Fifth Volume

MICROBIOME

April - 2019

NEWSLETTER
THE DEPARTMENT OF MICROBIOLOGY

VIJAYA COLLEGE, R V ROAD, BENGALURU - 560 004

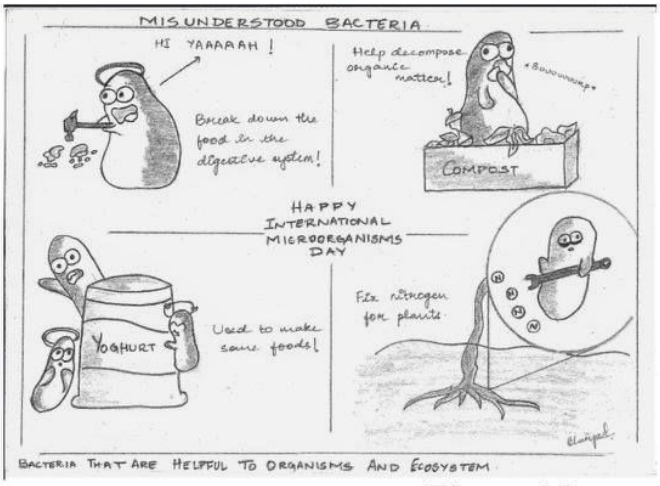
NOBEL LAUREATES

The Nobel prize is a set of Annual International Awards bestowed in several categories by Swedish and Norwegain Institutions in recognition of academic, cultural or scientific advances. The will of the Swedish scientist Alfred Nobel established the five Nobel prizes in 1895.

Nobel laureates of 2018 in the field of PHYSIOLOGY AND MEDICINE.

The 2018 Nobel Prize in Physiology or Medicine was awarded to **James P. Allison** and **Tasuku Honjo** "for their discovery of cancer therapy by inhibition of negative immune regulation". Their pioneering work on the CTLA4 and PD1 immune checkpoints revealed that these pathways act as so-called 'brakes' on the immune system and showed that inhibition of these checkpoint pathways allows T cells to more effectively eradicate cancer cells. This research laid the foundation for the clinical development of immune checkpoint inhibitors, which have dramatically improved outcomes for many people with cancer. By stimulating the inherent ability of our immune system to attack tumor cells this year's Nobel Laureates have established an entirely new principle for cancer therapy,"-a statement released by Noble Assembly. Allison and Honjo showed how different strategies for inhibiting the brakes on the immune system can be used in the treatment of cancer. The seminal discoveries by the two Laureates constitute a landmark in our fight against cancer," the statement added. How the two scientists developed the approach James Allison, PhD, Chair of Immunology and Executive Director of the Immuno therapy Platform at the University of Texas MD Anderson Cancer Center, has been awarded the 2018 Nobel Prize in Physiology or Medicine for launching an effective new way to attack cancer by treating the immune system rather than the tumor. He is the first MD Anderson scientist to receive the world's most pre-eminent award for outstanding discoveries in the fields of life sciences and medicine. Allison, Professor at the University of Texas, MD Anderson Cancer Center in the US, studied a known protein, CTLA-4, that functions as a brake on the immune cells called T cells. He realized the potential of releasing the brake and thereby unleashing our immune cells to attack tumors. He then developed this concept into a brand new approach for treating patients. On the other hand, TasukuHonjo, a professor at Kyoto University in Japan, discovered a different T cell protein i.e PD-1, after careful exploration of its function, eventually revealed that it also operates as a brake on the immune system but with a different mechanism of action. Honjo's research showed that the protein PD-1 (Programmed cell death protein is similar to CTLA-4 (Cytotoxic T-Lymphocyte Associated Antigen functions as a T-cell brake. Allison and Honjo have inspired to combine different strategies to release the brakes on the immune system with the aim of eliminating tumor cells even more efficiently. Allison's and Honjo's discoveries have added a new pillar in cancer therapy. It represents a completely new principle because unlike previous strategies, it is not based on targeting the cancer cells, but rather the brakes - the checkpoints - of the host immune system", said KlasKarre, a In the late 19th century and beginning of the 20th century the concept .

- Prakruthi S, Sudhruthi L, Prathiksha Y



- Bhargavi Iyenger

JAMES ALLISON

TASUKU HONJO

NEVER UNDERESTIMATE THE POWER OF

DARK CHOCOLATE

Dark chocolate which is also known as black chocolate or source chocolate, containing cocoa-solids cocoa-butter and sugar. Chocolate may be the food of the gods. For 4,000 years it was actually consumed as a bitter beverage rather than sweet edible treat. Anthropologist have found evidence that chocolate was produced by pre-Olmec cultures living in present day Mexico as early as 1,900 BC. The ancient Meso-Americans who first cultivated cocoa-plant found in tropical rain-forest of Central America. They fermented, roasted and ground the cocoa bean into a paste which they mix with water, vanilla, chilli-pepper, honey and other spices to brew a frothy chocolate drink.

Nutritional content:

Dark chocolate contains 1% water, 46% carbohydrates, 43% fat and 8% protein. It provides several dietary minerals such as calcium,iron,magnesium,phosphorus, potassium,sodium and zinc.It also contains vitamins like Vitamin A, Thiamine(vitamin B1),Riboflavin(vitamin B2), Niacin(vitaminB3), Vitamin B6(pyridoxine),vitamin E and vitamin K.

HEALTH BENEFITS OF DARK CHOCOLATE:

- It is very nutritious containing a decent amount of soluble fibre and loaded with Minerals.
- It is a powerful source of anti-oxidants.
- It improves blood flow and lowers blood pressure.
- It reduces the risk of heart disease.
- It protects skin from sun.
- It improves brain function.
- It decreases stroke risk.
- It increases good cholesterol level.
- It improves vision
- It helps to prevent cancer.

- Amrin Fathima A & Shubha N

Angel's Fruit – Papaya

Papaya has been declared a new super fruit after scientist found that it can prevent and may be able to treat a wide range of cancer. Researchers found that Papaya is effective anti-cancer agent against cervix, breast, liver, lung and pancreas cancer. Papaya(*Carica papaya*) is a tropical fruit having commercial importance because of its high nutritive and medicinal value. Papaya cultivation had it's origin in South Mexico. Total annual world produces 6 million tons. Other leading producers are Brazil, Mexico, Nigeria, Indonesia, China, Thailand and Philippines. Christopher Columbus, an Italian Voyager once referred to Papayas as the fruit of the angle.

Here are some of the top health benefits of papaya:

- ➢Lower cholesterol level.
- ➢Boost your immunity.
- ➢Good for diabetes.
- ➢Protects against arthritis.
- ➢Helps ease menstrual pain.
- ➢Prevents cancer.
- ➢It hydrates the skin and remove dullness.
- ➢Vitamin A and vitamin C which are antioxidant's which prevents the aging of skin.
- ➢The flavonoids present in papaya helps in collagen production which makes the skin soft & firm.
- ➢BHA(Betahydroxy acid) which acts as a mild exfoliator and it removes the dead skin cells on the face.

- Likhitha M & Mamatha R

PREVENTING ERADICATION OF GOOD BACTERIA FROM HUMAN MICROBIOTA

In the recent decades, rate of diseases like diabetes, asthma and allergies have spiralled, and many researchers have suggested that losses in our "MICROBIOTA" could play a crucial role. The microbiota present in our body is:

1. *Bacteroides thetaiotamicron* which is present in the gastro-intestinal tract which helps in the breakdown of plant food molecules.
2. *Lactobacillus johnsonii* is of critical importance to humans, especially in infants. This bacterium is found in the gut region and makes the process of milk digestion smoother.
3. *Escherichia coli* synthesises the vital vitamin K in human guts. Abundance of this vitamin allows humans blood clotting mechanism to function properly.
4. *Lactobacillus acidophilus* are found in the oral cavity, intestine,vagina. This bacteria helps strengthen the immune system.

Though the links between human health and the collection of bacteria, fungi and viruses are still largely mysterious. Studies have shown that industrialisation is strongly linked with a decline in microbiota diversity. To preserve the microscopic life for future generation, a team has called for a "Noah's Ark" of germs to be collected from people in untouched corners of the world who have not been impacted by modern society.

Microbiologist Maria Gloria Dominguez-Bello and colleagues lay out their ambitious vision to deal with a problem that they compare in severity in climate change because of the growing global health crisis, which requires the capturing and preserving the diversity of human microbiota while it still exists. Researchers said in the future it may be possible to prevent disease by reintroducing lost microbes. The scientists note that the so called bio-banking initiatives are springing up in research institutions around the world but most of them focused on samples from industrialised nations. An international effort to preserve a greater diversity of microbiota would require enormous investment but it is very important.

- Madala Honey Shree

Amazing facts

* The total microbial count of a Human body is as much as your **brain**: about 3 pounds

* Save! Save! not only trees but microbes as they generate at least **50% of oxygen** we breath.

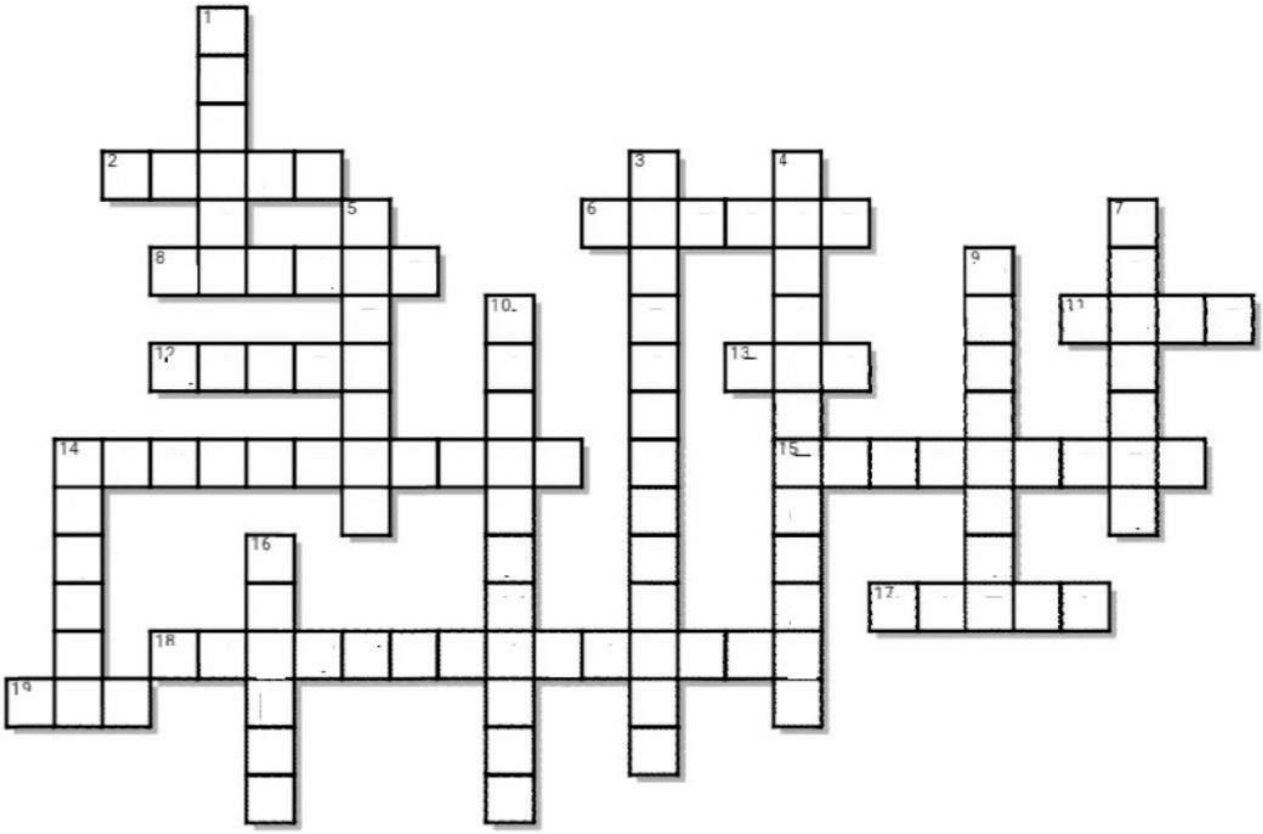
* The *Escherichia coli* can travel 25 times their own length in **One second.**

* There were some ancient viruses that use to infect human but today, **8%** of human DNA is actually made up of those ancient viruses!!

* Human DNA is 95% identical to the DNA of chimpanzee. That's quite understandable but what's shocking is that human DNA is 50% identical to DNA of **Banana!**
You read it correct! We said BANANAS

- H N Divyashree & Shazia Fatima

Crossword



ACROSS

2. *Saccharomyces cerevisiae*
6. Protein coat in viruses
8. Father of vaccination
11. Solidifying agent
12. 10 to the power of -6
13. Genetic material
14. Chemicals used to destroy bacteria
15. Asexual spore that develops inside the bacteria
17. Type of immune cell
18. Process to improve shelf life of milk and wine
19. Energy currency of cell

DOWN

1. DNA joining enzyme
3. Food that yields 4k cal per gram
4. Surface cleansing agent
5. Environment rich with air and oxygen
7. Dairy product with combination of bacteria and milk
9. Organisms that infects other organism
10. Organism that grows in acidic environment
14. Disease caused by fungus in plant
16. Type of vector

- Aniruddh G R, Ashwath U Bhide, Shreyas S Hebbar

CROSSWORD ANSWER :
1. LYGASE, 2. YEAST, 3. CARBOHYDRATES, 4. DISINFECTANT, 5. AEROBIC, 6. CAPSID, 7. YOGHURT, 8. JENNER, 9. PARASITE, 10. ACIDOPHILES, 11. AGAR, 12. MICRO, 13. DNA, 14. BLIGHT, BACTERICIDE, 15. ENDOSPORE, 16. COSMID, 17. BCELL, 18. PASTEURIZATION, 19. ATP

SCRAMBLE ANSWER :
1. TRICHODERMA, 2. ACETOBACTER, 3. LYMPHOCYTES, 4. TETRACYLINE, 5. PROBIOTICS, 6. FIMBRIAE, 7. MUSHROOM, 8. PARASITE, 9. YOGHURT

DEPARTMENTAL ACTIVITIES 2018 - 19

-Department of Microbiology and BIOMERIEUX India Pvt Ltd organized a Workshop and Hands on training on "Manual API Identi?cation and API Web" on 24th& 25th September, 2018.

- Pooja, Niveditha.B.S, MadalaHoneyshree and Divyashree.H.N of final year BSc Presented Poster on "Effects of Green Iron Nanoparticles on Biofilm forming Bacteria" in an International conference at Garden City College, Bengaluru on 18th& 19th September,2018.

- Madhumita Ghosh Dastidar was awarded with PhD on 20 th September, 2018 from Mother Teresa Women's university Kodaikanal.

- Dr. Madhumita Ghosh Dastidar gave an Oral presentation on "Treatment of Multiple drug resistant bacteria with Bio-Silver nanoparticles" in the National conference on Indian association of Applied Microbiologists organized by J.S.S academy of Higher education and Research, Mysore on 27

- PratikshaY,Sudhruthi L, VigneshVof ?nal year BSc presented Poster on "Isolation, Identi?cation And Analysis of Plastic Degrading Bacteria From Dumped Soil Area" in National Conference at Kristu JayanthiCollege, Autonomous,Bengaluru on 17th&18th January,2019.

- Divyashree H N, MadalaHoneyshree, Niveditha B S, Pooja of final year BSc presented poster on Anti-Biofilm Potential of Green Iron Nanoparticles against Biofilm Forming Multidrug Resistant Bacteria at the National Conference, KSTA in NMKRV college, Bangalore on 1&2

- Department of Microbiology and Team make intern, E-cell event IIT-Kharagpur organized a Workshop and Hands on training "Synthesis Of Bio-Nanoparticles and their Anticancer Activity" on 5

- Praveen A and Varun K of first year BSc attended Workshop on Techniques in Virology at Oxford college of Science, Bengaluru on 12th& 13th March, 2019.

- An Educational tour was organized at JNCASR and Nandi valley winery pvt ltd for final year students on 2nd March,2019.