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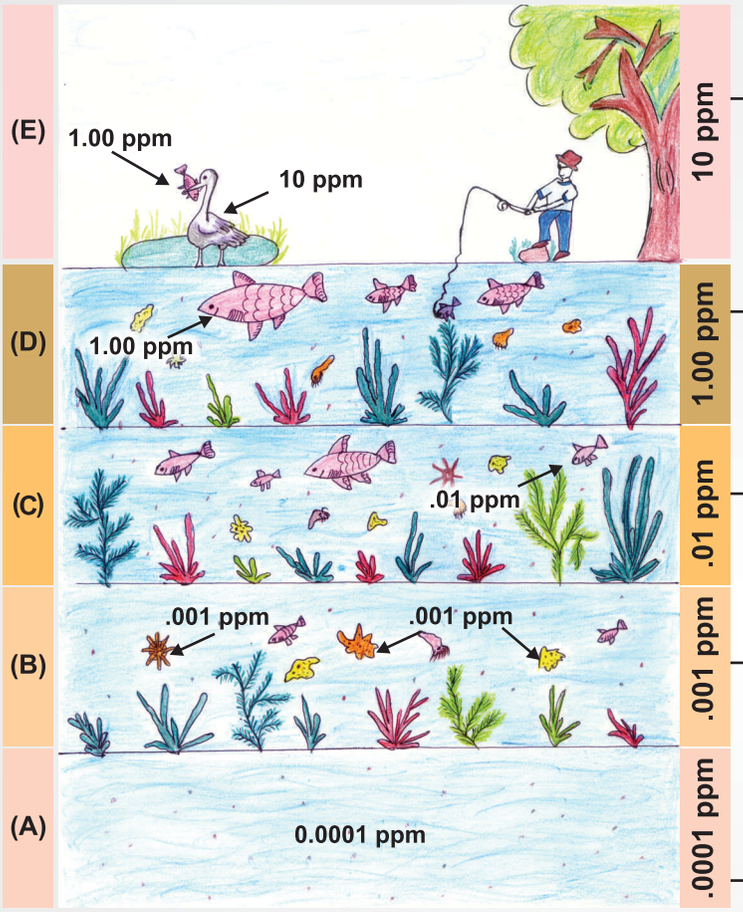
(deemed to be University u/s 3 of UGC Act 1956)

FAT LOVING CHEMICALS & ENVIORNMENTAL POLLUTION

Prof. Pradeep Bhatnagar
Dean, Faculty of Science



Sketch by: Richa Pundir (Research Scholar, Dept. of Biotechnology)

Lypophilic chemicals/pollutants are very harmful to human being, they try to accumulate in fats of the body, from there it may leach out gradually and affect the vital organs, it means that the organs of the body remain chronically exposed to the pollutant. In pregnant women these pollutants cross the placental barrier and may cause harm to the embryo. In nursing women, lypophilic chemicals/pollutants are excreted through the breast milk, resulting in exposure to the new born through milk.

E. *Animals, birds and human beings who are on the top of the food chain, will be exposed to very high concentration of pollutant, if they feed on these big fishes, which are carrying very high concentration of the pollutant. This phenomenon is called* ***bio-magnification****, in which at every higher trophic level of food chain, there is an increase in the concentration of the pollutant.*

D. *Big fishes which feed on small fishes having 0.01 ppm concentration of pollutant in their body, will accumulate very high concentration of that pollutant may be 1.00 ppm or more.*

C.*The small fishes feed on planktons, having 0.001 ppm of the pollutants in them. The cell wall of all the organisms is rich in lipids therefore, lypophilic pollutants (organo chlorine and some metals) enter in the cell and tissue. These chemicals generally do not get excreted through urine etc. Therefore, they accumulate in animals. This is called* ***bio-accumulation****. By this phenomenon larger fishes accumulate higher concentration of pollutants because they are eating small fishes which are already having high concentration of chemicals (0.01 ppm).*

B.*Small organisms like protozoan, zooplanktons and phytoplanktons, microbes which are present in the pond, absorb that pollutant, but they fail to excrete that chemical, therefore, the concentration of that pollutant increases in them e.g. they may contain 0.001 ppm of chemical.*

A.*The water of the lake or pond is contaminated with lypophilic (chemicals which are dissolved in fats e.g. many pesticides and some heavy metals) pollutants. The concentration of this pollutant/chemical in water is 0.0001 ppm.*

THE GREEN MEDICINE SERIES

Dr. Shilpi Rijhwani
Department of Botany

Lagerstroemia speciosa, the Pride of India, is also known as Queen's Crape-myrtle or Banabá or Jarul in Hindi. It is a small to medium-sized tree growing upto 20 metres tall with downy, crumbling bark. The leaves are deciduous, oval, oblong or elliptical with an acute apex. The large leaves are extremely appealing as they turn red, right before they drop in the winter (the colour is due to higher levels of corosolic acid). The hexamerous white, pink or purple flowers are produced in erect panicles. It is widely cultivated as an ornamental plant in tropical and subtropical areas and grows mainly in South East Asia, India and Philippines.

Lagerstroemia speciosa has a long history of folkloric medical applications that include control of blood pressure and hypercholestraemia, as a hypoglycaemic agent, for treatment of diarrhoea, for treatment of urinary dysfunctions and as a laxative. Important therapeutic phytochemicals that have been isolated from the plant extracts include corosolic acid, lager-stroemin, reginin A and flosin B.

A tea produced from the leaves of Banabá is also used widely in some parts of south east Asia.

The Pride of India-Lagerstroemia speciosa (L.) Pers.

A postal stamp was issued by the Indian Postal Department to commemorate this plant.

Several studies have identified compounds that are responsible for its anti-diabetic activity namely: (1) Lagerstroemin, an ellagitannin corosolic acid (2) corosolic acid (3) gallotannins, of which PPG – penta-O-galloyl-glucopyranose was identified as the most effective compound, with a higher glucose transport stimulatory action than Lagerstroemin. In addition to stimulating glucose uptake in adipose tissue, it also has anti-adipogenic properties, therefore can be used as a potent obesity control agent also. It is becoming a common ingredient in weight-loss supplements / products as a metabolic enhancer. This plant has been most comprehensively studied for its application in the treatment of diabetes. Old leaves and mature fruits are considered to yield the greatest amount of the insulin-like principle. Twenty grams of old leaves or fruits, dried upto two weeks, in the form of 20% aqueous concoction was found to have potency equivalent to 6 to 8 units of insulin.

Xanthine oxidase a key enzyme isolated from the leaves of *Lagerstroemia speciosa* (L.) Pers. has been shown to cure hyperuricemia or increased levels of uric acid in the blood by catalyzing the oxidation of hypoxanthine whose presence exacerbates the problem . Studies support the dietary use of the aqueous extracts from Banaba leaves for the prevention and treatment of this ailment.

A number of studies have also demonstrated the antibacterial, antioxidant and anti-inflammatory properties of the leaf extracts of *Lagerstroemia speciosa.*

Sesquiterpenes Lactones from Family *Asteraceae*: A Boon for Modern Medicine

ANITA CHAUHAN
Research scholar, Department of Botany

Since ancient culture plants have been used as an affluent resource of medicine. The traditional knowledge of use of herbs in treatment of various ailments is one of the thrust areas of research. Sesquiterpenes lactones have been isolated from numerous genera of the family *Asteraceae*. They possess wide variety of biological and pharmacological activities like antiviral, antimicrobial and cytotoxic and are also described as the active constituents of a variety of medicinal plants used in traditional medicine for the treatment of inflammatory disease. According to National Cancer Institute, Sesquiterpenes lactones consist of highly important antitumor or cytotoxic activity.

The plant *Ageratum* is a non-aging plant which belongs to the family of *Asteraceae* which is the second largest family of flowering plant. In agricultural areas, among the weeds, members of Ageratum are spreading most widely. This plant is used as a raw material for phytochemicals and possesses various biological properties In India, *Ageratum conyzoides* is the only plant used in HIV diseases and is also used for the treatment of fever, pneumonia, cold, headache and curing wounds. The plant possess many secondary metabolites which includes alkaloids, flavonoids, tannin and *Sesquiterpenes Lactones*. The presence of these phytochemicals will provide an influential support for the clinical uses of *A. conyzoides* in modern medicine and it can also be used in ethnomedicine for the management of cancerous disease.

Source:http://Cancerres.aacrjournals.org/content/31/11/1649

Upcoming Events

Conferences/Workshops/Symposium

CONFERENCES ORGANISED ON CAMPUS

- Department of Chemistry is organising an ACT funded National Conference on Emerging Areas in Chemical Education & Research and National Convention of Chemistry Teachers on October 16-18, 2014. www.ncct2014.iisuniv.ac.in
- Department of Home Science is organising a workshop on Differently abled Individuals: Inclusion and Management on January 16-17, 2015.
- Department of CIT is organising a workshop on Future Directions in Multidisciplinary Perspective of Computational and Information Technology: Research and Challenges on January 30-31, 2015.
- Department of Physics is organising a conference on Latest Trends in microwave techniques and optical communication on February 6-7, 2014.

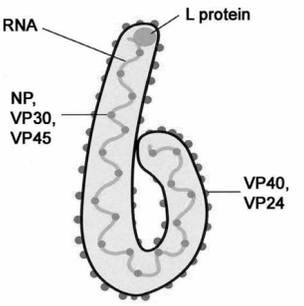
CONFERENCES ORGANISED OFF CAMPUS

- Conference of The Indian Botanical Society (2014) to be held on November 7-9, 2014 at S.S. Kelkar College, Mulund (East), Mumbai-40081. www.ibsconference2014.yolasite.com
- The 2nd International conference on Micronutrient and Child Health (MCH-2014) will be held at all All India Institute of Medical Science (AIIMS) in New Delhi on November 3-7, 2014. www.mchws2014.com
- 46th Annual National Conference of Nutrition Society of India will be held at Ludhiana, Punjab on November 7-8, 2014. www.nutritionsocietyindia.org
- 46th Annual National Conference will be held on December 12-14, 2014 on "New Paradigms in Nutrition Research & Practice" at Maharashtra Institute of Technology (MIT), Pune. www.idaindia.com
- 47th Annual National Conference of Indian Dietetic Association December 21-23, 2014 on "Dual Burden of Malnutrition-A National challenge" at Jawahar Lal Nehru Auditorium, AIIMS, New Delhi. www.idaindia.com

  17th National symposium in chemistry(NSC-17) and 9th CRSI-RSC joint symposium will be held in Ahemdabad, during February 5-8, 2015.www.crsi.org.in
- 10th International conference on Microwaves, Antenna, Propagation and Remote Sensing technically co-sponsored by IEE-GRSS, USA on December 9-12, 2014 in Jodhpur, Rajasthan. www.icmars.org
- CDAMOP 2015- 4th International Conference on Current Development in Atomic, Molecular and Optical Physics with Applications on March 11-14, 2015 in Delhi. www.physicsworld.com
- International Conference on Recent Advances in Nanoscience and Nanotechnology on December 15-16, 2014 in New Delhi. www.jnu.ac.in
- Temporally and Spatially Resolved Molecular Science: Faraday Discussion 177 on January 12-14, 2015 in Bangalore.www.rsc.org
- 55th Annual Conference of AMI-November 12-14,2014 at Tamil Nadu Agricultural University, Coimbatore.www.amiindia.info

EBOLA

Meeshal Wadhwani
M.Sc., Department of Biotechnology



Ebola, the most threatening word which knocks our ears frequently now days. It is a zoonotic pathogen which belongs to *Filoviridae* family. It was first described in 1976. In 2002, it was named as Zaire Ebola virus but later on in 2010, it was called EBOLA.

Its natural reservoir is believed to be fruit bats and it was initially transmitted through the body fluid between humans and animals. It is a long genome of approx.19, 000 b.p. In virion, it carries negative-sense RNA genome that is cylindrical and contains nucleocapsid, matrix and viral envelope.

The disease was first seen in African people especially, in SUDAN. The fertility rate of these Ebola viruses is highest i.e. 90%. Ebola virus causes Ebola hemorrhagic fever (EHF) in humans. In India its entry is suspected to be from a man who hailed from Nigerian, who was admitted in a hospital of Mumbai as he was showing common symptoms of EHF. Ebola virus. It reached human by taking animal as an intermediate.

SYMPTOMS:

1. Bleeding from nose, eyes, ears and mouth.
2. Increased sensitivity to pain and rashes all over the body, diarrhea, vomiting.
3 Reddening inside the roof of the mouth.
4.Decreased functioning of liver and kidney.

HOW TO PREVENT IT FROM SPREADING

DIAGNOSIS:

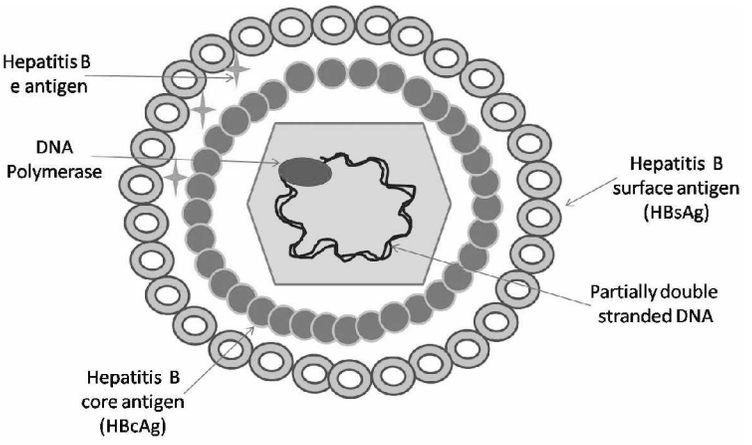
Test prescribed are:

CBC, Coagulation test, viralag test and liver function test

There is no definitive treatment and antiviral therapy doesn't work on virus. So, main goal remains specificaly to treat the symptoms and prevent secondary infection and complication.

An Introduction to Hepatitis B Virus (HBV), a causative agent of Hepatic Infections

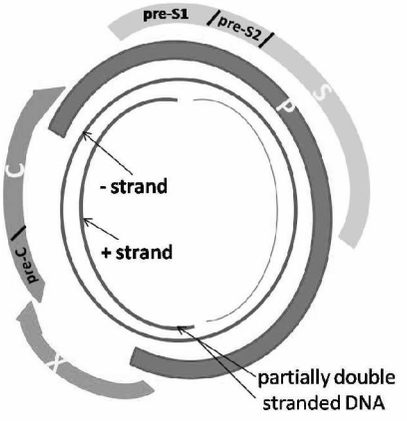
Dr. Nidhi Gupta
Research Associate, Department of Biotechnology



Structure- Hepatitis B Virus

Hepatitis B virus (HBV), the infectious causative agent for hepatitis is a significant global health problem. as estimated by World Health Organization, more than 2 billion people are affected worldwide, with about 400 million individuals chronically infected; several of whom would eventually develop severe liver diseases, including liver cirrhosis, and hepatocellular carcinoma (HCC), one of the most common form of liver cancers. The virus belongs to family *Hepadnaviridae*. It has a partially double stranded genome of 3.2 kb and replicates by reverse transcription of pregenomic RNA. The outer envelope is composed mainly of lipids. The core encloses the viral DNA and a DNA polymerase that has reverse transcriptase activity. The outer envelope contains embedded proteins which are involved in viral binding and entry into, susceptible cells. It has four open reading frames (ORFs) and encodes four genes, namely, C, X, P and S. The first ORF encodes various surface protein. The second promoter aids in synthesis of a 2.4 kb mRNA which is translated to yield the large (pre-S1) surface proteins. The "precore" region is well conserved, and regulates secretion of HBeAg. The third ORF is the largest, overlaps the other three; and encodes the viral polymerase. The fourth ORF, the smallest one is designated as "X"-a transcriptional transactivator.

The life cycle of Hepatitis B virus is quite complex and employs reverse transcription as part of its replication process. The virus enters into the cell by binding to some host cell receptor by endocytosis, followed by transfer of viral genomic DNA into the nucleus, where transcription for its four viral mRNAs takes place. The four viral transcripts thus produced, undergo additional processing to form progeny virions (1).



Genome organization-Hepatitis B Virus

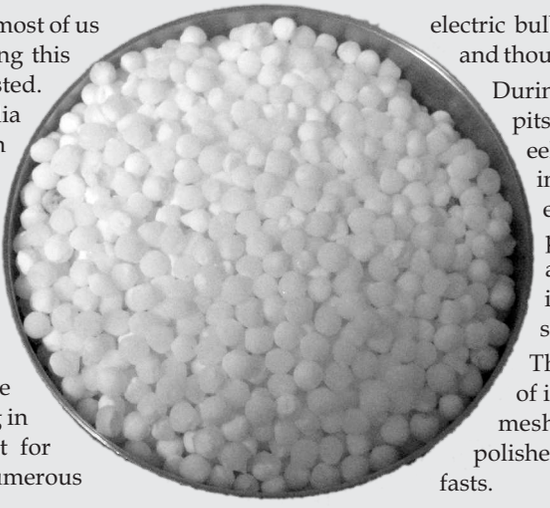
The X gene of HBV encodes a multifunctional, 154 amino acids polypeptide, HBx or X-protein, produced very early after infection. HBx plays an important role in viral replication in HBV infected cells and the liver diseases including hepatitis, cirrhosis and HCC. It is mainly known to activate many heterlogous promoters of the viral and cellular origin. HBx plays a major role in HBV infection and pathogenicity. Treatment of HBV infection is not yet very effective especially in case of active chronic hepatitis infection, though vaccine is available in order to prevent infection in non-infected individuals. One of the biggest challenge is therefore, to design and develop strategies that can cause potent suppression of HBx gene expression, thereby leading to inhibition of its functions such as transactivation of HIV-1 LTR promoter (2).

Source: (1) Seeger C., Mason W. S. and Zoulim F. (2007) Hepadnaviruses. In: Knipe DM, Howley PM, editors. Fields virology. Philadelphia: Lippincott Williams and Wilkins. pp 2977.
(2) Gupta N., Sood V., Bano A.S. and Banerjea A.C. (2007). AIDS (21) 1491-92. X protein of hepatitis B virus potently activates HIV-1 subtype C LTR promoter: implications of faster spread of HIV-1 subtype C.

Saboodana during fast?.....Think again!!!!

Kirti Shekhawat
Research Scholar, Department of Biotechnology

In India, we have a tradition of fasting and most of us eat saboodana during fast. But after reading this we have to think again if all our fasts are wasted. There are many saboodana factories in India like in Salem area of Tamil Nadu. We can have foul smell from these factories even from a large distance.



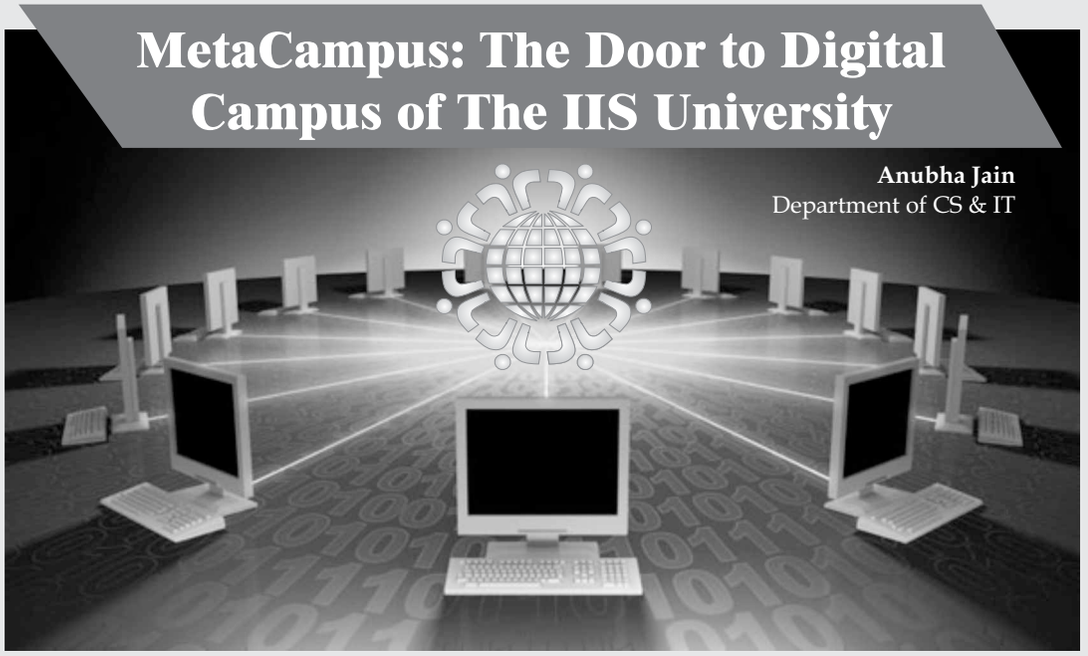
Saboodana is made by a root which resembles sweet potato. These roots are found mainly in Kerala and weigh about 6 kgs. During the season factory owners buy these roots in bulk because of cheap price. These roots are used for making pulp. The roots are put in a pit of about 40ft x 25ft long in an open ground. There the pulp is kept for several months to allow it to rot. The numerous electric bulbs illuminate throughout night over these pits and thousand of insects fall in these pits every night.

During the process of rotting, water is added to these pits everyday. As a result almost 2" long white color eel automatically develops just like pests are born in rotten food and gutters. By the time this process ends, the walls of pits are covered by millions of pests. This pulp is then crushed with machine and the pests are also crushed along and the pulp is converted into paste. This process is repeated several times during 5- 6 months.

This paste formed by the pulp along with millions of insects and pulp is then passed through a round mesh to make it into small balls which is then polished. This is saboodana which we eat mostly during fasts.

MetaCampus: The Door to Digital Campus of The IIS University

Anubha Jain
Department of CS & IT



There has been a rapid growth in applications related to teaching, research, management and service leading to increase in data produced by different processes. This brings many new problems of data usage, share, transportation and storage. There is a need for building a data exchange platform to achieve system integration and resolve all these problems. University Portal or Information Portal System, it is a one-stop solution to all the needs of an educational institution. It is a single gateway through which a user can gain access to web-based information and application systems from a single internet location with the help of a single sign-on.

The IIS University has constructed digital campus with an aim to enrich the teaching and learning environment, and at the same time boost efficiency campus-wide through high-quality support and technical facilities. The IIS University information portal, popularly known as "MetaCampus" is an integral part of the university's digital campus. It is the information hub of the university and helps the staff, students and parents work closely together by publishing of "Announcements", "News" and "Events". The user is authenticated through a secure login mechanism. The user gets real-time access and permissions to university's information resources, depending upon her profile. The staff can upload exercises, notifications, daily attendance, learning material and online resources for the students. The students can submit their assignments online; communicate with their "Mentors" via MetaCampus for personal counseling and orientation. The parents can be kept abreast of their wards' attendance and performance remotely through this portal.

Source: A.Jain, A., and S. V. Chande. "Information portal system for a digital campus based on information architecture". In Innovation and Technology in Education (MITE), 2013 IEEE International Conference in MOOC (pp. 349-352). IEEE, Dec. 2013

SUPER FOODS

Dr. Lata Shahani
Department of Zoology

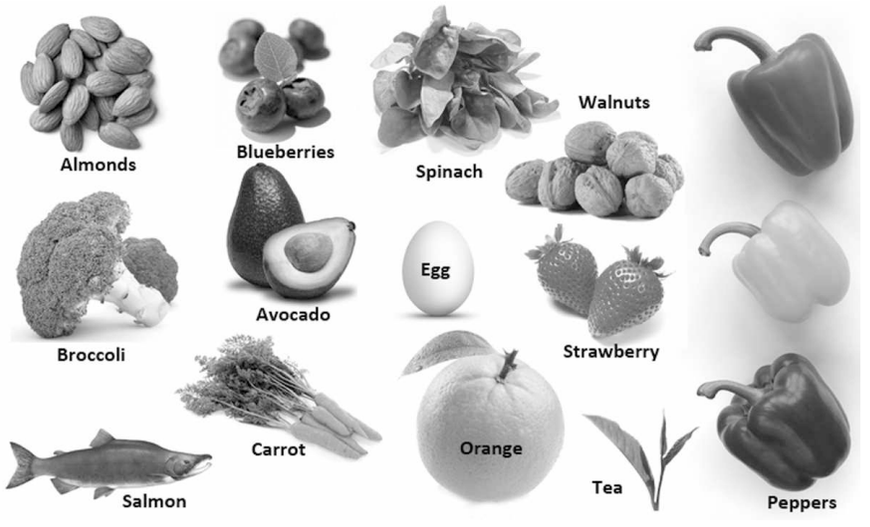
HAVE POWERFUL HEALTH BENEFITS

Super foods are nutrient rich foods that provide several health benefits. They have more than one nutrient in them. These foods keep our mind and body healthy and help us in preventing various diseases such as certain cancers, cardiovascular disease, type II diabetes and hypertension.

Three major benefits of Super foods:

ANTIOXIDANTS present in super foods help in prevention of cellular damage which are major causes of cancer, ageing and other diseases. They interact with free radicals and stop the reactions which cause damage to molecules.

NUTRIENTS in most super foods consist of high concentrations of crucial nutrients, several vitamins and minerals. They includes vitamin A (as carotenoids), vitamin C, folate, magnesium and potassium. Some super foods also contain protein, good carbohydrates, healthy fats such as omega-3s and GLA (gamma-linolenic acid).



FIBER keeps the digestive system healthy and improves absorption of nutrients, thus help in eliminating the toxins from the intestine and decrease the risk of certain diseases.

Source: www.webmd.com,www.joybauer.com

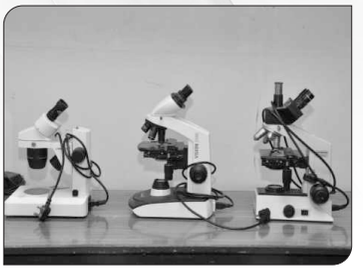
IDENTIFIED THRUST AREAS & RESEARCH FACILITIES

DEPARTMENT OF LIFE SCIENCES

- **Thrust Areas**
  - Animal cell culture & Microbiology
  - Cancer biology & Pharmacology
  - Microbial toxicology & Cell biology
  - Microbial enzyme production& Phytochemistry
  - Micromorphplogy & Plant Tissue Culture
  - Toxicology & Bioremediation
- **Research facilities**

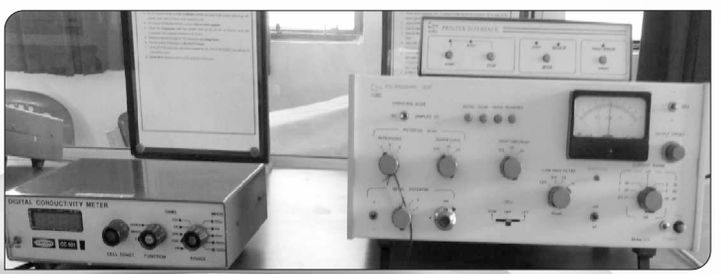
  Laminar Air Flow, PCR, Gel Doc, Hot Plate, Autoclave, CO_2 Incubator, Spectrophotometer, Microscopes, Clevanger's and Soxhlet Apparatus, Water Bath,
  Centrifuge, Homogenizer, pH meter, Oven, Gel Electrophoresis Unit, Calorimeter, Microwave, Electronic Balance, Rotary shaker, Microtome, SDS-PAGE unit, Electronic Balance, Muffle 's Furnace, Rotary Shaker, Hot Plate, Plant Growth Chamber, Magnetic Stirrer, Soil and water analysis kit, TLC with chamber, BOD incubator and stereoscopic microscope.











DEPARTMENT OF CHEMICAL SCIENCES

- **Thrust Areas**
  - Heterocyclic Chemistry
  - Analytical Chemistry
  - Computational Chemistry
  - Solid State Chemistry
  - Environmental Chemistry
  - Co-ordination Chemistry

- **Research Facilities**

  UV Visible Spectrophotometer, Heating Mantle, Cryostat, Muffle Furnace, Melting Point Apparatus, Digital Turbidity Meter, Vacuum Pump, Microwave, Mettler, Oven, Fume Hood, Refrigerator, Oil Bath, Microwave Oven, Magnetic Stirrer, Digital DO Meter, Nitrogen Gas Cylinder, Deep Freezer.

DEPARTMENT OF HOME SCIENCE

- **Thrust Areas**
  - Public Health & Nutrition, New Product Development
  - Clinical & Therapeutic Nutrition
  - Food Analysis & Gerontology
  - Eco friendly textile processing
  - Intervention and Special Education
  - Early Childhood Education, Behaviour Modification
- **Research Facilities**

  Seed Germinator, Moisture Analyzer, Winch Machine, SOCS Plus, KEL Plus & Fibra Plus, Sewing Machine, Singer fashion maker, OTGs, Microwave Oven, Harpendens Calipers, Spectrophotometer, Body composition analyzer, Laboratory Jigger, Heightometer, Infantometer,

DEPARTMENT OF COMPUTER SCIENCE & IT

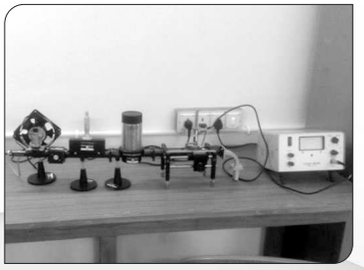
- **Thrust Areas**
  - Software Engineering, Databases
  - Data Mining, HCL, AL, Cloud Computing
  - Aspect programming, Networking
  - Agile Methodology, Cryptography
  - Ecommerce & Web Engineering
- **Research Facilities**

  4 labs equipped with high-end computers, High speed internet facilities, Softwares like SPSS, Eclipse, Oracle, Adobe etc

DEPARTMENT OF PHYSICAL SCIENCES

- **Thrust Areas**
  - Dielectric studies of food grains and vegetables
  - Dielectric studies of chemicals
  - Electronic structure of metal, alloys, metallic glasses and superconductivity
- **Research Facilities**

  Microwave benches for Ku-, C-, J- and X-Band, Spot Reflection Galvanometer-600 Ohms, Abbe's Refractometer, Digital Thermo-Hygrometer, E-H Tuner (C-, X-, Ku-, J-band), Dipole meter, Microwave Diffractometer, G.M.Counter, Michelson and ultrasonic interferometer, Hall effect, Temperature controlled Water bath.

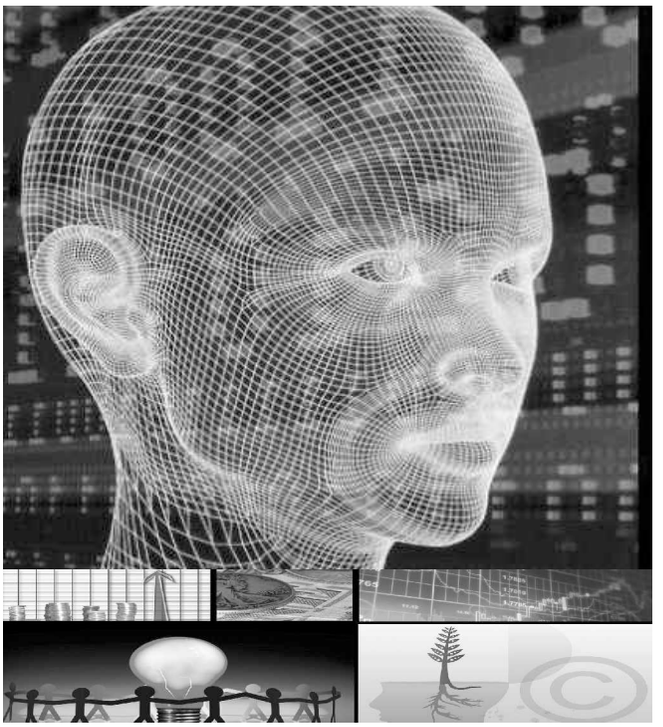


Multi-regional and Multilingual Approach in Educational Sites

Dr. Amita Sharma
Department of CS & IT

E-learning has become an important source of knowledge for lifelong learners. Properly used information from the Internet, represent added value to the education. Limiting the government's financial and human resources, consequently, has greatly increased the need to introduce such educational methods. Another emerging trend in educational websites is multilingual and multi-regional feature. A website that offers contents in more than one language is multilingual website. Examples of multilingual websites might include an Indian business with English, Hindi and a Punjabi version of its site, or a blog on Vedic Sanskrit available in both Sanskrit and English. Similarly A multi-regional website is one that explicitly target users in different countries. Some sites are both multi-regional and multilingual. The significance of such sites is we can simply switch between languages on any page on the website, rather than navigating separate sites to get to the same page in another language. As internet is extensively used around the planet; the multilingual websites seem an indispensable requirement, for interaction among people who understand different languages other than English. Educationists are planning to develop multilingual/multi-regional websites for higher education. These websites basically desire to cover those students that live in isolated areas. The contents of such websites are customized with respect to the user. The students belonging to varied region will be able to augment knowledge in their regional language. Multilingual educational programs can provide the means to meet this community and national aspirations. In the near future the blogs or articles on socioeconomic Indian growth, membrane computing, quantum physics and many more can be read by us in Hindi, Tamil, Dogri or Punjabi i.e. in our desired language. Obviously it wouldn't be very practical to have a website that could be in every single language of the world; however this may become a standard website feature. The futuristic websites will be personalized in our wishful language.

Source:
Multi-regional and Multilingual Approach in Educational Sites.
Yi Chang, Ruiqiang Zhang, Srihari Reddy, Yan Liu, "Detecting Multilingual and Multi-Regional Query Intent in Web Search",In Proceedings of the Special Track on AI & the Web (AIW) at the 25th AAAI Conference on Artificial Intelligence (AAAI), 2011.



INTELLECTUAL PROPERTY–OMNIPRESENCE

Pankaj Kumar
Department of Biotechnology

No matter what we do, we are almost always surrounded by fruits of individual creativity, innovations and invention. We are surrounded by intellectual properties in doing almost everything; no matter whether we are at home, at school, at work, at rest or at play. Intellectual property is an umbrella term including inventions, trademark, designs, copyright, subject matter etc.

All goods which are not under discovery, at the start being novel, non-obvious and having utility aspect qualify consideration for invention. An invention can be a product or process.

All goods and services we use having a certain mark which help us to differentiate such goods or services from one brand to another. Such marks in commerce helping in brand creation known as trademarks or service marks as per the goods or services respectively. These are denoted symbolically as TM and SM and if registered then ®.

All new designs having aesthetic aspects used on goods industrially manufactured qualify for protection under Industrial design-one of the type of IPR.

All literary, dramatic, musical, artistic creation qualifies for protection under Copyright.

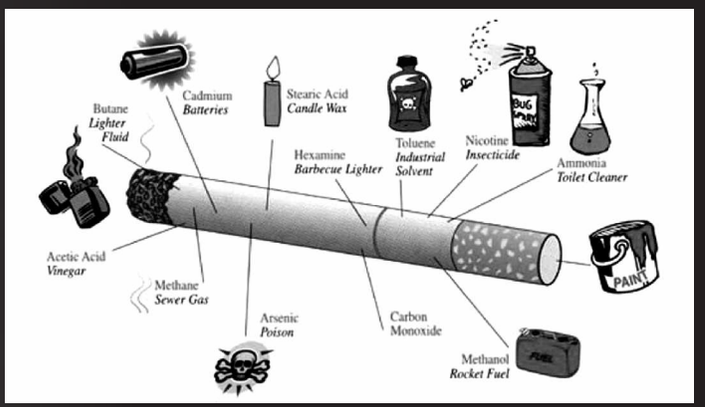
Alfred Nobel and IPR

Nobel earned huge wealth during his lifetime, with most of his wealth coming from his 355 inventions. Dynamite is one of his most famous inventions which was used hugely during World War II and so, he earned a lot of royalties out of commercialisation of patent- one type of IPR in dynamite. In order to get mental peace he made his last will which specified that his wealth be used for prizes for person who deliver the greatest benefit to mankind particularly in the field of physics, chemistry, peace, physiology or medicine, and literature. Nobel donated 94% of his total assets, 31 million SEK establishing the Nobel Prizes.

Third-Hand Smoke

Sushmita Aswal
Research Scholar, Department of Biotechnology

Smoking has become very common and fashionable, especially among young boys. This habit usually begins at school when boys think to try out with every new thing that they can lay their hands on. Some youngsters smoke for the sake of high society and some feel that would make them show modern and open-minded. According to smokers and drug addicts, smoking and drugs addiction makes them to feel relax and comfort. For this relax and comfort they use to smoke and take drugs frequently which makes them addict. They know that these things are harmful for them but they don't know that they make concoction of toxins for their loved ones. There are 250 poisonous toxins found in cigarette smoke. According to the recent study, smoking may also affect the surrounding people of the smoker through third hand smoke. Third hand smoke is tobacco smoke contamination that remains after the cigarette has been extinguish. Third hand smoke and its effect hang back the environment long after the smoking has stopped. This is generally considered to be residual nicotine, lead, cyanides (used as rat kill and as chemical weapon which interferes with the release of oxygen to tissues), arsenic (poisonous to kill mammals) etc. and other chemicals which left on indoor surfaces by smoking.



The studies show that the third hand smoke or these residues builds up on the surfaces over time and resists normal cleaning. Besides that they stick to hair, skin, clothes, furniture, drapes, walls, bedding, carpets, dust, vehicles, and other surfaces, even long after smoking has stopped. They can't be eliminated by dusting or airing out rooms, opening windows, using fans or air conditioners, or confining smoking to only certain areas of a home. These residues are reacting with common indoor pollutants to create toxins. These toxins are cancer causing substances posing a potential health hazard and risk of tobacco-related health problems to non-smokers, may weaken IQ, especially infant, children and pregnant women's. They expose to it through inhalation, ingestion, and by touching substances containing third hand smoke. According to the Winickoff survey, of the 1,500 smokers and non-smokers the majority (65% non smokers and 43% smokers) agreed that breathing air in a room today where people smoked yesterday can harm the health of infants and children.

So, if you still smoking, quit it now and motivate others to do so. If you can't do it now and are still thinking about quitting, don't smoke in front or in the places frequented by your children or family members. The best way is to quit now. So what you think!!!!!

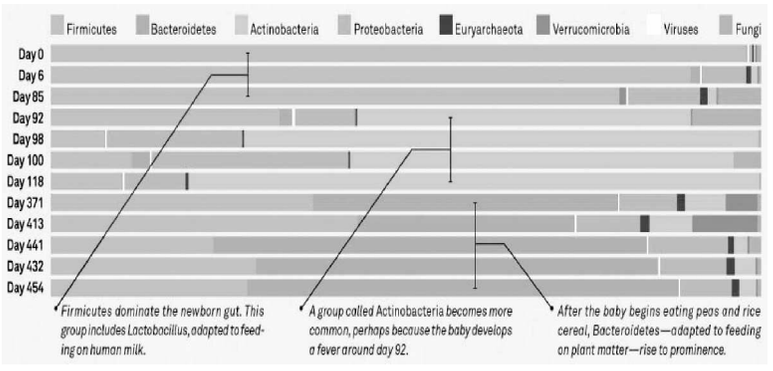
Source: http://www.scientificamerican.com/article/what-is-third-hand-smoke/

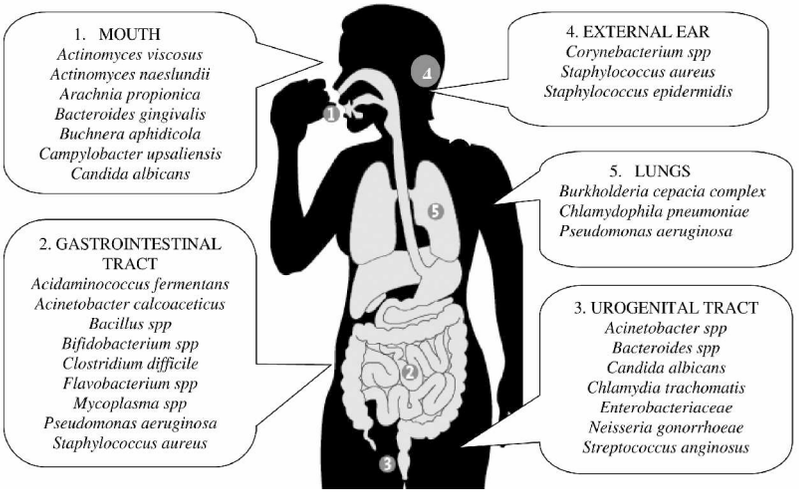
OUR OWN PERSONAL ECOSYSTEM

Science Spectrum Team

If some twisted genius vaporized all 10 trillion cells of our body, along with hair, the fingernails and other tissues- there would not be empty space behind. A body shaped cloud made of bacteria, viruses and other microbes would hover briefly in the air. The cloud would outline the skin, delineate the lungs and trace our digestive tract. The shadow biosphere of the body remains.

We start out sterile in the womb, but every baby gets coated with microbes the moment it passes through the birth canal. Babies born by cesarean section are colonized by microbes from their mother's skin.





The following chart shows how microbial diversity in the large intestine grew during the first 15 months of one child's life.

Source: Carl Zimmer, A planet of viruses

The Discovery of Teflon

Nidhi Sogani
Research Scholar, Department of Chemistry

Teflon, which is used in nonstick cookwares was invented by Roy Plunkett in 1938. It is a polymer of tetrafluoroethylene, known as polytetrafluoroethylene.

The invention of teflon is serendipity, when Roy was checking a frozen of pressured tetrafluoroethylene with freon refrigerants gases. He found that it had polymerized into a white waxy solid to form a polytetrafluoroethylene, which is one of the most precious and flexible technology ever formed. It is unreactive to all chemicals and the most glassy material and because of all these properties it can be use in electronics, industrial processes, aerospace etc.

YOU CAN WIN!!!

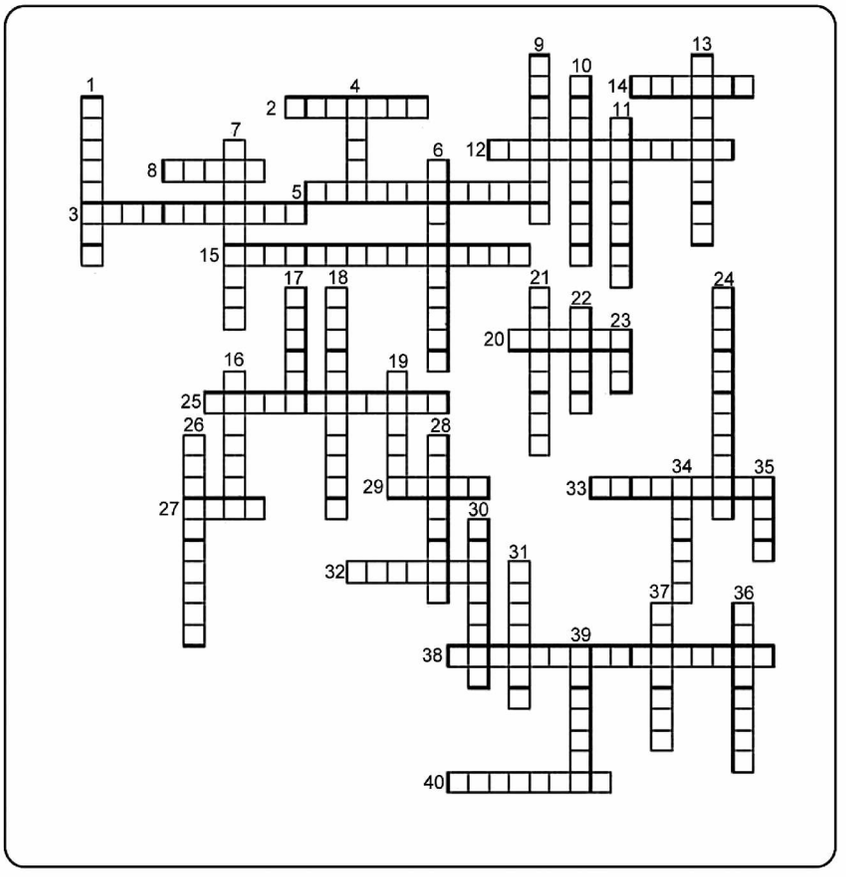
Dr. Priyanka Mathur
Department of Zoology

Down

1 Type of development in which organisms must undergo metamorphosis to change into their adult form (8)
4 Number of chambers in the heart of a reptile or amphibian (5)
6 Only group of invertebrate deuterostomes (10)
7 Baby birds that are blind, naked, and helpless upon hatching (9)
9 Ability to "self amputate" body parts (8)
10 Body system that handles nitrogen waste and osmoregulation (9)
11 Muscle forms from this germ layer (8)
13 Most common type of symmetry seen in animals (9)
16 Stationary animals (7)
17 Thick layer that forms shell in the Molluscs(6)
18 A pear shaped Polychaete larva (11)
19 Body cavity (6)
21 Members of this Phylum are classified on the basis of types of locomotory structures (8)
22 Organ in vertebrates that makes bile (5)
23 A Catadromous Fish with slender body and joined fins(3)
24 Hermaphroditic reproductive structures found in tapeworms (11)
26 Mammals that lay eggs (10)
28 A Pancreatic Hormone (8)
30 Humans belong to this order (8)
31 Wishbone" in a bird (7)
34 Most suitable type of symmetry in aquatic invertebrates (6)
35 In deuterostomes the blastopore converts into a structure (4)
36 Buccal Cavity is lined internally by it (8)
37 Coelom of flatworms (7)
39 Digestive enzyme made by the salivary glands (7)

Across

2 Position of heart in vertebrates (7)
3 Birds and mammals can make their own body heat. (11)
5 Coelom found in round worms (12)
8 Fingerlike extensions inside the small intestine (5)
12 Larva of parasite lives in this type of host (12)
14 Voice box in a bird (6)
15 Scientist who developed a hierarchical system of classifying organisms and giving them a genus and species name (15)
20 Segment of leg of an arthropod (6)
25 Organism whose embryos show indeterminate radial cleavage (12)
27 Type of circulation in which blood is NOT enclosed in blood vessels (4)
29 Fishes take in water through it (5)
32 Air sacs inside the lungs for increased surface area (7)
33 Excretory organs in earthworms (9)
38 Part of the brain that controls autonomic body organs (16)
40 Ammonia, urea, and uric acid are forms of waste (8)

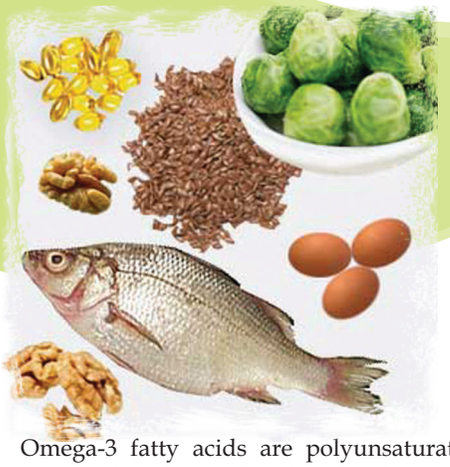


NOTE:

1. Students may send the answers in separate sheet through mail at sciencespectrum@iisuniv.ac.in by 15 November, 2014.

2. First three correct entries will be suitably awarded.

3. Members of Science Spectrum Team are not eligible.



Healthy Diet : Happy Life

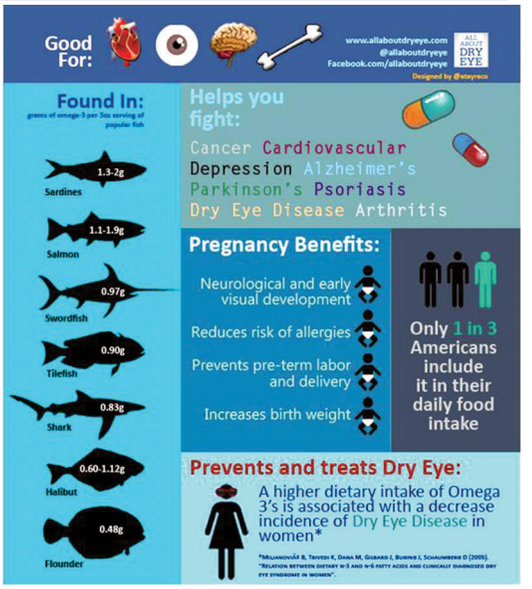
Omega 3-fatty acid

Palak Agarwal
M.Sc., Department of Biotechnology

Omega-3 fatty acids are polyunsaturated fatty acids. ALA (α- Linolenic acid) , is one one of the most important fatty acid in our diet because our body cannot synthesize it from starch. ALA is found in plant oils. Other than ALA, EPA (eicosapentaenoic acid) and DHA (docosahexanenoic acid), are two other important fatty acid found in animal oils. Among animals fish oils, egg oils, squid oils are common source of Omega-3 and among plants algal oil, flaxseed oil, sacha lnchi oil, hemp oil are common source of Omega-3 fatty acids. Omega-3 fatty acids are essential for normal metabolism of humans. Only mammals and fishes have limited ability to convert ALA, obtained through diet, into most crucial fatty acid EPA and DHA, so, we humans required to eat healthy food containing EPA and DHA. If we want to obtain EPA and DHA directly from diet then we can't be strict vegetarian. For that we have to include fish, yogurt, cheese, plant food fermented with certain fungi and eggs in our diet.

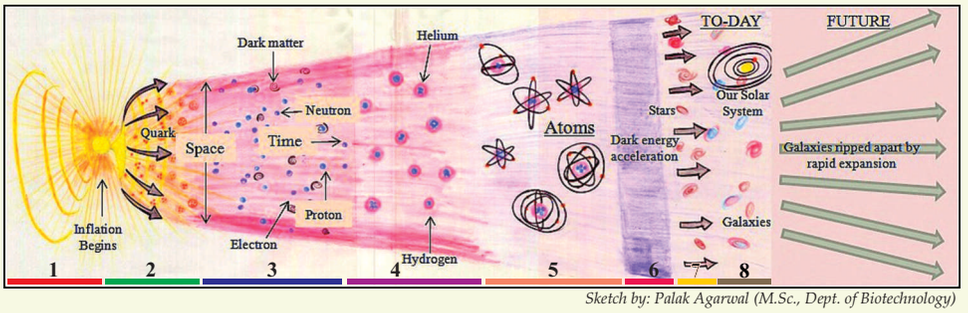
How omega-3 is beneficial to health??

1. Oral fish oil supplementation has beneficial effects in rheumatoid arthritis and among some asthmatics.
2. Omega-3 present in flaxseed oil lowers blood pressure and reduces coronary heart diseases.
3. It prevent atrial fibrillation after coronary artery bypass surgery.
4. Fish oil act as a therapeutic agent for children with autism.
5. EPA has therapeutic value in the treatment of chronic hepatitis C patients.
6. Diet rich in EPA and DPA increases its concentration plasma and hence lowers the risk of nonfatal myocardial infarction amongst women.
7. Diet rich in omega-3 reduces hypertension.
8. It may have therapeutic value in the treatment of dry eye syndrome.
9. It prevent the formation of urinary calcium oxalate stone.
10. Omega 3 fatty acid prevent early preterm birth in both low-risk and high-risk pregnancies.
11. Fish consumption reduces the risk of prostate cancer-specific mortality.
12. Omega 3 fatty acids decrease the severity of autoimmune disorders.
13. It reduces prevalence of allergic rhinitis.
14. EPA and DHA have an inhibitory effect on breast cancer growth and metastasis.
15. Higher intake of omega 3 fatty acid rich food reduces the risk of pneumonia.



Source: http://www.greenmedinfo.com/blog/61-health-benefits-omega-3-fatty-acids

COSMIC QUESTIONS



Sketch by: Palak Agarwal (M.Sc., Dept. of Biotechnology)

Science Spectrum Team

How did our universe begin?

1. About 13.8 billion years ago entire visible universe was contained in an unimaginably hot, dense, point, a billionth the size of a nuclear particle.

2. INFLATION: In far less than a nanosecond a repulsive energy field inflates space to visible size and fill it with subatomic particle, the quark. (Age: 10 milliseconds, Size: infinitesimal small to golf ball)

3. EARLY BUILIDING BLOCKS: The universe expands, cools. Quarks clump into protons and neutrons, the building blocks of atomic nuclei. Dark matter forms. (Age: 0.1 millisecond, Size: 0.1 trillionth of present size)

4. FIRST NUCLEI: As universe continues to cool, the lightest nuclei of hydrogen and helium arise. (Age: 0.01 to 200 seconds, Size: 1 billionth of present size)

5. FIRST ATOM, THE FIRST LIGHT: As electrons begin orbiting nuclei, creating atoms, the glow from our infant universe is unveiled. The first atom and first light are born. (Age: 3,80,000 years, Size: 0.0009 of present size

6. THE DARK AGES & FIRST STAR-GRAVITON WINS: For 300 million years this cosmic background radiation is the only light. Clumps of matter that will become galaxies glow brightest. (Age: 3,80,000 to 300 million years, Size: 0.009 to 0.1 of present size)

Dense gas clouds collapse under their own gravity- and that of dark matter- to eventually form galaxies and stars. Nuclear fusion lights up the stars. (Age: 300 million years, Size: 0.1 of present size)

7. ANTIGRAVITY WINS: After being slowed for billion of years by gravity cosmic expansion accelerates again. (Age: 10 billion years, Size: 0.77 of present size)

8. TODAY: The universe continues to expand, becoming ever less dense. As a result, fewer new stars and galaxies are forming. (Age: 13.8 billion years, Size: present)

What is our Universe is made of?

Stars, dust and gas make up less than 5% of the universe. Their gravity can't account for how galaxies hold together.

Scientist figure about 24% of the universe is a mysterious dark matter. The rest (71.5%) is dark energy, providing an explanation for observations that the expansion of space is accelerating.

Source: National Geographic Magazine, April 2014.

Release of Science Spectrum

The first issue of the Science Spectrum of The IIS University was launched on National Science Day (28th February, 2014). Prof Dipan Ghosh (IIT, Mumbai) and Prof. Shishir Bhaduri (Principal, MAIET, Jaipur) delivered their talk on the topic "On the interface of physics and chemistry- Exotic material and their exotic science" and "Innovation" respectively. The lectures were followed by poster exhibition displayed outside A.V. Hall.

Fellowship

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Biotechnology
SERB

Dr. Preeti Gupta
Zoology
UGC- S Kothari P.D. Fellowship

Ms. Pooja Maheshwari
Chemistry
UGC-SRF

Ms. Nidhi Sogani
Chemistry
UGC-SRF

Ms. Sonal Jain
Environmental Scieces
DST-Inspire JRF

Ms. Shruti Agrawal
Biotechnology
DST-Inspire JRF

Ms. Gayatri Jeph
Biotechnology
UGC-RGN Fellowship(SRF)

Ms. Asha Gurjar
Chemistry
UGC-SRF

Students Availing Fellowship From The IIS University, Jaipur

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Zoology

Ms. Nandini Goswami
Biotechnology

Ms. Anita Chauhan
Botany

Ms. Urvashi Vijay
Zoology

Ms. Rati Agarwal
Chemistry

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