

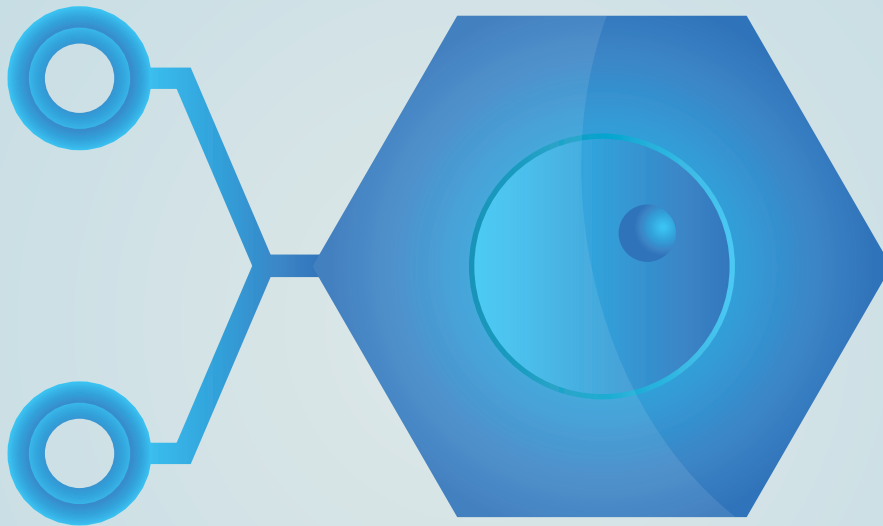


Kristu Jayanti College

AUTONOMOUS Bangalore

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Volume - 4 Issue - 1



SYNAPSE

The Impulse of Life

October 2015

A Newsletter of the Department of Life Sciences

From the Principal's Desk



rekindled. I hope that the newsletter will answer many questions, enable sieving through the biases of misconceptions and make everyone learn a little about the process of science. My hearty congratulations to all faculty members and students for their inquisitive mind and scholarly contribution in bringing forth this newsletter.

Fr. Josekutty P.D.
Principal

Humans are instinctly interested in the world we live in. Biology, a broad field, has always attracted enthusiasts to study a wide range of concepts in the field ranging from molecular events within a cell, details of the brain, genetic makeup, organ functions, etc., to broad concepts concerning ecosystems and climate change. The Human Genome Project has enabled medical geneticists to assess predispositions to diseases, and is being used to solve criminal cases, which is a dream come true. In today's busy world, we seldom find time to update ourselves. I am happy that in the preparation of Synapse, the creativity and inquisitiveness of the students have been

From the Vice Principal's Desk



Fr. Augustine George
Vice Principal

Biology unravels the mystery of living organisms from biomolecules to ecosystems. It is necessary that we have up-to-date knowledge and skills to participate effectively in the fast changing field of Biology. I am happy that the Department of Life Sciences has brought out yet another edition of 'Synapse' – newsletter of the department. It reflects the exciting developments in the field of life sciences and glimpse of the activities in the Department of Life Sciences. The collection of articles and creative work by students in this edition of the Synapse is to be appreciated. This would have definitely helped students to integrate skills and knowledge.

Interactive Platforms

National Seminar on 'Science and Technology' for Human Development



National seminar on Science and Technology for Human Development (23rd to 25th February 2015) was organized by the Indian Science Congress Association (ISCA), Bangalore chapter in association with the Department of Life Sciences, Kristu Jayanti College. The national seminar on Science and Technology for Human Development brought together over 300 delegates. The participants were a blend of scientists, faculty members, research scholars

and students of all branches in Life sciences representing 30 colleges under 7 universities all over India.

The seminar comprised 1 keynote address, 4 plenary lectures, 42 research papers presented in 8 paper presentation sessions and 32 research papers as posters, under 7 sub themes.



Guest Lecture

The Department of life Sciences under the banner of Life Science Club and Environment club provides a platform for the students to interact with the experts in the field of Life Sciences. Every semester two guest lectures are organized. The sessions usually start with an inauguration, introduction of the expert in the field and a talk by the expert, where he shares his experiences and interesting facts to the students. After the talk students are allowed to interact with the expert and it leads to a fruitful discussion session. These sessions gives students to understand about the various fields of Life Sciences and the opportunities available for their career.

Co-curricular Activities

Bioventura - Intracollegiate Biofest (PG)



The Life Science department of Kristu Jayanti College had organized a 1 day fest, Bioventura for the M.Sc Students on the 25th of August 2015. The fest provided a platform for students to showcase their various talents. The fest was inaugurated by the chief guest of the day Mr Sunil Kumar, Senior Advisor at the British High Commission at 9:30am in the Mini Auditorium. The welcome address was given by Dr Vijayanand, after which the lighting of the lamp ceremony took place. The Presidential address was given by Fr.

Augustine. The Chief Guest of the day, Mr Sunil Kumar shared a few thoughts and inspired the students to study science with passion. He also advised the students to be engaged in hobbies of their choice in order to refresh their minds amidst studies.

Connoisseur - Intracollegiate Biofest (UG)



Connoisseur 2015 was an intra-collegiate fest hosted by the final year students of the UG programme of the life science department. The event was inaugurated on 25th Aug, 2015 by Mr. Sunil Kumar M. (Senior Advisor of British Deputy High Commission in Bangalore). Connoisseur 2015 was conducted with 9 groups, 4 from the 2nd year with 8 members per team and 5 groups from the 1st year with 9 members per team.

It was a spectacular platform for students to showcase their talents in various forms. There were many events including but not limited to bioart, biomanager, bioconcert, biomarketing debate and talent hunt.

Bioaura Intercollegiate Fest



The Life Science department Of Kristu jayanti College successfully organized a one day Intercollegiate biofest, 'Bioaura 2015'. The fest provided an amazing platform for students to showcase their various talents and explore the depths of the wonderful world of science. The fest was a critical driver of performance and innovation and made way for young minds to put forth their innovative ideas and perceptions. Students participated actively in the events with a lot of enthusiasm and exhibited team spirit. Events for

both the UG and PG students were organized.

Creatrix - Life Sciences Exhibition



Creatrix 2015 is a science exhibition organized by the Department of Life Sciences on 21/01/2015 in Mini Auditorium 1 between 10am and 4.30pm. This exhibition showcased four different domains of the department, that is, Biotechnology, Microbiology, Genetics and Biochemistry. The exhibition started off with the inauguration function by our principle, Rev. Fr. Josekutty P.D. at 10am along with the Dean of Sciences, Dr. Calistus Jude and Head of the Department, Dr. Elcey C.D.

The exhibition was informative to students from other departments as Creatix explained the basic levels of all the domains in a simpler way. We witnessed the "Working model of Dialysis", reverse osmosis, functioning of human eye, estimation of Vitamin C, extraction of DNA from strawberries and many more. As a center of attraction, the department and the students also organized a 'Fun Zone' Section where the other jayantians could witness the Changing of liquid colour, the principle behind the color change in Chameleon. A Skit was organized and performed by the final year students explaining on how microbiology climbed the staircase of development in the field of vaccination at 1.00pm.

Honors for faculty members

Name of the Faculty	Honours
Dr. Calistus Jude	Reviewed manuscripts for the journals Cytotechnology and Journal of Food Science and Technology. Member BoS at Bharathiar University, Coimbatore and Government Science College, Bangalore,
Dr. Elcey C D	BOE member - panel of examiners for PhD programme, Kannur University, Kerala Editorial Board Member – Innovative Publications New Delhi, India
Dr. Deepa M A	Received grant from VGST K-FIST scheme for the Research project entitled “Study on development and evaluation of herbal formulation for treating melanoma Hyperpigmentation using cell lines”
Dr. Challaraj Emmanuel	Awarded best paper at National Seminar hosted by Garden City College.

Name of Faculty	Patent
Dr. Deepa	Garlic Formulation and process for preparing the same for treatment of Diabetes - US, 13/906,432

Achievements by students

Date of the Event	Name of the Student	Programme & Venue	Title of Paper Presented
5 - 6th Feb 2015	Priya P A and P. L. Simmy	Oxford college of arts & science, Bangalore	Propagation of Ruta graveolens - A Medicinal important plant

Name of the Student	Achievement	Year
Alphy Rose James	3rd Rank (MSc. Biotechnology)	2009
Betsy Joseph	3rd Rank (MSc. Microbiology)	2010
Sunetra Sen	5th Rank (MSc. Microbiology)	2010
Namratha Yogesh	5th Rank (MSc. Biotechnology)	2014
Rinitha Raj Deepthi Rajagopalan	Best Paper (II) at the National Conference on Molecular Medicine	2011
Dyon Thomas Alphonse Tess	Best Paper Award at National Conference, CMRIMS	2013
Sandra Daniel	1st place (Western Music - group), National Youth Fest	2009
Hayan Antoinette Yi	1st place (Western Music - group), National Youth Fest	2009
Dipayan Debbarma	3rd place (Cartooning) - South Zone Youth Festival	2010
Surabhi S Chandran	3rd place (Mime) - South Zone Youth Festival	2010

Major Projects

Year	Title of the Project	Name of the Funding / collaborating Agency	Investigator (s)	Amount (Rs)
2011	Regulation of flowering in Stevia expressing floral suppressor gene	Vision Group of Karnataka (VGST)	Dr. Kavyashree	4,00,000/-
2011	In vitro regeneration and Agrobacterium mediated transformation of Stevia	VGST- SPICE	Dr. Kavyashree	30,000/-
2012	Application of bio-fertilizer consortium to Improve crop yield in legumes – A way to economically viable agriculture.	Jnana Shodha Karnataka Jnana Aayoga (Karnataka Knowledge Commission)	Dr. Kavyashree & Dr. Deepa	1,53,000/-
2012	Processing of Allium for biomedical applications	Jian healthcare Pte Ltd, Singapore	Dr. Deepa	4,00,000/-
2013	Standardization of Allium based product formulation	Jian healthcare Pte Ltd, Singapore	Dr. Deepa	3,32,000/-
2015	Development and evaluation of herbal based formulation for treating Melanoma Hyperpigmentation using human cell lines	VGST under K-FIST Scheme	Dr. Deepa	20,00,000/-

Collaborative Research Projects	Collaborating Organization
Microbial Screening for different applications	Leads Pvt. Ltd, Bengaluru
Phyto-compound screening	Leads PvtLtd, Bengaluru
Microbial Screening and cell line studies	CellTricks Biotech Pvt Ltd., Bengaluru
Nutraceutical Formulation of Bioactive compounds	
Application of Biofertilizer consortium to improve crop yield in Legume – A way to Economically viable agriculture	
Development of Bioleaching Processes to Enhance the Fuel Efficiency of Sub-bituminous Coal	P G Dept. of Physics, Christ University
Molecular Identification of Bacteria	Kumar Organic Products Research Centre (Industry)
Study on development and evaluation of herbal formulation for treating Melanoma Hyperpigmentation using Cell lines	VGST, Government of Karnataka

Research Publication by Faculty Members (2014 - 2015)

Name	Title of the article	Publisher	Publication Year
Mr. John Caleb	A New species of Phintella Strand (Araneae : Salticidae) from India	Munis Entomology and Zoology	ISSN No1306-3022 June 2014
Mr. John Caleb	New species of Hyllus C.L. Koch (Araneae : Salticidae) from India	Munis Entomology and Zoology	ISSN No1306-3022 June 2014
Mr. John Caleb	A New species of Deinopis MacLeay (Araneae;Deinopidae) from India	Indian journal of Arachnology	July 2014 ISSN No 2278-1587
Dr. Deepa M.A	Anti-obesity action of gingerol: effect on lipid profile, insulin, leptin, amylase and lipase in male obese rats induced by a high-fat diet	Journal of science food & Agriculture	ISSN No 1097-0010 Sep 2014
Dr. Elcey CD	Synthesis of magnetite nanoparticle from optimized iron reducing bacteria isolated from iron ore mining sites	International journal of Current microbiology and applied sciences	ISSN 2319-7706 August 2014
Dr. Deepa M.A	Production of bioethanol from Citrus limetta and Citrus maxima Fruit waste by batch fermentation	International Journal of Pharma and Bio Sciences	ISSN No. 0975-6299 Nov 2014
Dr. Deepa M.A	Modulatory Effects of Diosgenin on Attenuating the Key Enzymes Activities of Carbohydrate Metabolism and Glycogen Content in Streptozotocin-Induced Diabetic Rats	Canadian Journal of Diabetes	ISSN No. 1499-2671 Nov 2014
Dr. S. Vijayanand	Antioxidant and antimicrobial activity of Melia azadirachta and Murraya koenigii	International Journal of Pharma sciences and research	ISSN: 0975-9492 December 2014
Mr. John Caleb	Description of a New species of Harmochirus Simon (araneae: Salticidae) from south india	Munis Entomology & Zoology,	ISSN No1306-3022 January 2015
Mr. John Caleb	Record of Araneus viridisomus Gravelly,1921 from Tamil Nadu	Indian society of Arachnology	ISSN 2278-1587 Dec 2014
Ms.Apoorva and Dr. Deepa MA	Study of Total phenolics, Total tanins, antioxidant potential and antimicrobial activity of Ailanthus excels	International journal of pharmaceutical sciences and research	ISSN 0975-8232 April 2015
Mr. John Caleb	Four new species of jumping spider (Araneae: Salticidae: Aelurillinae) with the description of a new genus from South India	Peckhamia	ISSN 2161-8526 (print) ISSN 1944-8120 (online)
Mr. John Caleb	Description of some interesting jumping spiders (Araneae: Salticidae) from South India	India Journal of Entomology and Zoology Studies	ISSN No. 2320-7078 (online) 2014
Mr. John Caleb	Description of Drassodes luridus O.P Cambridge (Araneae: Gnaphosidae): First record from Tamil Nadu, India.	India Journal of Entomology and Zoology Studies	ISSN No. 2320-7078 (online) 2014
Dr. Calistus Jude A.L.	Prevalence of Acne among women with Poly Cystic Ovarian Syndrome – a clinical study	Scrutiny International Research Journal of Health and Medical Science	Volume 1 Issue 1 (2014)

Role of Indian medicinal plants in Diabetes

Traditional Medicines derived from medicinal plants are used by about 60% of the world's population. This review focuses on Indian Herbal drugs and plants used in the treatment of diabetes, especially in India. Diabetes is an important human ailment afflicting many from various walks of life in different countries. In India it is proving to be a major health problem, especially in the urban areas. Though there are various approaches to reduce the ill effects of diabetes and its secondary complications, herbal formulations are preferred due to lesser side effects and low cost. A list of medicinal plants with proven antidiabetic and related beneficial effects and of herbal drugs used in treatment of diabetes is compiled. These include *Allium sativum*, *Eugenia jambolana*, *Momordica charantia*, *Ocimum sanctum*, *Phyllanthus amarus*, *Pterocarpus marsupium*, *Tinospora cordifolia*, *Trigonella foenum graecum* and *Withania somnifera*, *Melia azadirach* and *Murraya koenigii*.

Many active compounds have been isolated from the plant and herb species of India. These active principles are dietary fibres, alkaloids, flavonoids, saponins, amino acids, steroids, peptides and others. These have produced potent hypoglycemic, anti-hyperglycemic and glucose suppressive activities (Saxena et al., 2006). These compounds also exhibited their antioxidant, hypolipidemic, anticataract activities, restored enzymatic functions, repair and regeneration of pancreatic islets and the alleviation of liver and renal damage (Mukherjee et al., 2006). Some active constituents have been obtained from plants possess insulin like activity and could be provide alternate for insulin therapy.

Metabolic imbalance causing diabetes mellitus is a characteristic of materialistic world. Differences in social structure, psychic stress, obesity, hormonal imbalance and heredity are optimizing the growth of pandemic. Increasing population with diabetes has a huge requirement of effective remediation. The Indian flora has a vast variety of medicinal plants, which are used traditionally for their anti-diabetic property. However, careful assessment including sustainability of such herbs, ecological and seasonal variation in activity of phyto-constituents, metal contents of crude herbal anti-diabetic drugs, thorough toxicity study and cost effectiveness is required for their popularity. These efforts may provide treatment for all and justify the role of novel traditional medicinal plants having anti-diabetic potentials.

Dr. S. Vijayanand (Assistant Professor)

NASA has announced that it has found an extraordinarily similar planet to Earth orbiting around a distant star. The planet, Kepler-452b, is described as a larger, older Earth and is located around a star 1,400 light years from Earth. It is the first terrestrial planet found in the habitable zone of a star just like our sun. NASA said it is about 60 percent larger than Earth and lies in the constellation Cygnus.

The exact nature of the planet is not known specifically, but NASA's modeling suggests that it is a rocky planet, about five times the size of Earth, orbiting its star once every 385 days. The planet's star is 1.5 billion years older than our own, and is now growing hotter and brighter -- as our star will do in about a billion years.

Jon Jenkins, Kepler data analysis lead at NASA's Ames Research Center in Moffett Field, California, said that the data showed planets similar to Earth were "common throughout the galaxy". The planet is so similar to Earth that the SETI Institute is now listening for signals from the star Kepler 452 -- with no luck, so far.

"On the 20th anniversary year of the discovery that proved other suns host planets, the Kepler exoplanet explorer has discovered a planet and star which most closely resemble the Earth and our Sun," said John Grunsfeld, associate administrator of NASA's Science Mission Directorate at the agency's headquarters in Washington. "This exciting result brings us one step closer to finding an Earth 2.0."

NASA also announced that 521 new exoplanet candidates had been discovered, 12 of which have diameters between one and two times Earths, and orbit in their star's habitable zone. Nine planets orbit stars that are similar to ours in size and temperature.

Pradeek P.
1st Sem Bsc(MB)

Benefits of Blood Donation

The Joy of Saving Human Lives - It is such a wonderful feeling being able to help doctors save human lives. There are no perfect substitutes for human blood. The blood you donate is divided into various components according to the needs of patients. Each component can be used by different recipients for various purposes. Many newborn babies may benefit from a single blood donor as their blood requirements are smaller. Every time you donate blood, you can help up to 3 or 4 individual recipients.

Free Health Check-up - You can donate blood only if you are fit enough to do so. Before every blood donation process, a series of health check-ups are performed on the donor, free of cost. This will be of great benefit to you. For example, you may be made aware of any blood pressure abnormalities. That information will help diagnose some indolent diseases at the early stage before they flare up and present with multiple medical problems. Further, after the blood is donated, the blood and blood products that are derived from them, are screened for certain infections. You can choose to be informed if they find any abnormality in those screening tests. Frequent blood donations are good, free, health check-ups, that will help you stay healthy.

Reduces Risk of Heart Disease - Regular blood donations help to keep the levels of iron in the body in check, especially in males. This has shown to reduce heart disease. Though iron is an essential element for the proper functioning of the body, excessive iron build up can result in excessive oxidative damage.

Lalremkimi
B.Sc (BT) 3rd Sem

Red sea's glowing corals are rainbow of colours

Deep in the red sea, beyond the reach of most scuba divers, coral reefs are putting on a glowing, colourful show. Researchers found radiant corals more than 160 feet (50 meters) below the surface of the red sea, which separate Africa from the Arabian Peninsula.

At these depths, corals stay mostly in the dark. Despite their limited exposure to light, they glow brightly in fluorescent yellow, fiery orange, forest green and mustard yellow, in researchers' photographs. These luminous rainbow-coloured corals could be used to develop new tools for viewing microscopic objects in medical research.

The corals' glow comes from fluorescent pigments, noted study co-author Jorg Wiedenmann, a professor of biological oceanography at the University of Southampton in the United Kingdom. "These fluorescent pigments are proteins", Wiedenmann said in a statement. "When they are illuminated with blue or ultraviolet light, they give back light of longer wavelength, such as reds or greens".

Corals that live at depths of between 100 feet and 330 feet (30 to 100m) are called mesophotic corals because of the limited amount of light that reaches them. The word "mesophotic" translates to "meso" for "middle" and "photic" for "light". There is limited data on their distribution, quantities and way of life. Typically, special equipment such as autonomous underwater vehicles and remotely operated submarines are needed to access the reefs.

Nang Nipuna Mein
BSc (BT) 3rd Sem

Stem Cell Therapy for Brain injuries

Scientists have developed a gel that helps brain recover from traumatic injuries. It has the potential to treat head injuries suffered in comas, car accidents, falls or gunshot wounds developed by Dr. Ning Zhang at Clemson University in South Carolina. The gel is injected in liquid form at the sight of injury and stimulates the growth of stem cells there.

Brain injuries are particularly hard to repair, since the injured tissue swell up and cause additional damage to the cells. Various types of treatment have tried to limit the secondary damage by lowering the temperature or relieving the pressure at the site of injury. Most recently scientists have considered transplanting donor brain cells into the wound to repair damaged tissue. This method, unfortunately, only provided limited results.

The donor cells fail to grow or stimulate repair at injury site due to the inflammation and scarring present there. Dr. Ning Zhang's gel, however, can be loaded with different chemicals to stimulate various biological processes at the site of injury.

In a follow up study, Dr. Ning Zhang loaded the gel with immature stem cells, as well as chemicals needed to develop into full-fledged adult brain cells. When rats with severe brain injuries were treated with this mixture for eight weeks, they showed significant signs of recovery. The new gel could treat patients at varying stages following injury and is expected to be ready for human testing in about three years.

Umme Hani Khanum
5th Sem BSc.(MB)

The Mink

Mink is a small rabbit like animal that lives in burrows. Mink are actually found across Canada and United States. Its skin is covered with beautiful pure white fur. At no cost would that animal dirty its fur. It would always keep its fur pure and white. Hunters hunt this animal for its skin which is expensive. It is used to make the collars of mink coats which only the rich can buy.

Hunters cannot shoot the animal or use javelin because that would puncture the skin. So what they do is to hide in the forest near the mink's burrows. Once the animals get out of the burrows and wander off in search of food, the hunters would spread filthy dirt around the mouth of the burrows. Then they would wait for the animals to return. When the minks return to the burrows they find the filth and back out. But the hunters converge on them from outside. They see the hunters and run to their burrows. They see the filth and run towards the hunters. Thus they run to and fro and finally fall into the hands of the hunters rather than dirty their coats.

What a lesson the minks teach us! We should be prepared to die rather than dirty ourselves by doing bad things.

M. Catherine
Bsc MB 1st Sem

First Lab Grown Burger Patty

On Monday, August 5th 2013, Dutch Scientist, Dr. Mark Post, unveiled a hamburger, made from beef grown in the laboratory. The cultured beef, composed of muscle cells, was made by harvesting a sample of muscle tissues from a cow. Scientists cut the tissue into small pieces and separated fat from muscle cells. They then grew individual, muscle-specific stem cells, in the shape of a ring. These cells multiplied and grew into a patty, which had the consistency of beef.

The testers described the patty, as largely having the texture and juiciness of the meat, though not the intense flavour, typical of beef. Lab grown beef, is not considered as genetically modified food, because the cells in the meat, are derived from the same stem cells that grow into muscle cells in cows.

Thanks to the lab grown meat... at least we are assured that we will have a continuous supply of Burgers in the future!

Priya Anandi Carvalho
1st Sem BSc.(BT)

Ebola Virus Disease

Ebola virus disease [EVD] formerly known as haemorrhagic fever is severe often fatal illness in humans . The virus is transmitted to people from wild animals and spreads in humans through human to human transmission.

Transmission - Ebola spreads through human to human transmission via direct contact with blood ,secretions, organs or other bodily fluids of infected people and with other surfaces and materials contaminated with these fluids.

Symptoms of Ebola - Humans are not infectious until they develop symptoms. First symptoms are the sudden onset of fever fatigue ,muscle pain ,headache and sore throat. This is followed by vomiting, diarrhea, rash, symptoms of impaired kidney and liver function and both internal and external bleeding.

DIAGNOSIS - Confirmation that symptoms are caused by Ebola virus infection are made using Electron microscopy, Virus isolation by cell culture, Serum neutralization test, Antigen-capture detection test

Prevention and Control - Reducing the risk of wildlife to human transmission from contact with infected fruit bats or monkeys or apes and the consumption of their raw meat. Reducing the risk of human-to-human transmission from direct or close contact with people with Ebola symptoms particularly with their body fluids. Outbreak containment measures ,including prompt and safe burial the dead identifying people who may have been in contact with someone infected with Ebola and monitoring their health for 21 days.

RIA SCARIA
BSc.(MB) 3rd Sem

Amazing facts about the Human body

The Appendix - Appendix is usually treated as a body part that lost its function million years ago. All it seems to do is occasionally get infected and cause infection. Yet recently it has been discovered that the appendix is very useful to the bacteria that help your digestive system function. They use it to get respite from the strain of the frenzied activity of the gut, somewhere to breed and help keep the gut's bacterial inhabitants topped up.

Going viral - Our DNA includes the genes from at least eight retroviruses. At some point in the human history, these genes became incorporated into human DNA. These viral genes now perform important functions in human reproduction, yet they are entirely alien to our genetic ancestry.

Eyelash invaders - Depending on how old we are, it's pretty likely that we have eyelash mites. These tiny creatures live on old skin cells and the natural oil (sebum) produced by human hair follicles. They are usually harmless, though they can cause an allergic reaction in a minority of people. They are invisible with naked eyes as they typically grow to a third of a millimetre and are near-transparent. Around half the population have them, a proportion that rises as we get older.

Sensory tally - Despite the five sense organs, there are more. Here's a simple example. Put your hand a few centimetres away from a hot iron. None of your five senses can tell you the iron will burn you. You can feel the iron is hot from a distance and won't touch it. This is an extra sense – the heat sensors in your skin. Close your eyes and touch your nose. You aren't using the big five to find it , but instead proprioception. This is the sense that detects where the parts of the body are with respect to each other. It's meta sense.

Huntington's Disease

Huntington's disease is a severe genetic disease that usually has a late age of onset. Huntington's disease is currently not curable but medication (tetrabenazine and anti-psychotic drugs) that decreases the severity of the symptoms. The symptoms are muscle spasms, depression, personality changes etc. The medication, however, cannot change the course of the disease, which is the death of the patient.

Huntington's disease is an autosomal dominant disease. If an individual has even 1 copy of the Huntington allele, he will obtain the disease. If one parent is normal and the other parent is affected with Huntington's disease, there is a 50% chance that the offspring will inherit the Huntington's allele. There is about 5-7 in 100,000 individuals who suffer from Huntington's disease worldwide. Prenatal screening (amniocentesis or chorionic villi sampling) can be used to detect someone with Huntington's disease but most people with a family history of Huntington's disease refuse to test themselves.

Huntington's disease, unlike Tay Sachs disease has a late age of onset, which causes many ethical issues when considering selective abortion. People can live a meaningful and fulfilling life in 40 years (this is subjective) as compared to an aimless person who lives twice as long.

From a Public health perspective, a disease like Huntington's can be eliminated from the population because there are no "carriers", you either have Huntington's disease or you don't. Normal individuals can never have children with Huntington's disease, so if affected individuals use pre-implantation genetic diagnosis or prenatal screening, the disease can be effectively eliminated thereby preventing a very great deal of human suffering.

Prakash V. Cherian
BSc.(BT) 3rd Sem

Insecticide alternatives

A compound found in fruit could be the safe insect repellent of the future, according to a group of scientists from the University of California, Riverside in the US. Insects annually destroy huge amounts of agricultural products. Finding safe and effective repellents is, therefore, a top priority for agrichemical producers. In recent years, interest has grown in examining plants' defenses against pests, with one group, for instance, recently investigating how a plant's chemical distress signal can be converted into a weapon to combat insects.

To find alternatives to existing insecticides, the California team investigated a series of DEET (N,N-Diethyl-meta-toluamide) substitutes that are already approved as food additives. DEET is a widely used insect repellent, but has been the subject of some safety concerns and is only meant to be applied to skin and clothing.

The insect-repelling compound derived from fruit is already used as flavoring. A DEET substitute, butyl anthranilate, is found in fruits and is often used in flavors and fragrances. The team found that spraying blueberries with a 10% solution of butyl anthranilate provided nearly total protection for blueberry samples from the spotted wing *Drosophila*. This fruit fly is a major pest and causes hundreds of millions of dollars of agricultural damage worldwide each year, meaning new ways to fight the flies are urgently needed.

BIOROID

Bioroid is also known as Biorobotics. It is an uprising field in today's world. This field deals with the synthesis of life from non living matter or making biological organism as manipulated and functional robots. A biological brain grown from cultured neurons, which were originally separated, has been developed as the neurological entity is embodied within a robot body.

The brain receives input from sensors on the robot body, the resultant output from the brain provides the robot's only motor signals. Instead of microchips, we are using artificial neurons for the creation of robots which perform a particular task with their own intelligence. The bioroids can overcome the situation according to their skills and understanding which is not possible in the case of artificial robots. This growing field of synthetic biology or bio-nanotechnology is offered in India in the following institutes:

Indian Institute of Technology, Kanpur
National Institute of Technology, Hyderabad
Jadavpur university , Kolkata
Birla Institute of Technology, Pilani.

Herman kopa
1st Sem Msc. Biotechnology

Smart Contact Lens

Diabetes mellitus (DM) , commonly referred to as Diabetes, is a group of metabolic diseases in which there are high blood sugar levels over a prolonged period. As of 2014, an estimated 387 million people have diabetes worldwide. One in every 19 people is affected with diabetes. Diabetic patients have to struggle daily, to keep their blood sugar level under control. Uncontrolled blood sugar levels puts people at risk for a range of dangerous complications, short term and others long term, including damage to the eyes, kidneys and heart.

Although some people wear glucose monitors with a glucose sensor embedded under the skin, all people with diabetes must still prick their fingers and test drops of blood throughout the day. It is disruptive and it is painful and therefore many people with diabetes checks their blood glucose less often than they should.

Google is developing a new way which is much smarter, user friendly and does not causes pain, for people with diabetes to manage their disease. Google is testing a smart contact lens that is built to measure glucose levels in tears using a tiny wireless chip and miniaturized glucose sensor that are embedded between two layers of soft contact lens material, also a radio antenna thinner than a human hair is present to track glucose levels. Information about blood sugar levels, which is particularly useful for people with diabetes, could be uploaded to Smartphone devices and used by doctors and patients to monitor the data almost in real time.

If approved by FDA and labeled as safe to use, then this would be a huge breakthrough and a boon to diabetic patients all over the world, as controlling blood sugar level is the key to reduce diabetic complications.

Sree Priya S.
1st Sem MSc. Biotechnology

Bio-Limb

A rat in Boston received what scientists are calling the first lab-engineered replacement. The 'bio-artificial' rat fore limb is the result of a research experiment. Starting with the framework of a donor limb, the scientist at Massachusetts brought to life using the recipient's own cells.

Using 'Decellularization', Ott's research team rebuilt and incubated a new living rat leg structure from a deceased donor rat. First, all donor cells were stripped with a detergent from the donor leg, leaving just the underlying structure of bones, ligaments and hollowed out blood-vessels, called the 'Scaffolding'.

Then the rat's own stem cells were added back in to regenerate veins and arteries and jump-start the formation of muscle. Muscle cells were grown further through electrical stimulation. Once the rat leg was formed and the muscles contracted when stimulated the way living muscles should, researchers transplanted the limb onto a living rat. The parts of the newly attached bio-artificial limb accepted the blood and tissue of the living rat. Muscles reacted normally in tests, grasping or contracting along with the electrical stimulation, at 80% the strength of a new born rat. To make more clear about what the process would require for humans, Ott and his team also decellularized baboon forearms.

For people who have lost a limb, a bio-artificial replacement would offer the benefits of a normally functioning human limb with soft tissue and fine motor skills, using their own cells and therefore avoiding the risk of rejection associated with transplants from one person to another.

Juby J. Samuel
1st Sem MSc. Biotechnology

Kikiki Huna

When the entomologists laid insect traps in Yercaud in Tamil Nadu a few months ago, they did not expect that India would join the club of countries that are home to a unique insect. For, they were surprised to find the world's smallest flying insect, a fairyfly that goes by the name Kikiki huna.

Measuring a mere 0.16 mm, Kikiki huna is a multicellular organism that is smaller than single-celled organisms. Kikiki huna has been found in Chidambaram as well. While the insect's functions are yet to be determined, Kikiki was first discovered in Trinidad around 20 years ago and later in Hawaii. It has also been found in Australia and Argentina. It derives its name from Hawaiian which means 'tiny bit'.

Prashanth Mohanraj from the National Bureau of Agricultural Insect Resources (NBAIR), Bengaluru, said Kikiki huna is an engineering and artistic marvel. "It can do everything that a larger insect can do. It has a brain, a nervous and digestive system. It is the sheer marvel of creation... it is a great find as we didn't expect it to turn up in our traps," he said. He said that like all fairyflies, Kikiki huna lays its eggs in the eggs of other insects. "The entire life stage is passed in the single egg, from which it emerges as an adult," he said.

Not visible to the naked eye, the tiny insect has eluded many entomologists, said Abraham Verghese, director of NBAIR. He said that the challenge is now to study the tiny insect and understand its role. "Insects in our country are poorly known... we still have over a lakh species to identify. Each has a role to play in the ecosystem," he said.

Prasheetha P. Prasad
1st Sem MSc. Biotechnology

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