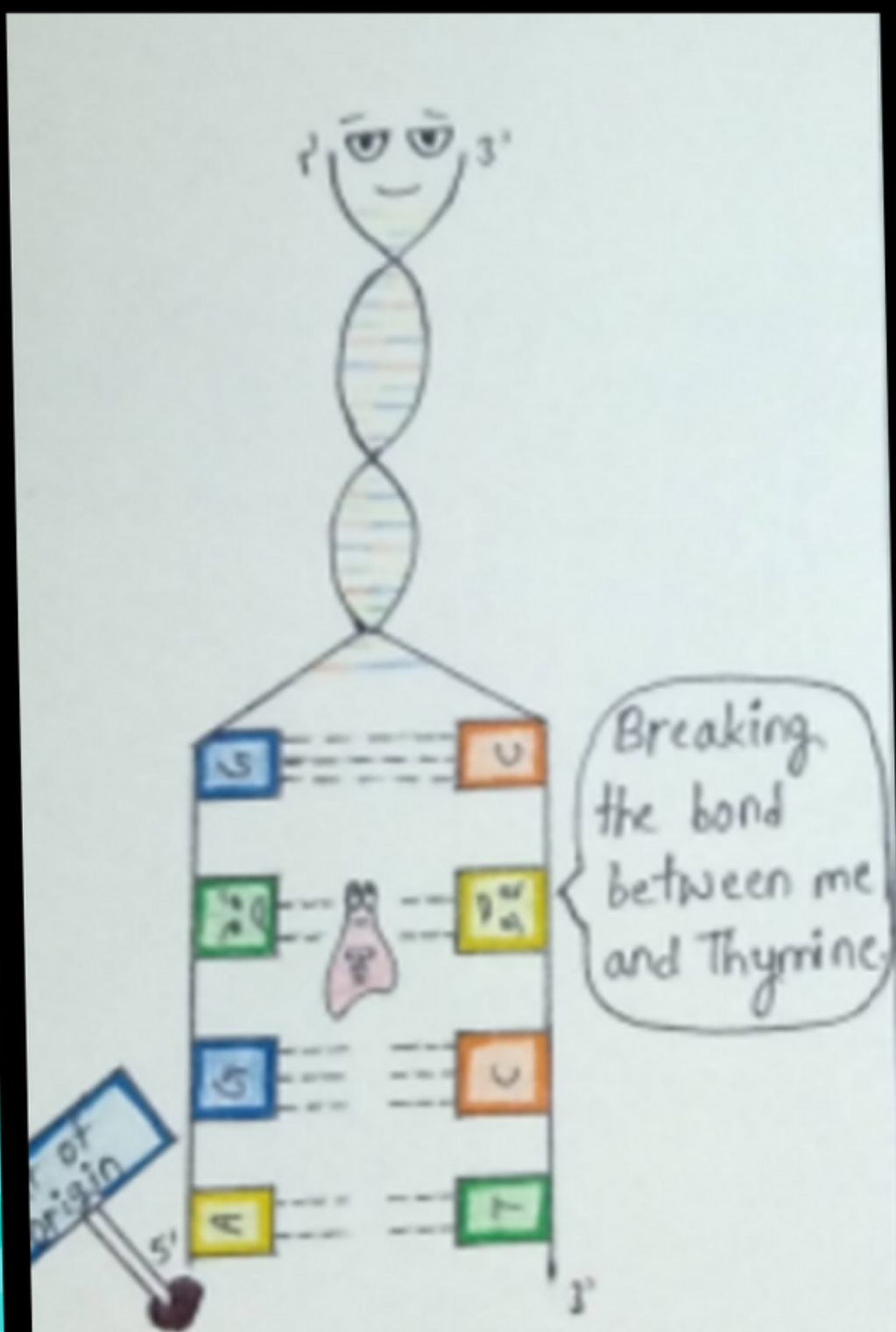
The little DNA decided that the only way he could make a friend, was to literally, "make" one. He asked 'HELICASE' for his help by calling through his CELL phone.



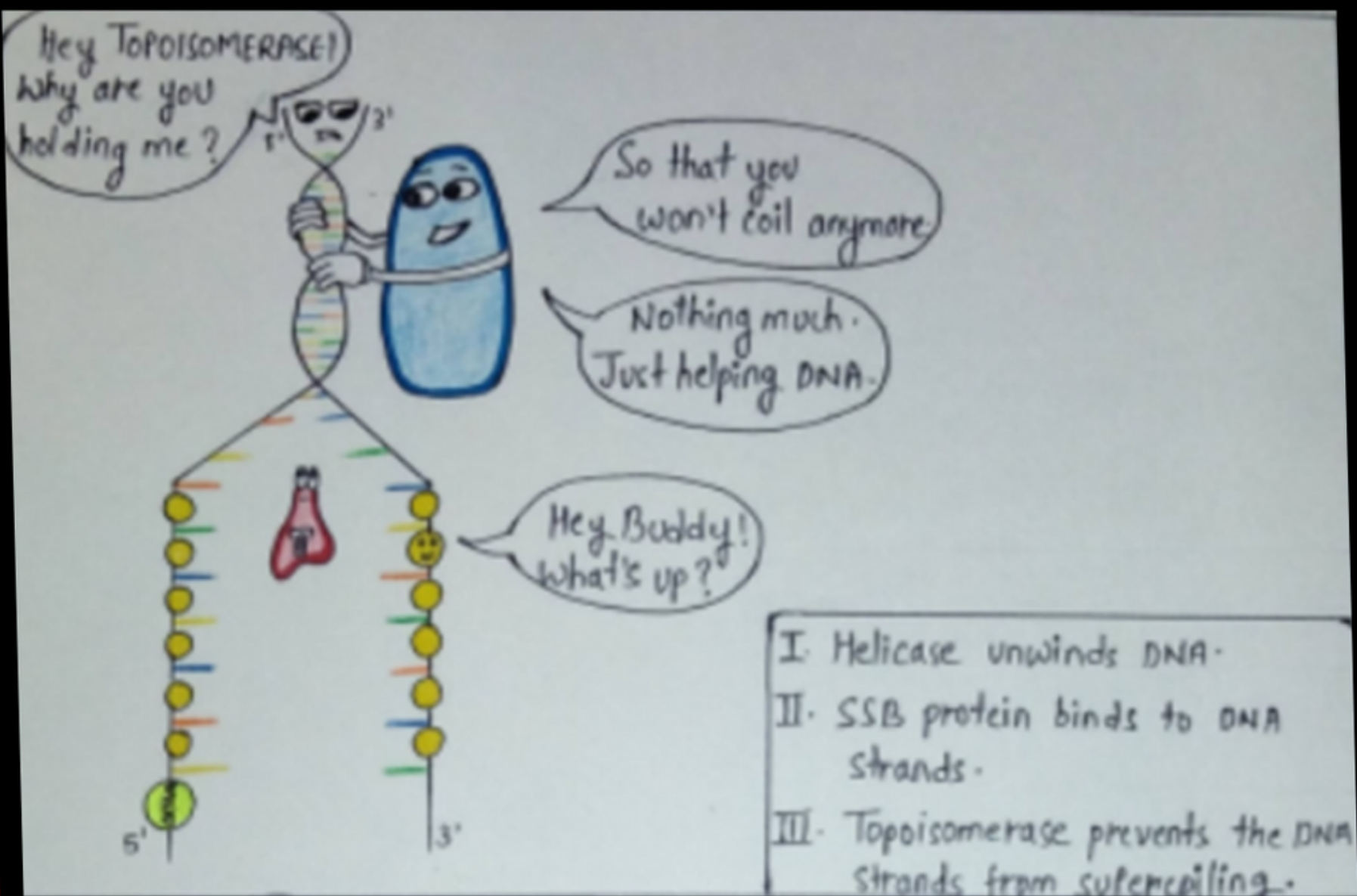




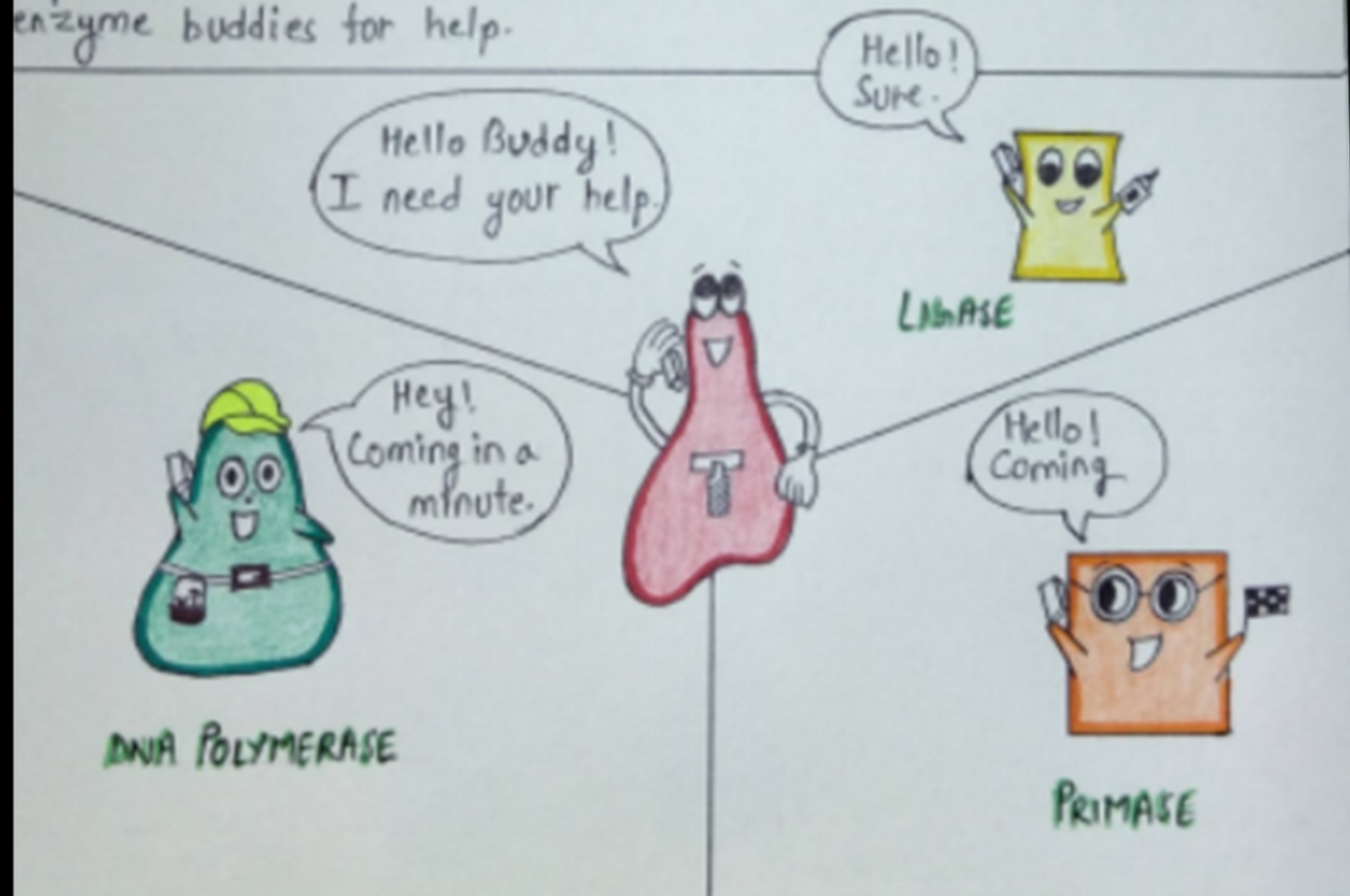
HELICASE started helping the DNA. He started unzipping the DNA strand by breaking the hydrogen bond between the base pairs.



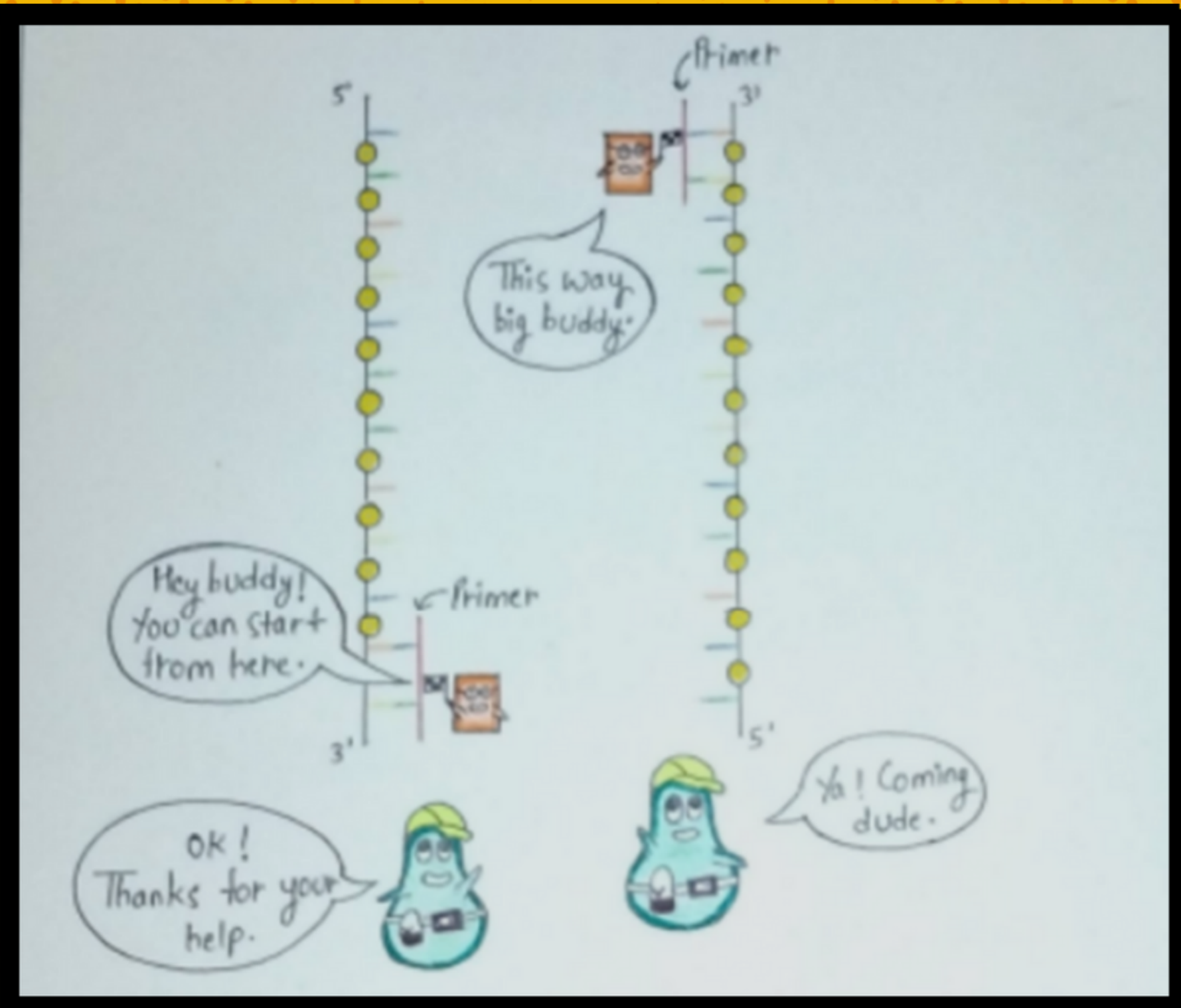
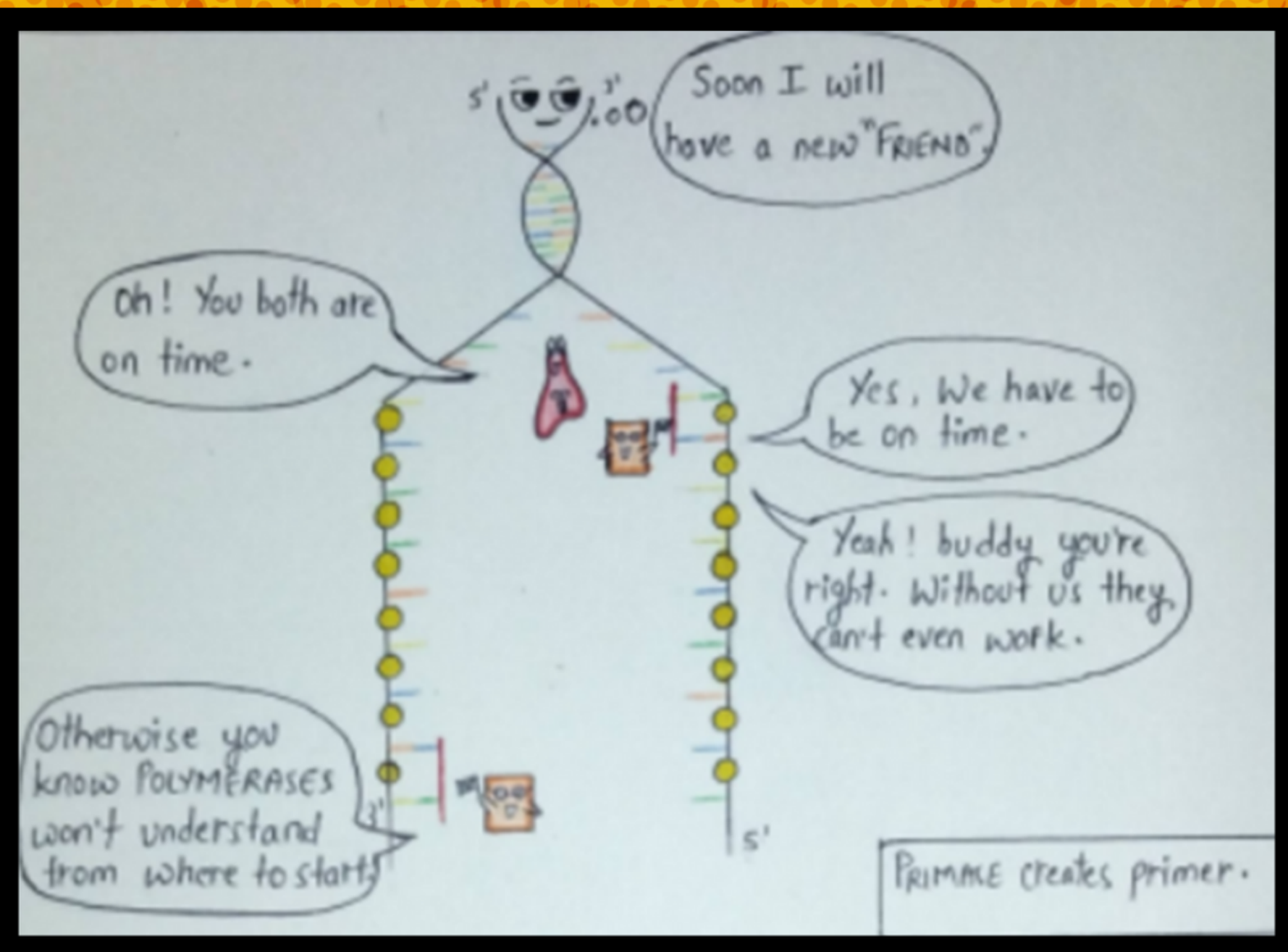




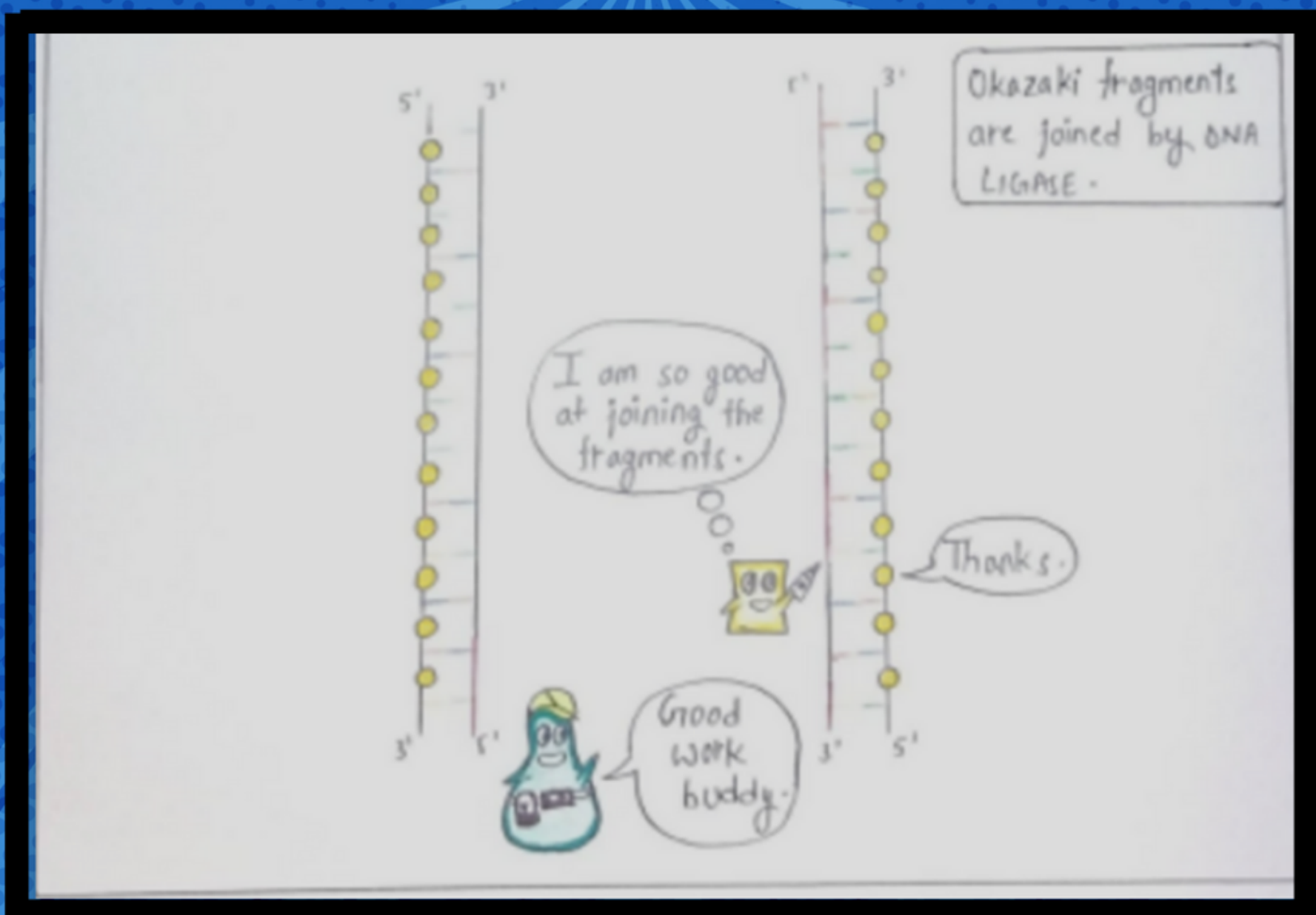
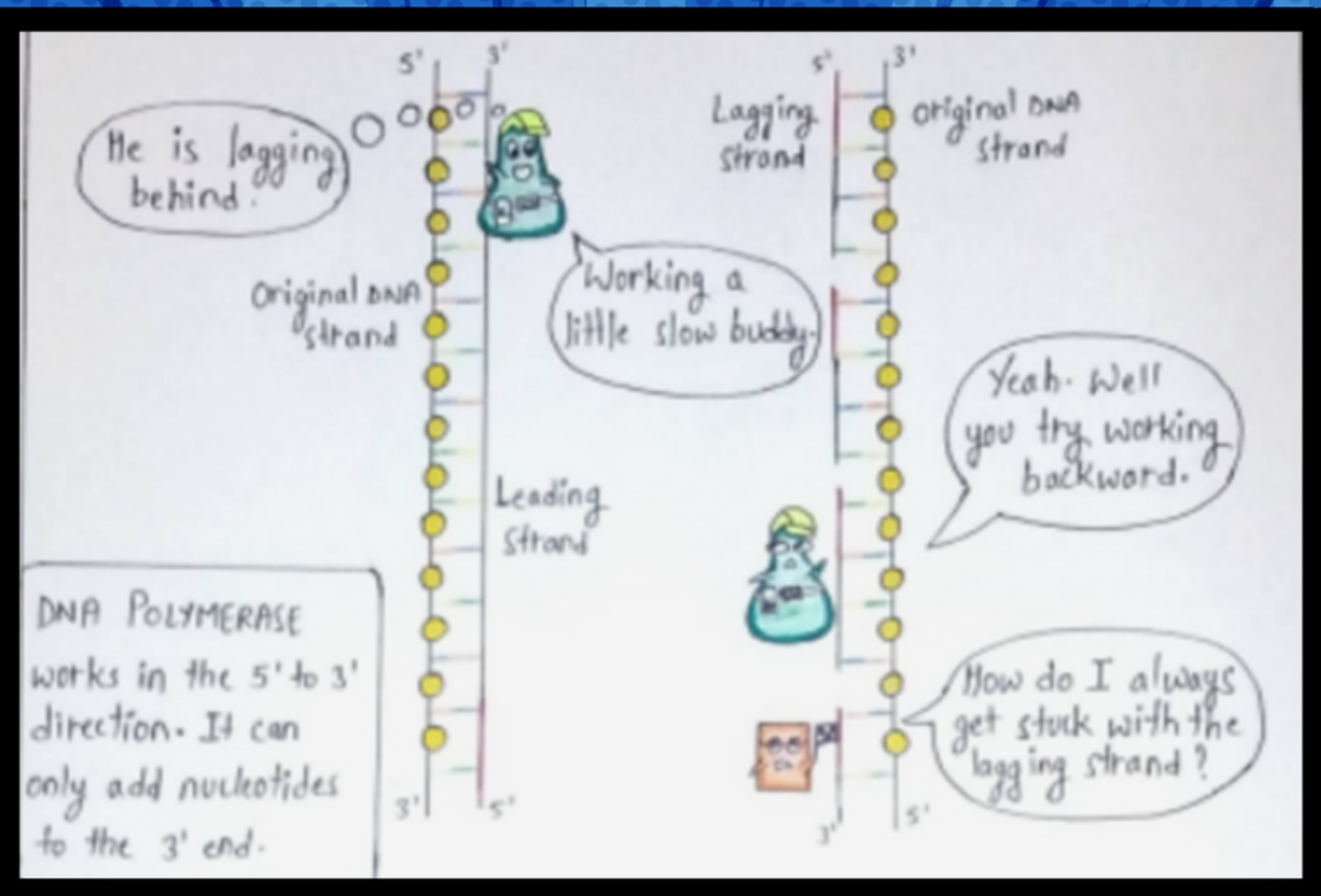
While helping DNA, HELICASE thought that he alone could not be able to help DNA "make" a new "FRIEND". So he decided to call his other enzyme buddies for help.



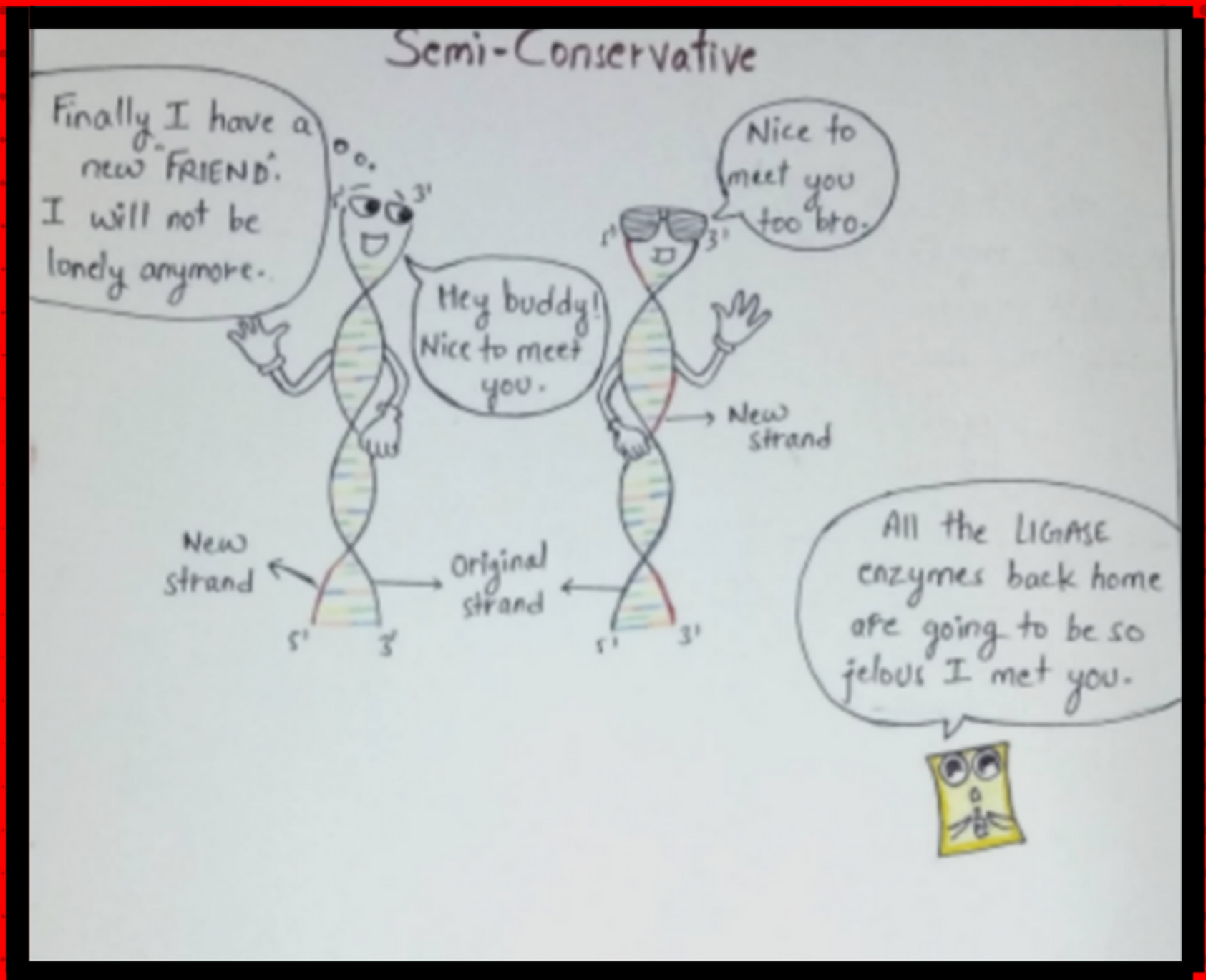












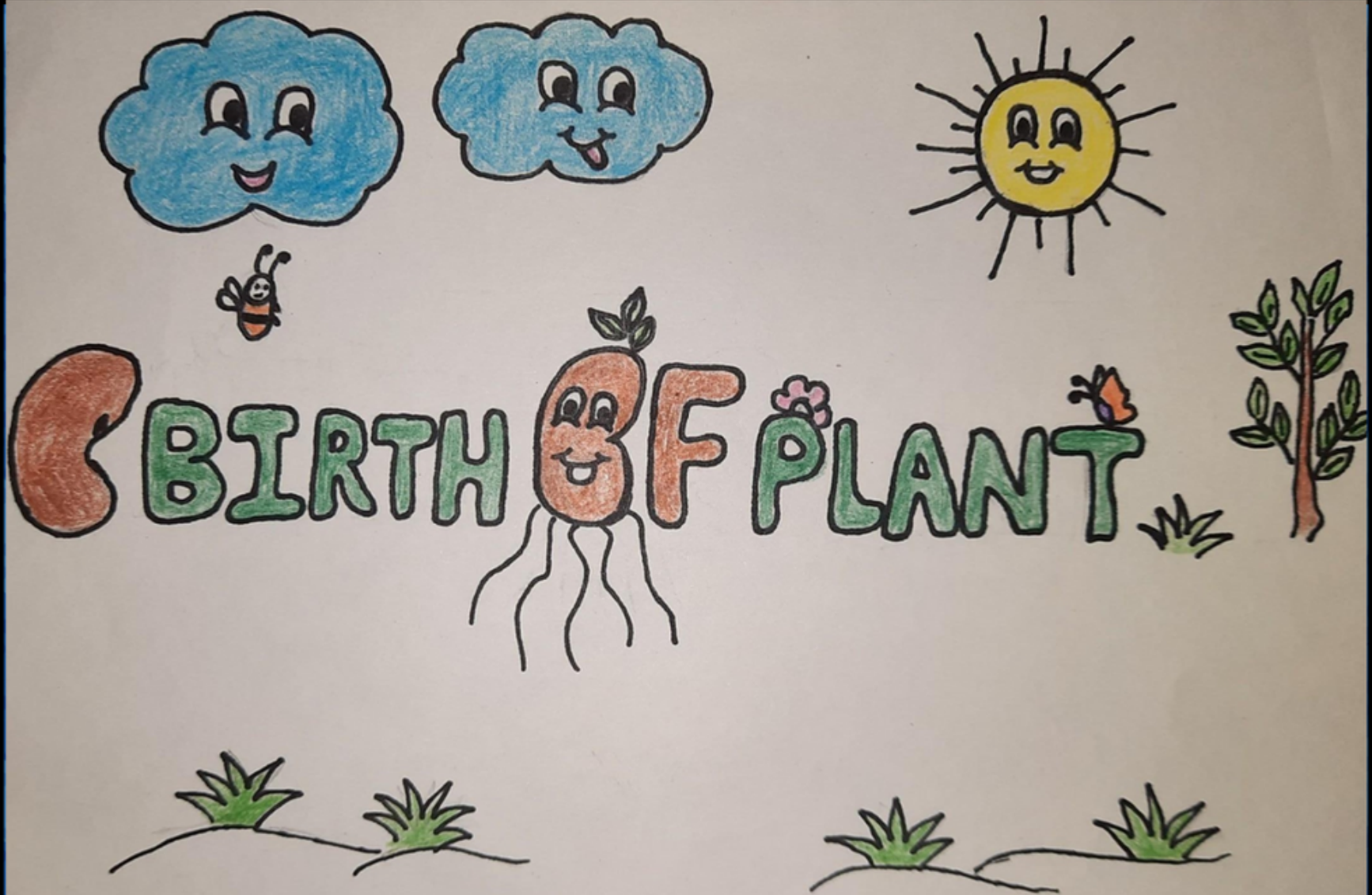




# BIRTH OF A PLANT

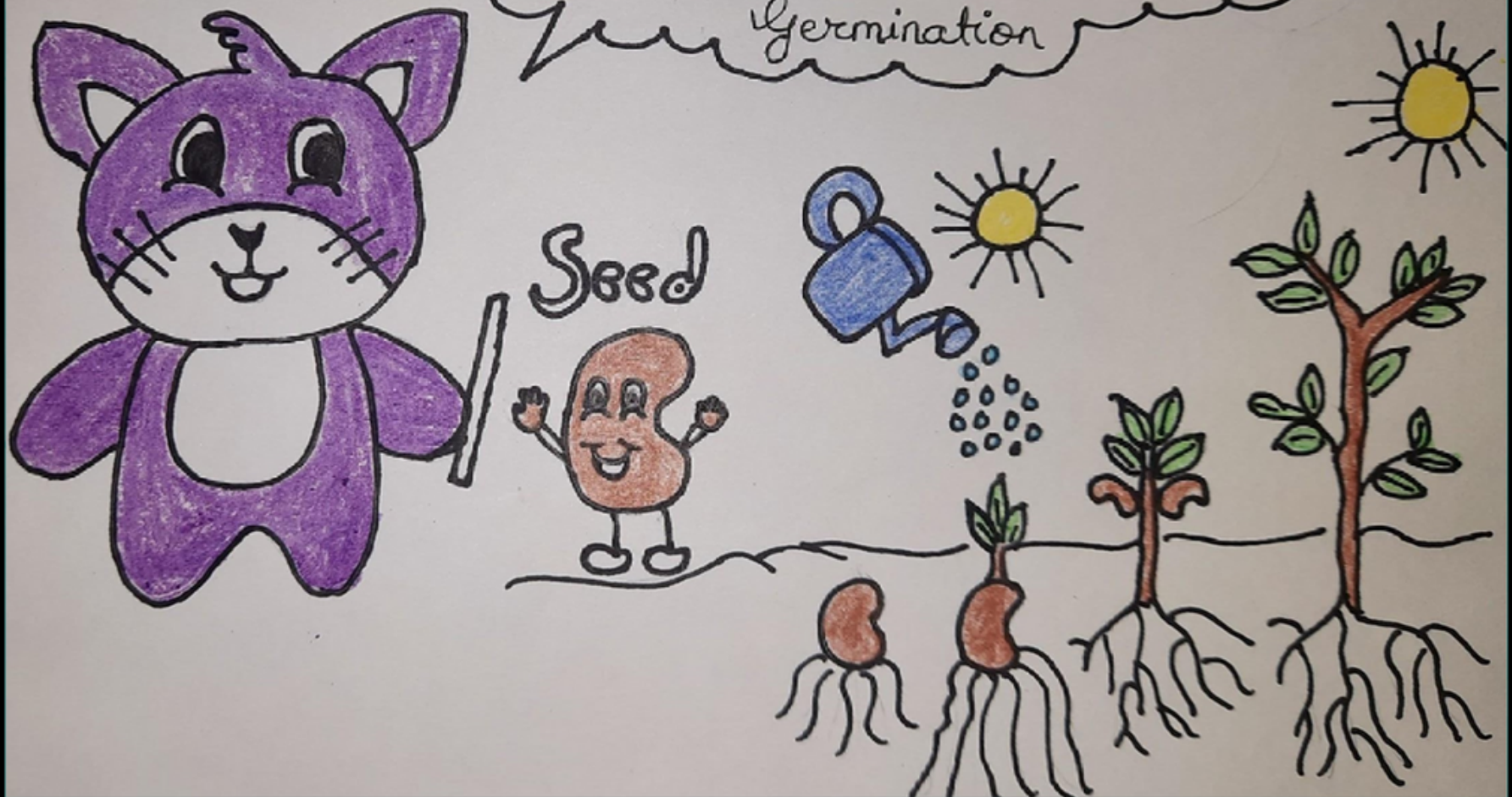






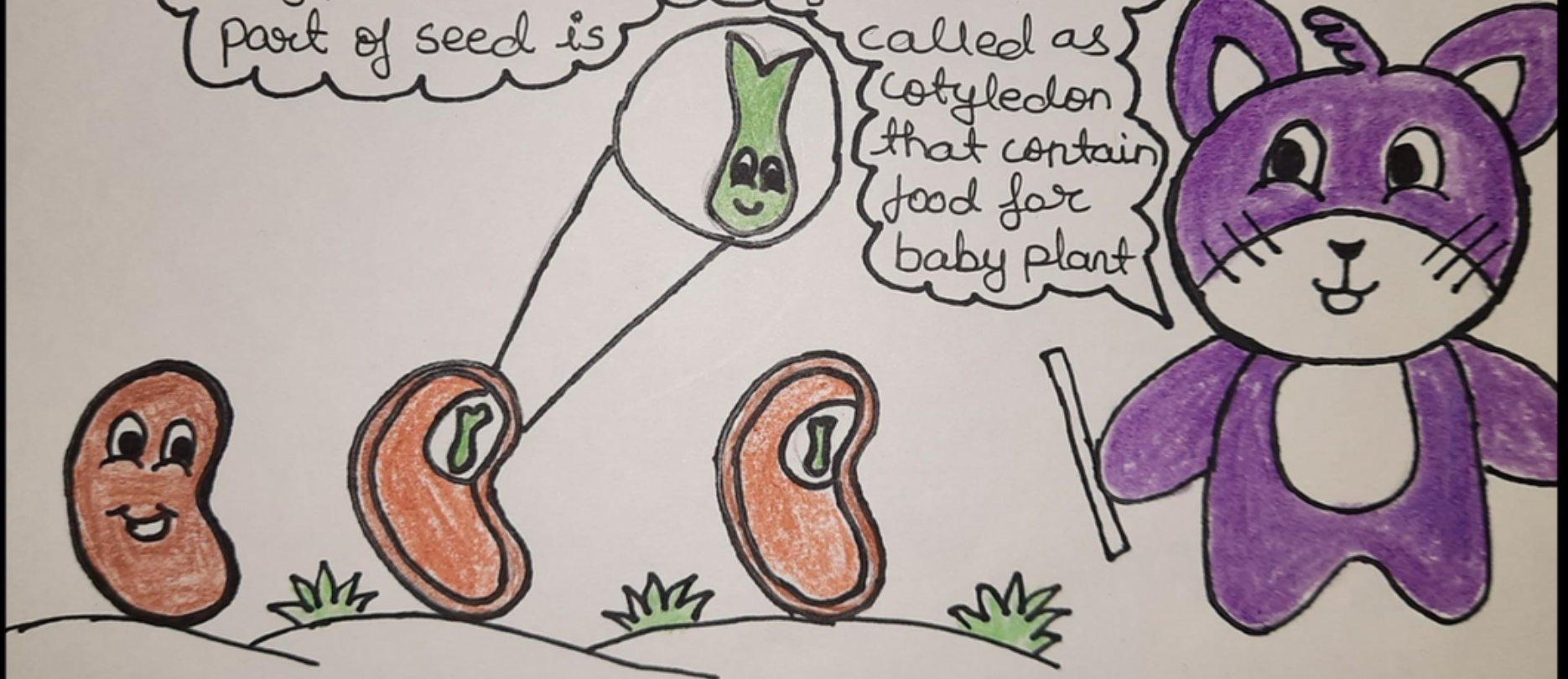


So let me answer your question. Plant comes from the seed. But how? The process by which different plant species grow from a single seed into a plant is called as Germination



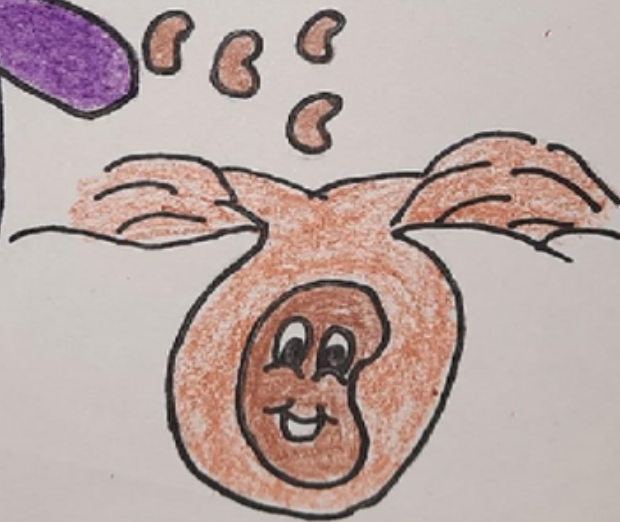
A seed has 3 major parts - a seed coat which is the outer layer of seed. And inside the seed, there is a baby plant, called embryo. And the rest of the part of seed is

called as cotyledon that contain food for baby plant

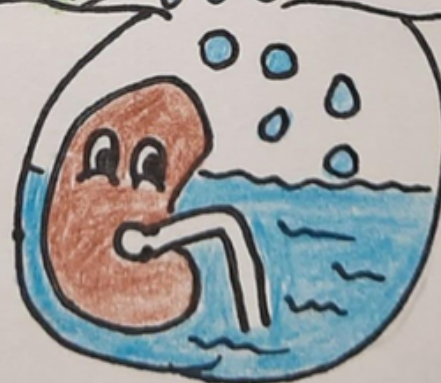




Let's see how the process occurs, step by step. First of all the seed is sown in soil. A proper seed must be sown in a suitable soil, if the seed doesn't match the soil type it won't grow.



So, the germination begins as the seed sown in soil, starts consuming the water from soil, which results in swelling of seeds and the seed's hard coat becomes soft. This process is called imbibition.



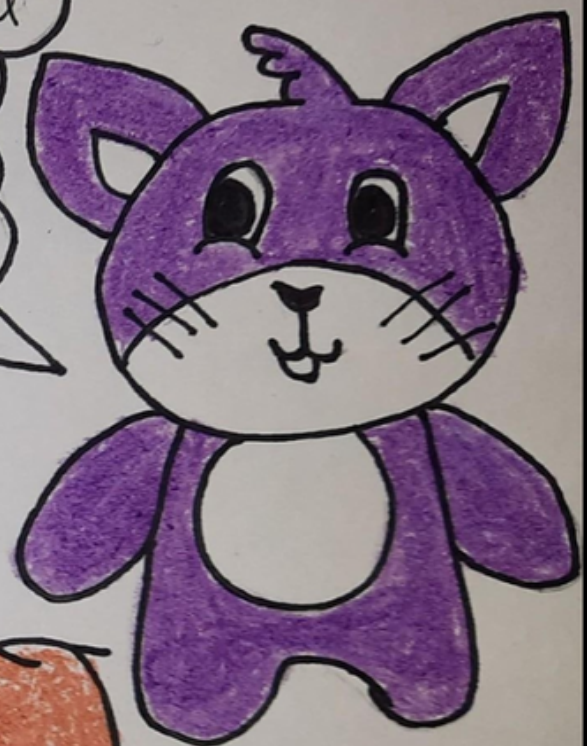


Water entered in a seed activates the enzymes required for growth. The baby embryo gets water from surrounding and food from the cotyledon, already present in seed. The embryo gets

nourishments and gets ready to grow



Now the seed coat gets rupture and small roots emerges from the seed. Later this roots goes deep down in soil in search of water and feeds embryo with more water and nutrients. This makes the plant base firm in soil.





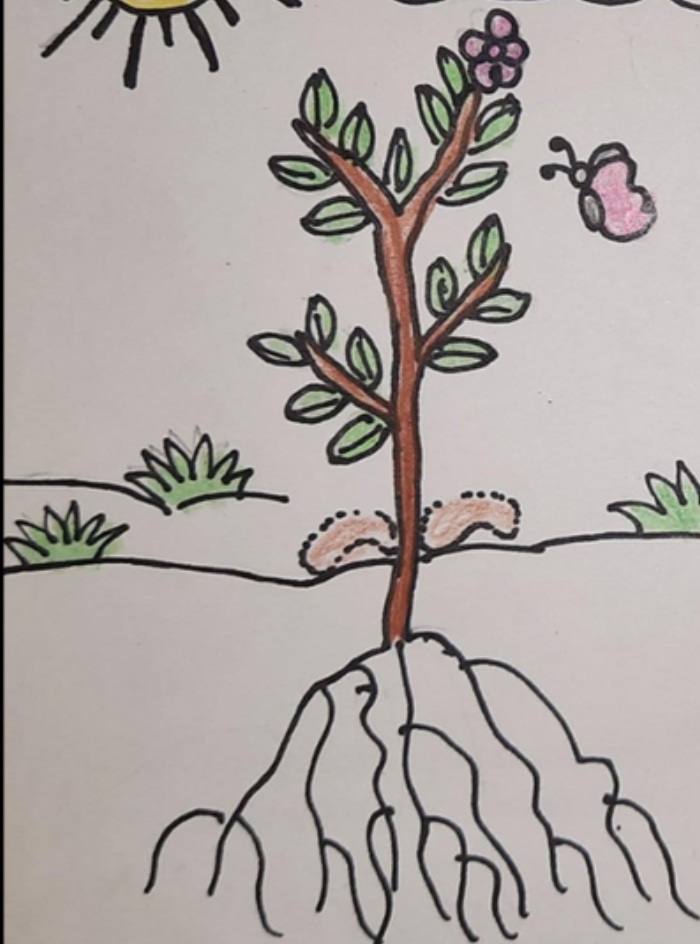
Next to this, the seed gets metabolically active and develops the shoot from the other side of seed. And we can finally see the small plant coming up from soil on the upper surface of soil in search

of light, this process is called photomorphogenesis.



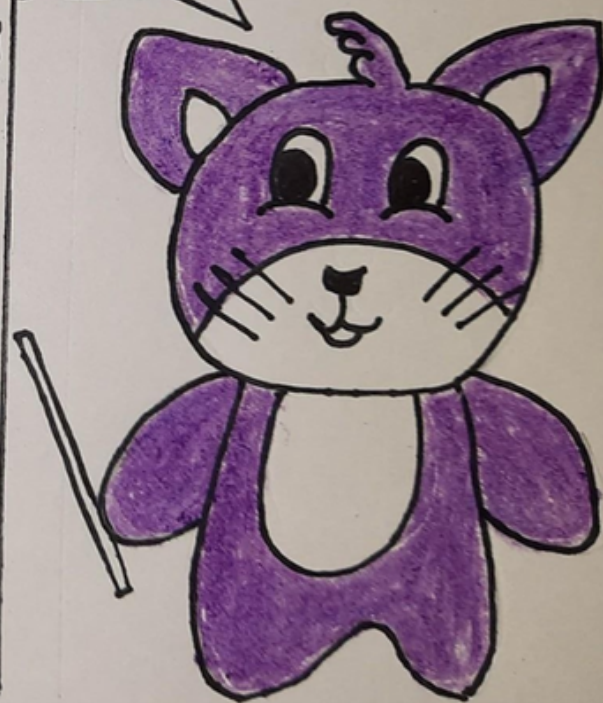
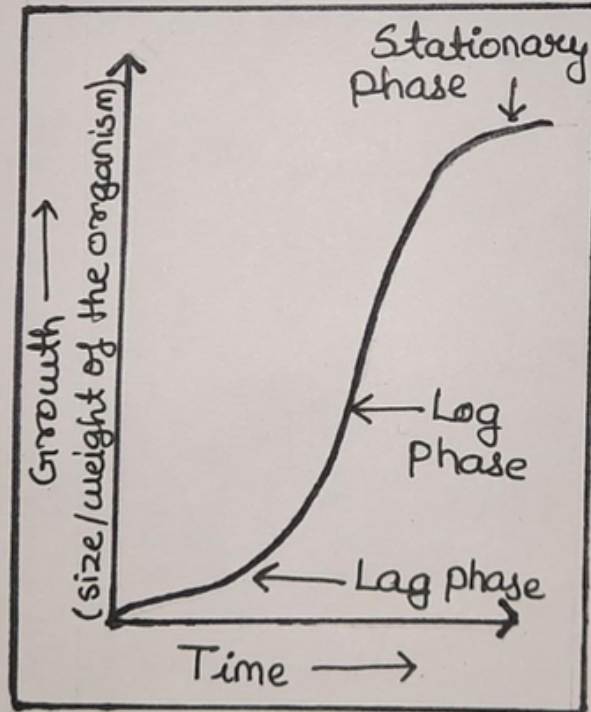
Now the cotyledons has completed there job and they fall off becoming the part of soil. Now the leaves starts performing photosynthesis and complete there need of nutrients. This is a complete process, which is called as germination.

A journey of seed to plant.

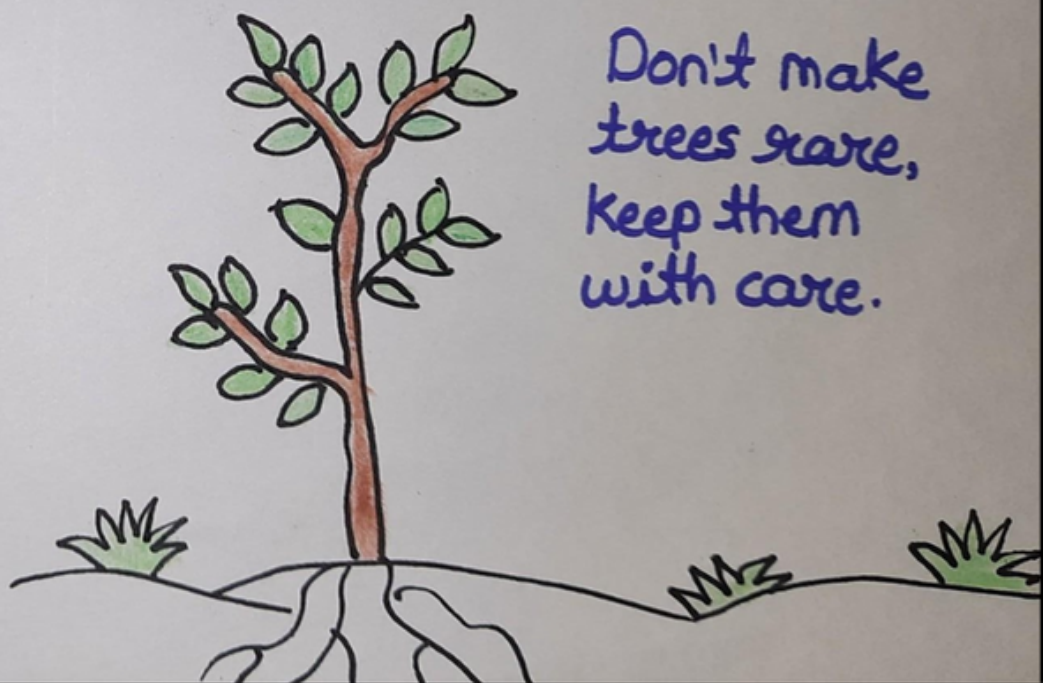
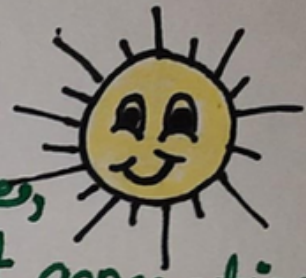




So, now let's see how the plant grows further, in short. We can understand the growth of plant with the help of growth curve of plant. When the rate of growth of plant is plotted against time, a "S" shaped curve is obtained in plants, it is called "Sigmoid Growth Curve". The growth is initially slow during lag phase, fast during log phase and steady during stationary phase.



Plant a Tree,  
So that next generation  
can get air for free.



Don't make  
trees rare,  
keep them  
with care.





# SCI-FACTOCASTS







# CULTURED MEAT



Hello everyone! Myself- Akanksha Khandge. Today I'm here with the topic: 'cultured meat'.

Would you like to have a bite of a cheeseburger made by a scientist? Technologies have started up and scientists are focusing on lab-grown meat. Currently, livestock is responsible for around 15% of global greenhouse gas emissions. This number could rise in the coming years. According to the World Economic Forum, the world's population will be around 10 billion by 2050. This will lead to a rise in the demand for meat. To feed the world's demand for meat, we already use around 27% of farmable land to raise livestock. That's why it's become essential to find a sustainable way for satisfying the rising demand for meat. So, cultured meat could be one of the future paths to sustainability.







Cultured meat is meat produced by in vitro cell culture of animal cells, instead of killing animals. It is a form of cellular agriculture. The concept of cultured meat was popularized by Jason Matheny in the early 21st century.

After that, in 2013, Mark Post, a professor at Maastricht University was the first who showed a foolproof concept of cultured meat, by creating the first burger patty grown directly from cells. This was done by the technician by taking a few cells from a chosen animal via biopsy, or from an established animal cell line, with no death involved in it. The cell line could also be established from secondary sources such as cryopreserved cultures. Cryopreserved cultures are the cultures that have been frozen from previous research. Now, these cells are taken to a lab and nurtured on a scaffold, in a bioreactor. A bioreactor provides a controlled environment for a culture medium to grow. The cells in the bioreactors grow and multiply exponentially.







Finally, the solution is purified in order to separate out the residual protein and the meat cells are harvested. Once harvested, the meat cells can be formed into different items, from patties to sausages!

In the future, it may be possible for us to use technologies like 3-D printing and produce edible scaffolds, to create particular cuts of meat and give the different shapes to meat, which we see. The lab-grown burger lacks one central element, which is fat.

The meat which is consumed every day contains different types of muscles, connective tissues, lipids, bones, and fats, which also give flavour and texture to the food. One of the biggest challenges for cultured meat-making is bringing the flavours and texture, that might be expected by the consumer, into the patty of the burger.







There are many other technological challenges that include developing better cell lines, and cheaper ones because the culture media prepared is very costly, and reducing the time it takes for the cells to grow are some of the challenges faced during the process of culturing meat.

The use of this serum is a major barrier for the industry because the concept of cultured meat is to remove the animals from the equation. So, the main challenge is to find an alternative for the use of foetal bovine serum. Cultured meat also needs to taste good and have the same taste as that of original meat which we consume every day. Consumers would not mind eating cultured meat just because it comes from a lab if it tastes the same as original meat.







Lab-grown meat is a lot more eco-friendly as compared to regular meat. It eliminates the need for livestock, which could reduce the use of energy by as much as 45%, reduce the use of land by 99%, and produce up to 96% fewer greenhouse gasses. It will also be animal-friendly as no animals will be harmed or treated in this technique.

Hope you learned something about cultured meat today!

**Click on the button below to listen to the podcast:**

**AKANKSHA KHANDGE'S**  
**PODCAST**





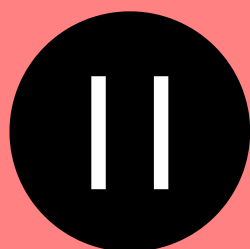


# MICROBIOME AND HEALTH



We are more them than us. Who's them? We'll come to that in a moment. Consider you and me. We both look different, sound different, and have different thought processes. Yet, it will be surprising to know that we are actually 99.9% identical to one another in terms of our genomes, i.e., the complete set of our genetic material-DNA. Then, where do all those differences in us come from? That's where our microbiome comes into the picture.

We are 80% to 90% different from one another in terms of our microbiomes. So, what is it? The microbiome is the sum total of all the microorganisms like the bacteria, fungi, viruses, protozoa, and parasites that live in all the particular environments where they can grow, reproduce, and put some major impacts on their surroundings.





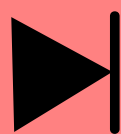
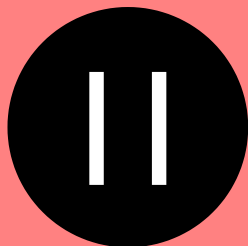


Let us all dive into understanding this micro-world within us and how our lifestyles have a profound impact on it, in this first episode of our podcast series ‘Microbiome and Health’.

Who better to have this discussion with than someone who's been working in this field! I introduce you to our very first guest, Naina Goel, a research scholar at K. U. Leuven, Belgium.

Hosts: Welcome, ma'am! We are really glad to have you as our very first guest in the series of Psyche Podcasts.

Guest: Thank you, Deeksha and Saloni, for welcoming me to the session, especially since it is your first very episode of the podcast Microbiome Health. So, looking forward to it!



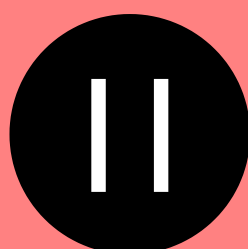




Hosts (introducing): Hello and welcome to Psyche Podcast, a podcast where I, Deeksha, and I, Saloni, interview people in science. Join us for some fun conversations and to get interesting insights into and around science!

Hosts: Our bodies are in constant interaction with the outside environment. Like, as we are taking in different molecules in our food, medicines, and various other substances. So, these molecules then interact with the microbes living inside us. So, how can these interactions between our bodies and the microbes help us in understanding what type of diet and lifestyle we should have?

Guest: It's really an interesting point that you are raising, Deeksha, here, because first of all the microbes are present everywhere, they are ubiquitously present. So, even if we are washing our hands and then touching our face, there is some kind of microbe going inside our body.

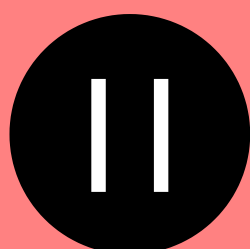






So, now the field is also emerging a bit, because... as you mentioned before, we have a 99.9% identical genome, but the microbiota is really having only 10% or 20% similarity between individuals. So, this is going to be a major cause and that's why we are calling me as Naina and you as Deeksha, and we have different sorts of interactions. And also, this microbiome really holds a lot of importance towards our diet, what we are eating, and how we are leading our lives- whether it's a sedentary lifestyle or an active lifestyle. So, indeed, the gut is, I think, something that's playing a major role towards health and immunity nowadays and also, I believe in this one saying that my forefather used to say that if you have a healthy gut, then you have a healthy body.

So, I think it's now proven somewhere that if you are eating healthy then you are free from diseases. So, maybe they are indicating towards the microbiome, who knows?

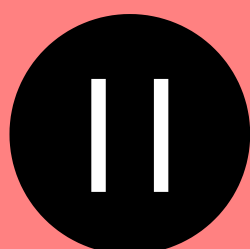






Host: Yes, yes! So, given different lifestyles consist of different dietary habits like what we eat, how much we eat, and at what times we eat, along with bathing, sleep and exercise patterns- so, we can say that, indeed, these are correlated to our microbiome, as you have rightly said- as our forefathers have been saying- so, is it right to say that these different lifestyles give rise to different compositions of microbes within us?

Guest: Yeah, yeah, Deeksha, we can make this valid point- different lifestyles could have different kinds of microbiome compositions- why not? We should look at certain examples. For example, if someone has a smoking habit or is a chain smoker, then they have a different kind of microbiome itself, so, they may have a problem like irritable bowel syndrome- like he may have the problem of constipation and things like that, and his stomach is bit upset and it may lead to colorectal cancer in the later stages and the studies have been done.

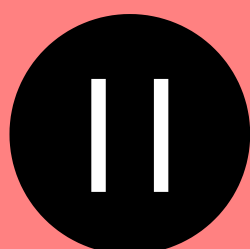






And, I would like to share another example, where people are really thinking in this direction- about 'dietary stress'- the way you are eating, what you are eating, whether you are having a high content of fibre in your diet, or whether you are having a lot of toxic foods- so, that has a kind of, uh...create and stress on your gut microbiome and that may lead to stress your brain, as well. And also, if you talk to a psychologist, they would also suggest you eat healthy and take care of yourself first, than doing something else. So, I think there's a correlation somewhere between the gut and the brain and controlling all these activities but still, it's a new niche and in terms of scientific data, we can't say a lot.

Host: Okay, that's interesting...





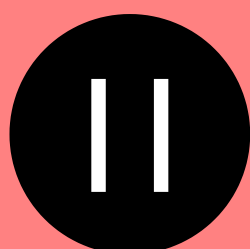


Guest: Yes, yes, Deeksha, and you would be surprised to know that people have seen this effect so fast even when they are migrating... and you know that although this is a 'corona' time when the situation is of the sort where everyone is in lockdown, but during the 'pre-corona' time and maybe in the 'post-corona' time, when our lives will be back on track and when we were travelling a lot, we had noticed certain microbiota changes within 15 days or 40 days- when we were spending our holidays in Europe. So, you can see this overseas- travelling and travelling around the globe- could have an impact because... again, as I would say, microbes are present everywhere, you can't see them but they are there.

Host: Yes, ma'am, they are watching after us!

Guest: Exactly, exactly, Deeksha. Can I share one simple experiment with you, Deeksha?

Host: Yes, ma'am, sure.

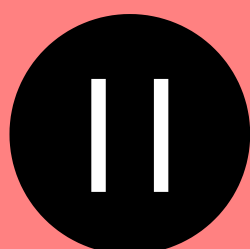






Guest: So, I read this article where they (researchers) prepared a simple experiment. They had obese mice and they had lean mice. And, what they did is- they took out the microbes from the obese mice and from the lean mice and put them into germ-free mice. What I mean by germ-free is that they don't have any microbes. And, when they see the phenotypic character, i.e., how they look like- the physical characteristics of the mice, they see that most lean mice remain lean but, the lean mice having (those received) obese microbiota became obese. So, can you see the point here? Obesity can be controlled by one's microbiome.

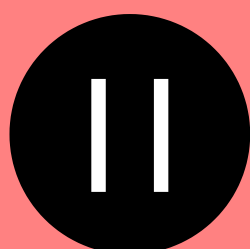
Host: Yes, ma'am. So, now if we talk about these differences, in terms of geographical differences, for instance- in India, if we consider the microbiomes of an individual from the south and one from the north, how much difference can we possibly see?







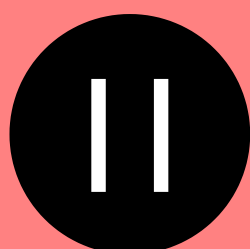
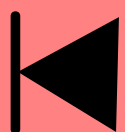
Guest: So, before going into the 'north and south' differences, I would really like to appreciate the initiatives taken by the researchers in India- they started the 'Human Health Gut' microbiome project in India. So, they want to study the microbiome of the whole of India. So, it's going to be amazing! Although the project started a few years back only, we already have some interesting results and I would like to share them with you guys. So, for example, everyone knows that the northern region is more herbivorous- they eat more vegetarian food. And, do you know what we noticed- we noticed that when people are eating a more herbivorous diet or a more vegetarian diet, they have more branch-chain amino acids and these amino acids are really helpful in the reproductive age of a person. But, on the other hand, when we noticed the south population, where people eat a more omnivorous diet- that means people are eating more non-vegetarian food and seafood as well- they have a higher density of short-chain fatty acids.







And, these short-chain fatty acids are really helpful in reducing your cholesterol levels and may, in turn, help you in reducing the chances of a heart attack or diabetes at the later stages of your life. So, you can see how the two different diets from two different parts of the same country, like India- because of such vast diversity- show a microbiome shift and there's a shift in the health habits. Also, there's an impact observed towards urbanisation, as well- so, I can divide the whole population, even the whole world... also, even during urbanisation, there are still people who are living in villages and there are people who are living in big cities- cities like New York or Delhi or Calcutta. It's super huge! So, having a diet with fibres or having a good diet in an environment where it's hard to breathe clean air is just hard. Thus, I think there's a difference in their microbiomes also and that's why we are noticing all these cases of lung microbial diseases as well, and those may have an effect on your health.





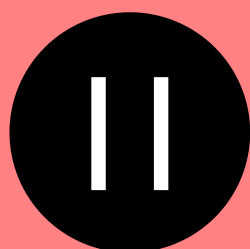


Host: So far, we have been talking about the differences between two different individuals, but are these differences in the microbiome also seen within the same individual?

Guest: Uh, Deeksha, do you mean to say with respect to different organs within the same organism or... could you please explain your question a bit more, in detail?

Host: Yes, ma'am- like we have microbes in different locations of our body as well, like in our lungs, our skin...

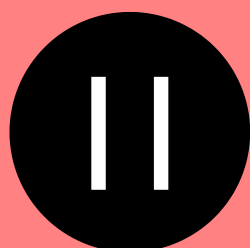
Guest: Right, got it. That's very interesting actually. So, if you will see the whole digestive tract, we have different microbiotas attached to your saliva and your salivary glands, and there's a different microbiota in the oesophagus, stomach, largest intestine, and small intestine. I am not going to take the names, but if you will see the composition, even with respect to the digestive tract, they are very different.







Also, we have seen changes with respect to age also. So, when a child is in their growing age, the microbiota is completely different, but when the child becomes an adult, then their microbiota is a bit more different, and when the person becomes older and even older, the microbiota is different. So, there is a change during ageing too. Also, there is an interesting change with respect to (a child's) delivery, as well. If a child is born through a C-section, instead of having a vaginal birth, there is a change in their microbiota composition also, because when the child passes through the vagina, they get more exposure to the (mother's) microbiota and that's how they (the child) inculcates... or gets more microbiome inside their body. So, these are the changes that are very specific. And also, there is one interesting thing- the skin microbiome is completely different from the digestive tract microbiome. So, each and every part has a different composition of the microbiome and that's also true because these microbes are very selective with respect to their environment- they look for different pH, different temperatures, and different locations.



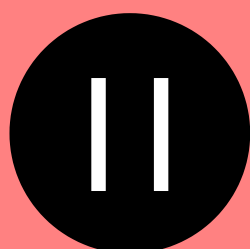
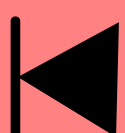




So, the locations that are the most vital to their survival—they select those paths in the body. So, they (microbiomes) differ a lot, in short.

Host: Okay... okay, ma'am. So, ma'am, it means that as we are growing, our microbes are also growing and they are also dividing and interacting with us and with our surroundings indirectly. And, so... this really makes it clear that keeping our microbiomes healthy should become one of our topmost priorities. So, ma'am, what kinds of dietary practices can help us keep it healthy and happy and thriving?

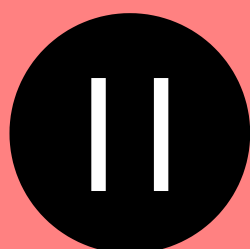
Guest: As we are growing microbiota is changing, indeed, and the particular key here is about keeping your gut healthy. So, as we discussed or as I mentioned before— if your gut is healthy, then you are free from diseases, so... but also, here we notice that there is co-evolution between the organism and the (organism's) microbiome. So, as an organism is getting older, its microbiome is also getting changed— it's an interesting example of co-evolution.







But, considering your (question's) last part where (you asked about) how we can make it healthy, happy and, thriving, I want to give you 4 'R's. The first ('R') stands for 'remove', the second for 'repair', the third for 'replace', and the fourth for 'reinoculate'. Let's talk a bit about these 4 'R's. The first 'R' stands for remove. So, what does to remove mean? So, cut out all the diets or all the foods that have certain amounts of toxins or harmful chemicals, that maybe a factor or later on (in life lead to)... developing syndromes or cancer, as well. So, cut... look after what you are eating and cut out or remove all those toxins that can have a bad impact. Repair- the second part- load up or create your diet such that it is more based on plant (products) as food- those give more supplements to your body because if you are having an omnivorous diet, then you are... to protect those animals (that we consume), we put lots of antibiotics to keep them healthy and those antibiotics also go into your body. So, you are creating a kind of biomagnification of antibiotics in your body.

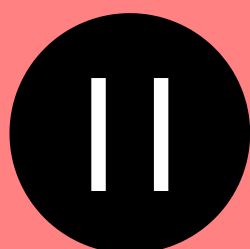






So, that's why repair your diet, change your diet. The third part here is to replace- think about how to maintain a good acidity of your stomach. You must have also heard that our stomach works in a small... slight pH range, but if it is too acidic- it is not good, if it is too basic- then, too, not good. So, think about all these parameters while thinking about how we can make the quality of life (better) by selecting good food. Then, the fourth is to reinoculate. So, currently, In the market, you can find a lot of examples of probiotics, like Yakult is available for you. And, one of the best elements of our diet is having Indian yoghurt- which every mother knows how to make. So, I think by including these small-small changes, you can make your life much better and adopt a healthier lifestyle. .So, eat healthy, keep your gut healthy, and (that's how) you can also stay healthy.

Host: Yes, yes! That means the road to health and happiness is through our intestines!







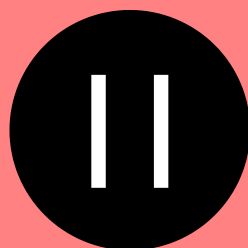
Guest: Indeed, indeed!

Host: Ma'am, it was so much fun having you here and getting to know the insights of this micro-world that we have been talking about, and we are also looking forward to having more such conversations about our microbiomes.

Guest: Thank you, Deeksha! I had an amazing time with you and I hope the audience will also learn a bit with us. So, thank you, you are amazing and it was a wonderful time! Thank you!

**Click on the button below to listen to the podcast:**

**DEEKSHA GARG'S**  
**PODCAST**



**Editor** - Suzanne Mondal  
Yeshesweeni Bhaskar  
Abhishek Parmar

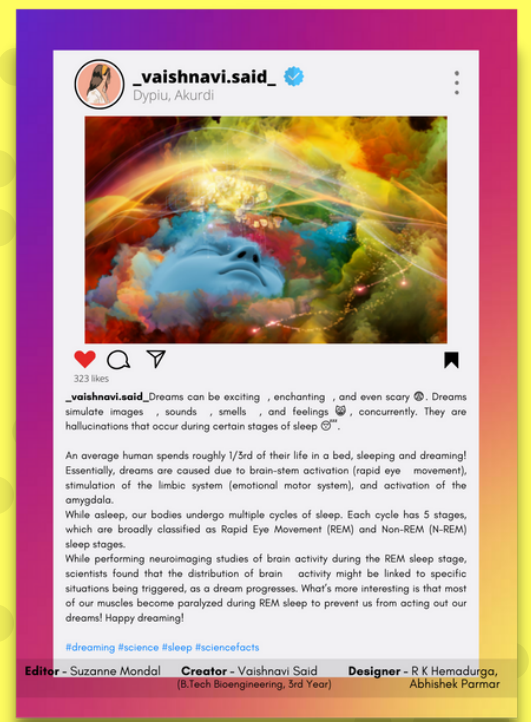
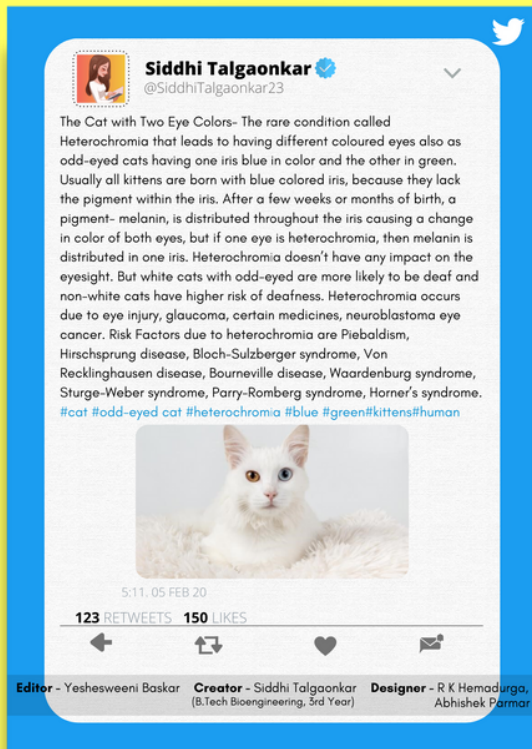
**Creator** - Deeksha Garg

**Designer** - R K Hemadurga



# SOCIWORTORY

The following section, of Sociwortory, comprises of social media posts- the form of communication no one is oblivious to today! Encompassing numerous platforms, this ever-loved form of expression never ceases to grow and has innumerable promising years of development to come!







**Abhishek Parmar**

Today 10:00



Close relatives of the tiger salamander, Axolotl, is a species of aquatic salamanders. The scientific name of Axolotls is *Ambystoma mexicanum*. Axolotls can be quite large, reaching up to a foot in length, although the average size is closer to half that. They are typically black or mottled brown, but albino and white varieties are somewhat common, particularly among captive specimens. Unlike humans, they have the “superpower” of regenerating their limbs, heart, brain, tail, jaws, and multiple other organs. These cute salamanders are of great interest to scientists, owing to their ability to regenerate limbs and parts of their brain; wish I could do that! Researchers call them the “masters of regeneration”.

[#regenerationpower](#) [#cutesalamander](#) [#walkingfish](#) [#cutestfish](#)



You and 68 others

69 comments



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Comment





**Siddhi Talgaonkar**

@SiddhiTalgaonkar23



The Cat with Two Eye Colors- The rare condition called Heterochromia that leads to having different coloured eyes also as odd-eyed cats having one iris blue in color and the other in green. Usually all kittens are born with blue colored iris, because they lack the pigment within the iris. After a few weeks or months of birth, a pigment- melanin, is distributed throughout the iris causing a change in color of both eyes, but if one eye is heterochromia, then melanin is distributed in one iris. Heterochromia doesn't have any impact on the eyesight. But white cats with odd-eyed are more likely to be deaf and non-white cats have higher risk of deafness. Heterochromia occurs due to eye injury, glaucoma, certain medicines, neuroblastoma eye cancer. Risk Factors due to heterochromia are Piebaldism, Hirschsprung disease, Bloch-Sulzberger syndrome, Von Recklinghausen disease, Bourneville disease, Waardenburg syndrome, Sturge-Weber syndrome, Parry-Romberg syndrome, Horner's syndrome.  
[#cat](#) [#odd-eyed cat](#) [#heterochromia](#) [#blue](#) [#green](#) [#kittens](#) [#human](#)



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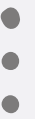






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**\_vaishnavi.said\_** Dreams can be exciting , enchanting , and even scary 🤩. Dreams simulate images , sounds , smells , and feelings 😊 , concurrently. They are hallucinations that occur during certain stages of sleep 😴.

An average human spends roughly 1/3rd of their life in a bed, sleeping and dreaming! Essentially, dreams are caused due to brain-stem activation (rapid eye movement), stimulation of the limbic system (emotional motor system), and activation of the amygdala.

While asleep, our bodies undergo multiple cycles of sleep. Each cycle has 5 stages, which are broadly classified as Rapid Eye Movement (REM) and Non-REM (N-REM) sleep stages.

While performing neuroimaging studies of brain activity during the REM sleep stage, scientists found that the distribution of brain activity might be linked to specific situations being triggered, as a dream progresses. What's more interesting is that most of our muscles become paralyzed during REM sleep to prevent us from acting out our dreams! Happy dreaming!

[#dreaming](#) [#science](#) [#sleep](#) [#sciencefacts](#)



# From SBB Teachers

*Dr. Priyatosh Ranjan:*

**"I would like to congratulate Team Scinion for such thought-provoking science content. I enjoyed reading each and every content of this magazine. You all presented your ideas and thoughts really well on the paper. I am impressed with the writing style. Keep it up!"**

*Dr. Meena Pandey:*

**"My best wishes to Scinion team**

**"You don't have to be great to start, but you have to start to be great." -Zig Ziglar**

**Really happy to learn that you have started publishing SCINION Magazine. I am looking forward to read all your thoughtful articles**

**Keep it up!!!"**



# From SBB Teachers

*Dr. Sonal Mahajan:*

*"It gives me immense pleasure to express my views on the release of the second edition of Scinion.*

*I congratulate the entire team for their sincere efforts in bringing out the magazine. It is a platform where budding talents can express their thoughts, ideas, aspirations, and convictions in a creative way.*

*This shows ambition, planning, hard work, and courage are key to success. Dear students try to learn new skills in life. The beautiful thing about learning is no one can take it away from you.*

*This magazine should be a good source of inspiration for coming students. I wish all the success to the entire team and to all students."*

*Dr. Sanjay Kumar:*

*"This work shows the hard work and dedication of our students. I personally feel that team involved with Scinion will pave the great path ahead. Wishing you all the best for the future endeavours towards next edition of Scinion."*





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