BIOSPARK E-Newsletter of Amity Institute of Biotechnology

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**Front image Source:**https://medium.com/@ongraphtech/are-you-ready-for-a-connected-health-monitoring-with-wearables-and-iomt-964b5b9f0b2e

**Prof. (Dr.) R. S. Tomar**

It gives me immense pleasure to bring before you the fourth issue of fifth volume of AIB Newsletter '*BioSpark*'. The present issue covers latest developments in the field of biomedical sciences and development of vaccines for COVID-19. In recent times, scientists from biotechnology have contributed a lot in this direction and best example we can see from Bharat Biotech for COVAXIN. Keeping the view of human health, its trial is under process in the third stage and we are hopeful to get a remedy as soon as possible to get rid of this pandemic. This issue has incorporated various other aspects related to agricultural biotechnology, environmental biotechnology and medical biotechnology. A wide range of topics have been covered in the present issue, including Russian vaccine for COVID-19, food safety, nobel prize winners, nanotechnology in the detection of coronavirus, post effect of COVID-19 etc in the form of contributory articles. Current issue contains the students' achievements and the current insight describing how distant we are in developing COVID-19 vaccine. In Industry profile, we have covered the details of Bharat Biotech, a premier biotech company. In the last, we have given the glimpses of E-poster competition organised by Amity Institute of Biotechnology during innovation week. I hope this issue will help students, research scholars and teaching fraternity to update themselves with the recent and applied research in the areas of life sciences. I would like to take this opportunity to thank editorial team for their efforts to bring out a wonderful and informative volume of 'Biospark' during Covid-19 pandemic. We welcome your valuable suggestions to improve our forthcoming issues of Enewsletter.

# BioSpark Editorial Borad

# COVID-19 VACCINE: HOW DISTANT WE ARE?

**Dr. Neha Sharma**
**Assistant Professor**
**Amity Institute of Biotechnology**
**Amity University Madhya Pradesh**

Four leading companies of world are presently undergoing a phase-3 clinical trial for coronavirus vaccine. Phase 3 is the last stage of testing for any drug. Pfizer, AstraZeneca, Moderna and Johnson & Johnson are working on phase-3 clinical trial. Pfizer has said that it hoped to get trustworthy scientific data on effectiveness of corona vaccine in the month of October. If the value of data will satisfactory, Pfizer will apply for approval for its vaccine. Other companies said they hoped that their corona vaccine would be ready early next year.

Acc. to a report in The Wall Street Journal, Russia is speed up its corona virus vaccine development and to ensure an approval by the middle of this month. Russia has developed first vaccine which was approved by the country's regulator on August 12.But this vaccine had been criticized because it had not followed phase-3 clinical trials. At present 193 vaccines are in pre-clinical trials in which 42 in clinical trials and 10 in final stages that is phase-3 of clinical trials.

In India, eight candidate vaccines being developed, 2 of them have entered phase -2 trials after completing phase-1. One vaccine is from Bharat Biotech, named Kovaxin. It is under Phase 1 clinical trial and the second phase will start soon. Zydus cadilla is also completed phase-1 and the second phase is about to begin soon.

# Sputnik V : COVID vaccine developed by Russia

*Sputnik V is now available to public. Sputnik V Covid vaccine is developed by Gamaleya Research Institute of Epidemiology and Microbiology under the Russian Health Ministry. This is very good news for India also that Dr Reddy lab has partnered with Russian Development Investment Fund (RDIF) for the distribution of Russia's Covid-19 Sputnik-V vaccine in India. Chief executive officer (CEO) of RDIF Kirill Dmitriev and Dr Reddy's MD GV Prasad have shared valuable and important informations related to this first vaccine. "Indian trials of the Sputnik-V vaccine candidate, being developed by Russia's sovereign wealth fund, and so many participants will be enrolled (around 1,000-2,000) and be conducted at multiple government and private hospitals across the country," Deepak Sapra, CEO for API and pharmaceutical services at Dr. Reddy's, told Reuters. Hopefully it may work in Indian conditions also. Sputnik will be a milestone in the history of vaccine research and human welfare.*

Modified from Source: https://www.indiatoday.in/coronavirus-outbreak/story

**'We're confident' (Russia to share legal risks of Covid-19 vaccine)**

*Russian researchers are confident enough and answering questions about doubts raised over Russia's Sputnik-V vaccine, Dmitriev (RDIF CEO) stated, "It is a clear example of negative propaganda of western companies. Our vaccine is based on human cells. Western vaccines have not been tested and competitors are trying to attack. This vaccine will be more safe and advanced".*

**Dr. Swapnil Rai**
**Associate Professor,**
**Amity Institute of Environmental Sciences, AUMP**

# Future Prospects of CRISPR-Cas9 technology

**Divleen Kaur**
**B.Sc. (H) Biotechnology, V Sem**
**Amity Institute of Biotechnology**

**O**ne of the easiest and accurate methods of gene manipulation CRISPR-Cas9 has caused thrill in the world of science. It is a versatile and unique technology that helps scientists to remove, add and alter the fragments of DNA sequence in turn editing the whole genome. This technology goes beyond the editing of genome.

If the range of CRISPR proteins is expanded beyond the normally used Cas9, then it can be used for the approaches of application-specific genome editing.

The uses of CRISPR or Cas systems are being devised such that base editing changes single nucleobases (for example, C to T) instead of adding or removing entire regions of a gene, and even newer prime editing is a search-and-replace method for writing new DNA on site without requiring a nucleic acid guide. Gene expression, which can be used for genetic screening, is blocked and activated by CRISPRi and CRISPRa. To use CRISPR or Cas systems as biosensors to recognise the existence of pathogen's DNA for diagnostic purposes is further technical approach.

The ability of Cas proteins to identify DNA or RNA but actively impair their nucleic acid breaking role is exploited by these novel applications. Then, by designing the protein with, for example, deaminase or signal transduction operation, new functionality is introduced. In theory, Cas can be applied to any protein function, suggesting that in the coming years, a whole host of enzymatic activity is likely to be coupled to CRISPR systems.

Fig: https://www.businessinsider.in/science/health/scientists-just-got-a-step-closer-to-treating-incurable-diseases-using-a-revolutionary-gene-editing-tool/articleshow/63087453.cms

# Relay Race: Vaccination program for oneness!

**Riya Rathore**
**Department of Biochemistry, Institute of Biosciences and Biotechnology**
**CSJM University, Kanpur**

India was the first country in the world who took an initiative to aware the people about their total reproductive health as a social goal and introduced a programmes named 'family Planning' in 1952. It not only broke the taboo related to personal hygiene but also dissipated the myths of reproductive health care which was always taken for granted. Further extension of program by National Health Portal of India created awareness among people of adolescent & reproductive age group and currently running globally under a very popular RCH (Reproductive and Child Health Care) program. Inculcating India's prodigious past at this moment in realm of Health-Science & Technology is just to retrace that how far our development and technology risen-up only after the independence. India, endorsed with enumerate number of policies & programs which provide the better health, medicine, tools, equipment and facilities for peoples among every age groups all possible because of progressive Technology. But why India is not ready before the encounter of any such a deadly viruses like COVID-19 which hamper our society immensely due to their outbreak at each level up to the community. What is the main reason behind this loop hole which points the finger towards the role of R&D and their governing body which work for the betterment of society?

Indian population is projected close to 1.380 billion by the end of 2020 which is equivalent to 17.7% of the total world population according to United Nations. Contribution of 0.7% share of gross expenditure on R&D by Indian GDP and the mean time spent on healthcare is 1.6% share only alarm our governing authority to take some encouragement projects and steps which motivate our scientists in field of R&D. It aims to rectify not only the problems but also come forward with innovative approaches & solutions before the encounter of any deadly attacks further. At every stage, the race to a vaccine is a relay now. India has a fairly reliable vaccine delivery system for children as a part of universal immunisation programme at a same pace India needs a proper vaccine policy for COVID-19 which ensures total coverage in very logical manners. The vaccination program possible only after the development of any reliable vaccine but again question arises who, how, when and where, will going to receive and formulate it first & able to reveal their unfold mystery behind protein coat of virus. And then the proper role of government comes under the force who developing a policy specific to COVID-19 vaccine; for preparing resources - both material & human - for the manufacture, storage, distribution and delivery. As Dr. Tedros, WHO Director General said, "Some people in all countries, rather than all people in some countries", should have access to the vaccine in the initial phase it indicated the prioritisation of vaccination to global health leaders leading to essential workers and those with co-morbidities and then rest all. It seems to be daunting task; we still have a long way to go.

# Emerging strategies for the development of food safety

The backbone of India's economy greatly depends on agriculture. Large numbers of perishable fruits are grown in India like *Banana, Mango, Apple* and *Papaya.* However, most of the post-harvest decay causes huge loss of Indian economy. Perishable fruits with high value of nutrient are wasted, resulting huge gap between the gross production and net availability. In today's world, there is need for safe and consumer friendly strategies to enhanced the shelf life of perishable, to reduce the loses between harvest and consumption, to reuse the perishable waste into value added product so to ensure food safety. The perishable fruits are rich source of vitamins, proteins, minerals and carbohydrate which are essential in human nutrition. Huge amount of bioactive compounds present in them, help in lowering the incidences of disease such as arthritis, heart disease, cancer and brain dysfunction. These are considered as the protective foods and assumed great importance as nutritional security of the people.

Present scenario of consumers demands for high quality and nutritious fruits lead to competitive struggle in market. However, the emerging trends are now focussing towards bioprocessing activity to reuse the perishable fruit waste. Derivation of important secondary metabolite like phenolic compound, flavonoid and antioxidant content from waste of perishable fruits with the use of low temperature storage and UV-C treatment, certainly contribute as promising growth of Pharma logical field and their future prospects. There is huge potential to fulfil the nutritious demand of country's people by exploring more about enhanced production procedure of bioactive compound, in perishable fruit waste.

Jyotishmita Kundu
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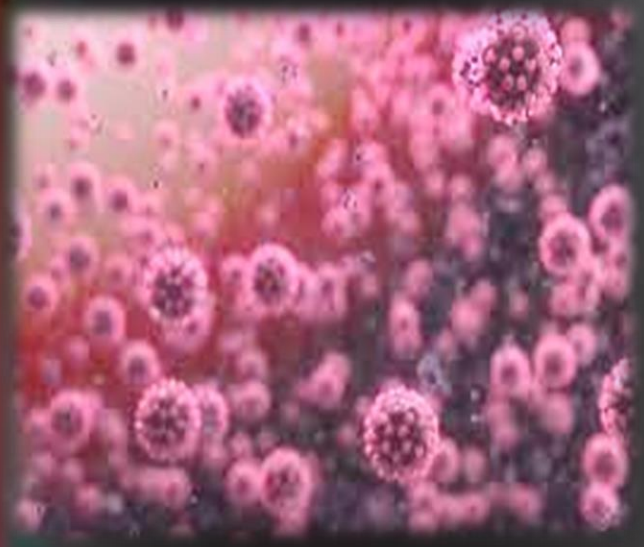
# Coronavirus Myth busting

People, who are not getting affected by virus, are getting affected by myths that have outspread like a forest fire. They are corrupting the mindset of people who later has been terminated by science. Many people started there summers believing that the summer heat will bring an end to novel corona virus. Albeit it has proven that neither snow cold winter nor hot bath can cease it. With the outspread of Covid19 myths also joined the talk of the town. The myths aren't only limited to the temperature killing of the virus, but many other misinformation joined the group of myths.

- Hydroxychloroquine or chloroquine, which came into the limelight, but the truth has been spoken that it mainly focuses upon the treatment for malaria, lupus erythematosus, and rheumatoid arthritis. The data showed that the drug does not reduce the killing of Covid19 patient.

- Prolong use of masks does not cause $O_2$ deficiency or $CO_2$ intoxication. Although it is healthy to change masks at a particular time interval.



- Thermal scanners are only detect people who are suffering from fever, albeit they do no identify the cause of the fever, or that the person is suffering from Covid19.

- Exposing yourself to high temperature will not save from getting affected from corona virus.

WHO has disproven all of them regarding them as just the misinformation from which we all need to maintain social distancing along with Corona Virus.

Ashruti Bhadauriya
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# Phases of vaccine and human challenge trials

**Tanuja Singh Tomar**
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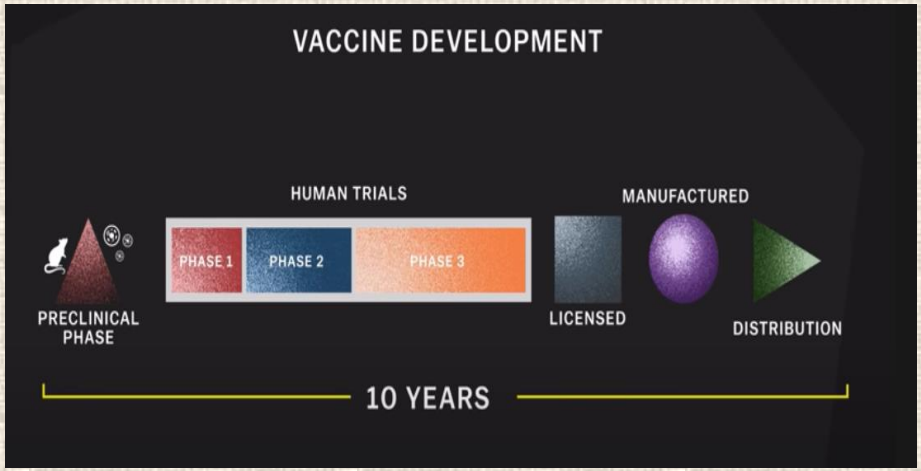
**A** vaccine is a substance used to produce antibodies against one or many diseases. The Exploratory stage includes basic laboratory research, pre-clinical stage includes the use of tissue/cell culture and animal testing then clinical-stage comes which include phase-1, phase-2, phase-3 after all these countries/laboratories review the test result and approved the vaccine and after approval manufacturing of vaccines take place. The most crucial and time taking stage is clinical-stage as it has many subphases in it. In phase-1 a low dose of the drug is given to a very small no. of healthy patients with conditions that vaccine can treat, in phase-2 the potential vaccine is given to several hundreds of patients of different ages to determine vaccine's safety and effects, after phase-2 phase-3 comes. Phase-3 of vaccine trial is like a larger version of phase-2 trial. It involves thousands of people all around the world with different age group, gender with different doses. By a process called randomization used by scientist, some patients are given the real vaccine and some are given placebo to test the effectiveness of treatments, placebo is a substance which has no therapeutic value. Due to the current emergency of the situation of COVID-19 researchers are combining the phases. One other way researchers are using for fast development of COVID-19 vaccine is "Human challenge trial". This study is also called controlled Human infection model (CHIM). In human challenge healthy vaccinated participants are deliberately exposed to the virus to help scientists understand a lot of things like infectious dose, kinetics of immune response, susceptibility of the disease and correlates of protection.

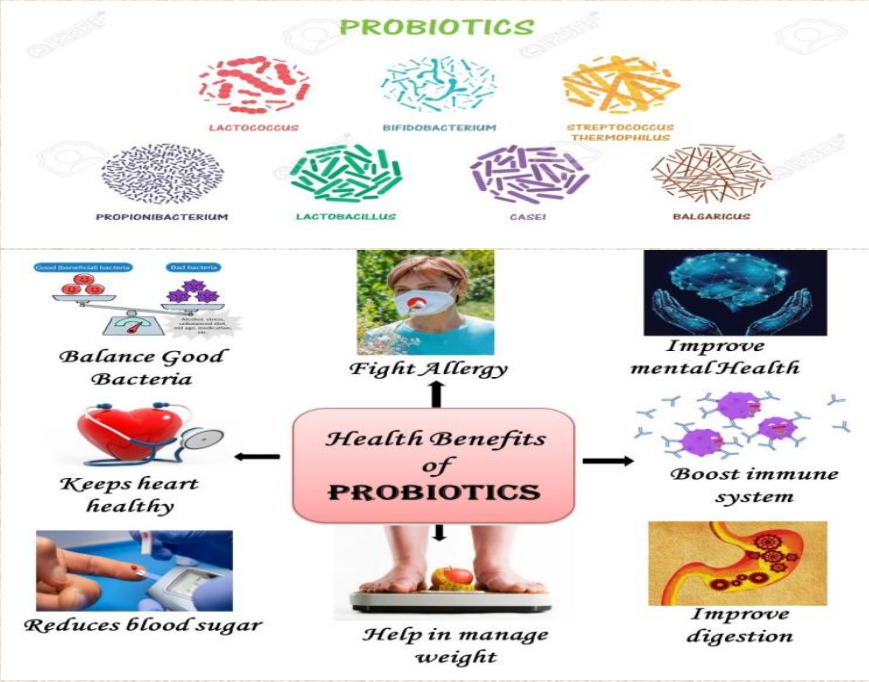
The advantage of human challenge trial (HCT) over animal trial is the speed it offers for identifying a good drug/vaccine. The World Health Organization (WHO) approved HCT's and released their guidelines. National Institute of health (NIH) is also developing viral stains that can be used in human challenge trial. Oxford University is also hoping to do human challenge trial by the end of this year. Some researchers believe that this could possibly remove the need for phase-3 trial on future. On the other hand, it is unethical as no human should be deliberately infected to a virus when there are no existing therapies to treat them and it may prove fatal to the candidate.



# Probiotics and Health Benefits

*Probiotics are living micro-organisms (bacteria) that can help improve your health when taken in the right amounts. Probiotics can be found in supplements and in some fermented foods such as: yoghurt, beyond berry, pre probiotic enhancer, cocobitic milk drinks such as Yakult, sauerkraut, kefir etc.*

Probiotic bacteria have become increasingly popular during the last two decades as a result of the continuously expanding scientific evidence pointing to their beneficial effects on human health. The probiotics are most commonly used in many ways such as foods and drugs scientific research etc. and the probiotics' main important role is the development of the human health. Now, a day's probiotics are classified to uses of human health; the world health organization approved to uses of probiotics in human animals these are generally recognized as safe. Probiotics have been incorporated in various products, mainly fermented foods and its secondary metabolites are used to the development of aquaculture therapeutic applications. The main probiotic groups are *Lactobacillus*, *Bifidobacterium*, *Pediococcus*, *Lactococcus*, *Bacillus* and yeasts strains which are used frequently. Probiotic strains exhibit powerful activity in human health improvement. Probiotics become a greater interest not only in the field of microbiology, but also their role in physiology and its impact on human health during infection.




**The utilization of probiotics has prompted promising outcomes in countless well-designed clinical studies. For example, as a therapeutic option for the treatment, control of various disorders and illnesses like, GIT related diseases, allergy, urogenital infections, inflammatory bowel syndrome, diarrhea and colon cancer. It has become one of the fruit in research area as it can prevent and treat communicable and non-communicable human diseases. It can demonstrate the improvement of health and quality of life. The potential application is in functional foods for better health and nutrition of the society.**

**Dr. Asha Singh**
**Assistant Professor**
**AIB, AUMP Gwalior**

Contributory Article

# Can a COVID-19 recovered patient be reinfected

**'First time a person had a virus that had one sequence and in the second infection, the virus had a slightly different sequence'**

**Dr. Manish Kumar**
**Assistant Professor,**
**Amity Institute of Biotechnology, AUMP**

This is looking unbelievable, but first confirmed case of Covid-19 reinfection was observed by researchers at the University of Hong Kong in the month of August. Some other anecdotal cases of reinfection have been observed, including one from Bengaluru. What was the extent of a case of reinfection confirmed? What are the chances of being infected again after a complete recovery? What it tells for long term immune response to the novel coronavirus which is at the centre of the current epidemic?

Most of the detections that are based on RT-PCR test (the reverse transcription polymerase chain reaction test used to confirm a Covid-19 infection) doesn't allow you to distinguish whether your sample contains a viable virus which is capable of infecting others or it simply contains fragments of viral genetic material without a viable virus. This infection may contain a fragment of viral genome only.

**Therefore it is appearing that the genetic material is responsible for second time infection? Answer is yes.**

Reference: https://qz.com/india/1904636/can-coronavirus-happen-twice-an-indian-virologist-explains/

Questions are surrounding that whether these are same viral agents or some other viral infection? The only way to prove that is to see if the virus the first time and the second time are something different in its genome sequence.

Viruses, as they multiply in people, they acquire small mutations. So it is highly unlikely that a case of reinfection will have exactly the same virus, that it will have exactly the same sequence, around 30,000 nucleotides.

I this pandemic situation, there is no any evidence that says that the variants of SARS COV2 may be different in their penetrance and extent of infection. There is no correlation. As far as we understand, all the virus variants of SARS CoV2 that are circulating are equally capable of causing disease. Now, in some people that disease is asymptomatic or mild. In other cases, the disease is moderate or severe. There is no correlation of this with the viruses with different genome. It is how our body reacts to the virus that makes the infection either mild or severe. It is not a property of the viral variant as far as the studies that have taken place so far show.

Contributory News

# DEVELOPMENT OF A METHOD FOR GENOME EDITING

## NOBEL PRIZE FOR CHEMISTRY 2020

EMMANUELLE CHARPENTIER

JENNIFER A. DOUDNA


The nobel prize in Chemistry 2020 was awarded to two lady scientists, Emmanuelle Charpentier and Jennifer A. Doudna for the development of a method for genome editing. This discovery was possible with the invention of genetic scissors.

Emmanuelle Charpentier and Jennifer A. Doudna have discovered one of gene technology's sharpest tools: the CRISPR/Cas9 genetic scissors. Using these, researchers can change the DNA of animals, plants and microorganisms with extremely high precisions. This technology has had a revolutionary impact on the life sciences, is contributing to new cancer therapies and may make the dream of curing inherited diseases come true. This discovery is an example of interdisciplinary research. "There is enormous power in this genetic tool, which affects us all. It has not only revolutionised basic science, but also resulted in innovative crops and will lead to ground-breaking new medical treatments," says Claes Gustafsson, chair of the Nobel Committee for Chemistry. This tool has contributed to many important discoveries in basic research, and plant researchers have been able to develop crops that withstand mould, pests and drought.

**Manvi sharma**
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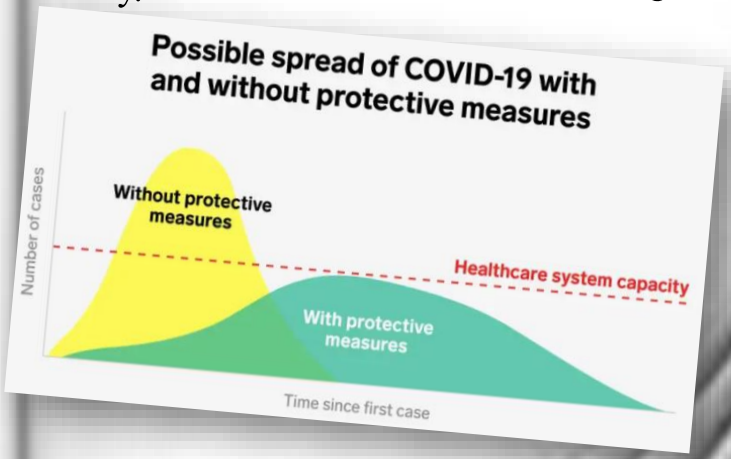
# Social Distancing : common strategy to avoid infections

As we are aware that, there is no approved treatment for the novel coronavirus, therefore prevention becomes an essential component. Some of the deadly features of this virus includes: long incubation period, transmission from asymptomatic people and many more, due to which its prevention becomes difficult. Thus, Social Distancing Measures (SDMs) becomes a good strategy to defeat the virus. Maintaining a distance of 1.5 m between people, can prevent the spread of most respiratory infectious diseases, which are transmitted by air droplets. The droplets produced by coughing or sneezing have a certain transmission distance. By keeping this distance, we can reduce the spread of the virus. Wearing masks, washing hands frequently and disinfecting with alcohol also help to prevent the virus from spreading from one person to another. Although, social distancing can never prevent 100% of transmissions, but this will definitely help us to reduce the spread of this deadly virus.

Thus, the only tool to fight against this pandemic is "Social Distancing". Therefore, at the community level, we all must avoid crowded areas and postpone non-essential travelling. After all, we all have a part to play in keeping others healthy.




**Mitali Khanchandani**
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# *A NOVEL GENE-THERAPY TECHNIQUE*

***"Scientists have developed a new gene-therapy technique by transforming human cells into mass producers of tiny nano-sized particles full of genetic material that has the potential to reverse disease processes."***

**LAKSHYANT DUBEY**
B.Tech Biotech V sem
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This experimental therapy slowed tumor growth and prolonged survival in mice with gliomas, which constitute about 80% of malignant brain tumors in humans. It takes advantage of exosomes, fluid-filled sacs that cells release as a way to communicate with other cells. This new method relies on patented technology that prompts donated human cells such as adult stem cells to spit out millions of exosomes that, after being collected and purified, functions as nanocarriers containing a drug. When they are injected into the bloodstream, they know exactly where in the body to find their target, even if it's in the brain. "They kill two birds with one stone: They fix the leakage to the cell membrane and dump the garbage out, the garbage bag they throw out is the exosome. What's expelled from the cell is the desired drug." The electrical stimulation had a bonus effect of a thousand-fold increase of therapeutic genes in a large number of exosomes released by the cells, a sign that the technology is scalable to produce enough nanoparticles for use in humans. It was tested on glioma brain tumors by delivering a gene called PTEN, a cancer-suppressor gene. Mutations of PTEN that turn off suppression role can allow cancer cells to grow unchecked.

*"They kill two birds with one stone: They fix the leakage to the cell membrane and dump the garbage out, the garbage bag they throw out is the exosome. What's expelled from the cell is the desired drug"*. The electrical stimulation had a bonus effect of a thousand-fold increase of therapeutic genes in a large number of exosomes released by the cells, a sign that the technology is scalable to produce enough nanoparticles for use in humans. It was tested on glioma brain tumors by delivering a gene called PTEN, a cancer-suppressor gene. Each exosome bubble containing messenger RNA is transformed into a nanoparticle ready for transport, with no blood-brain barrier to worry about. "The advantage of this is there is no toxicity, nothing to provoke an immune response," "Exosomes go almost everywhere in the body, including passing the blood-brain barrier. Most drugs can't go to the brain. The testing in mice showed the labeled exosomes were far more likely to travel to the brain tumors and slow their growth compared to substances used as controls, because of exosomes' safe access to the brain. It enables this drug-delivery system a promising technique for future applications in neurological diseases such as Alzheimer's and Parkinson's disease.

# Green Tea: Antiviral and Anti-cancerous

Antitoxin lowers the risk of Cancer, lower blood pressure and reduce the risk of stroke. Helps to stronger teeth and gums, improve memory and reduce inflammatory skin disease. Green tea is consumed throughout the world in many different ways. The year of safe consumption of this beverage has supported the numerous studies showing the health benefits which warrant the general recommendation for regular consumption. Catechins have been reported as potential anti-influenza virus agents in several experimental studies. An in vitro study showed that EGCG, the most abundant catechin in green tea, was shown to minimize the infectivity of the influenza A and B virus in Madin–Darby canine kidney cells. The green tea catechins, in particular, epigallocatechin-3-gallate (EGCG), are known to exert potent antiviral activity.

***Way back to 2737 BC Chinese emperor Accidentally had taken a boiling water with the tea leaves and since then it has been treated as beverage.***

*Tasteless.. I know but then too can we Ignore it's benefit?? Green tea, rather "mistakenly" beverage because it wasn't created.*

**Diksha Katiyar**
**B.Tech Biotechnology V sem**
**Amity Institute of Biotechnology, AUMP**

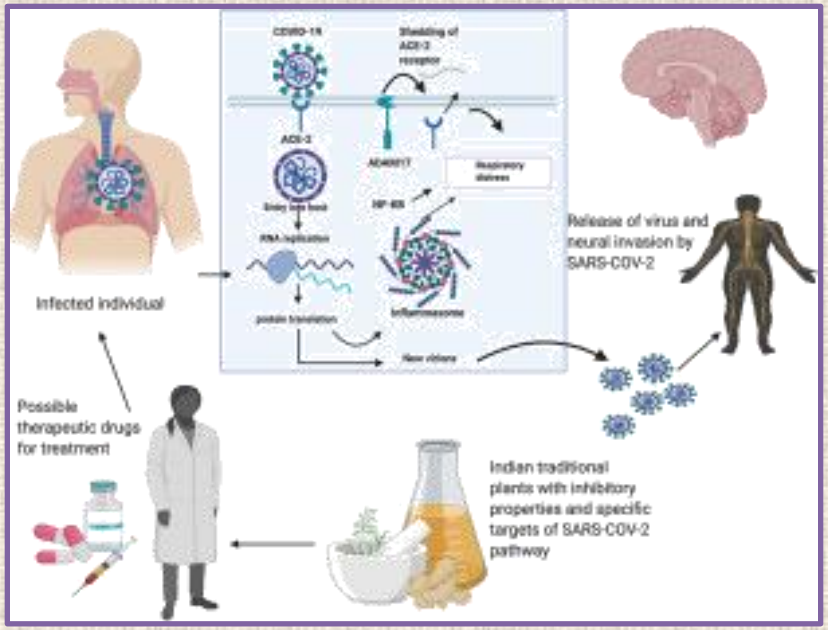
# TRADITIONAL PLANT BASED MEDICINES AND THEIR SYNERGISTIC EFFECTS AGAINST VIRAL DISEASES

**Bioactive compounds obtained from medicinal plants provide numerous opportunities for the development of new drug which are ecofriendly, cost effective and can act as therapeutic by synergistic effect of various compound. Active constituents play an important role as a potential antiviral, antimicrobial, antifungal agent and are considered environmentally safe, pest managing agents. According, to world health organization more than 80% of the world is dependent on traditional medicines for their basic healthcare needs. Several medicines are also recommended for boosting immunity.**

**Phytochemicals with mosquitocidal potential can be used as an alternative in mosquito population control. This will not only prevent diseases but it will also cause less harm to the environment as it is biodegradable and may prevent harmful effects caused due to insecticides such as skin and eye irritation, vomiting, nausea, difficulty in breathing etc. Species of mosquito such as- Anopheles, Culex, and Aedes are vectors for the pathogens of various diseases like malaria, filariasis, Japanese encephalitis, dengue, yellow fever, chikungunya, etc.**

Chloroquine and hydroxychloroquine are structural analogs of quinine. In SARS-CoV-2, hydroxychloroquine in combination with azithromycin, is found to be more effective in reducing the viral load. Similarly, glycyrrhizin, a saponin isolated from the roots of *Glycyrrhiza glabra* has been found to be effective against SARS-CoV by inhibiting viral replication. These compounds can repel, reduce inflammation caused by viruses, uncoat virus, effect different stage of mosquito and can even suppress viral replication.

*Punica granatum* can be used for the treatment of influenza virus and has shown synergistic effect with oseltamivir, essential oil derived from seed of *Apium graveolens* can act as potential irritant, larvicidal, repellent against dengue vector, adulticidal and repellent activities of *Rhinacanthus nasutus* leaf extracts against *Aedes aegypti*, mosquito larvicidal bioassays, repellent activities by *Cymbopogan citrates*, *Erythrina variegata* against *Culex* vector, *Cinchona officinalis* contains quinine (alkaloid) found in bark and has been used in the treatment of malaria since the 1960s.




**Radhika Jhavar**
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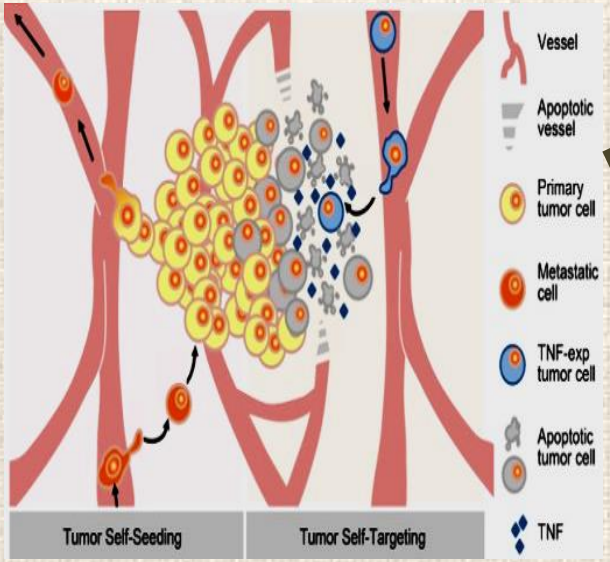
# Cancer cells: genetically engineered to fight their own kind

**Soumi Chattaraj**
**B.Sc. (H) Biotechnology, V Sem**
**Amity Institute of Biotechnology**

Using cancer to fight cancer might seem counterintuitive, but according to proof-of-principle animal experiments reported in Science Translational Medicine, it works says an oncologist of Angelo Corti of Vita-Salute San Raffaele University in Milan, Italy. The same has been validated at Seattle children's research institute, National Cancer Institute, Cambridge University. Cell based therapies hold tremendous promise for delivering therapeutic agents to tumors and may provide treatment options where standard therapy has failed after certain extent.




The new method shows that it is possible to reverse engineer a patient's own cancer cells and use them to treat cancer. Researchers are now negotiating the applicability of this treatment. However it is being claimed that it could be applicable across all cancer cell types. The new approach capitalizes on cancer cells self-homing ability. It is considered a type of process in which cancer cells can track the cells of their own kind that have spread within the same organ or to other parts of the body. Harnessing this power could overcome drug delivery challenges helping to get therapeutics to tumor sites that are otherwise difficult to reach. The team developed and tested 2 techniques to harness the power of cancer cells. The team used mouse models of primary and recurrent brain cancer and breast cancer that has spread to the brain. Direct migration of engineered cells was found to the sites of tumors, indicating they are highly specialized and specific. Further it was reported that it killed recurrent and metastatic cancer in the mice.

# A GREAT STEP IN HISTORY: OXITEC GETS THUMS UP FOR RELEASE OF GM MOSQUITOES IN 2021

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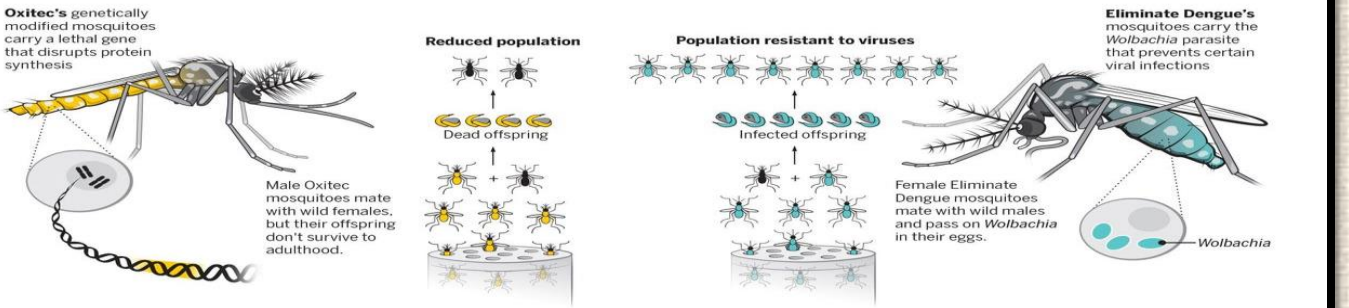
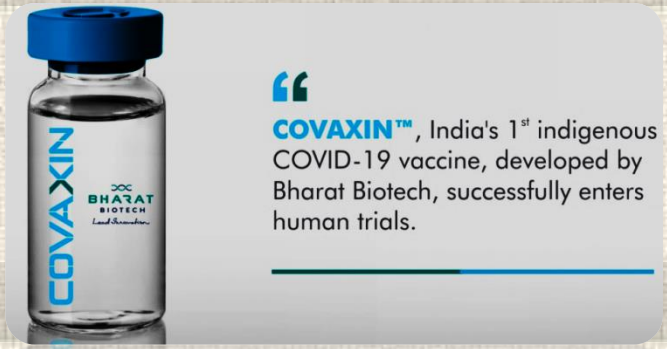
The new mosquito control technology includes a controversial and revolutionary steps in which the genetically modified ***Aedes aegypti*** mosquitoes will be released in the area which, in principle will eradicate the presence of this mosquitoes (vectors of many diseases). Originally from Africa these mosquitoes have become invasive species in nearly all tropical and subtropical regions, and are often called mosquito cockroaches. They will be released in the summer of 2021 in the USA for the first time in Florida and Texas as approved by EPA(Environment Protection Agency). Previous studies carried out in Brazil used ox-513a mosquitoes in the field trials which resulted in the suppression of mosquitoes by more than 70 % during the year, they also tested the ox-5034 mosquitoes and found a suppression of 98 % over 13 weeks that they finalized for use in USA.

Adult mosquitoes are released which then mate in the wild and pass the lethal gene to offspring which die due to unavailability of tetracycline in the environment. With improvement this technology only kills the female mosquitoes. This gene pool lasts 10 generation. There are questions by critics which ask about the risk of evolution of resistant mosquitoes and also the risk of transfer of genes to other organisms. .For further queries one may refer to the document named "Draft Environment Assessment for Investigational Use of Aedes aegypti OX513A". The gene encodes a protein that blocks transcriptional machinery of other genes required for the development of mosquito larvae . Scientist found a way that the mosquitoes can pass this gene to the off springs. The genetically modified larvae are reared in water containing tetracycline so ttav gene cannot effect the growth of larvae into adults. Eggs are injected with a DNA fragment containing self-limiting gene sequence i.e. tetracycline transcriptional activator variant(ttav gene) along with a fluorescent gene as marker.




REFRENCES: oxitech.com,sciencemag.org and www.fda.gov.in

Bharat Biotech is a pioneering biotechnology company known for its world-class R&D and manufacturing capabilities. Bharat Biotech's mission is to deliver affordable, safe and high-quality vaccines and bio-therapeutics that help people prevail over diseases. Bharat Biotech seeks to lead innovation in biotechnology in order to lead the fight against disease with a focus on emerging markets. Bharat Biotech International Limited is an Indian biotechnology company headquartered in Hyderabad, India engaged in the drug discovery, drug development, manufacture of vaccines, bio therapeutics, pharmaceuticals and health care products.




Bharat Biotech has delivered over 3 billion vaccine doses all over the world. EGEN-D® -epidermal growth factor produced from Bharat Biotech for diabetic foot ulcers and burns is a leading product in the wound healing segment. Company's key priority is to solve the health challenges of the developing world therefore this is the first to develop vaccines for viral diseases like Chikungunya and Zika. They have also developed eco-friendly recombinant Hepatitis-B vaccine (free of cesium chloride and Thiomersal); otavirus vaccine from a naturally attenuated strain and Typhoid Conjugate vaccine.

# *Jobs & Opportunities*

**National Institute of Ayurveda Biotech Research Associate Recruitment**
**Age limit:** 35 years
**Eligibility:** M.Sc Biotechnology
**Job post:** Research Associate
**Last date**: 25 Dec 2020

**CSIR-National Botanical Research Institute**
**Job Title: :**Senior Technical Officer
**No of Posts:** 1 **Experience:** fresher
**Eligibility :** B.E./B.Tech (Biotechnology) or M.Sc Biotechnology with 55% marks with experience in plant tissue culture and transformation.
**Location:** Lucknow

**ISKILLS MEDICAL CODING SOLUTIONS**
**Job Title:** Medical Coder
**No of vacancy:** 300
**Experience:** providers need efficient Medical Coders
**Eligibility**: B.Sc |B.Tech/B.E | B. Pharma , Biomedical, Biotechnology, Bioinformatics, Microbiology, Advanced zoology,
**https://iskillssolutions.com/index.php/careers/**

**Freshers Novozymes Biotech & Biochem**
**Job Title**: Quality Analyst
**Location**: Mumbai
**Eligibility :** M. Sc (biochemistry)/ B.Tech ( biotechnology).
**https://www.novozymes.com/en/careers/jobs/5926_2057_1682227**

**Pall Corporation**
**Job Title:** Biotech Specialist
**Location** Hyderabad, Telangana, India
**Eligibility**: B.Sc |B.Tech/B.Sc./M.Sc./M.tech , Bio technology
**https://www.pall.com/en/careers.html**

# Students' Achievements

| | | |
|---|---|---|
| **Radhika Jhavar**<br>**B.Tech Biotech V sem** | **CSIR-Summer Research Training Program (CSIR-SRTP-2020):**<br>**Awarded by CSIR-NEIST, Jorhat** |  |
| **Shivangi Bansal**<br>**B.Tech Biotech V sem** | **CSIR-Summer Research Training Program (CSIR-SRTP-2020) :**<br>**Awarded by CSIR-IITR, Lucknow** |  |
| **Bristhi Das**<br>**B.Sc.( H) Biotech V sem** | **CSIR-Summer Research Training Program (CSIR-SRTP-2020):**<br>**Awarded by CSIR-CFTRI, Mysuru** |  |
| **Divleen kaur sachdeva**<br>**B.Sc.( H) Biotech V sem** | **CSIR-Summer Research Training Program (CSIR-SRTP-2020):**<br>**Awarded by CSIR-NEIST, Jorhat** |  |
| **Manglam Soni**<br>**B.Sc.( H) Biotech, V sem** | **CSIR-Summer Research Training Program (CSIR-SRTP-2020):**<br>**CSIR-NEIST, Jorhat** |  |
| **Mitali Kanchandani**<br>**B.Tech Biotech V sem** | **CSIR-Summer Research Training Program (CSIR-SRTP-2020):**<br>**CSIR-NEIST, Jorhat** |  |

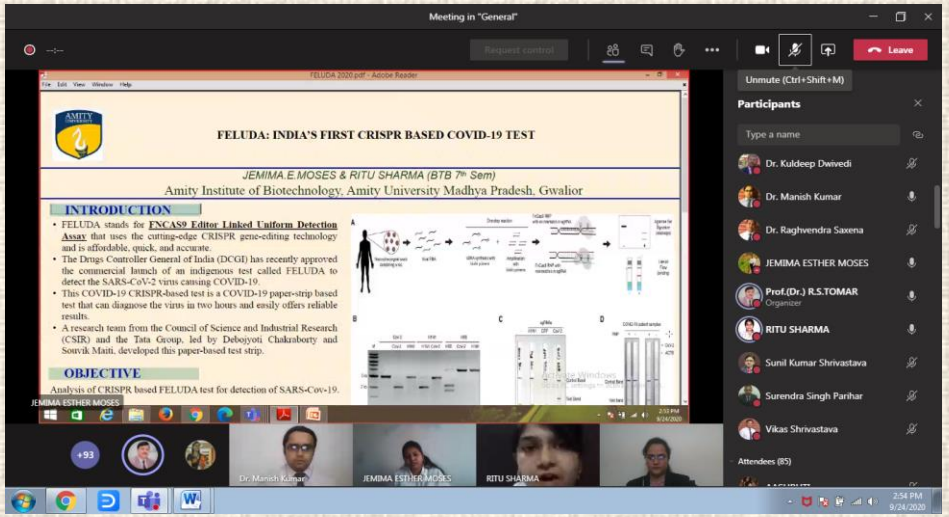
**Tanya Tomar**
**B.Sc Biotech I sem**
**AIB, AUMP**

**Second Runner Up in Photography Competition organised by Amity School of Architecture & Planning and Amity School of Communication during innovation week.**

# AIB Events

## E-poster competition organized by AIB

**(INNOVATION WEEK: Sept 2020)**


Pihu Sharma
B.Tech Biotech III sem

First Prize Winner
[ E-poster competition ]

Ritu Sharma and
Jemima Esther Moses
B.Tech Biotech VII sem

Second Prize Winner
[ E-poster competition ]

Tanuja Singh Tomar (B.Tech Biotech III sem) &
Sharon Francis and Vanshika Kumari
B.Sc.( H) Biotech III sem

Third Prize Winner
[ E-poster competition ]

# Students of AIB cleared All India graduate aptitude test-Biotechnology (GAT-B)2020

सत्यमेव जयते

**GAT-B 2020 RANK CARD**
**REGIONAL CENTRE OF BIOTECHNOLOGY**
DEPARTMENT OF BIOTECHNOLOGY
Ministry of Science & Technology, Government of India

**GRADUATE APTITUDE TEST - BIOTECHNOLOGY (GAT-B) 2020**

United Nations Educational, Scientific and Cultural Organization · Regional Centre for Biotechnology

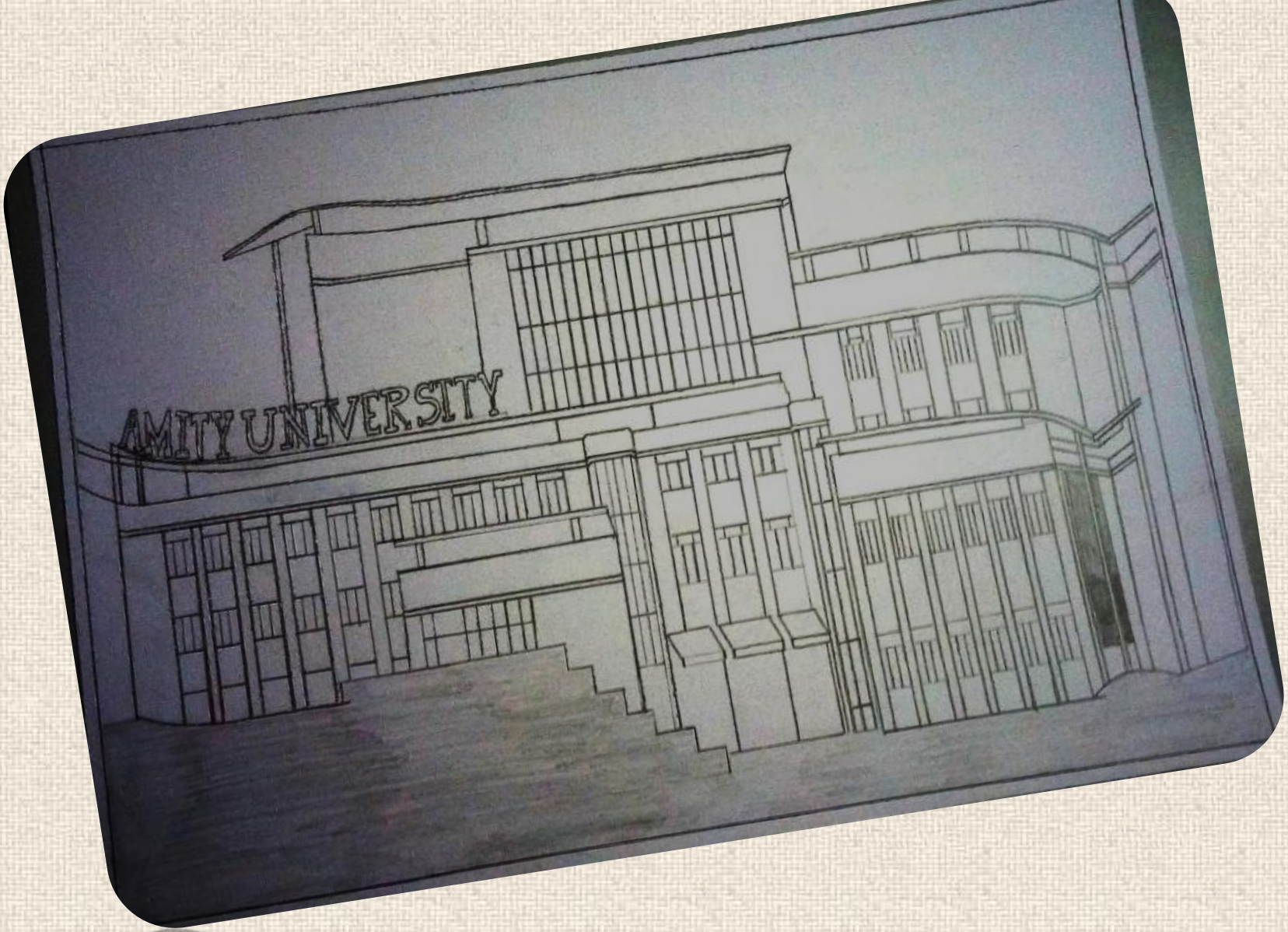
**Abhilash Srivastava**
**B.Sc (H) Biotechnology**
**(2017-2020)**
**Rank: UR-151**

**Shweta Bharadwaj**
**B.Sc (H) Biotechnology**
**(2017-2020)**
**Rank: UR-78**

**Gifty Mammen**
**B.Sc (H) Biotechnology**
**(2017-2020)**
**Rank: UR-142**

**Divleen Kaur Sachdeva**
**B.Sc (H) Biotechnology, V sem**
**(Received II prize in state level lockdown diary contest-2020)**

**STATE LEVEL LOCKDOWN DIARY CONTEST-2020**
Organised by
Department of Biotechnology
SANT HIRDARAM GIRLS COLLEGE, BHOPAL
In association with
MICROBIOLOGISTS SOCIETY, INDIA, M.P. STATE CHAPTER




**By: Gargi Shrivastava**
**M.Sc. Biotechnology I sem**
**Amity Institute of Biotechnology**