AMITY UNIVERSITY
GWALIOR

BIOSPARK

E-Newsletter
Amity Institute of Biotechnology

January 2017; Volume II Issue I

In this Issue

Cover Image: http://www.onhealth.com/content/1/cancer_types_treatments

Message from Editor-in-Chief .....

It gives me immense pleasure to bring before you the first issue of second volume of AIB Newsletter, **BioSpark**. The present issue carry forwards the coverage of miraculous science of Biotechnology. Biotechnology along with the allied areas contribute significantly towards improving social and economic quality of life in the 21st century. In recent times our focus has been shifted towards applied research which can directly contribute in the societal benefits. We strongly emphasize on working of the problems related to human health and environment. The encouragement of young minds for research in these areas will certainly fetch for the development of our nation.

The explosion in human population in the world has brought demands to deal with food security, safe environment and healthcare. In the midst of the prevailing gloom, biotechnology and nanotechnology combined with the creativity and inventiveness of human mind have the capability of lifting the afflicting misery. Biotechnology and allied areas through their unique and combined techniques can introduce new traits in plants, animals and microorganisms to produce foods that are nutritionally enriched and longer lasting. Genetically engineered crops can tolerate specific herbicides for weed control and are resistant to plant diseases and insect pests. In the area of environment, cleaning of soil and water contaminated by various chemicals, organic wastes and heavy elements can be successfully carried out by bioremediation through existing and new methods. In the field of healthcare, both the technologies, through detection of disease specificities at the genomic level are moving towards personalized medicines.

We have put in articles on cutting edge research in Biotechnology and advances in biological sciences. I hope this issue will help our students to be updated with the recent advances in life sciences, so that they can contribute to the growth and achievements of themselves and the institute. I would like to take this opportunity to thank the editorial team for their efforts in putting together a wonderful and informative newsletter. We welcome your inputs for forthcoming issues.

Prof. (Dr.) R. S. Tomar
Editor-in-Chief
BioSpark
AIB, AUMP e-Newsletter

E-NEWS LETTER BioSpark

Editorial Board

Editor-in-Chief

Prof. (Dr.) Rajesh Singh Tomar,
Director, AIB & Dean (Academics), AUMP, Gwalior

Editors

Dr. Raghvendra Kumar Mishra
Associate Professor

Dr. Vikas Shrivastava
Associate Professor

Dr. Shuchi Kaushik
Assistant Professor

Dr. Anurag Jyoti
Assistant Professor

Reviewers

Dr. Raghvendra Saxena
Assistant Professor

Dr. Sushmita Shrivastava
Assistant professor

Dr. Pratistha Dwivedi
Assistant Professor

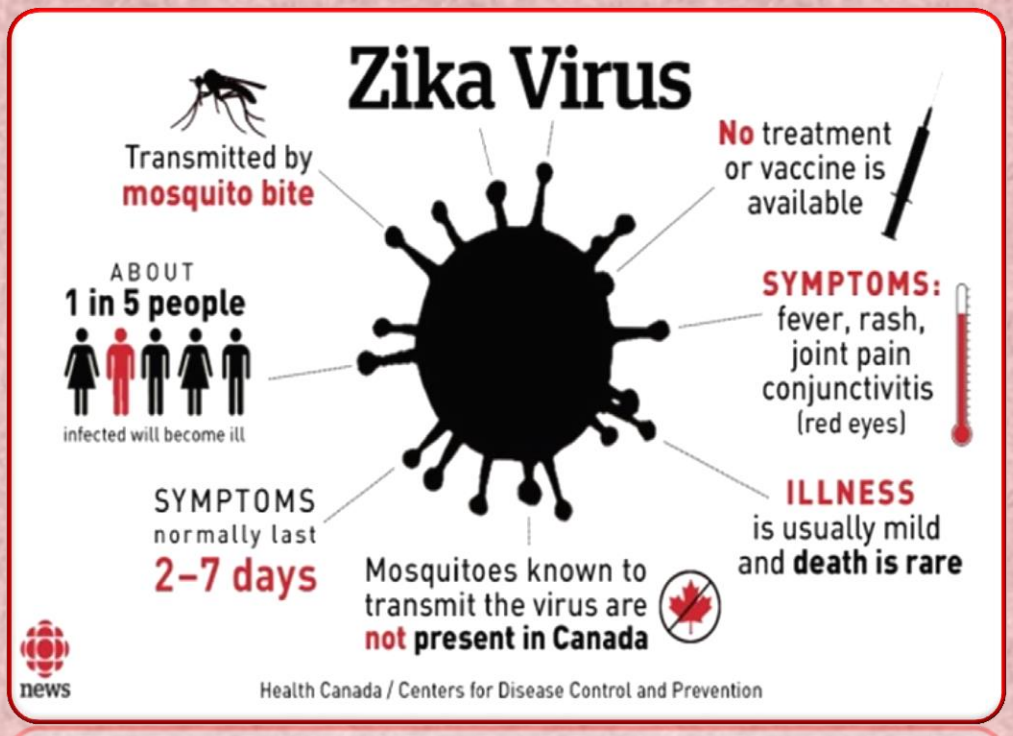
Dr. Manish Kumar
Assistant Professor

Mrs. Sharmistha Banerjee
Assistant Professor

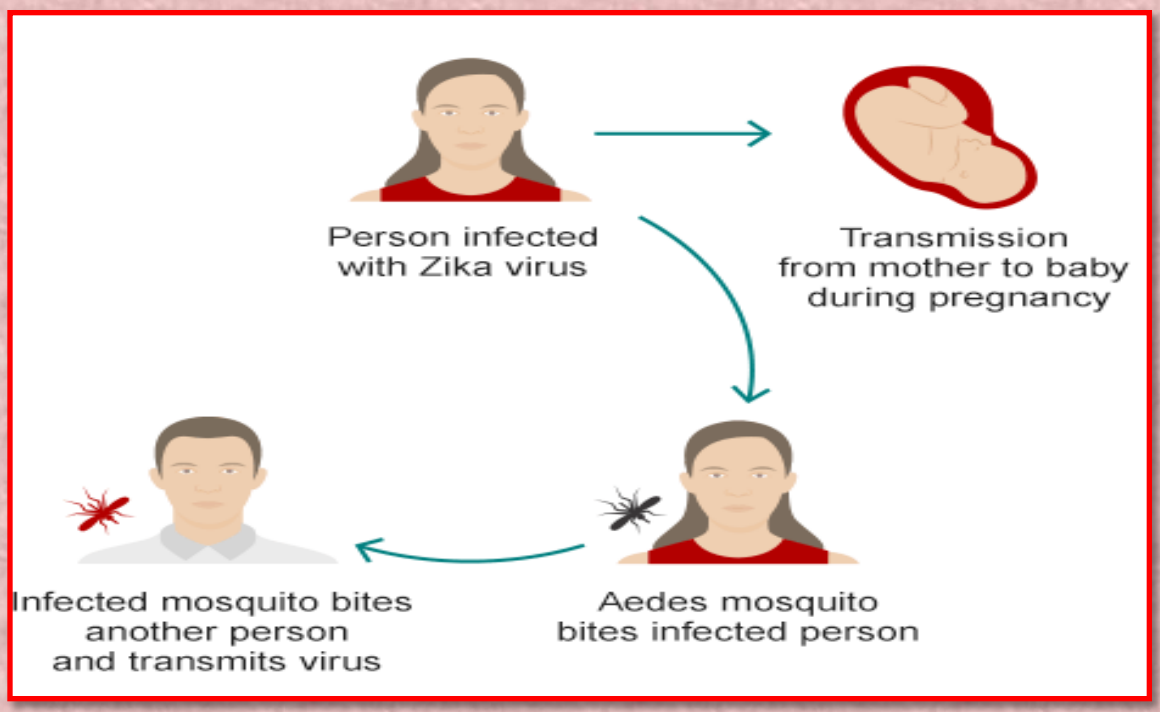
Zika Virus: How it Infects Newborn Through Pregnant Mother?

[Source: www.who.int/mediacentre/factsheets/zika/en/]

Zika virus is a mosquito-borne illness that is spread by the Aedes species of mosquito, the mosquito also responsible for the transmission of dengue and chikungunya viruses. Unlike malaria-carrying mosquitoes, this species is mostly active during the day and so barrier methods such as mosquito nets are ineffective. These mosquitoes can survive in both indoor and outdoor environments. The two known species responsible for Zika transmission are the *Aedes albopictus*, known as the Asian Tiger mosquito, and the *Aedes aegyptispecies*. A growing concern that is currently under investigation is a possible link between maternal Zika virus infection and infant microcephaly.



A study provides evidence that Zika virus infection in the first trimester of pregnancy can result in placental and fetal damage and loss. One explanation for how the virus crosses the placental barrier is by initial infection of syncytiotrophoblasts, the outermost layer of cells that surrounds and nurtures the fetus. The work from the Suthar Lab shows that the less-differentiated cytotrophoblasts are permissive for Zika virus infection.

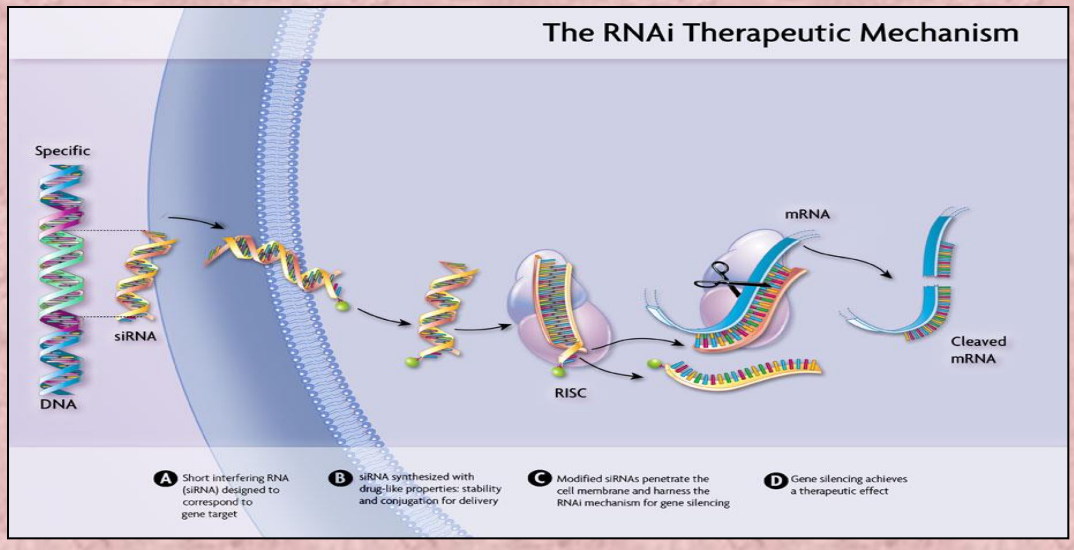


Researchers have linked Zika virus to microcephaly -- a birth defect affecting the head and brain of infants born to infected mothers. Yet little is understood about how the virus crosses the maternal-foetal barrier, a layer of cells that serve as a filter to protect the foetus from harmful substances. A team of researchers studied the question by using three different strains of Zika virus to infect three types of cells found in placental tissue. The cells types known as Hofbauer cells, cytotrophoblasts, and fibroblasts -- were obtained from normal term pregnancies. The researchers found that fibroblasts and Hofbauer cells were susceptible to infection by Zika virus in isolated cultures. They also observed infection of Hofbauer cells within whole placental tissue. These placenta-specific cells could potentially serve as a reservoir for Zika virus production within the foetal compartment. The researchers also stated that the Hofbauer cells, which are believed to migrate around the placenta, may aid in delivery of Zika virus to the foetal brain. The study results may also help investigators develop new strategies to potentially prevent infection of the foetus.

As Zika spreads throughout the world, the call for rapid development of therapeutics to treat Zika rings loud and clear. Taking a step further in identifying a possible therapeutic candidate, a team of researchers has discovered the mechanism by which C10, a human antibody previously identified to react with the Dengue virus, prevents Zika infection at a cellular level.

RNA Interference (RNAi): Role in Therapeutics

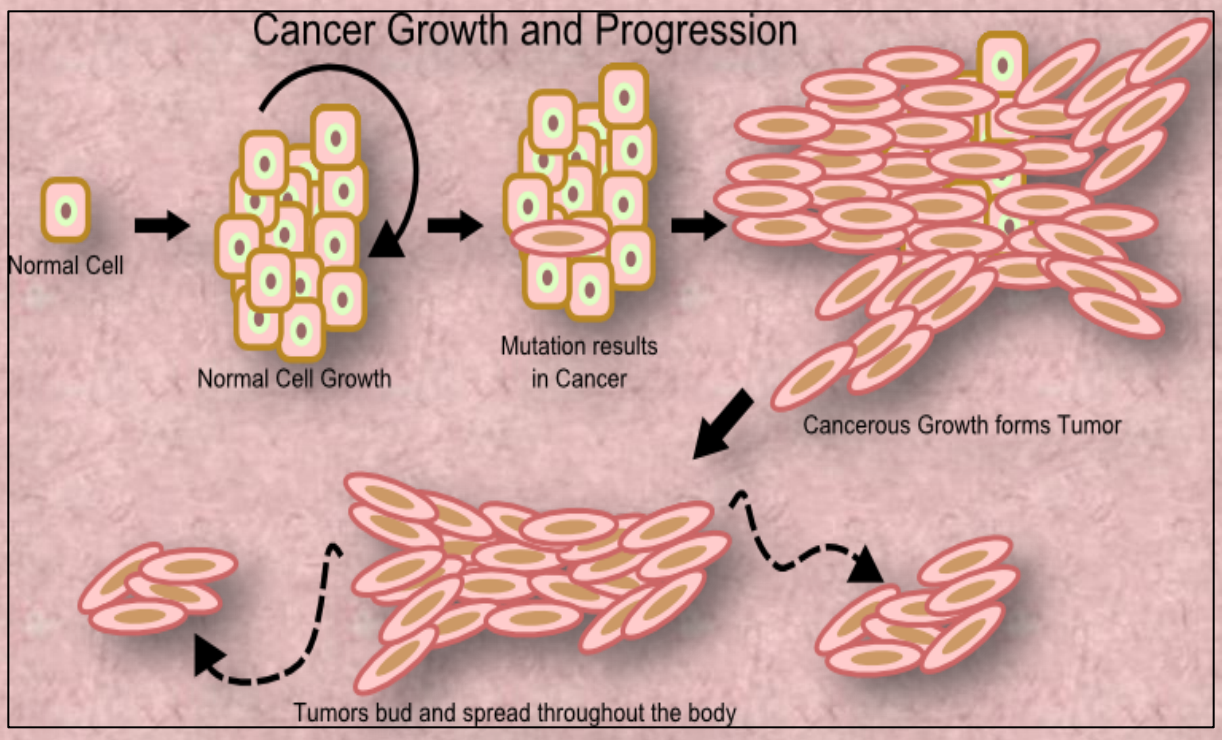
RNA plays an important role in regulation of gene expression. The RNA world was given a booster shot with the discovery of RNA interference (RNAi). A compendium of mechanisms involving small RNAs (less than 30 bases long) that regulate the expression of genes in a variety of eukaryotic organisms. RNA interference (RNAi) is a system within living cells that helps to control genes are active and how active they are? RNAi, is commonly ds RNA mediated sequence gene regulation phenomenon.Which leads to post-transcriptional gene silencing (PTGS) after endogenous production or artificial introduction into a cell of small interfering double strand RNA (siRNA) with sequences complementary to the targeted gene. RNAi is a novel gene regulatory mechanism that limits the transcript level by either suppressing transcription (TGS) or by activating a sequence-specific RNA degradation process (PTGS/RNA interference (RNAi). There is a mechanistic connection between TGS and PTGS. TGS is an emerging field where as PTGS needs to be explored for information content. RNAi potentially useful for gene knockdown technology, which is used to assess the gene function in various organisms. Although RNAi was first discovered in worms, similar kind of phenomena were also identified in viruses mediated infection protection in plants. i.e., post transcriptional gene silencing of coat protein. During the 1990s number of gene silencing phenomena that occur at the post-transcriptional level were discovered in plants, fungi, animals and ciliates. As more information available for mechanism of RNAi mediated gene silencing, it application in therapeutics and disease treatment opens better hopes in future for the treatment of disease.



Dr. Raghvendra Kumar Mishra
Associate Professor
Amity Institute of Biotechnology

Role of H1 Protein in Survival Mechanism of Cancer Cells

An international study led by scientists from the Crick Institute in London and the Hebrew University of Jerusalem revealed a survival mechanism in cancer cells that allows the disease to erupt again even after aggressive treatment. In a paper published in *Science*, the researchers describe the mechanism by which cancer tumor cells become cancer stem cells that can sustain long-term growth. When cancer develops, the generated cells are not uniform in their biological properties and contribute differently to tumor development. Only a small portion of cancer cells can form new tumors or metastases, and these are called "cancer stem cells". This disparity between tumor cells poses major challenges in understanding the nature of the tumor, its sensitivity to drugs, and planning an effective treatment that will eliminate all tumor cells. Prof. Eran Meshorer, head of the Laboratory for stem cells and epigenetics in the Institute of Life Sciences and a member of the Edmond and Lily Safra Center for Brain Sciences (ELSC) of The Hebrew University of Jerusalem explained that many chemotherapy drugs leave a small amount of cancer stem cells that cause a renewed outbreak of the disease after a few years. It is therefore important to identify cancer stem cells in tumors and characterize the differences between the different tumor cells as the basis for detecting weak spots in the course of the development of the disease.

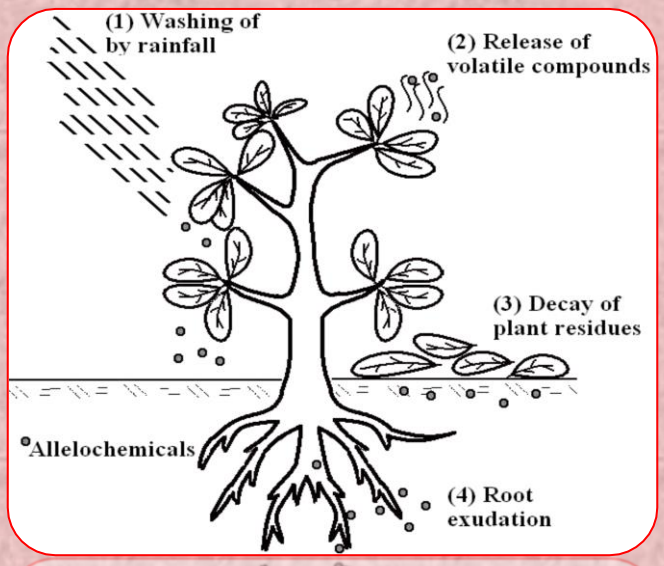


Cancer stem cells are not limited to the tumor itself and they are able to engage again in healthy environment and stimulate the disease. To study the characteristics of those unique cells, Prof. Meshorer and doctoral student Alva Biran from the Hebrew University teamed up with Dr. Paula Scaffidi and Christina Morales Torres from The Crick Institute in London. The international research team also included Dr. Ayelet Hashahar Cohen of the Hebrew University, Dr. Rotem Ben-Hamo and Professor Sol Efroni from Bar-Ilan University, and Dr. Tom Misteli from the National Cancer Institute, NIH. The research team found that in a number of cancer types, those cancer stem cells lose one of their DNA packaging proteins - H1.0. By binding to DNA, H1.0 silences the expression of the genes it binds to.

Dr. Shuchi Kaushik
Assistant Professor
Amity Institute of Biotechnology

Sustainable Weed Management and Crop Production Exploiting Allelopathy

Diverse biotic and abiotic stresses are the major deterrent towards sustainable crop production. Apart from other environmental stress, weed causes enormous crop losses due to their interference, which is approximately 37 percent. Enhancing the crop competitiveness through preventive methods, cultural practices, mechanical methods, plant breeding, biotechnology, biological control and crop diversification will be the central point in new paradigms of sustainable agriculture. Integration of above techniques will be important to sustainable weed management that maintain or enhance the crop productivity, profitability and environmental quality. Applications of high cost herbicides, development of resistance, environmental and health hazards of chemical pesticides including herbicides and declining profitability are the major challenges of sustainable agriculture. Therefore concern over to facilitate the development of ecofriendly alternative approaches for sustainable weed management to support crop production systems.



The possible pathways of release of Allelochemicals in the environment (Source: Manoel et al., 2011).

Allelopathy, a well known natural ecological phenomenon can offers a novel approach, which can provide multiple solutions towards sustainable agriculture with wide applications in weed management, it can replace hazardous chemical and mechanical approaches being used in crop production. Development of crop cultivars with more allelopathic potential may help in better resistance to biotic and abiotic stresses.

Allelopathy refers to the beneficial or harmful effects of one plant on another plant, both crop and weed species, by the release of biochemicals known as allelochemicals, from plant parts by leaching, root exudation, volatilization, residue decomposition, and other processes in both natural and agricultural systems.

Such diverse chemicals may also impart synergistic allelopathic effect when mixed together than individual compounds alone. Several studies indicated that allelochemicals can also persist in soil, affecting both neighboring plants as well as those planted in succession. Since allelochemicals derived from plants, they are more biodegradable than traditional herbicides,but allelochemicals may also have undesirable effects on non-target species, necessitating ecological studies before widespread use. Several food as well as forage crops like sorghum, oat, alfalfa, rye, rice sunflower, wheat, mustard, beet etc. are widely studied for allelopathic potential. Eventually enhancement of target specific allelopathic potential in crop plants be used to produce improvised crop cultivars. Such allelopathic traits from wild or cultivated plants into crop plants can be introduced through traditional breeding or genetic engineering methods may lead to enhanced biosynthesis and release of allelochemicals to achieve substantial effect. Genetic basis of allelopathy has now been demonstrated in winter wheat and rice. The study of allelopathy appears to have a bright future, being cost-effective, eco-friendly, easy to use, efficient and safe. Research efforts should be focused on screening more allelopathic plants, to search potential cultivars producing more allelochemicals and to translate our research into technologies that will reduce our dependence on synthetic herbicides.

Dr. Raghvendra Saxena
Assistant Professor
Amity Institute of Biotechnology

Ebola Re-Entry: The Deadliest Scare of the Decade

While it has been quite some time since the deadliest scare of the decade was assumed to be done with, it has ignited the deep rooted fears of its reappearance with a case reported lately in some parts of West African countries. In a most recent outbreak, a 10 year old boy in Monrovia was diagnosed with Ebola almost a year later the last case was reported. What makes the case of particular interest is the fact that he had no known exposure to the virus, leaving with one wild probability that he might have caught it from a survivor! Well, even the World Health Organization suspects so.

It might begin a tale of harrowing disaster as the virus has the most unique feature of shutting down itself and not replicating till it's the right time– something that has never seen before in this type of virus. At least seven of such outbreaks were reported in those who had recovered from Ebola where the virus has been silently lingering. The West African epidemic has shown that the Ebola virus can hide in organs that are sheltered from the immune system, such as the eye and testes and then re-emerge as happened in case of Pauline Caferkey, a British nurse who fell ill again nine months after recovering from Ebola.

Jason Ladner at the US Army Medical Research Institute of Infectious Diseases in Fort Detrick, Maryland, and his team examined a flare-up of Ebola in Liberia in June 2015. At that time, Liberia had experienced no Ebola cases for three months, but then a 17-year-old in the town of Needowein died and tested positive for the virus. On sequencing the viral strain, the team found out that they were genetically similar to others that had been seen in the Liberian epidemic. It implied that Ebola had not been newly contracted from host animals or another country!

Amongst the companies who are showing up to deal with such situation includes Merck, which says that it would soon have 300,000 doses of this vaccine to help manage such flare-ups. Looking at the devastating form that Ebola could shield itself into, it becomes the need of the hour to effort towards forestalling further outbreaks of the virus and even more importantly registering the Ebola survivors and testing their bodily fluids.

Dr. Pratistha Dwivedi
Assistant Professor
Amity Institute of Biotechnology

Ginger: A Potent Dietary Agent That Treats Ovarian Cancer With No Side Effects and Better Efficacy

In 2007, the BMC Complementary and Alternative Medicine published a study that demonstrated ginger's ability to combat ovarian cancer, which is the most deadly cancer of the female reproductive system, according to the American Cancer Society. The ginger works by blocking the cancer from growing, limiting its ability to spread. Ginger inhibits growth and modulates secretion of angiogenic factors in ovarian cancer cells.

The study points out the most amazing part of ginger cancer treatments — it's non-toxic. While conventional therapies like chemo and radiation can cause great harm and even kill patients themselves in some cases, the ginger targets the cancer only and leaves the rest of the body alone. Ginger, a pungent aromatic rhizome of the plant Zingiber officinale, is native to China, where it has been used as a medicinal plant for thousands of years. There is evidence about the chemopreventive effect of ginger; however, more human trials are needed to strengthen this evidence. The ginger component [6]-gingerol has been shown to exert anti-inflammatory effects through mediation of NF-κB. NF-κB can be constitutively activated in epithelial ovarian cancer cells and may contribute towards increased transcription and translation of angiogenic factors.

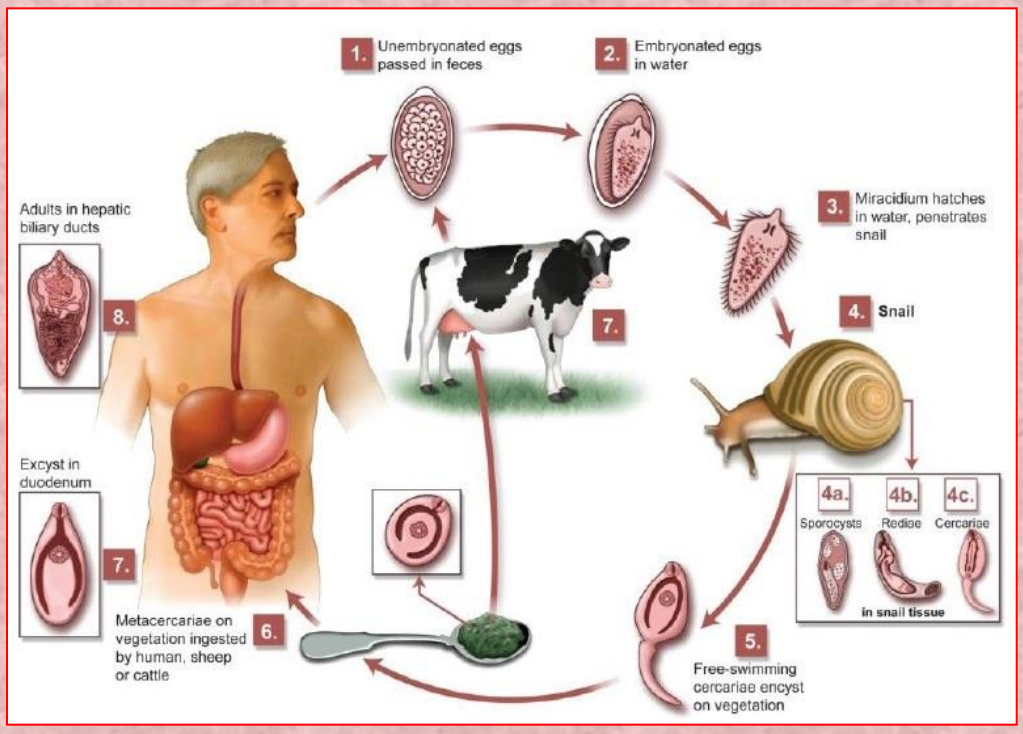
Evidence suggests that ginger can help to prevent numerous types of cancer and is effective at killing ovarian, prostate, and colorectal cancers, but unlike chemotherapy, ginger offers a natural and less dangerous alternative to chemotherapy. Ginger does not harm healthy cells, it does not poison patients, it prevents cancer development and kills cancer cells.

Ginger makes the body hot and cancer cells cannot survive in hot environment. Scientists at the University of Michigan Comprehensive Cancer Center examined the chemosensitizing effect of ginger in ovarian cancer cells. Ginger selectively kills the ovarian cancer cells that have acquired resistance to standard therapy. It destroys cancer cells through two distinct cell death pathways called apoptosis and autophagy.

Sharmistha Banerjee
Assistant Professor
Amity Institute of Biotechnology

Fasciolosis: A Plant Born Trematode Zoonosis

Fascioliasis or Distomosis or liver rot, is a plant born zoonoses caused by a platyhelminth Fasciola. Its different species like *F. hepatica* and *F. gigantica* are known to be responsible for causing this disease in cattle as well as in human beings. Infection proceeds through incubation period of few days to some months showing acute symptoms like fever, abdominal pain, gastric problems, anemia, jaundice, etc. which ultimately leads to chronic stage of inflammation of bile ducts, gall bladder including fibrosis.



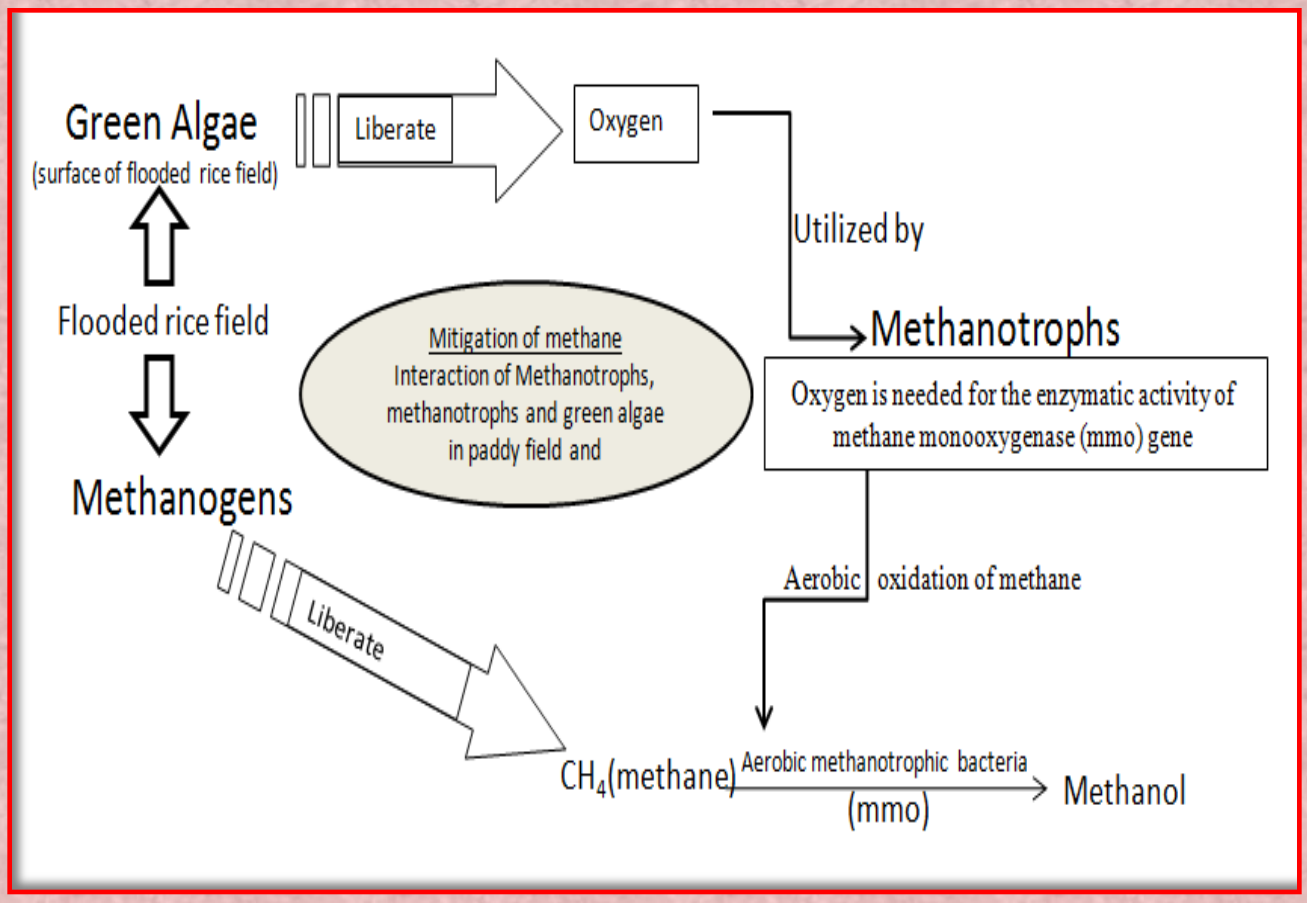
Fasciola is a digenetic parasite shows polyembrony for its survival. It has miracidium, sporocyst, redia, cercaria and metacercaria larval stages. Adult fasciola resides in primary host (mostly cattle or human). Miracidium is free living aquatic form while sporocyst, redia and cercaria larva found in secondary host i.e. Limnea or Planorbis. Metacercaria comes out from snail's body and gets stick to aquatic flora. When any cattle take this contaminated flora or water, these metacercaria larva gets enter into its body.

Preventive measures are mainly primary treatment and immunization of livestock. Triclabendazole is highly effective antihelminthic drug to prevent fasciolosis. Other methods include use of molluscides and decrease in uptake of infected aquatic flora.

Dr. Sushmita Shrivastava
Assistant Professor
Amity Institute of Biotechnology

Methylotrophic Bacteria in Climate Change Mitigation

Mitigation reveals the slow climate change by the reduction of amount of green house gases (GHGs) present in the atmosphere. This lowering of GHGs is accomplished by diminishing the energy use. A large group of microbes are also participating in the reduction and lowering of these harmful gases. The prompt effort for the climate change mitigation is to suppress the emission of potent green house gases. Natural ecosystems are presumed as the sinks of carbon such as ocean and forest and their protection through silviculture and green technology is considered to be another way of mitigation. United nation environment protection (UNEP) has a major contribution in sustaining low carbon society worldwide through climate change mitigation approaches. A number of new technologies such as solar power, tidal energy, hydrogen fuel cells, wind power and geothermal power are utilized to restrict the green house gas emissions. Moreover, there is huge involvement of microbial communities also in the climate change mitigation.

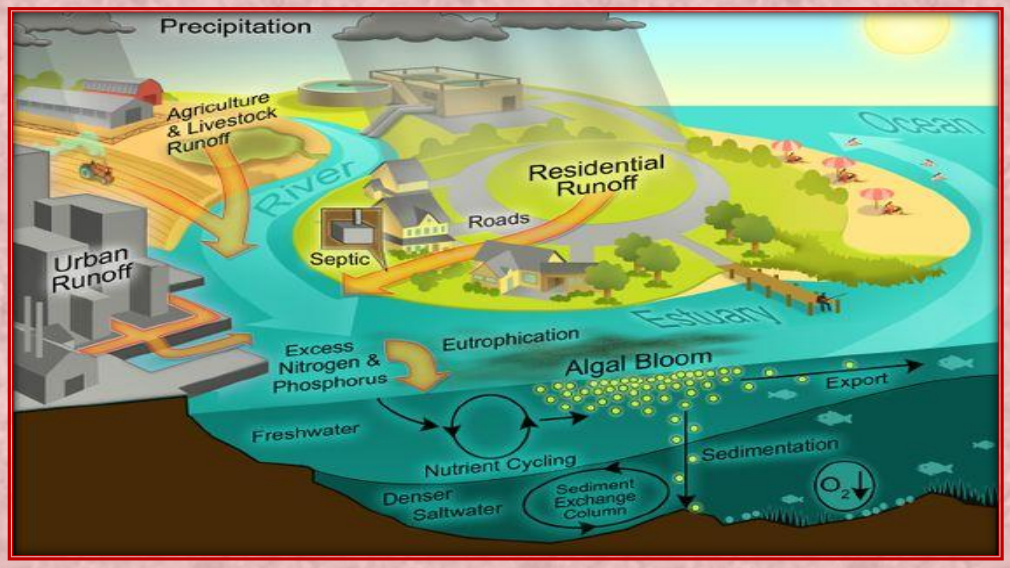


Since methylotrophic bacteria are utilizing and degrading reduced carbon compounds such as methane, playing a very important and distinguished role in climate change by their mitigation. This group of bacteria is peculiar in sustaining the climate by reducing the green house gas emission in the environment. The most abundant ecosystem for methanotrophs is rice field where enzymatic activities are facilitated by the other organism such as algae and methanogens. However, methylotrophs degrading several methane derivatives together with methane in the environment are mitigating most potent green house gas CO_2 also but indirectly. Therefore this survival mechanism of methylotrophs is also sustaining climate directly or indirectly. A number of bacterial species having methylotrophic potential reported in soil, water and plant ecosystem contribute a lot in the climate change mitigation. The basic research therefore cannot ignore the importance and involvement of methylotrophs to sustain and maintain the climate change.

Dr. Manish Kumar
Assistant Professor
Amity Institute of Biotechnology

Effect Of Polluted Water On Human Health

Water is a growing problem of urban cities. To meet the demands of growing population & modern life style, water is depleting day by day and most of the available ground and other water sources are polluted. Gwalior region (*i.e.* district towns) is at the threshold of speedy urbanization and industrialization. Along with other pollutions *viz.* air, soil etc. Water pollution in these areas is gradually increasing. Ground water is the major source of drinking water in both urban and rural areas. The importance of ground water for the existence of human society cannot be over emphasized. Groundwater crisis is not the result of natural factors. It has been caused by human actions. Much of ill health which effects humanity, especially in the developing countries can be traced to lack of safe and whole some water supply. The consequences of waterborne bacteria and virus infection; polio, hepatitis, cholera, typhoid, diarrhea, stomach cramps, etc., have been well established but nitrate contamination is just deadly. The consumption of unsafe water has been identified as one of the major causes of this disease. Deterioration of water quality is due to increasing human population and urbanization. As water pollution is getting serious, houses especially in the urban area started to equip with a water filter system. As water physically looks colorless, odorless and even tasteless is very difficult to say about its quality. Therefore, its quality measurement is very much required to determine safe water for consumption.



Dr. Surender Parihar
Teaching Associate
Amity Institute of Biotechnology

Moist Wound Healing: Advanced Trends in Treatment of Wounds

There are a wide variety of dressing techniques available for the management of both acute and chronic wounds. The primary objective in both the cases is to achieve a healed wound. An ideal dressing material should accelerate wound healing and reduce loss of necessary fluids from the wound, and also help minimize pain and infection. The present trend is to promote the concept of moist wound healing. This article emphasizes on the importance of assessment of the wound, the volume of drainage fluid, amount of damage, presence of infection and location of wound for optimal wound healing. The key characteristic of a modern dressing agent is to restore and maintain a moist environment which will accelerate the process of wound healing. The modern dressings are categorized according to the excipients, including alginates, hydrocolloids and hydrogels. They generally are in the form of thin films and sheets.

Hydrocolloid dressings

These consist of a combination of gel-forming agents (carboxymethylcellulose (CMC), gelatin and pectin), elastomers and adhesives. Examples of recent hydrocolloid dressings include GranuflexTM (Conva Tec, Hounslow, UK) and TegasorbTM (3M Healthcare, Loughborough, UK).

Alginate dressings

Alginate dressings are produced from a polysaccharide comprising guluronic and mannuronic acid units. Alginate dressings occur either in the form of flexible fibres or as foams.

Hydrogel dressings

Hydrogel dressings are made from synthetic polymers such as poly (methacrylates) and polyvinylpyrrolidine.

Semi-permeable adhesive film dressings

Opsite TM (Smith and Nephew, Hull, UK) is a thin, semi permeable film made from polyurethane and covered with hypoallergenic acrylic derivatives.

Foam dressings

These dressings are made up of porous polyurethane foam or polyurethane foam film, and have adhesive borders.

Biological dressings

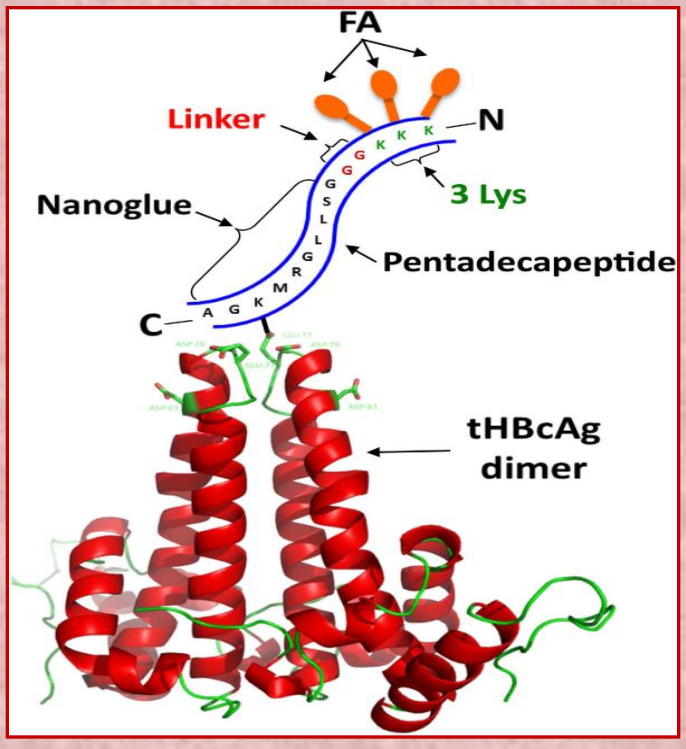
These are also called as bioactive dressings. These technologies usually combine polymers such as collagen, hyaluronic acid, chitosan, alginates and elastin.

The field of wound care is ever expanding with advances in technology. While there is no superior substitute, the new products can help in the following various ways like prophylaxis against barriers to healing, augmentation of wound healing factors, bridging time to definitive repair and optimization of wound reconstruction. Recent wound healing products and modalities increase the armamentarium of the health professional to address all aspects of wound care.

Pallavi Singh Chauhan
Ph.D. Scholar
Amity Institute of Biotechnology

pH Dependent Polymeric Nanoparticles for Targeted Drug Delivery in Cancer

Polymeric nanoparticles such as Virus-like Nanoparticles (VLNPs) are made of natural biological building blocks with great potential for revolutionizing medicine as new noninfectious nanocarrier platform. pH responsive VLNPs, based on truncated hepatitis B virus core antigen (tHBcAg), displaying folic acid (FA) for controlled drug delivery is a novel option for cancer therapy. Doxorubicin (DOX) is a potent drug used in treating several types of cancers including lung cancer, breast cancer as well as ovarian and colorectal cancers. When Hepatitis B core antigen (HBcAg) self-assembles into VLNPs, is observed to be most powerful protein engineering tool employed to display immunogens and cell-targeting peptides, as well as for the packaging of genetic materials. FA was conjugated to a pentadecapeptide containing the capsid binding sequence, nanoglue bound on tHBcAg nanoparticles to increase the specificity and efficacy of the drug delivery system. FA molecules were conjugated to the free Lys residues at the N-terminal end of the pentadecapeptide bound on tHBcAg nanoparticles. In this manner, the FA molecules extend flexibly away from the nanoparticle, and their exposure to target FRs (Folate Receptors) on the surface of cancer cells is maximized. This enhances the tumour-targeting activity of tHBcAg nanoparticles loaded with doxorubicin (DOX).



Displaying of Folic Acid molecules at the tip of a tHBcAg dimer using Nanoglue
(Reference: Biabanikhankahdani et al., 2016)

To package DOX inside tHBcAg nanoparticles and to release the drug in a controlled manner, polyacrylic acid (PAA) is mixed with DOX and loaded into the tHBcAg nanoparticles during the reassociation of the particles. The pKas of PAA and DOX are 4.8 and 8.6, respectively, and an electrostatic interaction takes place between the negatively charged PAA and positively charged DOX at pH 7.4, and this interaction is reversible at low pH. Thus, at the physiological pH of normal tissues, DOX is retained in tHBcAg nanoparticles, and it is only released when the nanoparticles reach extracellular tumor tissues or intracellular endosomes with a pH approximately 5–5.5. The tHBcAg nanoparticles loaded with doxorubicin (DOX) and polyacrylic acid (PAA) demonstrated a sustained drug release profile in vitro under tumor tissue conditions in a controlled manner and improved the uptake of DOX in colorectal cancer cells, leading to enhanced anti-tumor effects. Hence, it is seen DOX-PAA can be packaged into VLNPs without any modification of the DOX molecules, preserving the pharmacological activity of the loaded DOX. The nanoglue can easily be used to display a tumor targeting molecule on the exterior surface of VLNPs and can bypass the laborious and time-consuming genetic engineering approaches.

Tooba Mazhar
Ph.D. Scholar
Amity Institute of Biotechnology

Environment in Peril

At this point in time, we need to contemplate what we are really doing to our planet. Many of our daily chores and activities are detrimental to the environment. The repercussions are going to be catastrophic. Global warming is progressing at an unprecedented pace. There are ample evidences supporting the fact, for instance, there is a rise in sea level, ocean warming, glacial retreat, blatant rise in global temperature and many more. We are accountable for this mayhem. According to WHO, more than 80 per cent of the urban population that monitor air pollution are exposed to air quality levels that exceed the World Health Organization limits. The deteriorating air quality will only augment the number of cardiovascular and pulmonary disease outbreaks. We need stringent laws and efforts at the individual level to curb this situation. Saving environment will save many lives. An article published in *Climate Central* depicted that the Arctic region is warming twice as fast as the whole planet and we could possibly see ice-free summers in Arctic as soon as the 2030s with the current pace of carbon emissions. The scientific evidences in support of climate change and heavy damages to the environment cannot be overlooked. It is time for the world community to come close for the holistic welfare of our present generations and safeguard our planet for our future generations. We cannot leave a planet littered all around with dirt and poison for our children. Still, at this time of chaos, few rays of hope continues to come from our scientific community whose commendable research and innovative technologies need to be further taken to next level for better results.

We hear of ground breaking technologies of green plastic, microorganisms producing green energy, sustainable industrial application, live monitoring of the various aspects of our biosphere, and other green technologies. All the stakeholders need to be present, be it a developing country or developed country. In the recent 22nd COP to the UNFCCC organized at Marrakech, countries agreed to conclude the framing of rules for the implementation of the Paris agreement by 2018. India, too, participated constructively with emphasis on efforts to ensure actions based on equity. This can be thought as stepping stones for a better future. Paris Agreement was one of the finest deal brokered for climate actions by all the countries to save mother Earth from disastrous consequences of climate change and global warming and to reduce greenhouse gas emissions. Apart from scientific, political and diplomatic interventions, it is quite good and relaxing to see common people forming part of the movement. As described by our Union Environment Minster, Anil Madhav Dave, people must come forward and form a 'Jan Andolan'- mass movement- in rescue of the environment and regeneration of forests.

Finally, more needs to be done to encourage people to pitch in and generate a huge mass movement before it is too late to act.

NOT ONLY SAVE TREES, PLANT TREES!

Suchi Agrawal
Suruchi Bhargawa
Student- B.Sc. (Biotech) V Sem
Amity Institute of Biotechnology

The Menace of BPA

Bisphenol A or shortly called BPA is a carbon based synthetic compound that is used in making various plastics and epoxy resins. It mimics the animal hormone estrogen and shows pseudo-estrogenic activities. Today, we live in world full of plastics and hence are greatly exposed to BPA.

Its exposure is linked to various morbidities ranging from hormonal irregularity to cancer. This articles covers ranges of BPA uses and implications on human health. Bisphenol A or shortly called BPA is a carbon based synthetic compound that is used in making various plastics and epoxy resins. It mimics the animal hormone estrogen and shows pseudo-estrogenic activities. Today, we live in world full of plastics and hence are greatly exposed to BPA.

How does BPA get into your body?

Because BPA itself is an unstable chemical and has lipophilic (fat-seeking) properties, it very easily leaches into our food products particularly when heated. BPA is found so extensively in people, from prenatal to adult ages, is particularly impressive given the relatively short half-life of the chemical. Evidences from study found the prevalence of BPA in various samples. BPA has been found in blood and urine of pregnant women and in breast milk soon after women gave birth. Blood samples from developing foetuses and the amniotic fluid were also found to contain traces of BPA. It is extremely concern that even placental tissues and umbilical cord blood were found to have BPA.

AMIT OJHA
Alumni
Amity Institute of Biotechnology

Mitra Biotech Pvt Ltd.

Mitra Biotech Pvt Ltd. is a biotechnology company which focuses on personalised cancer care. It provides personalized cancer care and drug development solutions. It develops CANScript, a novel functional assay for high sensitivity assessment of tumor response to anti-cancer drugs. The company's assay replicates a patient's own tumor micro environment in vitro, measures multiple parameters to determine whether a tumor is responding and then converts these parameters into a single score that predicts clinical response to each of the customer selected therapies. Its technology also helps biopharma companies in various phases of drug discovery and development across drug classes, including immuno-modulators.

Mitra Biotech Pvt Ltd. was formerly known as Mitra Life sciences. The company was founded in 2008 and is headquartered in Woburn, Massachusetts, with a laboratory office in Bengaluru, India. Mallikarjun Sundaram & Pradeep Majumder founded Mitra Biotech in 2009. Mitra helps doctors take informed decisions and treat patients with drugs that are most optimal for them. The company, through its model Oncoprint, determines which drug would suit which class or segment of cancer patients to give the best results. The company is using this platform for both theranostic (therapy and diagnostic) and drug discovery segment. For translational biology or drug development segment, Oncoprint will help pharma companies to determine, which drug is more relavant for treating cancer. Using this platform, the company has been co-developing a cancer drug with a pharma company and has reached its final stages of pre-clinical trials. Mitra cultures a particular cancer tumor in an incubator, giving it same micro-environment in a laboratory plate that it would have inside the human body. Mitra Biotech, which is developing personalized treatment options for cancer with Oncoprint, won BioSpectrum Asia Pacific emerging company award.

Amity Institute of Biotechnology
Amity University Madhya Pradesh, Gwalior

Biotechnology has emerged as a major discipline not only in industrial terms but also as academics. The frontier areas of biology are being integrated to enhance the quality of Food products, Agriculture, Medical and Environmental conditions. Integration of advanced aspects of traditional biological sciences of Zoology, Botany, Biochemistry, Genetics and Microbiology, this course has been evolved to meet the demands of the Research and Industry based world. The interdisciplinary approach and the emphasis on research and publication is the novel method used in this course to make it more contemporary and relevant. The global developments in Biotechnology need to be understood and harnessed by the Research Scientists in India at all the levels viz. undergraduate, postgraduate students, Ph.D. With these objectives Amity Institute of Biotechnology, was established at the Amity University Madhya Pradesh, Gwalior (M. P.) in 2011 for teaching and research in the areas of Biotechnology.

The academic programs of AIB are well integrated with Research & Development. High quality research work is being carried out in frontier topics like bioremediation, bionanotechnology, environmental biotechnology, microbial and molecular genetics, natural products, etc. AIB is dedicated to provide quality education, so we can empower talented and balanced human young minds with the required theoretical and technical knowledge that is necessary to take on the challenges offered in the highly competitive field of biotechnology.

Institute Overview & Vision

Amity University Madhya Pradesh is established by the Ritnand Balved Education Foundation (RBEF), New Delhi to promote professional, industry-oriented education in the state of Madhya Pradesh. Amity University Gwalior, located on 100 acres of land opposite Gwalior Airport, imparts modern, practical and research-based courses which will lead to the development of manpower which is employable and ready for industry. The Amity Institute of Biotechnology in AUMP was established in 2011. The main focus of AIB is to promote high quality research and develop technically skilled human resources in the area of Biotechnology. Our vision is to achieve excellence at the National/International level in research and manpower development in the field of Biotechnology. Development of cutting edge technologies, imparting high quality education and conducting research in forefront areas are the main features of the Institute. The Institute faculties have also been contributing to high quality research in the front line areas of Biotechnology in the form of publications and patents. The department organizes the regular visit of eminent Professors & Scientists of National and International repute from Institutes/University in India and abroad.

OPPORTUNITIES AHEAD

- Admissions to Ph.D. & M.Sc. (Neuroscience) Programmes – 2017 at NBRC (Last Date : 31st March, 2017)

- Opportunity to Carry Out Food Science / Technology Projects / Dissertation in an Industry Oriented Environment. visit the following links:

http://www.ffsqindia.org/projectinternship.html

http://igmpiindia.org/Research-%40-IGMPI.htm

- UNESCO Internship Program – 2017 For International Students

http://en.unesco.org/careers/internships

- Ph.D. scholarships Available in Life Sciences Under VIB International Ph.D. Program (Last Date : 15th Feb., 2017)
- INSPIRE PhD Fellowships Available @ Université Sorbonne Paris Cité (USPC)

Amity Institute of Biotechnology is dedicated to groom and to produce young minds with academic cum research background. Department aims to nurture the potential of all the students. The department is well equipped with modern and sophisticated instruments. Department is committed to develop their students competent enough not only for achieving good academic records but also to qualify national competitive examinations like CSIR, ICAR, ICMR NET , GATE, JRF/Lectureship.

Ph.D. Scholars enrolled: Seven Research scholars are pursuing PhD in AIB.

Summer Internship by AIB Students (B.Tech, B.Sc and M.Sc/M.Tech. Biotech)

• Banaras Hindu University, Varanasi	Tanuj chauhan, Aditi Pandey
•CSIR-National chemical Laboratory, Pune	Nirmal Modi
•Delhi University	Ayush Rastogi, Arushi, Shruti
•NCCS, Pune	Suchi and Suruchi
•Barkatullah University, Bhopal	Deepak, Sidhharth
•Hyderabad University	Siddiqua Fatima
•ICAR-IGFRI, Jhansi	Gagan Jyot Kaur
•JNU, New Delhi	Harshit Agarwal
•IIT, Delhi	Harshit Agarwal
•Jamia Hamdard, New Delhi	Vineet Sharma, Pragati, Khushbu

Workshops and Lectures Organised

National Workshop cum Hand-on-Training on "Latest Techniques in Molecular Biology, Medical Biotechnology, Bioinformatics and Industrial microbiology" Amity Institute of Biotechnology, Amity University Madhya Pradesh Gwalior has organized a five days National Workshop from 12th to 18th October 2016.

Popular Lecture Series (PLS): Amity Institute of Biotechnology, Amity University, Gwalior organised three days lecture of Popular Lecture Series from 7th to 9th Sept 2016.

Laboratory experiments were carried out for B.Tech. and B.Sc.-III sem students of Amity Institute of Biotechnology, Amity University Chhattisgarh, Raipur by faculties of AIB, AU MP, Gwalior during (26th to 29th Dec 2016)

Infrastructure:
Amity Institute of Biotechnology has fully equipped, centralized air conditioned Class rooms with wifi connection and audio visuals facility. The Institute has been established with well equipped Laboratories for different streams like Microbiology, Molecular Biology, Immunology, Biochemistry, Plant tissue culture, Animal cell culture, Bioprocess Technology, Bioinformatics etc. We have all basic and advanced instruments related to all programmes offered by Amity Institute of Biotechnology.

Glimpses of Popular Lecture Series
(07th to 09th Sept 2016)

Glimpses of National Workshop cum Hands on Training (12th to 18th Oct 2016)

Glimpses of Laboratory experiments carried out for AIB, AUC, Raipur students (26th to 29th Dec 2016)