



- Science & Technology

- **BIOLOGY**

- Part 1

## TB Tuberculosis

- Prevention of TB involves screening those at high risk, early detection and treatment of cases, and vaccination with bacillus Calmette Guerin (BCG) vaccine.
- Treatment requires the use of multiple antibiotics over a long period of time.
- Antibiotic resistance is a growing problem with increasing rates of multi drug-resistance tuberculosis (MDR-TB).
- Presently one third of the world's population is thought to be infected with TB.

## Contagious Diseases

- A contagious disease is the one which are transmitted to other persons, either by physical contact with the person suffering the disease, or by causal contact with their secretions or objects touched by them or airborne route among other routes.
- VIRUS: Flu, HIV, Ebola, Measles  
BACTERIA: TB

## Surrogacy

- Couples who are unable to conceive after over a year of trying could use procedures called assisted reproductive technologies(ART) to get pregnant. These include intrauterine insemination, IVF, sperm/egg donation and surrogates of gestational carriers (called surrogacy)
- Surrogacy is when another woman carries and give birth to a baby for a couple. The child could be the biological child of the couple or in some cases, a sperm or an egg donation is used.

## Surrogacy

- Surrogacy earned a bad name about five years ago in India when in a couple of cases, children born to surrogates were abandoned by their biological parents; the children were left 'stateless'.
- In late 2015, India announced a ban on surrogate service to foreign couples. India has ART guidelines but not the law. Actor Tusshar Kapoor has become a single parent through surrogacy.

Law has not been passed so far.

- Draft says surrogacy is only for married , infertile couples.
- In Dec 2011, actor Aamir Khan announced that he and wife Kiron got a son through Surrogacy.
- Shah Rukh Khan and wife Gauri too had a son using surrogacy.

## Zica Virus

- Zica virus is a member of virus family FLAVIVIRIDAE. It is spread by day-time active Aedes mosquitoes. The name comes from Zika Forest of Uganda where the virus was first located in 1947.
- Zica virus is related to the dengue, yellow fever, Japanese encephalitis and West Nile viruses. It has been known to occur within a narrow equatorial belt from Africa to Asia. From 2007-2016 the virus spread eastward, across the Pacific Ocean to the Americas, leading to 2015-16 Zica virus epidemic.
- Zica can spread from a pregnant woman to her baby. This can result in microcephaly sever brain malformations, and other birth defects.

## Zica Virus

- The World Health Organization has declared a public health emergency for Zica virus. The best form of prevention is protection against mosquito bites.
- Zica virus disease is caused by a virus transmitted by Aedes mosquitos.
- People with Zica virus disease can have symptoms including mild fever skin rash conjunctivitis muscle and joint pain headache



## Zica Virus

- The virus was first identified in Uganda in 1947 in monkeys through the network who monitored yellow fever. It was later found in human being in 1952 in Uganda and Tanzania. Outbreaks of this virus were reported Africa, the Americas Asia and the Pacific in 1960 and 1980.
- The first large outbreak of disease caused by Zica infection was reported from the Island of Yap (Federated States of Micronesia) in 2007. In July 2015 Brazil reported an association between Zica virus infection and Guillain-Barre syndrome. In October 2015 Brazil reported an association between Zica virus infection and microcephaly.

## Zica Virus

- Zica virus is primarily transmitted to people through the bite of an infected mosquito from the Aedes genus, mainly *Aedes aegypti* in tropical regions. *Aedes* mosquitoes usually bite during the day, peaking during early morning and late afternoon and evenings. This is the same mosquito that transmits dengue, chikungunya and yellow fever. Sexual transmission of zika virus is also possible.
- Zica virus disease is mild and does not require special treatment. The person should get plenty of rest drink enough liquids and treat pain and fever.
- There is currently no vaccine available.

## Fluorosis

- Fluoride is an important mineral for everyone, especially children. We all have bacteria in our mouth. Bacteria produce acid that harms teeth. Fluoride protects teeth and helps reverse early sign of decay.
- Fluorosis occurs when young children get too much fluoride, over an extended period of time. Dental fluorosis is a minor change in the appearance of the teeth, usually resulting in faint white marks on the enamel. Using too much of toothpaste can cause fluorosis.

## Vaccination

- Vaccination is the administration of antigenic material (a Vaccine) to stimulate an individual's immune system to develop adaptive immunity to a pathogen.
- Vaccination is the most effective method of preventing infectious diseases. Like Small pox, Polio, Measles and Tetanus.

## MRI

- Magnetic resonance imaging  
MRI is a medical imaging technique used in a radiology to form pictures of the anatomy and the physiological processes of the body.
- It is a noninvasive medical test that physicians use to diagnose medical conditions.
- MRI uses a powerful magnetic field, radio frequency pulses and a computer to produce detailed pictures of organs, soft tissues, bone and all other internal body structures

## Unicellular Organism

- A unicellular organism, also known as a single-celled organism, is an organism that consists of only one cell. Unicellular organisms fall into two general categories: Prokaryotes and Eukaryotes  
Example:  
Prokaryotes- bacteria  
Eukaryotes- Protozoa, some fungi-Valonia ventricosa
- Unicellular organisms are thought to be the oldest form of life on the earth. Probably emerging about 4 billion years ago

## Lichen

- A lichen is a composite organism that arises from algae and fungi in a symbiotic relationship. The dominant partner is the fungus.
- The combined lichen has properties different from those of its component organisms. Lichens come in many colours, sizes and forms.
- The properties are sometimes plant-like, but lichens are not plants. Lichens may have tiny, leafless branches, flat leaf-like structures, flakes that lie on the surface like peeling paint or other growth forms.
- It is estimated that 6% of earth's land surface is covered by lichens.

## Green Plants

- **Green plants make their own food.** Animals (including humans) cannot synthesize food and they feed on either plants or other animals. In all cases the food for animals comes directly or indirectly from plants.



## Swine Flue

- Vaccination is the best way to prevent or reduce chances
- Why H1N1- It is mainly found infecting people and exhibits two main surface antigens, H1 (hemagglutinin type1) and N1 (Neuraminidase type 1)
- The eight RNA strands from novel H1N1 flu have one strand derived from human flu strains, two from avian (bird) strains and five from swine strains.

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## Blood Transfusion

- Blood transfusion is generally the process of receiving blood into one's circulation intravenously.

## Myopia

- (Near-sightedness or short -sightedness)
- It is a condition of the eye where light focuses in front of retina instead on retina. This causes distant objects to be out of focus. The distant objects blurs out. The closer objects look normal.
- Optical correction is possible by using lens (Glasses). Lens helps in formation of image on retina.
- The lens used is concave lens whose focal length is in negative so that we get Minus (-) number in our prescription from doctor.

## Stem Cells

- Stem cell is an undifferentiated cell of a multicellular organism. The cell is capable of giving rise to indefinitely more cells of the same type.
- From stem cells many other types of cells arises that is called differentiation. In lab it is possible to grow organs from stem cells.
- Stem cells have the remarkable potential to develop into many different cell types in the body during early life and growth.
- Stem cells play a huge part in the body's healing process. Stem cells act as basic building blocks of our body. Stem cells have potential to develop into specialized cells such as blood cells, muscle cells, brain cells etc.

## Ultra Violet Rays

- Ultraviolet is an electromagnetic radiation with a wavelength from 10nm to 400nm, shorter than that of visible light but larger than X-rays.
- UV radiation is present in sunlight constituting about 10% of the total light output of the Sun.

## Friction

- Friction is the force resisting the relative motion of solid surfaces. Friction also occurs in fluid layers.
- Friction works against the motion and acts in the opposite direction.
- When one object is sliding on another it starts to slow down due to friction.
- Friction helps in walking.
- For Vehicle movement friction is to overcome and for braking friction force should take over the momentum or moving force.

## Friction

- There are four types of friction: static, sliding, and rolling friction occur between solid surfaces.
- Fluid friction occurs in liquid and gases.  
sliding friction is less than static friction.  
rolling friction is less than sliding friction

ex. Stroll, fish in water, streamline body of plain



## Fish in Frozen Lake

- When water is heated , its volume gradually decreases till the temperature rises to 4 degree Celsius. Above 4 degree water starts expanding.  
At 4 degree water has least volume.  
At 4 degree it has highest density.  
This irregular expansion of water is called anomalous expansion.  
This anomalous expansion plays an important role by only freezing the upper layer in lakes and rivers.
- The surface water freezes at 0 degree while the lower part still remains at 4 degree Celsius. The light frozen layer of ice floats on top.

## Sunburn

- Sunburn is a form of radiation burn that affects living tissue, such as skin, that results from an over-exposure to ultraviolet (UV) radiation, commonly from the Sun.
- Common symptoms in humans and other animals include red or reddish skin that is hot to the touch, pain, general fatigue, and mild dizziness.
- Excessive UV radiations is the leading cause of primarily non-malignant skin tumors.

- Thank You