

# MICRO BIOME

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## **NEWSLETTER** **DEPARTMENT OF** **MICROBIOLOGY**



# **VIJAYA COLLEGE**

R.V. ROAD BASAVANAGUDI, BENGALURU-04

ACCREDITED BY NAAC WITH B++ GRADE, RECOGNISED BY CPE

# NOBEL LAUREATES



David Julius and Ardem Patapoutian jointly received the 2021 Nobel Prize in Physiology or Medicine for their work on biological receptors which help in nociception. Nociception is the sensory nervous system's process of encoding noxious stimuli i.e., a stimulus strong enough to damage the tissues. The discoveries enabled an understanding of how heat, cold and mechanical forces trigger nerve impulses.

## DAVID JULIUS

David Julius was born in New York, United States in 1955. He graduated with a Ph.D. from the University of California, Berkeley in 1984, and then went on to Columbia University in New York as a postdoctoral scholar. David Julius was invited to join the University of California, San Francisco faculty in 1989. He won the 2020 Kavli Prize in Neuroscience (shared with Patapoutian).

In 1997, Julius *et al* cloned and characterized TRPV1 (Transient Receptor Potential cation channel subfamily V member 1), a receptor protein for capsaicin, a chemical irritant found in chillies.



## ARDEM PATAPOUTIAN

Ardem Patapoutian was born in 1967, in Beirut, Lebanon to an Armenian family. In 1996, he graduated with a doctorate in biology from the California Institute of Technology. He has worked as a scientist at Scripps Research in La Jolla, California, since 2000.

Patapoutian's study focuses on the biological receptors for temperature and touch (nociception).

The information is applied to the creation of therapies for a variety of illnesses, including chronic pain. The insights allowed for a better understanding of how mechanical, thermal, and cold forces affect nerve impulse initiation.



## SVANTE PAABO

In 2022, Svante Pääbo received the Nobel Prize in Physiology or Medicine for his research on the genomes of extinct hominins and the history of humanity.

After spending a year in the School of Interpreters of the Swedish Defence Forces, Pääbo enrolled at Uppsala University in 1975.

He received his Ph.D. from Uppsala University in 1986 for studies looking into how adenoviruses' E19 protein affects the immune system. His father Sune Bergström, a Swedish biochemist is a Nobel laureate too. He contributed to the development of paleogenetics.

Pääbo's most important discovery is DNA extraction and sequencing to look at the connections between modern and prehistoric humans. Using mitochondrial DNA (mtDNA), he was the first to sequence a piece of the Neanderthal genome. The results showed that humans (*Homo sapiens*) and Neanderthals (*H. neanderthalensis*) are separate species that split from one another roughly 500,000 years ago. The full Neanderthal genome was later sequenced by Pääbo, and when it was compared to the modern human genome, it revealed an overlap of up to 4% with the genomes of persons with European and Asian ancestry. This finding confirmed the interbreeding of the two species.



- Vishwajeet U R, Shrvanthi S



What Award Did Gregor Mendel Receive For His Work?

The Nobel Peas Prize

## **FLAX SEEDS**

Flax seeds are small edible seeds from the North American flax plant. These seeds not only add flavor to dishes but are also bursting with nutrients.

The nutrients in flax seeds include lignins, antioxidants, fiber, protein, and polyunsaturated fatty acids such as alpha-linolenic acid (ALA) or omega-3 fatty acids. Additionally, they are good sources of magnesium, phosphorus, manganese, vitamin B1, selenium, and zinc.

### **HEALTH BENEFITS OF FLAX SEEDS**

- It improve cardio vascular health, by reducing bad cholesterol and will keep the increasing blood pressure level under check.
- It support digestive health, as these seeds are rich in dietary fibers it keeps digestive system healthy.
  - Reducing the risk of cancer.
    - it helps with blood sugar regulation.
  - It acts as defense against inflammation.
- Protective effect against post menopausal events.

Flax seed has been one of the most studied foods regarding possible relations to breast cancer, though mainly in experimental studies in animals. Flax seed is rich in omega-3 fatty acids,  $\alpha$ -linolenic acid, lignin, and fibers. One of the main components of flax seeds is the lignans, of which 95% is made of Secoisolariciresinol Diglucoiside (SDG). SDG is converted into enterolactone and enterodiol, both with antiestrogen activity and structurally similar to estrogen; they can bind to cell receptors, decreasing cell growth. Some studies show that the intake of omega-3 fatty acids is related to the reduction of breast cancer risk.



- Shubha V, Likitha S

## **THE MAGIC POTION – BLUE TEA**

- Blue tea is a herbal beverage derived from the herbaceous plant of the legume family.
- *Clitoria ternatea*, commonly known as butterfly pea, is also called *Shankhpushpi* in Ayurvedic literature.
- Blue pea flowers are well known for their beneficial effects on the brain and nervous system. It is also known to improve memory and reduce stress levels in the body.
- They are traditionally known as an eye medicine and as a food coloring agent that imparts a beautiful blue color due to an anthocyanin called 'ternatin' present in them.
- Extracts of different parts of this plant have been known to have diuretic, nootropic, anti-asthmatic, anti-inflammatory, analgesic, antipyretic, antidiabetic, antilipidemic, antiarthritic, antioxidant, anthelmintic, insecticidal, antibacterial and wound healing properties.
- Packed with health benefits, it is known for its attractive color-changing capacity. Blue pea tea is Native to Southeast Asia, where they are often enjoyed with honey and lemon in countries such as Thailand and Taiwan. This drink is called "Nam Do Quang Chan" and is served in many places.
- Blue peas and ginger, a great combination, have antioxidant, antibacterial, anti-inflammatory, anti-diabetic, anti-cancer, and immunomodulatory properties and are commonly used together in the drying process of blue tea preparation.
- Herbal blue tea can be prepared at home by drying the flowers under the sun, but traditionally tray drying technique is used. After drying, flowers and ginger can be powdered and ready to use. Voila! It's that simple.
- Add a little amount of powder prepared, a teaspoon of honey, and boiling water. Stir the mixture well and enjoy a cup of tea full of flavor, aroma, and many health benefits.



- Eesha Prasad

🍌 What Do You Call A Whole Grain That's Zero Calories But Is Rarely Used? Weird Flax But Ok.

🍌 Don't Dunk Your Biscuit In This Tea, Cause Its Tea-Licious.



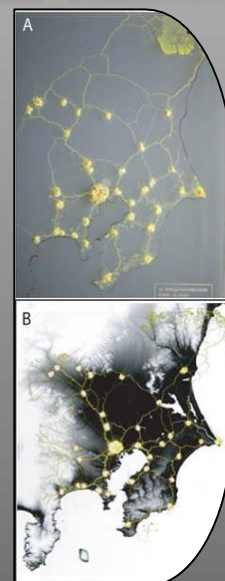
## MINDLESS MASTERMIND MOLDS

The second largest island country Japan is known for its philosophy, traditional arts, foods, and much more. One such amusing aspect is that its subway system transports over 7.5 million people daily supported by its complex subway system created over decades. However, a mindless, bodiless single-celled slime mold *Physarum polycephalum* had it figured in just a couple of days.

These amoeboids feed on every proteinaceous thing on their way exploring the humid autumn forests making a network and transporting the signals to other parts of cells in an uncomplicated and minimum distanced way by taking up different shapes and directions depending on the food's location.

A bunch of researchers from Hokkaido University, Japan studied the behavior of this slime mold by putting them on the city map of Tokyo and oats on its major cities, and voila! these mindless slime molds have managed to create a network almost identical to the actual route of the Tokyo subway system. This adaptive intelligence of slime could help urban planning in other domains in a more efficient manner, bringing up the field of study called Biomimicry which is when humans take inspiration from nature to solve modern problems and we can see many examples of this right from Wright brothers – “The desire to fly is an idea handed to us by our ancestors who looked enviously on the birds which fly”.

-Thanuja H



## MICRO-BOTS...!!!

Artificial Intelligence (AI) is a branch of science that deals with machines, to find solutions to complex problems and decision-making by mimicking the human mind.

Application of AI in clinical microbiology labs are very useful and also emerging fields of science. The application includes – Antimicrobial resistance using AI, Drug designing using AI, Microbial diagnostic Testing using AI etc.

**ANTIMICROBIAL RESISTANCE USING AI** – Antimicrobial resistance (AMR) is the ability of bacteria and fungi to defeat the drug designed to kill them that is caused by the evolutionary resistance towards antibiotics.

**AST** – Antibiotic Susceptibility Testing. AST is a crude and old method that is not completely accurate which checks antibiotic susceptibility.

[WGS – AST]- is the modern and the most accurate method used in the diagnosis of AMR. Here ML can be used during genome sequencing of the microbes.

**AI APPLICATIONS FOR AMR** –

Preparing Antimicrobial Peptides (AMPs) using AI peptides in most biological organisms. This plays an important role in the innate immune system. AMPs can be designed using various techniques in which AI can be used since most of the AMP designing techniques depend on molecular sequencing, genomic editing, and molecular docking of DNA sequences. Preparation of new antibiotics using AI tools teach computers how to find quick and efficient medications which structurally very different.

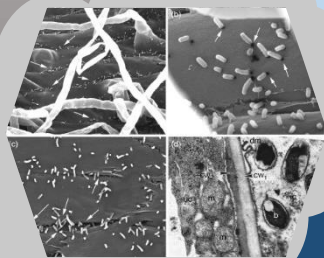
Prediction of AMR using AI: Early AMRs can be easily detected by ML techniques which helps to predict the phenotype also. An antimicrobial resistance database of 11,496 instances of medicine wards of a public hospital in Greece was processed by using Microsoft Azure AutoML. AI and ML implementation for AMRs databases can provide useful information regarding possible AMR. Predicting the severity of infections using AI Tools of deep learning can be used in recognition of the pathology of infectious disease and management. AI and deep learning can be used in predicting the severity and prognosis of infected patients with COVID – 19 & cardiovascular diseases.

- Gouthami R, Shwetha M

- 🤖 What Do You Call A Fungi That Makes Music? A De-Composer.
- 🤖 I Invented A Surgical Robot, So Far It Only Operates On Batteries.

# WELCOME "BAC"!!!

*Mesorhizobium onobrychidis* sp.



Rhizobia are Gram-negative bacteria, which are able to induce nodules on the roots of legumes and fix atmospheric nitrogen. *Mesorhizobium onobrychidis* sp. is a new rhizobiales species isolated from root nodules of *Onobrychis viciifolia* that actively induce nodules and achieves atmospheric nitrogen and carbon dioxide fixation.

Its genome reveals functional and plant growth-promoting signatures, like a large unique chromosomal genomic island with a high density of symbiotic genetic traits. *Onobrychidicola* is described as a type species of the new genus *Onobrychidicola* in Rhizobiaceae. This strongly indicates its function in biotic stress reduction and motility.

## IMPORTANCE

Increased utilization of Biological nitrogen fixation (BNF) mitigates the negative impact on the environment. In order to optimize this, suitable conditions for different legume species are required. These are of high importance for the host and may help to increase sustainability in agricultural practices. The combination of in silico prediction and planta experiments, is an effective way to detect promising plant growth-promoting bacteria.

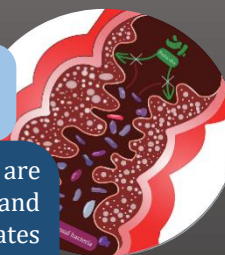
- Kusum B Y, Sharanya R

## Microflora In Genito - Urinary System

Normally, microflora is found in the human body from birth until death and are always constant and are found as residents in the skin, gut, oral, and mucous membranes. In the brain, respiratory tract and heart microflora population is less found, if in these areas microbial populations are found it indicates that they have invaded and infected and the suffix -itis is used to indicate the location and type of diseases. In the skin mainly the groin region and at the armpit region microbes are found more in number as sweats are released that are rich in nutrients, moisture, and pH are perfect for these microbes to grow. The factors that contribute to the microflora population are the age, anatomy, physiology, immune system interaction, and rate of diseases in the population.

The Human Microbiome Project mainly focused on the skin, gastrointestinal tract, respiratory tract, and oral cavity. Earlier the genitourinary tract was not focused as it was believed that urine was sterile of microbes, and it included only the ions and toxic waste. In the year 1800s, when the clinical protocols focused only on the number and type of pathogen in the infected person by advanced research techniques and methods it was found out that along with the pathogenic microbes, normal microorganisms were also found as constant residents. The human genito-urinary tract as the name suggests consists of the urinary system and reproductive system. From the production of urine that takes place in the kidney and till it is excreted through the external urethral meatus these are constantly subjected to the microorganism. Not only that, during delivery, injury, infection, and diseases like cancer, and syphilis contribute to the invasion of pathogens and hamper the normal microflora. Thus, we can conclude that microorganism is known to show beneficial and harmful role in the human body. Not only this, but we also found that human and microorganism interactions are constantly associated and inseparable. With proper nutrition, lifestyle, precautions like safe blood transfusion, preventing contact with infected persons, and educating the public about STDs and the precautions to be taken.

- Sherin R, Upasana P, Sree Chandana C



FROTIOSICMAB  
RUSSIPTES  
UBMINESCENCEOIL  
PRISCR  
PLANTHYPONK  
PARETHEGENY

# SCRAMBLE

- Hemanth Kumar A, Harsha A,  
Nikhil P M, Abhishek C S

## KNOW ABOUT THE INVISIBLE ILLNESS OF OUR CELEBRITIES..!!

An autoimmune disease develops as a result of a faulty immune response in recognizing self and non-self-antigens.

Multiple factors have been linked to autoimmune response including genetics, age, environment, and viral infections. Viruses have been considered a major environmental factor that triggers the autoimmune phenomena in genetically weaker individuals. A "WESTERN DIET" is also another suspected risk factor for developing an autoimmune disease.

More than 80 types of autoimmune diseases are identified. Some of them are well-known such as diabetes mellitus, rheumatoid arthritis, lupus, multiple sclerosis, etc.

### CAUSES OF INVISIBLE ILLNESS:

Specific causes for this are unknown but some pathways were identified by Scientists, which can trigger an autoimmune disease.

### VIRUS TRIGGER:

Some patients have been exposed to viruses like HTLV-1 or Coxsackie B virus and were found to develop symptoms later.

### GENETIC TRIGGER:

The specific genes that put a risk for the disorder have not been identified but there may be genetic factors that increase the likelihood in some patients to occur the disease.

Some of our CELEBRITIES were prone to this INVISIBLE ILLNESS...

### MYOSITIS...

It is a rare type of autoimmune disease that inflames and weakens the muscle fibers.

This results in inflammation, swelling, pain, and eventual weakness. Where there is no skin involvement, it is called "polymyositis". Where there is skin involved, it is called "dermatomyositis".

Most recently a South Indian actress "SAMANTHA RUTH PRABHU" suffered from "myositis".

### SYMPTOMS:

Most often it involves muscles in the upper arms and thighs, which causes difficulty in raising arms. Some people also experience difficulty breathing or may have difficulty swallowing.

### LUPUS...

Lupus is also an autoimmune disorder that can affect different parts of the body. It has several different symptoms and also affects each person with varying levels of severity. The condition is known to cause inflammation in the body and in severe cases can also result in heart failure, kidney damage, brain damage, and amputation.

Teen heartthrob "SELENA GOMEZ" was diagnosed with "LUPUS". Known to be "DISEASE OF A THOUSAND FACES".

### SYMPTOMS:

Some common symptoms include fatigue, fever, joint pain, stiffness and swelling, shortness of breath. It may also include a butterfly-shaped rash on the face that covers the cheeks and bridge of the nose or rashes elsewhere on the body.

Skin lesions that appear or worsen with sun exposure.

### MYASTHENIA GRAVIS...

It is a disorder that affects the neuromuscular junction of the skeletal muscles. Weakness of muscle is generalized here which is caused due to reduced transmission of electrical impulses across the neuromuscular junction. The formation of autoantibodies against specific postsynaptic membrane proteins is what causes muscle weakness.

It may be caused by some factors that play a role are thymus gland antibodies and other causes.

In "1984 AMITABH BACHCHAN" was diagnosed with "MYASTHENIA GRAVIS".

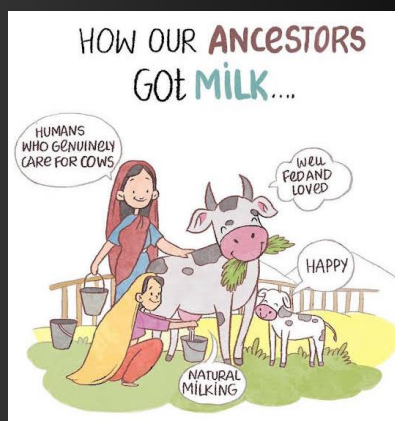
### SYMPTOMS:

It causes symptoms like asymmetrical ptosis weakness, diplopia, aspiration risk is high, proximal muscle weakness

Snarling faces is caused when smiled dysphagia-oropharyngeal dysphagia. The symptoms also include nasal twang to voice which is seen in the wearing of a soft palate and also deep tendon.







## HISTORY

Milk from cow is equivalent to ambrosial nectar not only according to Vedas, but in other holy books too. It is said that milk is the purest form of food and is used to cure many diseases.

The first people to drink milk regularly were early farmers and pastoralists in western Europe. They were some of the first humans to live with domesticated animals like cow.

## HOW IS MILK RELATED TO MICROBIOLOGY?

Milk from cows, sheep, goats, and humans are rich in microbes hence can be used as a good culture medium.

Commercially produced milk contains few beneficial bacteria

Many microorganisms are used in milk products like Yakut, yoghurt, etc.

Lactic acid bacteria, the most abundant microorganism found in milk facilitate dairy fermentation and promotes health

## YAKULT

It is a fermented milk product containing *Lactocaseibacillus paracasei shirota*, the strain of bacteria unique to yakult in the field of probiotics and microbiology. It contains more than 6.5 billion beneficial bacteria.

## WHAT IS VEGAN DIET?

People who follow vegan diet do not consume any animal or animal-based food products like milk or milk products. Nearly 10-15% of total population has converted to vegan diet.

Before industries came in to existence cows were treated as gomatha. They were like family, but now as the human population is increasing, the demand for milk and milk products is also increasing. This is when gomatha turned into money minting machine.

Similar to humans, cows produce milk to feed their young ones. Operators of factory farms artificially inseminate cows every year to force them to continue producing milk. Within a day of birth, calves are often separated from their mothers, which causes both of them great pain. For days, one can hear mother cow calling out to their calves. Female calves suffer the same tragic fate as their mothers, being taken to crowded veal crates or sterile feedlots where they will be fattened for beef.

Mother cows are connected to milking machines twice or more in a day after their calves have been separated from them.

This is the major reason why people are shifting towards vegan diet. According to them their taste buds are not important compared to lives of poor animals but aren't they missing a lot more than just taste?

As mentioned before, milk has high nutritional value. Fermented milk products which contain beneficial microorganisms are recommended by doctors to maintain good health.

## CONCLUSION

People would consume milk and its products if the cows were treated humanely. Human population should not dominate over other population for their health and taste.

# THE LAST OF US ?

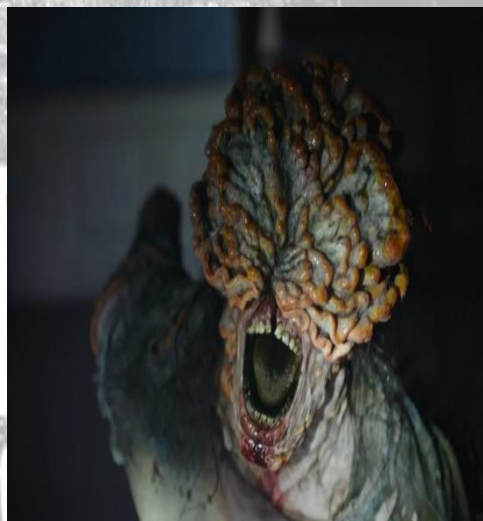
A Popular TV show “THE LAST OF US” is set in post-apocalyptic 2023 and introduces a world that has been devastated by a global pandemic caused by a fungus called *Cordyceps* (surprisingly, a real-life fungus). *Cordyceps* is a parasite, which in the show infects humans and grows while the host is still alive. It slowly and quite painfully takes control over the host's body and mind turning them into terrifying zombies called ‘clickers’ which only further spread the infection. Within 2 weeks the fungus thrives within the host and grows out of the host's head disfiguring their face and rendering them blind and the host adapts to echolocation as compensation. If the host survives for a decade, it develops hardened plates over its body, and the host's body grows fungal-like projections to release infectious spores. The infection can also be spread through a bite. Due to the parasitic nature of the fungus, it is unable to infect dead bodies and infects hosts only while they're still alive. Does this actually happen?? Is it indeed the ‘The Last of Us??’ Let's find out!!

Fungi of the genera *Ophiocordyceps* have been known to infect various species of ants. Once a spore lands on the ant, a network of roots infiltrates its muscles and the ant starts exhibiting strange or unusual behavior. The fungus produces chemical substances allowing it to take control over the ant's body and force it to head towards where conditions are perfect for the growth of the fungus. The fungus makes the ant crawl up the plant stem and attach itself to a leaf vein using abnormal force from its mandibles, or a ‘death bite’. Once the ant dies a fruiting body emerges out of its head (very similar to the ‘The Last of Us’). After 3 weeks of growth, the fungus can release its own spores and infect more ants. *Cordyceps* have been known to wipe out entire colonies of ants.

It is known that fungi prosper at warm temperatures. Although most fungal organisms cannot reproduce at human body temperature (37°C or 98.6 F), the world is ‘warming up’ due to global warming and climate change and these fungi must either adapt or die. Fungi's potential adaptation to the higher heat and humans' dropping body temperature is on a

collision path. The ability of *Candida auris* (yeast) to adapt and reproduce at human body temperatures is one example of this. The bad news is that because of climate change, fungi are mutating and at least one fungus species can now infect people.

But here's the good news!! Our body temperature might not protect us but our brain and immune system will protect us from being hijacked by these ‘zombifying’ fungi. Humans are innovative beings who can develop treatments and fungal vaccines are in development and it might take a lot more years for fungi to actually ‘zombify’ humans. It might not be ‘the last of us’ YET!





# MENINGIOMA..

*Better be brainless...*



Meningioma refers to the cancer of arachnoid cap cells found in the meninges of the brain and spinal cord. This is also known as cranial nerve palsy or intracranial tumour, simply known as a brain tumour, this primarily originates as a benign tumour form but also can get transformed into a malignant tumour. As these tumours grow and spread, they press the various parts of the brain thereby hampering its activities. the occurrence and its malignant form depend upon the histopathological characteristics of the tumour. according to the studies meningioma is classified into 3 grades according to the tumour growth, grade 2 can be treated but it can relapse grade 3 is the deadliest form and difficult to treat and the fastest growing tumour. These tumours are commonly seen in females as research studies have believed that female hormones are involved in tumour formation and there is also a close link between breast cancer and meningioma, also seen in males and more often in elderly people. This tumour can also be seen as inherited patterns seen in the case of neurofibromatosis type 2. This tumour is seen in patients in an asymptomatic form later when the main symptoms are seen the grade of the tumour would be around 2 or 3. The survival rate seen in the patients is around 5 years, several factors can induce this tumour to relapse.

## Factors

Exposure to ionizing radiation during childhood is mainly seen as the primary factor causing this brain tumour. In the case of neurofibromatosis type 2 this tumour is seen as an inherited pattern because of the mutation in the nf2 genes on chromosome number 22 where the gene is a tumour suppressor, the mutation in the tumour suppressor genes leading to failure to control the cell growth and division, obesity, exposure to the certain chemical, pesticides in the occupational fields are also the inducers for this tumour, overproduction of hormones.

## Signs and symptoms

- Seizures especially in the early mornings
- Loss of smell like the inability to identify and analyse smell
- Vision problems such as vision loss or double visions
- Intelligence failure
- Dementia, loss of memory
- Speech problems like slurry speech

## Diagnosis and tests

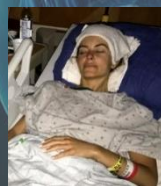
It can be detected through your mare and city scanning that produced contrasting images the location and size of the tumour can be analysed. A biopsy is done followed by scanning that gives information about the type and grade of tumour. Advanced research method in immunology has developed molecular techniques like western blotting and immunological techniques like immunohistochemistry (IHC marker).

## Famous celebrities who suffered a brain tumour

Kate Walsh



Maria Menounos



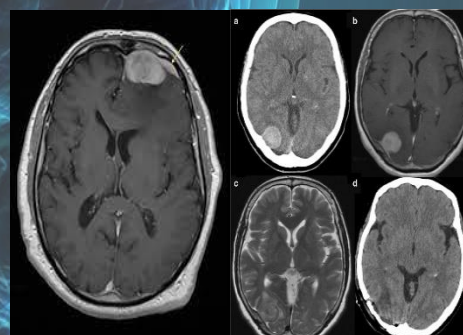
Sheryl crow



Irrfan khan



Elizabeth Taylor



- Upasana Prabhu

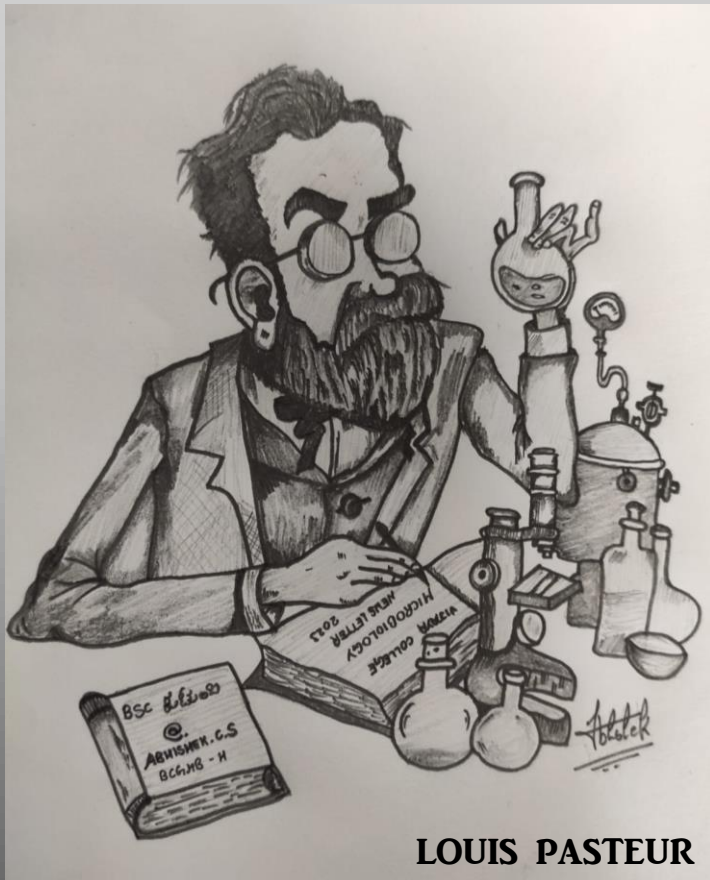


Why Was The Neuron Sent To The Principal's Office?  
It Had Trouble Controlling Its Impulses

# LET'S CURD THE MILK!!

## MILK MAN OF MICROBIOLOGY..

Sketch By: **ABHISHEK C S**

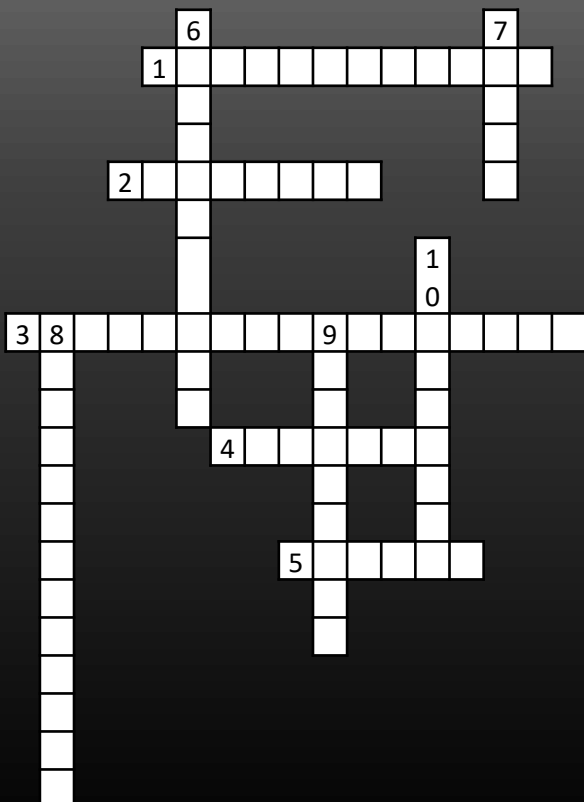


**LOUIS PASTEUR**

# Amazing FACTS!!

- ✓ 99.9% of the unique genes in your body are bacterial and only about 0.1% are human.
- ✓ Our soils are one of the largest reservoirs of microbial diversity on Earth. (5000 different types of Bacteria in 1 gram of soil).
- ✓ Viruses are not really ALIVE (When a virus is not in a host, it is basically an inanimate object).
- ✓ Milkshakes originally contain alcohol (the presence of alcohol in milk is because of lactobacilli bacteria) which makes milk a mildly alcoholic drink.
- ✓ *Saccharomyces cerevisiae* is commonly known as Brewers Yeast. As it produces alcohol by fermentation of different malted cereals and fruit juices.
- ✓ Cloud carry drug - resistant bacteria across distances- 1ml of cloud water contains 330 to more than 30000 bacteria. These bacteria have 29 sub types of antibiotic resistant genes.
- ✓ Biocconcrete is normal concrete mixed with a special kind of bacteria that produces limestone to fill up cracks.
- ✓ Half of the oxygen in the atmosphere is generated by microbes.
- ✓ Mycoplasmas are the smallest known bacteria.
- ✓ *Deinococcus radiodurans* withstand blasts of radiation 1000 times greater than would kill a human being.

- B M Sumanth, Sunil L N, Varun Manjunath



# CROSSWORD

## ACROSS

1. Father of antiseptic surgery -
2. The concentrated liquid form of -formaldehyde used as a disinfectant spray --
3. First patented microorganisms in the world-
4. Infectious protein particles-
5. Protein shell of a virus –

## DOWN

6. I discovered *Mycobacterium tuberculosis* -
7. Substances that aid the growth of bacterial population -
8. Microbial strain used in the production of beer -
9. Auto + clay + we -
10. I am a primitive organism capable of causing the Athlete's foot Infection! Find me –

- Sunil M C, Aneesh S, Manoj Kumar M, Ujwal S S

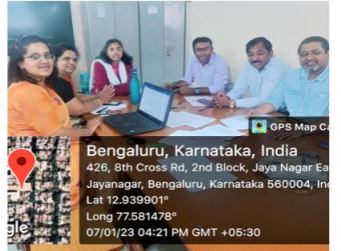
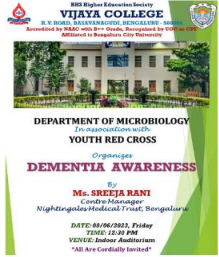


## Departmental Highlights 2022-23

- 100% ACADEMIC RESULT
- **08<sup>th</sup> June 2022** – The Department initiated Add-on course on the topic “**Production of Advanced Biofertilizers and Field Applications**” by attending a one-day certificate training course at Biocenter, Hulimavu, Bengaluru. 37 students of 2<sup>nd</sup> & 3<sup>rd</sup> year BcGmb students along with faculty Ms. Meghana S., attended the same.
- **15<sup>th</sup> July 2022** – In house project titled “**Microbes used as a tool for bioremediation of heavy metals from waste water**” was initiated in the Department by IV semester BcGmb students, **Eesha Prasad, Jayanth D. R., Abhishek C. S., Sowmya Sri N G, Sree Chandana C, Sharanya R., and Upasana Prabhu.**
- **26<sup>th</sup> & 27<sup>th</sup> July 2022** – Students of IV semester BcGmb have participated in two day online **National Conference on “Emerging Trends in Research and Career paths in Bio-sciences and Biotechnology”** organized by SCMS Institute. The students have presented a poster titled “**Analysis and Characterization of Microbes Present in Industrial Effluents**” and have secured **First Prize** for the same.
- **30<sup>th</sup> July 2022** – 8<sup>th</sup> volume of annual newsletter, MICROBIOME was released by Dr. K. S. Sameera Simha, Dean & Joint Secretary, BSHSHES
- **3<sup>rd</sup> August 2022** – the Department conducted an interclass competition “Agarella – Agar Art with a twist” as part of Vijnan 2022.
- **September 2022** – Students of IV semester BcGmb have completed phase two of their in-house project titled “**Microbes used as a tool for bioremediation of heavy metals from waste water**” at Ganga EnviroTech Pvt. Ltd. Nelamangala.
- **17<sup>th</sup> -18<sup>th</sup> November 2022** – IV semester BcGmb students, **Eesha Prasad, Jayanth D. R., Abhishek C. S., Sree Chandana C, Sowmya Sri N G, Sharanya R., and Upasana Prabhu** have participated in **National Conference on “Recent Innovations in Biotechnology, Biochemistry and Microbiology”** organized by Reva University in collaboration with Indian National Science Academy (INSA). The students have given an oral presentation on their research work and secured **Second Prize** for the same.
- **16<sup>th</sup> December 2022** – As part of Science Fair, organized by Vijnan 2023, the Department arranged an exhibition in which microbe models were displayed, basic experiments were demonstrated, and key achievements of the Department were highlighted in order to motivate pre-university students to opt life sciences for their higher studies.
- **2<sup>nd</sup> January 2023** – In house project titled “**Isolation and characterization of keratinophilic bacteria from poultry soil**” was initiated in the Department by III semester BcMb students, **Sumukh Srinath, Saleem Ahmed, Khushi C., Jayanth Kumar S., Nikitha R. and Chinmay A. B.**
- **7<sup>th</sup> January 2023** – A meeting was hosted for Microbiology faculty of BCU affiliated colleges to discuss syllabus of **3<sup>rd</sup> semester NEP** scheme.
- **7<sup>th</sup> -9<sup>th</sup> April 2023** – V semester BcGmb students, **Eesha Prasad and Jayanth D. R.,** have attended an online International Conference on “**Advance Interdisciplinary Research**” organized by Digvijay Nath PG College, Gorakhpur, UP and Science Tech Institute, Lucknow. The students have delivered an oral presentation on their research project titled “**Microbes used as a tool for bioremediation of heavy metals from waste water**”.
- **29<sup>th</sup> -30<sup>th</sup> April 2023** – V semester BcGmb students, **Eesha Prasad and Jayanth D. R.,** have attended an online International Conference on “**Multidisciplinary Academic Research and Innovation**” organized by Aryabhat Institute of Academics and Research & Khun Khun Ji Girls PU college, Lucknow. The students have delivered an oral presentation on their research project titled “**Microbes used as a tool for bioremediation of heavy metals from waste water**”.
- **27<sup>th</sup> May 2023** – A meeting was hosted for Microbiology faculty of BCU affiliated colleges to discuss syllabus of **4<sup>th</sup> semester NEP** scheme.
- **8<sup>th</sup> – 9<sup>th</sup> June 2023** – **Eesha Prasad,** student of VI semester BcGmb has participated in **National Conference on “Contextual Approaches in Applied Microbiology”** organized by Dayananda Sagar University, Bengaluru in association with Association of Microbiologists of India. She has presented a **poster** titled “**Microbes used as a tool for bioremediation of heavy metals from waste water**”.
- **9<sup>th</sup> June 2023** – The Department in association with Youth Red Cross conducted a “**Dementia Awareness Program**” as part of Social Responsibility. Ms. Sreeja Rani, Centre Manager of Nightingales Medical Trust, Bangalore was the resource person.
- **30<sup>th</sup> June 2023** – The Department has completed 30<sup>th</sup> add-on course on “Production of Advanced Biofertilizers and Field Applications”.
- **12<sup>th</sup> July 2023** – The students of VI semester BcGMB were taken on an Industrial Visit to **Unibic Factory and Kinvaah Winery,** as part of their practical syllabus.



# Let's RELOAD



**Crossword:** 1. Joseph Lister, 2. Formalin, 3. Pseudomonas Putida, 4. Prions, 5. Capsid, 6. Robert Koch, 7. Media, 8. Saccharomyces, 9. Autoclave, 10. Fungus  
**Scramble:** 1. BIOINFORMATICS, 2. PERTUSSIS, 3. BIOLUMINESCENCE, 4. CRISPR, 5. PHYTOPLANKTON, 6. GENE THERAPY

*Hoping you had a good Experience..!!*

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