M. G. SCIENCE INSTITUTE

MICROBIOLOGY SOCIETY OF M. G. SCIENCE INSTITUTE

DEPARTMENT OF MICROBIOLOGY

presents

THE WORLD OF MICRO

BIO & ME

Volume 4

February, 2021

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MEET JOSHI

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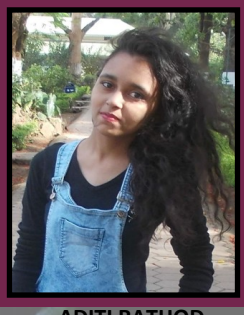
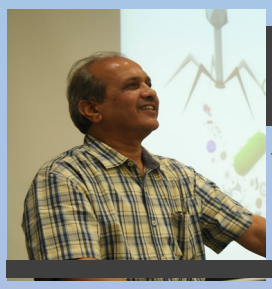


ADITI RATHOD



Faculty Article

Vivek N. Upasani

Principal (Offg.) & HoD, Microbiology Department

Exploring the Microbial ecology of a saline lake in India.

Salinity is usually associated with the presence of salts mainly sodium chloride (NaCl) near to or above the concentration in sea-water. However, the composition of the water of the saline water bodies varies in the composition i.e. presence of salts and pH. The saline water originating from sea-water has magnesium and potassium salts as other major components besides NaCl. On the other hand, the saline water of dessert lakes which are also referred to as the soda lakes have an alkaline pH due to the presence of sodium carbonate and sodium bicarbonate. This also leads to absence of divalent cations (magnesium and calcium) in such water. There are six major saline water bodies and lakes in India namely: Sambhar Salt lake and Pachbhadra Lake (Rajasthan); Lonar Lake (Maharashtra); Chilika Lake (Odisha); Pulicat Lake (Andhra Pradesh and Tamil Nadu); Pangong Tso (Ladakh). These lakes have a diverse flora and fauna and serve as a favorite destination for migratory birds such as flamingos during the winter season. Only few of these are studied for their microbial diversity. The microorganisms that can grow and require high salt concentration for their growth are called "halophiles", where *halos* means salt /NaCl and *philus* means to love or like. Here I will try to give you a glimpse on the microbiological studies on one of the famous saline lakes of India.

SAMBHAR LAKE

This lake is India's largest saline lake and is designated as a Ramsar site in 1990 as unique ecosystem that supports diverse life forms. It has been a source of salt and other chemicals for centuries. It lies about 60-70 kms southwest from Jaipur near Phulera. We started pioneering work on the isolation of halophilic archaea from this lake in 1984-85. At that time, I had joined Ph. D. studies under the guidance of Prof. S. G. Desai and Dr. Moiz F. Mullakhanbhai (who along with Prof. Helge Larsen had isolated the first halophilic archaeon *Halobacterium volcanii* now, *Haloferax volcanii*). During the literature survey I came across a paper by Grant and Tindall on the isolation and characterization of haloalkaliphiles from the saline and alkaline lakes (soda lakes) of African Rift Valley. These were different from the well-known *Halobacterium* species that were commonly isolated from marine salterns and salted fish /meat that could grow at high salinity, but not at high pH. However, the *Natronobacterium* strain (archaea) isolated from soda lakes could grow in highly saline and alkaline conditions.

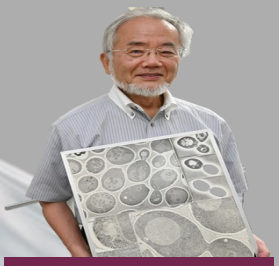
This ignited an urge to find a similar environment in India and that lead me to isolate and characterize the first haloalkaliphiles archaeon namely *Natronobacterium* sp., now reclassified as *Natrialba* sp. This lake is rich in microbial diversity and its water color changes based on the salinity, pH and weather that controls the growth of specific microbial type. For example, at low to medium salinity, *Cyanobacteria* such as *Spirulina* and the eukaryotic alga *Dunaliella* form blooms giving green to orange colospr to the brine. As the salinity increase the halo bacteria and the *Ectothiorhodospira* species (anoxygenic phototrophs) predominate giving the red-pink color to the lake water, with a typical sulfide odor. The other organisms that have been reported from this lake include: *Euhalothece* sp. (unicellular cyanobacteria); *Dunaliella* sp. (eukaryotic unicellular alga); *Geitlerinema* (filamentous cyanobacteria); *Nitzchia* spp. (diatom), etc. (Bhatt HH, 2017). NCCS, Pune scientists have recently reported the isolation of *Natrialba swarupiae* from these lake water. However, recent media articles claim that there is a severe threat to this wetland ecosystem due to several reasons and prompt action plan is required to save this lake.

NOBEL LAUREATES

-Zalak Solanki (B.Sc. Sem 6)

Nobel prize: For discovery of mechanisms for autophagy.

Date of Nobel prize: October 3, 2016



Yoshinori Ohsumi

- The word *autophagy* originates from the Greek words *auto*-meaning "self", and *phagein* meaning "to eat". Thus, autophagy denotes "self-eating". It is the process for degrading and recycling cellular components. This process involves dynamic membrane rearrangements for the sequester cargo of particles to the lysosome, where the delivered material is degraded and recycled. The origins of autophagy are inextricably linked to coevolutionary events essential for the emergence of eukaryotic life.
- Yoshinori Ohsumi used baker's yeast to identify the genes essential for autophagy in a series of experiments in the early 1990's. He then went on to elucidate the underlying mechanisms for autophagy in yeast and showed that similar sophisticated machinery is used in our cells. This can play an important role if used for mammalian health and disease.
- Ohsumi and colleagues described the presence of "autophagic bodies" in the vacuole of protease-deficient *Saccharomyces cerevisiae* devoid of nutrients. They performed a genetic screening to isolate mutants that accumulate autophagic bodies in the vacuole and show decreased viability during nitrogen starvation.
- However, the molecular machinery of autophagy in more complex eukaryotes was critical to define the functions of autophagy in health and disease. Several vertebrate genes were cloned that shared high degree of sequence homology with essential yeast autophagy genes, including human ATG12 and human VPS30/ ATG6/Beclin 1.
- Yoshinori's group had discovered that GFP-LC3 was a useful marker of autophagosomes; his shared reagents and fluorescent tagged versions of Atg/LC3 orthologs have been used worldwide to monitor autophagosomes numbers in a wide range of species.
- Autophagy has role in various cellular functions. One example is in yeasts, where the nutrient starvation induces a high level of autophagy. That degrades unneeded proteins and recycles them into essential ones. Xenophagy is the autophagic degradation of infectious particles. Cellular autophagic machinery also plays Important role in innate immunity. This process is also involved in repair mechanism for degradation of damaged organelles, cell membranes and proteins.
- Cancer often occurs when several different pathways that regulate cell differentiation are disturbed. Autophagy plays an important role in cancer, both in protecting against cancer as well as potentially contributing to the growth of cancer. Because autophagy decreases with the age and age is a major risk factor for osteoarthritis, the role of autophagy in the development of this disease is suggested.
- Parkinson's disease is a neurodegenerative disorder partially caused by the cell death of brain and stem cells. Deregulation of the autophagy pathway and mutation of alleles regulating autophagy are believed to cause neurodegenerative disorders. Since dysregulation of autophagy is involved in the pathogenesis of a broad range of diseases, great efforts are invested to identify and characterize small synthetic or natural molecules that can regulate it.

A species of bacteria, *Wolbachia*, has been known to change a sow bug (aka pill bug / rolly polly) from a male to a female.

MIGHTY VIRUS: CAN WORLD WIN AGAINST COVID-19?

Darshit Vaishnav (B.Sc. Sem 6)

"CORONA". An infectious disease caused by Severe Acute Respiratory Syndrome Coronavirus 2(COVID-19). COVID-19 typically presents with systemic or respiratory manifestations. Some individuals can act as carriers and it is transmitted via contact with droplets of infected individual's upper respiratory tract secretions (coughing or sneezing). There are more than 200 viruses that stimulate responses similar to those of COVID-19 in the infected host. Some of the examples are H1N1, H3N2 - cause influenza or flu, *Rhinovirus* or RSV and *Parainfluenza* - cause common cold. Symptoms may appear in 2-14 days like fever, cough, and shortness of breath.

Now it has gained popularity worldwide taking up the attractive title of pandemic. More than 1,54,000 deaths and over 10.8 million cases are reported all over the world. On March 13, it was said that Europe is now centre of the pandemic, as many other European countries and USA reported increasing number of cases more than China. First case of *Human Coronavirus* was observed in December 2019 in Wuhan, China.

Coronaviruses are not new, in fact they are a large family that can cause symptoms ranging widely in severity. First outbreak of severe illness began in China, 2003. While second outbreak of severe illness began in 2012 in Saudi Arabia. It is more acceptable to call the recent one as mutant strain better known as SARS-COV-2. In India, first case was observed in Kerala on 3rd February. The initial slow response in countries such as the UK, USA and Sweden now looks poorly judged as leaders scramble to acquire diagnostic kits, personal protective equipments, ventilators for hospitals.

Compared to other countries, India was sooner to enforce a 21 day lockdown in order to stifle the spread of Coronavirus which turned out to be 6 months' vacation at home inducing strange fear. Till today many variants of the viruses have arisen from different countries and vaccines have been out. Still many are concerned regarding the side effects of vaccines. There are many diagnostic tests like CDC, Serological, and Antibody test available to confirm it, by collecting specimens from both upper and lower respiratory tract such as expectorated sputum, endotracheal aspirate and bronchoalveolar lavage. CDC has developed a new laboratory test kit using Real Time Polymerase Chain Reaction. Through the entire 2020, Hydroxychloroquine and Azithromycin have gained remarkable fame for its use in recovery of mild symptoms of Covid-19. As it is said prevention is better than cure and same goes for this new virus -- Avoid close contact or maintain social distancing, wash hands properly (Being a microbiologist you are smart enough to choose soap over sanitizers in order to keep tiny little organisms from acquiring resistance). Let's not take it for granted as we know how tough it has been to survive a year where virtual world had taken a lead and we all had back pains sitting in front of smart screens.

The largest bacteria found so far can actually be seen without the use of a microscope - *Thiomargarita namibiensis*, which means "sulfur pearl of Namibia", a single celled giant bacteria that lives in the ocean.

OCEANIC BACTERIA TRAP VAST AMOUNT OF LIGHT WITHOUT CHLOROPHYLL

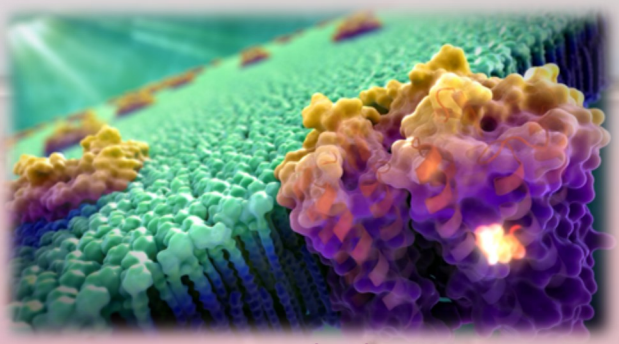
Aditi Rathod
B.Sc. Sem-2

Microbes that dwell in nutrient-poor waters use a photopigment called retinal to harvest energy from sunshine at levels equal to those stored by chlorophyll-based systems.

For years, scientists believed microorganisms that use 'Chlorophyll' capture the majority of solar energy in the ocean. However recent researches show that bacteria having 'Proteorhodopsin' capture light with a pigment called retinal which has significant role in converting light into energy, typically where nutrients are scarce. Proteorhodopsins use light to pump protons out of the cell and thus generate energy as they flow back in ocean dwelling bacteria. Proteorhodopsins enable bacteria to survive in low-nutrient conditions, to maintain their size and energy levels. Among the active molecules of the system - carbon which is produced by photosynthesis is absent here thus, cells are more energetically limited hence the retinal containing molecules starts to play bigger role in the system.

Proteorhodopsins were most common in the nutrient-poor waters of the Mediterranean sea having more abundant levels than that of chlorophyll. The researchers first developed a method to detect retinal and then collected seawater samples from various locations and depths throughout the sea and Atlantic ocean. Since each proteorhodopsin binds one molecule of retinal, they measured retinal to estimate the total number of proteorhodopsin in each sample. The research team kept track of the water column and the light intensity for the purpose. Estimating proteorhodopsin levels helped in the estimation of light trapped. This revealed that proteorhodopsin provides enough energy for the bacteria to survive. Scientists also found that proteorhodopsin absorbs light as much as chlorophyll-a does. Even in certain cases it showed the potential of trapping energy much more above the sufficient levels. For instance, in the eastern Mediterranean Sea, proteorhodopsin captured 107 $kJ/m^2/day$ solar energy, while solar energy captured by chlorophyll-a in the same region topped out at 19 $kJ/m^2/day$.

Purple membrane of the archaeon - *Halobacterium salinarum* contains high levels of bacteriorhodopsin molecules that contains retinal protein as well. These are packed in an ordered two dimensional crystalline array. On absorption of light, bacteriorhodopsin undergoes a series of conformational shifts, causing a proton to be transported across the membrane. The resulting electrochemical membrane potential drives to ATP synthesis, through H^+ - ATPase enzyme.



Bacteriorhodopsin

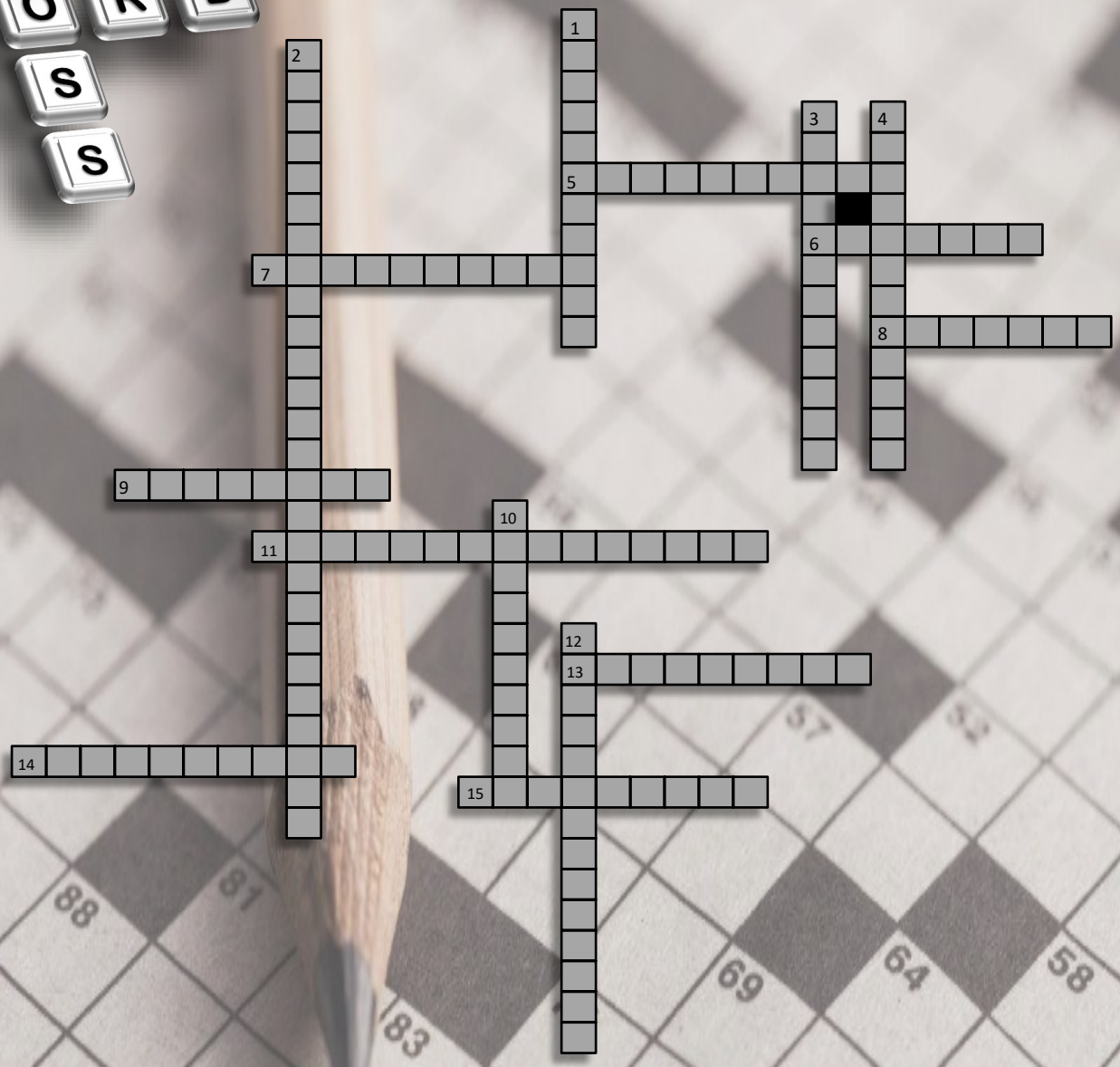
Inserting genes for proteorhodopsin in *E. coli* followed by providing retinal in its modified condition, the cells will incorporate the pigment into outer membrane and will pump H^+ in the presence of light. A deep purple colour generated by light absorption represents clearly transformed colonies. Proton gradients can be used to power other protein structures in the membrane by acidifying vesicle type organelles present. The proton gradient generated by proteorhodopsin can be used to generate ATP as well.

Wearing headphones for just an hour will increase the bacteria in your ear by 700 times.

Dimpal Gohil (B.Sc. Sem-6),

Urvisha Parmar (B.Sc. Sem-2)

CROSSWORD



Across: -

5. Typhus infection caused by

6. Amino acid that gives yellow color in paper chromatography

7. Who developed PCR?

8. The body of fungi known as

9. Increase in blood urea

11. Chemical substance responsible for resistance nature of spore

13. Robertson's cooked meat medium used for cultivation of _____ bacteria

14. Decrease in WBC

15. Inorganic material used as solidifying agent

Down: -

1. Natural media was first employed by

2. Causative agent of diphtheria

3. Father of modern surgery

4. Eli Metchnikoff described

10. Arrangement of *Neisseria gonorrhea*

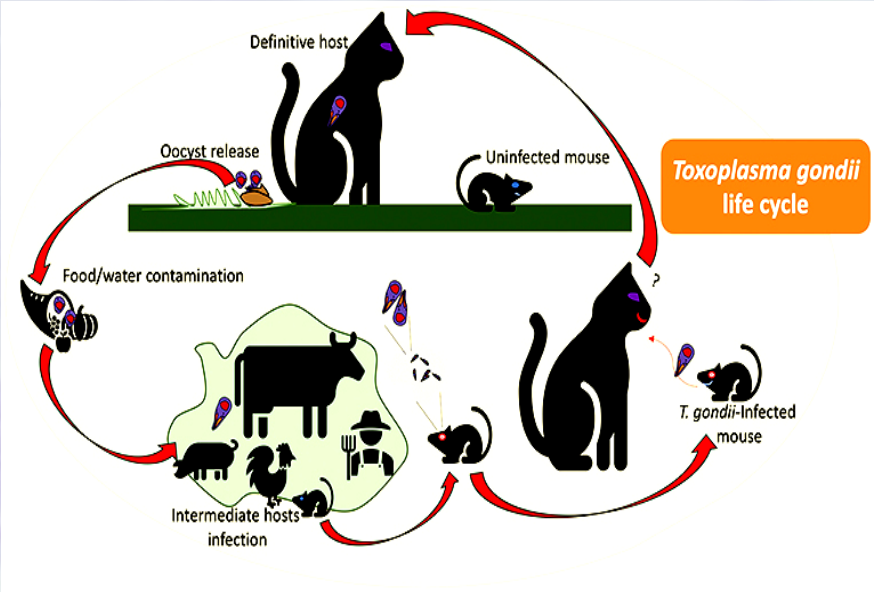
12. Dolipore septa found in

Toxoplasma gondii : A Microbe That Turns Mice into Zombies!!

-Fenil Parmar (B.Sc. Sem 6)
-Khushali Makwana (B.Sc. Sem 6)

Toxoplasma gondii **is one of the most successful, commonest brain parasite in the world. It is a single-celled eukaryote (specifically an apicomplexan) which causes the infectious disease toxoplasmosis. It is capable of infecting a broad range of warm-blooded hosts including humans. But its effects on rodents are unique. It infects approximately one-third of the human population. It is also estimated that 50–80% of Brazilians are infected and already have symptoms of toxoplasmosis. It is also known as Mind-Bending Parasite which permanently quells cat fear in mice.**

LIFE CYCLE :



The life cycle of *T. gondii* - Cats are one of the hosts of *T. gondii*, and they are the only host in which this parasite produces structures called oocysts. An oocyst is a thick -walled structure in which the parasite can survive for a long time outside a host. When cats are infected, they release the parasites' oocysts into the environment through their feces (poop). When other animals, such as birds, mice, cows, or even humans ingest water, vegetables, or meat contaminated with oocysts, these animals can become infected. Once inside a new host, the parasites emerge from the oocysts and multiply. Now begins the fight between the parasite and the hosts' immune system.

After invading a host cell, *T. gondii* tries to protect itself against attacks by the host's immune system by forming a bubble-like compartment inside the host cell. Inside this compartment, the parasite multiplies many times, enough to fill the entire cell. These parasites are now free to infect new cells in the host. This cycle then repeats itself. The cycle of parasite replication is what causes the disease known as toxoplasmosis.

Mice are normally afraid of cats, because cats are predators that present a constant, mortal threat to mice. However, when the brains of mice are infected with *T. gondii*, they lose their fear of cats, and can easily stare them in the face. Thus, the parasite seems to turn mice into fearless zombies! Mice lose their fear of cats and risk being eaten by them!

HOW IT HAPPENS ?

When *T. gondii* enters into mice it hijacks the brain and immune system. Inside a mice's brain, it disrupt brain cell communication in a brain area called the amygdala, which is responsible for the feeling of fear. Once it gets inside a brain, it can ensconce itself within neurons and create dormant cysts. Scientist observes that after infection when parasite has been removed from mice's brains, they continue to behave as it is unafraid of the smell of cat urine. Infection causes long-term changes in the brain and its presence is unnecessary.

When T. gondii **hijacks dendritic cells (DCs) it makes them "hypermobile". As a result crawling more actively through tissue and migrating (spreading) faster around the body than usual. The DCs are vehicles that transport the parasite around the body. Parasite does this by turning on a set of genes within DCs for producing and secreting a chemical called Gamma - Aminobutyric acid GABA. This was a surprise as GABA is a neurotransmitter, carrying signals in the brain from one nerve cell to another. As a neurotransmitter in the brain, GABA reduces fear and anxiety. Brain cells may be infected by parasite and turn on their GABA genes.**

Diamonds are thought to be made from carbon and dead bacteria.

VEDIC MICROBIOLOGY: WHAT YOU NEED TO KNOW !

-Krishnaa Pandyaa (B.Sc. Sem 6)

Many ways Ayurveda has shown up in 2020. We all have observed the growth of Ayurveda as it is spreading across the globe during this period of corona virus pandemic. What was once unknown to the majority ("Ayur-wha?") is now hinging on mainstream. The Indian traditional system of medicine offers enormous knowledge of nature based medicine and can be considered as sustainable .

Science of Microbiology in Ayurveda :

The science of microbiology is unnew to Ayurveda. Rig Veda highlights the concept of microbes as invisible organisms having specific unique characteristics. Classical Ayurvedic formulations are not only supplement of diet but also an alternative in the treatment of bacterial infections.

The concept of Ayurveda – not seeing oneself separate from nature, but as a part of nature leads to many ways it can help coping up with modern problems arising in case of microbes, one such is antibiotic resistance.

Concept of 3 elements : Vatt, Pitta and Kapha -

Ayurveda works in two ways of maintaining health i.e. first by increasing immunity and second by correcting the 'Dosha' functioning. Dosha is nothing but the imbalance of one of the above three elements.

These goals of maintaining health are accomplished either by practicing Yogasana or by prescribing combination of Herbal medicines. There are lots of herbs which contains antimicrobial activity thus, can be used in the treatment of microbial infections/diseases. One such example is Pashanbhed (पाषाणभेद) which is known for having antimicrobial (flavanoid) and antiplasmodial compounds and hence used in the treatment of malaria as well as other microbial diseases. *Garcinia zeylanica* - plant usually found in Sri Lanka has shown antimicrobial activity against methycillin resistant *Staphylococcus aureus*. Many researches are going on and there are evidences demonstrating combinations of medicinal plants may increases the antimicrobial spectrum and potency.

New horizon to explore –

VEDIC MICROBIOLOGY VIRTUAL UNIVERSITY has been launched for global education of Vedic Microbiology, located in Surat. Books and Publications regarding vedic microbiology is present on their site – www.vedicmicrobiology.com .

The fusion of Ayurvedic wisdom into our modern lives is only just beginning, and as the science of life, it still has so much to teach us on how to live well in the world currently ruled by tiny mischievous organisms.

Genetically altered bacteria could be used to create an environment on Mars that is similar to earth's environment.

Stem cells Research. Future of medical science?

- Shruti Amin (B.Sc. Sem 4)

Introduction and Biology-

Stem cells are unspecialized cells of the human body, able to differentiate into any cell of an organism and have the ability of self-renewal. They exist both in embryos and adult cells.

A blastocyst is formed after the fusion of sperm and ovum fertilization. Its inner wall is lined with short-lived stem cells, namely, embryonic stem cells. They are composed of two distinct cell types: the inner cell mass (ICM), developing into epiblasts to induce the foetus development, and the trophectoderm (TE). The TE continues to develop and forms the extraembryonic support structures for embryo, such as the placenta. the ICM cells remain undifferentiated, fully pluripotent and the pluripotency of stem cells allows them to form any cell of the organism. Human embryonic stem cells (hESCs) are derived from the ICM.

Pluripotent stem cells occur all over the organism as undifferentiated cells, and their key abilities are proliferation by the formation of the next generation of stem cells and differentiation into specialized cells under certain physiological conditions.

After hESCs differentiate into one of the germ layers, they become multipotent stem cells, whose potency is limited to only the cells of the germ layer.

DNA of Stem Cells is arranged loosely with working genes. When signals enter the cell and the differentiation process begins, genes that are no longer needed are shut down, but genes required for the specialized function will remain active. This process can be reversed, and it is known that such pluripotency can be achieved by interaction in gene sequences.

Why Stem Cell Research is so important?

- The influence of stem cells in regenerative medicine and transplantology is immense.
- Currently, untreatable neurodegenerative diseases have the possibility of becoming treatable with stem cell therapy.
- Induced pluripotency enables the use of a patient's own cells.
- With stem cell therapy and all its regenerative benefits, we are better able to prolong human life than at any time in history.
- Used in new drug tests. Each experiment on living tissue can be performed safely on specific differentiated cells from pluripotent cells. If any undesirable effect appears, drug formulas can be changed until they reach a sufficient level of effectiveness.

Challenges-

Transplanting new, fully functional organs made by stem cell therapy would require the creation of millions of working and biologically accurate cooperating cells. Regenerative medicine will require interdisciplinary and international collaboration. Immunological rejection is a major barrier to successful stem cell transplantation. Ethical dilemma for ESCs.

Conclusion-

The promise of SCR is so great that it seems wise to consider seriously how best to further such research in a manner that is sensitive to public sensibilities. Public conversations about research and use of human stem cells are well underway. This report is intended to contribute to and inform this ongoing dialogue.

QUIZ

1. **Which one of the following is not true for Ubiquinone…**

a) **Flavoprotein + Ubiquinone-H_2 ⇌ Flavoprotein-H_2 + Ubiquinone**

b) **It is found in both eukaryotes as well as prokaryotes**

c) **It is known as co-enzyme A**

d) **It is a Fat soluble coenzyme**

2. **Which one of the following is not used as Bio-Weapon ?**

a) Yersinia pestis *c) Cryptococcus neoformans*

b) Bacillus anthrax *d) Ebola virus*

3. **Which of the following acid will have higher bacteriostatic effect at any given pH?**

a) **Acetic acid** c) **Maleic acid**

b) **Tartaric acid** d) **Citric acid**

4. **The anticodon is located on ...**

a) **DNA** c) **mRNA**

b) **rRna** d) **tRNA**

5. **Hydrophobia is one of the symptom appears in viral disease known as…**

a) **Tetanus** c) **Rabies**

b) **Poliomyelitis** d) **Measles**

6. **The diagnostic enzyme for denitrification…**

a) **Nitrate reductase** c) **Nitrite oxidoreductase**

b) **Nitro reductase** d) **Both A and B**

7. **Gram-positive bacteria, responsible for food poisoning, is/are…**

a) **Mycoplasmas** c) **Pseudomonas**

b) **Clostridia** d) **all of these**

8. **All of the following are features of prokaryotes except**

a) **Nitrogen fixation** c) **Photosynthesis**

b) **Sexual reproduction** d) **Locomotion**

9. **What is the use of salt in cheese making process ?**

a) **To improve the flavor** c) **To eliminate harmful growth**

b) **It controls the moisture** d) **All of above**

10. **Velvety blue-green growth of pathogenic fungi usually appears on rotting oranges is of…**

a) Penicillium digitatum *c) Penicillium roquefortii*

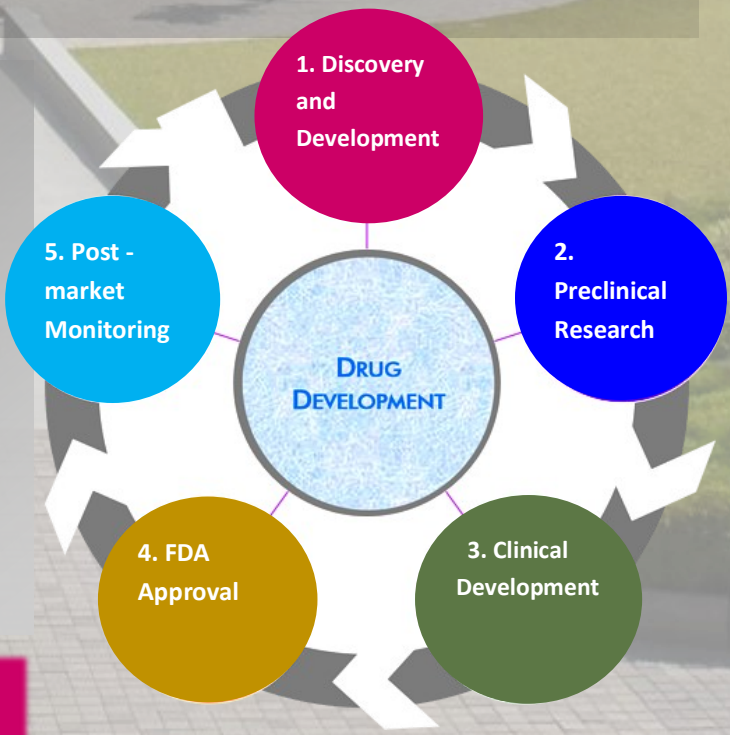
b) *Penicillium citrinum* *d) Aspergillus flavus*

KNOW YOUR CITY

torrent PHARMA

Meet Joshi B.Sc. Sem 4

- Torrent Pharma, the flagship Company of Torrent Group, has a turnover of Rs. 7673 Cr is one of the leading Pharma companies in the Country. They are the pioneers in initiating the concept of niche marketing in India and today is ranked amongst the leaders in therapeutic segment of cardiovascular (CV), central nervous system (CNS), gastro-intestinal (GI) and women healthcare (WHC). The Company also has significant presence in diabetology, pain management, gynecology, oncology and anti-infective segments.
- Torrent Pharma has crossed many geographical boundaries with presence in more than 40 countries. The Company is ranked first amongst Indian Companies for having largest market share in Brazil and Germany.
- Their state-of-the art R & D Centre at Bhat near Ahmedabad has one of the most advanced infrastructures for both basic and applied research. Spread over a lush green campus and housed in an architecturally unique energy efficient structure, the R & D Centre is spread out over 125,000 Sq. mts. with a built-up area of 41,000 Sq. mts.
- It is managed by a dedicated staff, who work round the clock to take care of all its needs. It houses 999 inquisitive minds whose passion is to discover and develop medicines to help patients lead a longer and healthier life.



Bellybuttons have unique bacterial fingerprints .

DEPARTMENT ACHIEVEMENTS

Research works:

- Fenil Parmar, Jay Patel, Vivek Upasani. Isolation, Identification of phytopathogens cause disease in pomegranate and study on its virulence factor. (Soon to be published)
- Fenil Parmar, Jay Patel, Vivek Upasani. Explore microbial diversity of Bhavnagr and Okhamadhi marine salterns and screen for production of industrially important enzymes. (Soon to be published)

Competitions & Student Achievements:

S. NO.	NAME	EVENT	POSITION	CLASS
GIBioN, P P Savani College, Surat				
1	Manas Lele	Poster Presentation	First	F. Y. B.Sc.
2	Riya Sheth	Extempore Speech	Second	T. Y. B.Sc.
Swarnim Science College, Gandhinagar				
1	Krishnaa Pandyaa	Oral Presentation	Second	T. Y. B.Sc.
2	Zalak Solanki	Scientoon	Second	T. Y. B.Sc.
3	Preyas Solanki	Poster Presentation	Second	T. Y. B.Sc.
BioCalyx, Xaviers College, Ahmedabad				
1	Manas Lele & Swapnil Omble	Crossword	Second	F. Y. B.Sc. & T. Y. B.Sc.
2	Manas Lele, Nirali Thakkar & Swapnil Omble	Quiz Competition	First	F. Y. B.Sc. & T. Y. B.Sc.
Minaxi Lalit Science Award, Gujarat University, Ahmedabad				
1	Gohil Pooja	Science Award Exam	First	T. Y. B.Sc.
Science Manthan, Charusat University, Ahmedabad				
1	Jay Patel & Fenil Parmar	Poster Presentation	First	T. Y. B.Sc.

- Apart from above competitions Meet Joshi won first price at national level for his photographic skills.
- Jay Patel and Fenil Parmar won first price at national level for presenting their research work orally.

Faculty Achievements:

Our Head of the Department Dr. Vivek N. Upasani is now " Offg. Principal" of M. G. Science Institute. (1st January, 2021)

OTHER CONTRIBUTERS (MAGAZINE):

FACTS	DHRUVIN PATEL(F. Y. B. Sc.)
PROOF READING	RIYA SHETH (T. Y. B. Sc.)

WHAT WE DID AT DEPARTMENT?

THE 2020 CAN BE DIVIDED INTO THREE PARTS :

1. PRE LOCKDOWN
2. LOCKDOWN
3. POST LOCKDOWN

A SMALL GLANCE AT PRE LOCKDOWN PHASE :

SY & TY students

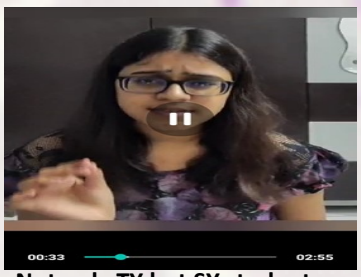
Present and past together

Dr. Vivek Upasani with Dr. B. K. Jain

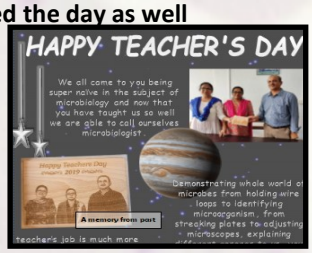
- A small farewell arranged for final year students by juniors also, considered as a small part of MSMG activity.
- Unveiling BIOME 3 one last time before B. K. Jain sir's retirement.

DID LOCKDOWN STOP MICROBIOLOGY DEPARTMENT ?

Video tribute by TY students to professors



Not only TY but SY students celebrated the day as well



Card

Certainly not…

- Virtual world had gained considerable fame due to the pandemic hence students and faculties of MGSC had decided to go online .
- Online webinars and quizzes remained happy choices for many. Faculties helped by sending links and other details of virtual events
- Students of MSMG celebrated Teachers' day on google meet.

AFTER THE LOCKDOWN / UNLOCK 1 :

- Students of the department participated in various competitions with full support from their teachers.
- It has been a while and you might definitely like to see the make over of the building and labs.