The Luminary

SCIENCE SECTION

Dr. Ashwani Kumar Sharma
Editor

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Student Editor

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Editorial

Science, is a quest, and as such it's one of the oldest and most enduring stories we have. It's about searching for answers, struggling with setbacks, persevering through tedium and competing with colleagues, all eager to put forth their own ideas about how the world works. Perhaps most of all, it's about people possessed by curiosity, people who devote their lives to pursuits which the rest of us find mystifying or terrifying. It is about chasing viruses, finding undiscovered planets, dusting off dinosaurs or teasing venomous snakes. While the importance of science in our daily lives may not always be obvious, we actually make countless science based choices each day. Whether it's the cars and trains, our smart phones, the energy that lights up our chambers, the clothes we wear, the food we eat, all of these were developed and improved through research in science. It's the foundation of everything. It can fuel out nation's economic growth.

Though modern science is of relevant recent origin in human history, it has made very rapid progress and transformed outwardly our manner of living. It's said that life has changed more in the last one hundred years than it did earlier in thousands of years. And this is largely because of scientific knowledge accumulated over the last century and its application in the form of technology. The impacts of science on society is very visible, and the results of progress in agriculture, medicine and healthcare, telecommunications, transportation, computerization and so on are part of our daily living.

Science demands us to "Question Every thing". The result is that theories come and go, or at least are modified through time, as old ideas are questioned and new evidences are discovered. Science can form a pathway for our young people in a competitive global marketplace. Science is not only about long hours of study and endless experiments, rather it is a system for exploring and innovation which can fire our imagination.

Dr. Ashwani Kumar Sharma
Department of Botany

Student Editorial

Science and technology is the basis of modern civilisation. It is really hard to imagine living without the scientific inventions. From a simple pencil to the high powered satellite sent in space all are the creations of science & have proved to be a blessing for mankind. They have reduced human effort.

But, now a days the scenario seems to be changed. The dynamite experimented by Sir Alfred nobel to clear huge mountains and turn into productive land has now paved the way for destruction of humanity and nature. This is the main concern of our science section which includes science trivia i.e. facts regarding plants & animals, new discoveries and inventions like advancing cancer treatment, identification of new species, various space missions, etc. which will definitely prove to be an asset for society.

Science is a way of thinking and a method of organising our curiosity. So, we need to look at the constructive aspects of technology and always act positively like a proton. Our scientific and spiritual power should always run hand in hand so that we may not mis guide men in the urge of guiding missiles. This is the approach of most of the articles of this section. I hope the readers get that point through them.

Pahul P.K. Sandhu
B.SC.-III, Medical

Science Trivia

1. Tigers can spend upto 18 hours sleeping
2. Tigers have eyes that are brightest of all animals in the World.
3. Dolphin can swim 37 miles per hour
4. Sharks are immune to disease i.e. they do not suffer from any disease
5. Paris & France have more dogs than people
6. New zealand is home of 70 million sheeps & 40 million people
7. Male polar bear weight 1400 pounds where as female polar bear weigh 550 pounds
8. African desert frog has no tongue. The tongue of crocodile is attached to the roof of its mouth. It cannot move. It cannot chew but its digestive juices are so strong that it can digest & steel, nail, glass pieces etc.
9. The man with longest beard in the world (4.5 ft) tripped over it. Broke his neck and died.
10. The Internet speed at NASA in 91 GB per second
11. Babies have around 100 more bones than adults

Yuvraj
BSC-II, Biotech

Some Interesting Facts That will blow your mind

1. The Eiffel Tower can be 15cm taller during summer.
2. 20% of the earth's oxygen is produced by Amazon Forest
3. Some metals are so reactive that they explod on contact with water.
4. A tea spoonful of neutron star would weigh 6 billion tones.
5. Hawai moves 7.5 cm closer to Alaska every year.
6. Chalk is made from trillions of Microscopic Plankton fossils
7. In 2.3 billion years, It will be too hot for life to exist on earth.
8. Polar bears are nearly undetectable by infrared cameras.
9. It takes 8 minutes, 19 seconds for light to travel from sun to earth.

10. Stomach acid is strong enough to dissolve razor blade.
11. Venus is the only planet to spin clockwise.
12. The Human brain takes in 11 million bits of information every second but is aware of only 40.
13. RBCs can make a complete circuit of your body in 20 sec.
14. Human saliva contains a painkiller called opiorphin that is 6 times more powerful than morphine.

Shikha
B.Sc.-II, Medical

Hard facts about Soft Drinks

1. Soft drinks contain high calories but not nutrients.
2. It increases the risk of bone fracture in children.
3. It may cause gastropharangeal reflex in some people.
4. Within 5 days 'FANTA' dissolves 5% of teeth, coca cola 7% and Mountain Dew 2%
5. Nails disappear in cold drinks within 5 days.
6. Adverse influence on nervous system have also been observed.
7. Consumption of soft drinks particularly in adolescence may lead to oesteoporosis in girls in later life.

Navneet
B.Sc-I, Medical

Amazing Flora & Fauna

Plants Trees

1. Tallest Species - Eucalytus
   These trees can grow to more than 130 m (427 ft.) in height
2. Heaviest Species : Giant sequoia, Also know as Welligton tonios, these conifers weight upto 2,000 tonnes.
3. Oldest Species : Ginkgo
   This ancient species first appeared about 160 million year ago in China.
4. Oldest living tree : Bristle cone pine
   This species can live for more than 5000 years.
5. Most Drought- Resistant Tree : Boabab This african tree can store upto 1,36,000 litres of water in its trunk.
6. World's Biggest Living Tree : The General Sherman Giant Sequoia : It is 84m tall, and its base approximately 10m. wide.

Animals

Most Poisonous Animals

1. Reptile - Hydrophis belcheri
   This snake is for more poisonous than any land snake. Its bite is fatal, without an antitoxin that counteracts the venom.

2. Fish - Death Puffer

   This harmless looking fish keeps poison in its blood & organs. If eaten it can kill a person.

3. Arachnid : Brazilian Wandering spider
   This aggressive spider bites if disturbed.
4. Mollusc : Blue ringed octopus
   The painful bite of this Australian octopus can kill in minutes.
5. Amphibian : Golden Yellow poison - Dart frog, it has highly poisonous chemical in their skin.

Birds :

1. Largest flying bird : Great bustard
   A male bird can weigh upto 19kg
2. Largest Flightless Bird :Ostrich
   The African Ostrich weighs 130kg and grows to a height of 2.7 m
3. Largest Prehistoric Bird : Elephant bird, weighs around 438kg and is 3m tall
4. Smallest Bird : Bee Humming bird
   This cuban bird measures only 5.7 cm & weighs just 1.6 g
5. Largest wingspan: Wandering Albatross
   The wingspaon of this huge sea bird can stretch upto 3.6m across
6. Largest Egg : Ostrich egg
   The largest specimen can weigh upto 1.65 kg & measures 20cm long
7. Smallest Egg : Bee humming bird
   These eggs weigh only 0.25 kg.

Fungi

1. Biggest Fungus : Bracket Fungus
   This huge species measures several metres across
2. Most poisonous fungus : Death cap, If eaten this deadly mushroom can cause death with in 15 hours.

Flowering Plants

1. Largest Flower : Giant Rafflesia
   This foul smelling flower can grow upto 1.05 m. across & weigh as much as 7kg
2. Smallest Flower : Australian Duckweed
   The flower of this floating plant measures only o.61mm across.
3. Smallest land plant : Dwarf snow willow
   this miniscule plant grows only a few centimetres long.
   Longest Seaweed : Pacific Giant kelp Seaweed ; The fronds of this seaweed can grow as long as 60 m.

Mammals

1. Largest Mammal : Blue Whale
   The World's heaviest & longest animal. It can grow upto 35m long & weigh upto 190 tonnes.
2. Largest Land Mammal : African Elephant
   The average male elephant is 3 m tall and weigh about 5 tonnes.
3. Tallest Mammal : Giraffe
   The adult male Giraffe can grow upto 5.9 m tall.
4. Smallest Mammal: Kitti's hog: Nosed Bat sometimes known as bumblebess bats these tiny creatures have an average length of 3.3 cm & weigh no more than 2g.

5. Heaviest Primate: Gorilla
   The male gorilla can weigh as much as 220 kg.
6. Largest flying Mammal: A flying fox can grow to the size of a small dog & have a wingspan of 2m.

Navi Goyal
B.Sc-III, Medical

Some Facts about Diseases

1. People who use mobile phones are 2.5 times more likely to develop cancer in areas of brain that are adjacent to ear they use to talk on mobile.
2. Over 90% of diseases are caused or complicated by stress.
3. Over 4,30,000 U.S. troops were exposed to depleted uranium during the first gulf war.
4. On an average, 90% of the people that have the disease are female
5. Many cancer patients who are treated with chemotherapy loose their hair.
6. Diabetes is the 4th leading cause of death in U.S. accounting for about 1,80,000 deaths per year.
7. Chances of getting a women breast cancer are increased by excessive use of alcohal.
8. A person who is struck by lightening has a great chance of developing motor neuron disease
9. Every year in U.S. there are 1,78,000 new cases of lung cancer.
10. Every 3 minutes a women is diagnosed with breast cancer.
11. Asthma affects one in every 15 children under the age of 18.
12. Every 4 minutes in U.S. a women dies of breast cancer
13. Due to eating habits in U.S., one in 3 children born in the year 2,000 have a chance of getting type-II diabetes.
14. The oldest known disease in the world is leprosy.
15. The DNA of Human is closer to a rat than a cat.
16. Carbon Monoxide can kill in less than 15 minutes.
17. The lining of the person's stomach is replaced every 36 hrs.

Mind Blowing facts :

1. It can take a photon 40,000 years to travel from the core of the sun to its surface, but only 8 minutes to travel the rest of the way to earth.
2. When helium is cooled to almost absolute zero (-460oF or -273oC) the lowest temperature possible, It becomes a liquid with surprising properties :
   It flows against gravity and will start running up and over the tip of glass container !
4. If you took out all the empty space in our atoms, the human race could fit in the volume of a sugar cube.
5. Water can boil and freeze at the same time. Its called the triple point and it occurs when the temperature and pressure is just right for three phases (gas, liquid and solid) of a substance to co exist in thermodynamic equilibrium.
6. A cracked egg looks like a crazy jellyfish under water 60 feet below the surface of the ocean, the pressure on the egg is 2.8 the times atmospheric pressure and it holds it all together like an invisible egg shell.

Darpandeep Kaur
B.sc I, Medical

Life of a Science Student

A science student leads a life full of worries and tensions. He can't enjoy sound sleep, because 'sound' in physics is always surrounding his ear. The force of attraction always attracts him towards text books while the force of repulsion repels him from studying them. The physical balance in physics and chemical balance in chemistry always put his mind out of balance. Electric charges always over charge him whenever he opens current and electricity. The current of fear begins to flow through his body.

In zoology when he carries out dissections in order to study the veins and arteries he punctures his own hands with forceps and scissors. In botany the only fun are the 'Education Trips' and rest requires the caliber of bookworm who can devote his time to learn everything by hook or crook in order to pass but when he enters the examination due to heat of his brain, everything gets evaporated.

Moral :

Don't study in summers due to evaporation, everything in brain can be evaporated. So, study in winters due to cold so that evaporation can't take place and only condensation remains to pass.

Gurjeet Singh
B.sc-III Med.

Last Year in Science

1. Brain to brain communication was demonstrated in two humans at a distance of 8,000km.
2. A Tech company developed a cell phone battery that can charge in 30 seconds.
3. Scientists created a single molecule led light
4. A man became the first to wear and simultaneously control two modular prosthetics with his
   thoughts alone.
5. Scientists created a plastic cell with working organelles.
6. Astronomers created the first realistic virtual universe 350 million cubic light years in size.
7. Researchers developed a tractor beam 100 times more powerful than any previous version.
8. A new coral reef was discovered off the coast of Iraq.
9. **The following genomes were sequenced**
   1. Electric Eel
   2. Northen Pike
   3. Rainbow Trout

4. Black grouse
5. Mosquito
6. Spider
7. Tsetse fly
8. Coffee

10. Researchers developed nanobots that can successfully enter the blood stream and kill cancer cells.
11. A new dental technique allowed decayed teeth to repair themselves without needles or drills.
12. High quality wooly mammoth DNA was discovered which offers good chance of cloning using an elephant host.
13. A sports car fueled by salt water was approached for testing. It has a 600 Km range.
14. Google developed a contact lens to monitor blood sugar.
15. A paralysed man walked again after revolutionary new spinal cord cell transplant therapy.
16. Researchers developed camera which can capture one billion frames per second i.e. fast enough to see light move.
17. Scientists used synthetic biology to create the World's first artificial enzymes.
18. Data transfer by quantum teleportation was achieved with 0% error rate

Dinkar Sharma
B.Sc.-II, Medical

Mom of the Year - Mother Spider Feeds Self to Babies

The arachnid world may have found its 'mom of the Year' in the female stegodyphus lineatus, lineatus a desert spider that feeds herself to her young shortly after they are hatched. This practice which is known as matriphagy was discovered by the German arachnologist Ernst Kullmann in the seventies.

Found in the semi arid regions of Israel and other parts of the Mediterranean basin as well as throughout the Near East & Asia Minor, the spider spins her web in shrubbery (which were found in bushes near dried up river beds in Israel's Neguv Desert) and inside the web creates a silk disc that contains 70-80 eggs, while her intestine tissue begins to dissolve.

When the 'spiderlings' hatch, she pierces the silk disc and starts regurgitating the liquid that has accumulated in her gut. The liquid travels back through her intestinal tube to her mouth where she secretes it for her youngones.

Babies crawl all over her head & eventually pierce off her soft abdomen with their mouths. After few hours, she dies giving all but 4% of her body mass to her youngone who leaver her heart.

Nishtha Goyal
BSC-II, Medical

New Species of Moth Named After TRUMP!!

Thanks to the yellowish white scales on its little head, a newly identified species of moth has been named for Donald Trump - a move that will highlight the importance of these small animals.

Native to California & Mexico after the DNA testing and other analysis, Vazrick Nazari, the evolutionary biologist who made the discovery named it Neopalpa donaldtrumpi.

The reason of the choice of name is to bring wider public attention to the need to protect fragile habitats in US that still contain many undescribed species. Moreover, the head scales of moth reminded the scientist of Trump's distinctive hair.

Hope that the discovery & its name highlight the importance of discovering new species of even the microfauna- the smallest creatures that inhabit the world.

Trump's predecessor Barack Obama, has had both a fish & flat worm named after him !!

Nishtha Goyal
B.Sc.-II, Medical

The Biggest Black Hole

Recently Scientists have discovered the largest hole. This black hole is so large that it can easily swallow our whole solar system. Its weight is equal of that of 6.8 Arab suns. Its area is four times bigger than the orbital path area of Neptune. This black hole is five crore light year away from the earth. The scientists have discovered this black hole with a specially prepared telescope at Hawai Island.

After many experiments they found that it is 2 times more heavier than our guess. It is added in record book as the hole situated in the milky way is 1000 times shorter than this black hole. How this discovery took place? Scientists of Tenas University say that they used the 801 mt. long telescope for its discovery. Its long optical power is so much that we can even see the stars revolving around the black hole at the speed of 500km per hour.

Navneet
B.Sc-I, Medical

Ecofreindly Plastics Made using Lemon Extracts, CO_2

Scientists have developed eco-friendly plastics using lemon extracts and CO2 that may replace potentially cancer causing materials widely used in everyday items such as phone cases, baby bottles and DVD's

Researchers led by Avjan Kleij from the Institute of Chemical Research at Catalonia in Spain, developed a method to produce poly carbonates from limonene and CO2, both abundant and Natural products, instead of dangerous building block - bisphenol A.

The researchers not only succeeded in producing a more environment friendly polymer, but they also managed to improve its thermal properties. The limonene - derived polymer has the highest glass transition temperature making it safer for everyday use.

Extinct Wasp species found

Scientists have discovered a 100 million years old extinct wasp species and named it after the english musician. Daird Bowie alter ego, Ziggy stardust. Researches from Capital Normal University in China found two unidentified wasp specimens that were exceptionally well preserved in Burmese amber.

An analysis of the specimens revealed that both represent species new to science. One of the wasps showed such amazing similarities to a modern group of wasps that it was placed in a currently existing genus, Archaloteleria which has long been considered as an ancient lineage.

The second new species belong to a genus (Proteroscelio) known exclusively from cretaceous fossils. Like wise it is a tiny insect, measuring less than 2 mm in length as confirmed by researchers.

Arshpreet Kaur
B.Sc-III, Medical

Light Pollution : A new threat to pollination

Artificial light disrupts nocturnal pollination and leads to a reduced number of fruits produced by the plant. This loss of night time pollination cannot be compensated by diurnal pollinators.

The negative impact of artificial light at night on nocturnal pollinators might even propagate further to the diurnal community as ecologists were able to show. It has been shown for the first time that nocturnal pollinators can be affected by artificial light leading to a disruption of the pollination service they provide.

In the last 20 years the light emissions have increased by 70% particularly in residential areas.

New Material Removes water pollutants using solar energy

Scientists have developed a new non toxic material that uses solar energy to degrade harmful synthetic dye pollutants which are released at a rate of nearly 3,00,000 tonnes a year into world's water. The novel, non- hazardous photocatalytic material developed, effectively removes dye pollutant from water, adsorbing more than 90% of the dye and enhancing the rate of dye breakdown by almost ten times using visible light by heating the reaction mixture at high pressures inside a sealed container, the composite is synthesized by growing ultra thin nano wires of tungston oxide on the surface of tiny particles of tantalum nitride. As a result of incredibly small size of two material components both the tantalum nitride and tungsten oxide are typically less than 40 billion of a metre in diameter the composite provides huge surface area for dye capture.

Sehajpal Kaur
B.Sc-III, Medical

New Technology Can Reverse Ageing in Human Cells

Scientists have developed a new technology that can reverse ageing and rejuvenate human cells that may help treat PROGERIA - a disorder that causes children to age too quickly. While advances have been made to slow down ageing in humans, true age reversal at a cellular level remains difficult to achieve. Progeria is a rare condition marked by rapid ageing which takes away the chance to live beyond their early teens. Telomeres which are found at the tip of chromosomes get shorter in children with progeria. When the process of telomere shortening in the cells is reversed from these children and lengthen them, it can reverse a lot of problems associated with ageing. A technology called RNA - therapeutics is used which produce a protein called telomerase that can extend and lengthen the telomere. This protein has very good and meaningful effect on the lifespan and function of the cells.

Gagandeep Kaur
B.Sc-III, Medical

Galaxy 'Saraswati' in Universe is Discovered

An extremely large supercluster of galaxies , "Saraswati have been discovered in the universe. The ultra large structure is on the direction of Constellation pisces and 400 billion light years away from earth. There is very high concentration of galaxies in the universe and it is very rare. Few such structures have been observed till now. Earth which belongs to Milky way galaxy is actually also a part of supercluster called the Laniaka supercluster. Since the galaxy that has been discovered is far away from earth the light has taken that much more time to reach earth. This means what scientists have observed is actually the past. This helps us understand how the universe must have been many many years ago. Dark energy is behind the expansion of the universe but nobody has ever detected it. But everybody is studying this and discovery of Saraswati will help us to understand the dark energy and other evolution of universe.

Pooja Chauhan
B.Sc-III, Medical

'Euro Devil' Fossil of Carnivore Marsupial Relative Discovered in Europe

On 17th August, 2017 scientist at University of Salford have discovered fossil remains of a new carnivorous mammal in Turkey, one of the biggest marsupial relatives ever discovered in the northern

hemisphere.

The new fossil is a 43 million year old cat-sized mammal that had powerful teeth and jaws for crushing hard food, like the modern Tasmanian Devil. It is related to pouched mammals i.e. marsupials and it shows that metatherians were far more diverse in the northern hemisphere than previously believed.

Dr. Maga found the fossil at a site near the town of Katan, north west of the Turkish capital, Ankara It has been named Anatoliadelphys massae. The fossil is remarkably well preserved and includes parts of the skull and most of the skeleton.

Most fossil metatherians from the northern hemisphere were insect eating creatures no bigger than mice and rats, whereas Anatoliadelphys was ten times larger and could have eaten vertebrate prey. Its body design indicates that it could climb trees.

Deepanshu Verma
B.Sc-III, Medcial

Ghana, Kenya, Malawi to Pilot First Malaria Vaccine in the World : WHO

The World's first malaria vaccine will be piloted by Ghana, Kenya and Malawi from 2018. These three countries will be offering the vaccines to children in the high-side areas as part of real life trials, according to a statement by the World Health Organisation (WHO) on 24 April 2017. The injectable vaccine called 'RTS, S" or Mosquivix, has been developed by the British drug maker Glaro Smithkline to protect children from the most deadly form of malaria in African countries. Malaria kills 4,30,000 people in the world every year, the vast majority among the victims being the babies and the children in the Sub Saharan African Region. Global efforts by various international agencies like WHO in the last one and a half decades have cut the malaria death toll by 62 percent between 2000 and 2005. WHO while launching the project stated that it wanted to see the results of on the ground testing in pilot programme. It would help the international organisation to make decisions on the wider use of the vaccine, the WHO stated. In the clinical trials, the vaccine proved to be partially effective and it needs to be given in four doze schedule. It is first regular approved vaccine against the mosquito borne disease, the WHO claimed, while announcing the name of three countries - Ghana, Kenya & Malawi as the pilot countries for the project.

Garima
B.Sc-II, Medcial

Life Threatening Flavivirus Infection Japanese Encephalitis (JE)

Japanese Encephalitis (JE) is a kind of Encephalitis which falls under a spectrum of diseases called Acute Encephalitis syndrome (AES). JE is a mosquito born infection caused by Flavivirus. Domestic pigs and wild birds (Herons) are reservoirs of the virus. It is potentially life threatening but rare disease causing acute inflammation of brain.

Causes : It usually affects all ages, but children and elders are more at risk. It is caused sometimes, when the brain's own immune system mistakenly attacks brain tissue. Acc. to New York Times Report, it may occur due to bacterial, parasitic infection. This disease is non- communicable

Symptoms : Vast majority of such infections are a symptomatic. It usually shows mild symptoms - fever, headache, stiffness, disorientation and other non- specific symptoms.

Treatment : Viral forms of encephalities are not treatable. Doctors often prescribe steroid hormones, antibiotics or pain killers based on symptoms. In mosquito infested areas, mosquito repellents odomos and ointments should be used. JE has no cure at all.

How severe it is : JE is recognized as leading cause of disease in India. At least 60 children have lost their lives in the couple of days at the state run Baba Raghav Das (BRD) Medical hospital. Gorakhpur in UP. UP Govt has launched a vaccination campaign in 38 sensitive districts of state to combat JE virus.

Rajdeep Kaur
B.Sc-III, Medical

New Cancer Treatment

A new cancer treatment may provide hope for cancer patients. Scientists have discovered that some cancer cells in a person's body mutate. The breakthrough came when researches formed out that cancer cell leave behind markers when they spread.Changes in cell structure varies in different parts of the cancer area. Now scientists claim that they may be able to stop cancer cells at their roots. They aim to create a vaccine that could guide immune cells to attack cancer cells and stop mutations from spreading. Although it is still a long way before that happens, scientists hope that testing this new cancer treatment on humans could begin within the next years. However, there are some facts to consider. First of all, not all forms of cancer develop at the same speed. Some may be so quick that it should be impossbile to find out where mutations begin in time. Others would have a higher success rate. In addition, such treatment would be expensive, because each patient would have a personalized vaccine. Immunotherapies have been in the market for some time but only about one third of the drugs have worked and proved successful. Up to now doctors have mostly used chemotherapy to treat cancer. Even though this form of treatment kills off cancer cells when they divide it also attacks healthy cells and produces many side effects. Chemotherapy could not be replace with an individualized treatment. Pharmaceutical companies have welcomed the new development and will spend money or developing the

required vaccines.

Mannatjot Kaur
B.Sc-II, Medical

New tools of Science to Solve Crimes

Investigators use Forensic science to help solve crimes. Scientists use science to solve crimes. And researchers at labs around the world are developing new techniques to do this. Researchers team, for instance, is investigating how microbial signatures might identify suspects.

According to Researchers, "The bacteria that live in our body appear to be quite unique to us." and people shed these bacteria everywhere they go. Bacteria are like cloud around you. If you touch a surface, you leave behind millions of bacteria and other microbes. If each persons community of microbes is unique, this bacterial smudge could act like a fingerprint.

Collecting microbial samples from a crime scene, or from a suspect is surprising. Student investigators just run cotton swabs over a surface at crime spot. Then they seal each swab inside a sterile container. Each sample tends to hold hundreds of thousands or even millions of single celled organisms and each microbe has its own DNA.

Back at the lab, team extracts DNA from microbes in the sample. They use machines to look at the DNA's code. The results tell about the mixture of species present.

This research is not yet complete and investigators have cautioned that it's too early to use microbal fingerprinting to solve real crimes. Investigators say, you should be very careful of using (such a technique) in an investigation where someone's life and safety and future freedom is at stake,

Ravinder Kaur
B.Sc.-II, Medical

Ganoderma lucidum - THE WONDER MUSHROM

Mother nature has empowered the human body with a wonderful element, the body's natural defence system called the immune system. But , due to the contaminated environment i.e. the various toxins entering the human body through food, air, water, play havoc with our immune system and have made the term 'HEALTH' a RARITY. Therefore to tackle the ever increasing health problems & ailments researchers are working to unfold the mysterious healing potential of the herbs. One such herb has recently drawn the attention of scientists globally. This is a mushroom, known by the botanical name - Ganoderma lucidum.

In Japan, it is known as 'REISHI' ,in China as 'LINGZHI' and in Russia as 'CHAGA'. Also known as 'King of Herbs' or 'MIRACULOUS HERB' it is accorded with these wonderful names based on strong evidences. Many of us are unaware of astounding potentials of Ganoderma lucidum i.e. WHAT IT CAN DO AND HOW?

There are thousands of testimonials to prove the worth of this product- which include skin diseases, diabetes, high as well as low BP, arithritis, heart diseases, paralysis, cancers, childless couples, asthma, allergic disorders, nervous disorders, kidney stones & failure, epilepsy, obesity, liver disorder, ulcers, high cholesterol, migraine, piles, sinusitis, menstrual irregularities etc. Its potential as an ANTI-INFLAMMATORY AGENT as well as role in PREVENTION OF ALZHEMER'S DISEASE & CARDIOVASCULAR DISEASES has also been reported.

A study from the Toyama Medical & Pharmaceutical University describes the INHIBITORY EFFECTS OF Ganoderma against HIV-1. Scientists at the National Research centre for Mushrooms at Solan, Himachal Pradesh have commented that,"Ganoderma is no less than a SANJEEVANI BOOTI (A PANACEA) for cancer, diabetes, hypertension etc. Extracts of Reishi selectively protect NORMAL CELLS during RADIOTHERAPY AND SUPPRESS the movement & growth of highly invasive BREAST & PROSTATE CANCER CELLS."

Reishi extracts have also been referred to as 'CHEMOTHERAPEUTIC'. It is also referred to as SAVIOUR OF HUMAN RACE FROM KILLER DISEASES like RHEUMATISM, hepatitis A,B,C psoriasis, mumps etc.

Ganoderma is NOT A MEDICINE. It is a NATURALLY GROWING MUSHROOM which is a health food supplement with no side effects or harmful effects.

ITS BASIC ACTION IS AT THE CELLULAR LEVEL- TO CLEANSE & DETOXIFY THE CELLS, balance the body systems and in the process strengthen the body's immune system, which takes care of the various disorders in the body.

Ganoderma is HEALTH SPECIFIC & NOT DISEASE/ SYMPTOM SPECIFIC. "There is NO ROOM FOR DISEASE IN A HEALTHY BODY." Till date about 250 active components have been isolated from Ganoderma lucidum.

The need of the hour is to combine the TRADITIONAL HERBAL MEDICINE & MODERN MEDICINE FOR THE ALLEVIATION OF HUMAN SUFFERING.

Pahul P.K. Sandhu
B.Sc.-III, Medical

The Tree That Drinks Cloud

How a Tree Survives on a Rocky Island With No Rain.

The dragon's blood tree is found only in the arid and canyons of socotra, an island in the Indian Ocean. It is named for its scarlet sap, which the local

people use in make up.

But the tree's real claim to fame is rather more subtle. It has an extraordinary strategy for surviving the summer here. Resembling a huge toadstool,the tree's canopy acts as a funnel. When regular morning mist condenses on tree's leaves and is channeled to the base of the trunk, where it is drawn in by roots. The foliage acts as a parasol in extreme heat of the middle of a day.

Most of the dragon's blood trees are at least 200 years old, and the life team were surprised to find no young specimens. It may be guessed that the domestic goat population is eating the saplings.

Nitika
B.Sc.-II, Medical

How goldfish make alcohol to survive without oxygen???

Scientists at the Universities of Oslo and Liverpool have uncovered the secret behind a goldfish's remarkable ability to produce alcohol as a way of surviving harsh winters beneath frozen lakes.

Humans and most other vertebrate animals die within a few minutes without oxygen. Yet goldfish and their wild relatives, crucian carp, can survive for days, even months, in oxygen-free water at the bottom of ice-covered ponds. During this time, the fish are able to convert anaerobically produced lactic acid into ethanol, which then diffuses across their gills into the surrounding water and avoids a dangerous build-up of lactic acid in the body.

The muscles of goldfish and crucian carp contain not just the usual one, but two sets of the proteins normally used to channel carbohydrates towards their breakdown within a cell's mitochondria — a key step for energy production. While one set of these proteins appears very similar to that in other species, the second set is strongly activated by the absence of oxygen and shows a mutation that allows channelling of metabolic substrates to ethanol formation outside the mitochondria. Further genetic analysis suggest that the two sets of proteins arose as part of a whole genome duplication event in a common ancestor of goldfish and crucian carp some 8 million years ago.

During their time in oxygen-free water in ice-covered ponds, which can last for several months in their northern European habitat, blood alcohol concentrations in crucian carp can reach more than 50 mg per 100 millilitres. However, this is still a much better situation than filling up with lactic acid, which is the metabolic end product for other vertebrates, including humans, when devoid of oxygen.

This research emphasises the role of whole genome duplications in the evolution of biological novelty and the adaptation of species to previously inhospitable environments. The ethanol production allows the crucian carp to be the only fish species surviving and exploiting these harsh environments, thereby avoiding competition and escaping predation by other fish species with which they normally interact in better oxygenated waters.

"It's no wonder then that the crucian carp's cousin the goldfish is arguably one of the most resilient pets under human care."

Jaspreet Kaur
B.Sc.-III, Medical

Big Data Yields Surprising Connections Between Diseases

Using health insurance claims data from more than 480,000 people in nearly 130,000 families, researchers at the University of Chicago have created a new classification of common diseases based on how often they occur among genetically-related individuals.

Researchers hope the work, published this week in Nature Genetics, will help physicians make better diagnoses and treat root causes instead of symptoms.

"Understanding genetic similarities between diseases may mean that drugs that are effective for one disease may be effective for another one," said Andrey Rzhetsky, PhD, the Edna K. Papazian Professor of Medicine and Human Genetics at University Chicago who was the paper's senior author. "And for those diseases with a large environmental component, that means we can perhaps prevent them by changing the environment."

The results of the study suggest that standard disease classifications-called nosologies-based on symptoms or anatomy may miss connections between diseases with the same underlying causes. For example, the new study showed that migraine, typically classified as a disease of the central nervous system, appeared to be most genetically similar to irritable bowel syndrome, an inflammatory disorder of the intestine.

Rzhetsky and a team of researchers analyzed records from Truven MarketScan, a database of de-identified patient data from more than 40 million families in the United States. They selected a subset of records based on how long parents and their children were covered under the same insurance plan within a time frame most likely to capture when children were living in the same home with their parents. They used this massive data set to estimate genetic and environmental correlations between diseases.

Next, using statistical methods developed to create evolutionary trees of organisms, the team created a disease classification based on two measures. One focused on shared genetic correlations of diseases, or how often diseases occurred among genetically-related individuals, such as parents and children. The other focused on the

familial environment, or how often diseases occurred among those sharing a home but who had no or partially matching genetic backgrounds, such as spouses and siblings.

The results focused on 29 diseases that were well represented in both children and parents to build new classification trees. Each "branch" of the tree is built with pairs of diseases that are highly correlated with each other, meaning they occur frequently together, either between parents and children sharing the same genes, or family members sharing the same living environment.

"The large number of families in this study allowed us to obtain precise estimates of genetic and environmental correlations, representing the common causes of multiple different diseases," said Kanix Wang, a graduate student at University Chicago and lead author of the study. "Using these shared genetic and environmental causes, we created a new system to classify diseases based on their intrinsic biology."

Genetic similarities between diseases tended to be stronger than their corresponding environmental correlations. For the majority of neuropsychiatric diseases, such as schizophrenia, bipolar disorder and substance abuse, however, environmental correlations are nearly as strong as genetic ones. This suggests there are elements of the shared, family environment that could be changed to help prevent these disorders The researchers also compared their results to the widely used International Classification of Diseases Version 9 (ICD-9) and found additional, unexpected groupings of diseases. For example, type 1 diabetes, an autoimmune endocrine disease, has a high genetic correlation with hypertension, a disease of the circulatory system. The researchers also saw high genetic correlations across common, apparently dissimilar diseases such as asthma, allergic rhinitis, osteoarthritis and dermatitis.

Abhishek Mittal
B.Sc.-III, Medical

Sleep Helps Instant with Language Development

Babies brain do astonishing things during sleep. New research out of Leipzig at the Max Plank Institute for Human Cognitive and Brain Sciences (MPI CBS) found that babies can associate meanings to words between six and eight months of age.

We associate memory with meaning of words. These memories and meanings pass through the same stages in sleep as they do in lexical development. This personal language development includes things like proto words that combine both visual and acoustic stimuli to make a word that has a meaning to that person.

The infants in this study received a lot of information which would normally be seen or learned over an extended period however it is interesting that sleep allows them to disconnect from the outer world to filter and save essential memories.

The research indicates that proper sleeping patterns and duration are essential to an infant's cognitive and language development.

Nitika
B.Sc.-II, Medical

RoboBee's

A robot as small as a housefly has managed the delicate task of flying and hovering the way the actual insects do. An electrical engineer Ronald Fearing, works on robotic flies at the University of California in Berkeley said that this is a major engineering break through in 15 years of his making. First there were drones then there were quadcopters and now there's RoboBee, which really looks more like a fly. After more than a decade of work, engineers have build an insect sized robot that can take off, fly back & forth land & take off again. It is made from carbon fibre & weighs a fraction of gram and has superfast electronic "muscles" to power its wings which are made up of piezoelectric crystals, which shrinks or stretch depending on the voltage applied to them. Real insects have flexible wings & can move in many directions but that was too difficult to reproduce in robot. So its wings can just flap & rotate. RoboBee's ceramic muscles bends when subjected to a voltage, causing the attached wings to flap. The voltage comes from a thin wire that connects the robot to a power source and a computer. The Robot takes just 20 second long flights as its material will fatigue & fail after a total of 15 minutes of use. And just like a real fly the robot's thin flexible wings beat approximately 120 times every second. The researches achieved this wing speed with special substance call piezoelectric material which contracts every time a voltage is applied. The tiny components some of which are just micrometres across are extremely difficult to make using conventional manufacturing technologies so they created layers of flat, bendable materials with flexible hinges that enabled the 3D structure to emerge in one fell swoop. RoboBee's can be used in rescue operations for example navigate through tiny spaces in collapsed building & also has the fly like agility that allows insects to evade even the swiftest of human efforts to swat them. The current model of roboBee is tethered to a small, off-board power source but the next step will be to miniaturise the other bits of technology that will be needed to create a "fully wireless flying robot."

Ishita
B.Sc.-III, Medical

Vaccines in tattoo form!

When Edward Jenner pioneered the concept of vaccination, it was heralded as a major milestone in the medical field. Ever since, we have been able to battle countless number of diseases and keep them at bay. But, how many of us are happy about the actual process of vaccination?

The very right of smiling nurse or approaching with the glinting needle of a syringe while extruding the first drop from the nozzle can terrify any mortal being. Nano technology has now been employed to engineer patches that can effectively deliver vaccines without needles. Called" nanopatches"there are small square frames containing thousands of nanoscales projections coated with miniscule amounts of the vaccines. On application to the skin surface, the nano needle pierce through outer skin layers and deliner the bio agent right into the immune cells found abundantly in the epidermis.

Smaller than the size of portal stamps, nanopatches can be designed in two forms :-
those that can dissolve into the skin and those that need to be removed after application.

Apart from being pain free, are there any other advantages over their needle counterparts? Certainly! Nanopatches can elicit a greater immune responses because the conventional needles target the vaccines into muscles tissues that contain less number of immune cells. Intradermal and Intramuscular (IM) routes of delivery require upto 1 ml of vaccines, whereas delivery via nanopatches is a matter of just a few microlitres! This allows immunization of larger population with smaller amounts.

Moreover, vaccines are deposited on the nano projections by a process called dry coating, there by passing the requirement for cold chain. Being a high cost and energy intensive process, it is considered to be one of the major limitations in the logistics of conventional vaccines in rural areas.

The technology, master minded by Professor Mark Kendell from the University of Queensland, Australia was conceived with the goal of improving the cost and efficiency of vaccination. Pre- clinical trials conducted by Professor Kendall in mice using flu vaccine established the dose- sparing benefits and higher biological response compared to IM injection.

If these studies can be successfully translated into humans, nanopatches will be the next major break through as the grand challenges in the global health has identified the development of a needle free vaccination system as a major challenge in the global healthcare sector.

It might not be too long when everyone could self-vaccinate painlessly with the ease of using a sticker tattoo!

Arpit Kaur
B.Sc.-III, Medical

The Mars Orbiter Mission

The Mars Orbiter Mission (MOM), also called Mangalyaan is a space probe orbiting Mars since 24 September 2014. It was launched on 5 November 2013 by the Indian Space Research Organisation (ISRO). It is India's first interplanetary mission and ISRO has become the fourth space agency to reach Mars, after the Soviet space program, NASA, and the European Space Agency. The Mars Orbiter Mission probe lifted-off from the First Launch Pad at Satish Dhawan Space Centre (Sriharikota), Andhra Pradesh, using a Polar Satellite Launch Vehicle (PSLV) rocket C25 at 09:08 UTC. The launch window was approximately 20 days long and started on 28 October 2013. After a 298-day transit to Mars, it was successfully inserted into Mars orbit on 24 September 2014. Marking India's first venture into the interplanetary space, the primary objective of the mission is to develop the technologies required for designing, planning, management and operations of an interplanetary mission. MOM will explore and observe Mars surface features, morphology, mineralogy and the Martian atmosphere. Further, a specific search for methane in the Martian atmosphere will provide information about the possibility or the past existence of life on the planet. This programme showed that India was capable of the same feats that the other large space programs were doing, and even better yet, it was completed on first try, something no other space program has ever done. It succeeded in doing all of the primary and scientific objectives, which were to demonstrate technology and to study both the morphology of Mars and its atmosphere. It had a planned mission duration of 6 months, but it has been going for 3 years already. Also, the mission was conducted in tandem with NASA's MAVEN mission. When comparing the two, MAVEN was the costlier one, costing $672 million US dollars, while MOM costed only $74 million dollars, 11% of NASA. Even after functioning for 1000 days, the satellite is in good health and has provided a data of over 715 images which will be analysed scientifically. Also, ISRO has launched MOM Announcement of Opportunity (AO) programmes for researchers to use the MOM data for research and development. Meanwhile, India is also planning a new mission to Venus after 2020 and Mangalyaan 2.0's return to Mars.

Mansi Achhoda
B.Sc.-II, Medical

Relationship Between Science and Religion

Religion has been guiding the society for thousands of years. People have been worshiping their "God and Goddesses" with an devotion. People leave all their worries and anxieties and believe that God will solve all their problems.

Science taught human beings to examine things scientifically. Science influenced people's minds and ideas to a great extent.

There is a close relationship between science and religion. Religion teaches us the principle of morality and science should always be guided by this principle or morality. The scientific power become more and more effective and benevolent only when it is guided by religion and morality. Our atom bombs, hydrogen bombs are examples to show, how the scientific power has been missused because of the lack of religion and morality.

Belief in God does not mean disbelief in science. One may believe in both, and the time has come when the scientists have realised that religion begins where science ends. The scientific ideas should never persuade the people that there is no God and no religion because even the great scientist of the world have declared that there is some invisible power that governs the universe and they have said that in right earnest. We feel the presence of God and his invisible hand everywhere.

There is need for Harmony between science and religion. Therefore it is now quiet evident that science and religion should work together for well being of humanity. The scientist with the belief in God and the Principles of morality can achieve many things for the betterment of humanity.

Shikha
B.Sc.-II, Medical

Dead Sea : The Sea of Life

This is astonishing! One of the saltiest water bodies on the planet earth located in Israel has a very contradictory name. Is it really dead? The Dead sea is roughly 8.6 times saltier than the ocean. This salinity makes for a harsh environment in which animals cannot flourish. The unique salt & chemical content of the waters of the dead sea prove to be toxic when in contact with fish and nearly the entire marine life.

Almost nothing lives in the water. It is lanlocked and is the longest valley on earth. All the minerals gather into one pool & get baked by the sun. Thus, making it highly saline.

The salt is all dissolved in the water, this makes the water much denser than normal water making it uncomfortable to swim. The water is even much more denser than the human body which is 70% unsalted water. Therefore, the high concentration of salt makes it impossible to sink in the dead sea.

It is amazing to note that human body floats like a wooden log on the surface of water & even researches have found people meditating and reading a book while floating!

None, the question arises, 'Why is it called the 'Sea of Life'. This is because the dead sea has been blessed with a rare blend of potent natural resources proven by endless scientific researches worldwide to be therapectically effective for healing skin diseases like PSORIASIS and other diseases like RHINOSINUSITIS, OSTEOARITHRITIS etc. Dead sea minerals such as Magnesium, Potassium and Calcium help heal psoriasis. Additionally each of the 21 minerals found in it is vital for the skin's normal metabolism each litre of water contains 345 grams of dead sea minerals salt.

Anjali Sharma
B.Sc.-III, Medical

Multi Drug Resistant and Anti-Drug Resistant Tuberculosis

The bacteria MvcobacteriumTuberculosis that cause tuberculosis can develop resistant to anti¬microbial drugs used to cure the disease. Multi-drug resistant tuberculosis or MDR-TB is tuberculosis that doesn't respond to at least Isoniazid and Rifampicin , the two most powerful anti-Tb drugs.

Almost one in four people in the world are infected with TB bacteria. Bacteria become active as a result anything that can reduce the person's immunity.

Resistant strains of TB are already present in the population, so MDR-TB can be directly transmitted from an infected person to an uninfected person. In this case previously untreated person develops a new case of MDR-TB. This is also known as Primary MDR-TB and is responsible for upto 75% of cases. Acquired MDR-TB develops when a person with a non-resistant strain of TB is treated inadequately resulting in development of antibiotic resistant in the TB bacteria infecting them. These people can in turn infect other people with MDR-TB.

The two main reasons that why multi-drug resistance can continue to emerge and spread are mismanagement of TB treatment and person -to-person transmission. Most people with TB are cured strictly followed, 6-month drug regime that is provided to patients with proper support and supervision.

In some countries, it is becoming increasingly difficult to treat MDR-TB. Treatment options are limited and expensive, recommended medicine are not always available and patient experience may adverse effect from the drugs. In some cases even more severe drugs - resistant TB may develop. It has been reported in 117 countries worldwide.

Drug resistance can be detected using special laboratory tests which test the bacteria for sensitivity to the drugs or detect resistance patterns.

New recommendations of W.H.O aims to speed up detection and improve treatment outcomes for MDR-TB through the use of novel rapid diagnostic test and shorter, cheaper treatment regime. Not only is it less expensive than current regimes, but it is also expected to improve outcomes and potentially decrease deaths due to better adherence to treatment and reduce lose to follow-up.

Pragya Garg
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