Prime College of Pharmacy, Prime Nagar, Erattayal, Near Govt Poly Technic,
Kodumbu (PO), Palakkad Pin - 678551, Kerala.

• www.primecollegeofpharmacy.com, • primecollegeofpharmacy@gmail.com
• 0491-2571117, 2570040, 9744977000

Volume : 7, Issue: Dec 2022

Prime College of Pharmacy

Approved by PCI, & Govt of Kerala Affiliated to Kerala University of Health Sciences,Thrissur & Directorate of Medical Education, Thiruvananthapuram.

Prime Pharma
Newsletter June 2022

INTRUIZION

THE INSIGHT

Enter to Learn || Exit to Serve

COURSES OFFERED

- M. PHARMACY - PHARMACEUTICS - 4 semesters (Master of Pharmacy)
- M. PHARMACY - PHARMACEUTICAL CHEMISTRY - 4 semesters (Master of Pharmacy)
- B. PHARMACY - 8 semesters - (Bachelor of Pharmacy)
- D. PHARMACY - 2 years (Diploma in Pharmacy)

Applications of Artificial Intelligence in the Pharmaceutical Industry

AI can be implemented in almost every aspect of the pharmaceutical industry, right from drug discovery and development to manufacturing and marketing. By leveraging and implementing AI systems in the core workflows, pharma companies can make all business operations efficient, cost-effective, and hassle-free. The best part is that since AI systems are designed to deliver better outcomes as they continually learn from new data and experience, they can be a powerful tool in the research and development wing of the pharmaceutical industry.

Some of the most mention-worthy applications of Artificial Intelligence in the pharmaceutical industry:

1. R&D

Pharma companies around the world are leveraging advanced ML algorithms and AI-powered tools to streamline the drug discovery process. These tools are designed to identify intricate patterns in large datasets.

2.Drug Development

AI holds the potential to improve the R&D process. From designing and identifying new molecules to target-based drug validation and discoveries.

3.Diagnosis

Doctors can use advanced Machine Learning systems to collect, process, and analyze vast volumes of patients' healthcare data.They use ML technology to store sensitive patient data securely in the cloud or a centralized storage system. This is known as electronic medical records (EMRs).

4. Disease prevention

Pharma companies can use AI to develop cures for both known diseases like Alzheimer's and Parkinson's and rare diseases.

5. Epidemic prediction

AI and ML are already used by many pharma companies and healthcare providers to monitor and forecast epidemic outbreaks across the globe. These technologies feed on the data gathered from disparate sources in the Web, study the connection of various geological, environmental, and biological factors on the health of the population of different geographical locations.

Mrs. Greeshma S,
Asst. Prof.

BIOFILM

What is a biofilm?

Accumulations of microorganisms of mono- or poly-microbial aggregates are commonly referred to as a biofilm and can consist of diverse communities of bacteria and fungi. The close proximity of the microorganisms enables substrate exchange, distribution of metabolic products and removal of toxic end products so that the different species can support each other. The structure of biofilm communities can protect the bacteria within them from attack by antimicrobials, shear forces and the immune system.

How is it formed?

The initial contact of the moving planktonic bacteria with the surface is the starting point, which is still reversible at this stage. The bacteria will then start to form a monolayer and will produce an extracellular matrix or "slime" for protection. The matrix consists of extracellular polysaccharides, structural proteins, cell debris and nucleic acids; referred to as extracellular polymeric substances (EPS). The initial steps of the matrix formation are dominated by extracellular DNA (eDNA), whereas polysaccharides and structural proteins take over later on. In these stages, the formation of microcolonies takes place, which exhibit significant growth and cell-cell communication such as quorum sensing. The biofilm grows in a three-dimensional manner and the attachment is now irreversible. In the last stage, some cells of the mature biofilm start to detach and disperse into the environment as planktonic cells again to potentially start a new cycle of biofilm formation.

The role of biofilms in pathogenesis

Biofilms of commensal bacteria such as Staphylococcus epidermidis, which can impede the colonisation of potentially pathogenic bacteria through the stimulation of host-cell immune defences and the prevention of adhesion.

Future directions

Owing to increasing antimicrobial resistance, the focus is shifting from targeting bacterial growth that causes cell death or dormancy, towards novel approaches.

Mrs.D.Deborah Evangeline,
Assoc. Prof.

ANTI DRUG CAMPAIGN-SPARSHAM

NSS unit of Prime College of pharmacy has organized an anti-drug campaign entitled SPARSHAM 2021-22 in collaboration with the Excise department, Govt of Kerala on 24.3.2022. The program conducted in the auditorium at 2 PM was began with the prayer song and Mrs. Aiswarya AT, Assistant professor, Prime college of Pharmacy welcomed the gathering. Prof Dr N L Gowrishankar, Principal, Prime college of Pharmacy delivered the presidential address. The program was officially inaugurated by Shri. P K Satheesh, Excise Circle Inspector, Excise circle office, Palakkad and delivered a detailed seminar on" Drug addiction and its consequences". The Anti-drug campaign was felicitated by Shri N Srinivasan, Excise inspector, Excise range office, Palakkad. Thereafter the students took a pledge against drug abuse administered by Shri Abhilash K, Civil Excise officer, Excise range office, Palakkad. Ms. Naeema, IInd semester B.Pharm student delivered the vote of thanks and the campaign was ended up with National Anthem.

WORLD HEALTH DAY 2022- ESSAY WRITING COMPETITION

Kerala Pharmacy Graduates Association (KPGA) jointly with IPGAhas organized an Essay Writing Competition for Pharmacy students as a part of observance of World Health Day with the theme "Our Planet, Our Health". The preliminary round competitions was conducted in our college on 30-03 2022. The students from our college has actively participated in the competition. The topic for essay was "IMPACT OF PHARMACEUTICAL WASTE ON GLOBAL HEALTH". The best two essays was selected and sent for the final level competition.

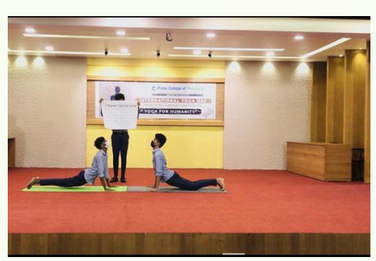
WORLD ENVIRONMENT DAY 2022

As a part of World Environment day 2022 NSS unit MP032 A -126 of Prime College of Pharmacy B.Pharmacy students actively involved themselves in planting the saplings. Mrs . Aiswarya A.T , Assistant professor, Prime College of Pharmacy welcomed the gathering. The programme was officially inaugurated by Prof. Dr. N. L. Gowrishankar, Principal , Prime College of Pharmacy by planting saplings. First year B.Pharm students have organized various cultural activities based on the theme "Only One Earth". Mrs Sumathy.A Associate professor, Prime College of Pharmacy delivered the vote of thanks and the programme was ended up with National Anthem.



INTERNATIONAL YOGA DAY 2022

Prime College of Pharmacy has organized International Yoga day 2022 on 21 June 2022, Tuesday in the college auditorium based on the theme “Yoga for Humanity”. Our students actively participated in the programme with great enthusiasm. Mrs. A. Sumathy, Associate Professor welcomed the gathering. Our Principal Dr. N. L. Gowrishankar inaugurated the programme speaking about the importance of yoga in life. First semester B. Pharm students has given an informational talk on yoga. They performed yoga dance and tableau based on the theme of this year “Yoga for Humanity”. A quiz was conducted in accordance with yoga day and prizes were distributed to the winners. A 15 minutes yoga session was conducted for the students emphasizing the physical and mental strength by doing different yogasanas. The vote of thanks was delivered by Mrs. Greeshma. S, Assistant Professor. The programme ended with National Anthem.

Antibiotic-resistant MRSA strain can jump from pigs to humans: Study

The strain, called CC398, has been associated with increasing numbers of human infections, in people who have and have not had direct contact with livestock. A highly antibiotic-resistant strain of the superbug, methicillin resistance aureus, or MRSA, which emerged in pigs in the last 50 years, has the potential to spread to humans, finds a new study. MRSA was first identified in human patients in 1960. Due to its resistance to antibiotics it is much harder to treat than other bacterial infections. The World Health Organisation now considers MRSA one of the world's greatest threats to human health. MRSA, which originated probably due to widespread antibiotic use in pig farming doesn't cause disease in pigs.

Mr. D. ranjith Kumar,
Assoc. Prof.

New revelations from monkeypox outbreak study

A review of 185 cases by British Journal of Dermatology found that the main features of the current outbreak differ from past cases. The research, conducted by categorised key features of the current monkeypox outbreak. The 185 cases studied represent 9% of those reported to the Spanish national surveillance system by 11 July 2022.
While fever and lymph node swelling remained common in this current outbreak, cases tended to feature few skin lesions, sometimes appearing only in a single area with most starting on the genitals, face, arms, hands and perianal area.
Other skin symptoms include ulcers where the pseudo-pustules meet the moist, inner linings of body cavities such as the nose, mouth, or genital areas, also known as mucous membranes. These mucosal ulcers can be the most common lesions in certain cases.

Mrs. Sangeetha. R
Asst. Prof.

US FDA authorises Bavarian Nordic’s Jynneos for emergency use against monkeypox

FDA authorised Bavarian Nordic’s Jynneos vaccine for emergency use via intradermal injection in individuals aged 18 years and older who are determined to be at high risk for monkeypox infection.
The authorisation will increase the total number of doses available for use by up to five-fold and also allows for use of the vaccine in individuals younger than 18 years of age determined to be at high risk of monkeypox infection by subcutaneous injection.
“In recent weeks, the monkeypox virus has continued to spread at a rate that has made it clear our current vaccine supply will not meet the current demand,” said Robert M Califf, Commissioner, FDA

Ms. Anjana . V. S,
Asst. Prof.

Scientists create long-acting injectable drug delivery system for tuberculosis

In 2020, more than 1.5 million people around the world died of tuberculosis, marking the first time in more than a decade that annual TB deaths had increased and demonstrating the global need for better access to treatments. To address that problem, scientists at the UNC School of Medicine, the UNC Institute for Global Health and Infectious Diseases, & the ICATS developed a long-acting injectable formulation of the anti-TB drug rifabutin.
The animal models showed the potential of delivering a TB drug with one injection that lasts at least four months. Not adhering to strict drug regimens can lead to treatment failure and drug resistance. To overcome this, UNC researchers sought to create a therapeutic delivery system that would provide an effective way to improve adherence to medications.
This long-acting formulation prevented infection in mice that were exposed to TB. Also, the single injection cleared infection from lungs and other tissues in mice that had been previously infected with TB.

Mrs. Jyothi S,
Asst. Prof.

Iron deficiency leads to AMD (Aortic media degeneration)

Aortic dissection (AD) is a macro vascular disease which is pathologically characterized by aortic media degeneration (AMD). Aortic dissection (AD) is a catastrophic aortic disease with an extremely high mortality rate with a 1–2 % increase in mortality per hour within 24 h. Aortic media degeneration (AMD), characterized both by the cytoskeleton destruction and dysfunction of aortic smooth muscle cells (ASMCs) and phenotypic switching and apoptosis, is considered to be the specific condition that favors the development of AD. Disorders of trace element metabolism have been reported to cause abnormal structure and function of organs or tissues of the body. As one of the essential trace elements for organisms, iron participates in the biosynthesis and activity of many important proteins and enzymes such as hemoglobin, cytochrome and peroxidase. Ferrous-proteins are essential for biological activities, such as oxygen transportation, mitochondrial respiration, intermediate product and derivative metabolism, nucleic acid replication and repair, cell defense and cell signaling.

Endoplasmic reticulum (ER) is the site of lipid and sterol synthesis, protein synthesis and folding, and post-translational modification. Environmental damage, oxidative stress and insufficient energy supply will cause unfolded protein response (UPR) in the ER cavity and induce ER stress. The ER stress can reduce the synthesis of proteins in the ER and increase the correct folding of proteins, but the excessive ER stress will trigger the apoptotic signal in the cell and promote cell apoptosis. When ER stress occurs, UPR will activate its typical signaling pathways. These signaling pathways are divided into three categories according to their different effectors on the ER membrane, namely RNA-dependent protein kinase-like ER kinase (PERK) and inositol-requiring enzyme 1 (IRE1) and activating transcription factor 6 (ATF6). This article tells that the Iron deficiency promotes aortic media degeneration by activating endoplasmic reticulum stress-mediated IRE1 signaling pathway.

Mrs. Pradeepa Prason,
Assoc. Prof.

NUS study provides evidence of the cytotoxic effect of black cardamom on lung cancer cells

The main challenges associated with existing lung cancer drugs are severe side effects and drug resistance. In Indian Ayurvedic medicine, black cardamom has been used in formulations to treat cancer and lung conditions. A team of researchers from the NUS Faculty of Science, studied the scientific basis behind this traditional medicinal practice and provided evidence of the cytotoxic effect of black cardamom on lung cancer cells. The research highlighted the spice as a source of potent bioactives, such as cardamonin and alpinetin, which could be used in the treatment or prevention of lung cancer. The study is the first to report the association of black cardamom extract with oxidative stress induction in lung cancer cells, and compare the spice's effects on lung, breast and liver cancer cells. The findings could potentially lead to the discovery of safe and effective new bioactives which can prevent or cure cancer formation.

Delving into the science behind Ayurveda

Black cardamom is typically used in Asian households in rice preparations, curries and stews. The spice is also prescribed in Indian Ayurvedic medicine in powder form where it is used for conditions such as cough, lung congestion, pulmonary tuberculosis, and throat diseases.

In the NUS study, black cardamom fruits were powdered and extracted with five types of solvents, including organic solvents and water and the extracts were then tested for their cytotoxicity against several types of cancer cells. These included cancer cells from the lung, liver and breast. Among the three types of cells, lung cancer cells were least likely to survive when tested with the black cardamom extracts. The sequential extraction method using hexane followed bydichloromethane produced a black cardamom extract that was most effective against lung cancer cells. Dichloromethane extract treated cells were found to be killed mainly by apoptotic pathway where the measure of live cells, dropped to less than an average of about20%after48 hours of contact with the black cardamom extracted using dichloromethane.

Mrs. Ancey Abraham
Asst. Prof.

INDUSTRIAL VISIT

LABINDUSS PVT LTD

Prime College of Pharmacy had successfully organized an industrial visit for M. Pharm and Eight semester B. Pharmacy students (2017-21 Batch) with staff coordinator Mr. A Mohamed Harish and visited Labinduss Pvt Ltd in Industrial development area, Kanjikode, Palakkad. The company Labinduss Private limited started its journey in 1984 to provide quality medicines that can be afforded even in the weakest section of the society. Labinduss has continuously improved its manufacturing facility to provide medicines with international standards. Labinduss has facilities for oral liquid section ,External products. The manufacturing facility as per the WHO-GMP standards laid out by the central governing authority. R & D department has got a top of the class lab scale manufacturing facility for trial and development purposes. The aim of the industrial visit is to help the students to explore the various manufacturing techniques involved in the Pharmaceutical industry and also to understand the various roles and responsibilities of the pharmacist in the manufacturing industry. It also makes the students to interact with the Production Manager and understand the working methods and SOP'S.

IMAGE (INDIAN MEDICAL ASSOCIATION GOES ECOFRIENDLY)

Prime college of pharmacy had successfully organized a Industrial visit for first year D. Pharm Students (2021 batch) with staff coordinator Mrs.Sruthi.T.P and Placement in charge Mr.A.Mohamed Harish and visited the IMAGE CBWTF, Common Bio medical waste treatment facility to understand the basic concept, construction and mechanism of working in bio medical waste treatment. IMAGE (Indian Medical Association Goes Ecofriendly) is a bio medical waste treatment plant and disposal project of the Indian medical association. They collect all the biomedical waste from the hospitals, clinics, pharmacies etc., from the entire Kerala This field visit is mainly focused based on the new regulation of D. Pharm (ER-2020) for the subject Social Pharmacy. It was very useful to the students and they understood the practical knowledge about the collection and bio medical waste disposal management process of yellow waste, red waste, glass wares, expiry drugs.

PRIME PHARMA PLACEMENT DRIVE 2022

NOUVEAU MEDICAMENT PRIVATE LIMITED

A Campus Placement Drive was conducted by Nouveau Medicament Private Limited on 19th April 2022 at Prime College of Pharmacy. Mr. Sudarshan, Regional Manager Nouveau Medicament Private Limited carried out the interview. The placement was for the post of Medical representative and the interview proceeded through various stages. The Placement drive started with a Prayer song and the welcome address was delivered by Prof. Dr. N. L. Gowrishankar, Principal, Prime College of Pharmacy Four Students who showed excellence and greater interest in the field were selected based on their performance in the interview.




APOLLO PHARMACY

Apollo Pharmacy conducted a Campus Placement Drive on 19th April 2022 at Prime College of Pharmacy. Mr. Sreejith, Assistant Manager, HR, Apollo Pharmacy Division led the placement. The placement progressed with various levels of interview for the post of Pharmacists and Clinical Pharmacists. The programme started with a Prayer song followed by welcome address by Prof. Dr. N. L. Gowrishankar, Principal, Prime College of Pharmacy. Our students participated with full enthusiasm and 32 students got placed. Shortlisted students were sent for next level of technical interview.




DR. REDDY'S

Dr.Reddy's conducted a Campus Placement Drive on 28th April 2022 at Prime College of Pharmacy. Mr. Kutty Krishnan Regional Manager, Dr Reddy's lead the placement. The placement progressed with various levels of interview for the post of Territory Manager . The programme started with a Prayer song followed by welcome address by Prof. Dr. N. L. Gowrishankar, Principal, Prime College of Pharmacy. Our students participated with full enthusiasm and Shortlisted students were sent for next level of technical interview.



AMVUTTRA

AMVUTTRA is a transthyretin-directed small interfering RNA indicated for the treatment of the polyneuropathy of hereditary transthyretin-mediated amyloidosis in adults. AMVUTTRA contains vutrisiran, a chemically modified double-stranded small interfering ribonucleic acid (siRNA) that targets mutant and wild-type transthyretin (TTR) messenger RNA (mRNA) and is covalently linked to a ligand containing three N-acetylgalactosamine (GalNAc) residues to enable the delivery of the siRNA to hepatocytes. This game-changer drug in the treatment of polyneuropathy of hereditary transthyretin-mediated amyloidosis was approved by US FDA on 13 June 2022.

Chemistry of AMVUTTRA

The molecular formula of vutrisiran sodium is C530H672F9N171Na430323P43S6 with a molecular weight of 17,290 Da. AMVUTTRA is supplied as a sterile, preservative-free, clear, colorless-to-yellow solution for subcutaneous injection. Each 0.5 mL of solution contains 25 mg of vutrisiran (equivalent to 26.5 mg vutrisiran sodium), 0.2 mg sodium phosphate monobasic dihydrate, 0.7 mg sodium phosphate dibasic dihydrate, 3.2 mg sodium chloride, water for injection, and sodium hydroxide and/or phosphoric acid to adjust the pH to ~7.

Mechanism of Action

Vutrisiran is a double-stranded siRNA-GalNAc conjugate that causes the degradation of mutant and wild-type TTR mRNA through RNA interference, which results in a reduction of serum TTR protein and TTR protein deposits in tissues.

Dosage and Administration

The recommended dosage of AMVUTTRA is 25 mg administered by subcutaneous injection once every 3 months. AMVUTTRA is for subcutaneous use only and should be administered by a healthcare professional.

Dosage Forms and Strengths

Injection: 25 mg/0.5 mL in a single-dose prefilled syringe

Indications and Usage

AMVUTTRA is indicated for the treatment of the polyneuropathy of hereditary transthyretin-mediated amyloidosis in adults

Mrs. Sumathy A
Assoc. Prof.

Know about you and your hormone
Role of melatonin in human sleep

What Is Melatonin?

Melatonin is a hormone produced by the pineal gland in your brain. It's primarily responsible for regulating your body's circadian rhythm to manage your natural sleep cycle .Therefore; it's often used as a sleep aid to combat issues like insomnia. It's widely available in the US and Australia as an over-the-counter medication but requires a prescription in other parts of the world, such as Europe. In addition to improving sleep, melatonin is also involved in managing immune function, blood pressure and cortisol levels.

Can Support Better Sleep

Melatonin is often called the sleep hormone — and for good reason. It's one of the most popular sleep aids and a common natural remedy to treat issues like insomnia. Melatonin can support better sleep. One study in 50 people with insomnia showed that taking melatonin two hours before bed helped people fall asleep faster and enhanced overall sleep quality

Could Reduce Symptoms of Seasonal Depression

Seasonal affective disorder (SAD), also called seasonal depression, is a common condition that is estimated to affect up to 10% of the population worldwide. Some research indicates that melatonin plays a role in regulating circadian rhythm, low doses are often used to decrease symptoms of seasonal depression. Alterations in circadian rhythm were shown to contribute to seasonal depression, but taking melatonin capsules daily was effective at reducing symptoms

May Help Treat GERD

Gastro esophageal reflux disease (GERD) is a condition caused by the backflow of stomach acid into the esophagus, resulting in symptoms like heartburn nausea and belching Melatonin has been shown to block the secretion of stomach acids. It also decreases the production of nitric oxide, a compound that relaxes your lower esophageal sphincter, allowing stomach acid to enter your esophagus For this reason, melatonin may be used to treat heartburn and GERD. Taking melatonin alone or with omeprazole was effective at relieving heartburn and discomfort

Dr. T. Sengottuvel
Assoc. Prof.

Bharat Biotech expects regulator's nod for intranasal COVID-19 vaccine in August

Bharat Biotech, which is working on an intranasal COVID-19 vaccine candidate is hopeful of getting regulatory licenses this month, if all goes well, Chairman and Managing Director of BBIL, Krishna Ella said. He also has said BBIL (Bharat Biotech International Limited), which has a vaccine manufacturing plant in Ankleshwar in Gujarat is one of the two plants in the world to manufacture vaccine for monkeypox. The other one is in Bavarian Nordic, Germany.

"We will be applying for licenses and (they) should come. If everything goes well, we know by next month (August). You (people) would rather get the coronavirus nasal vaccine and if any variant comes it is easy to plug in quickly and move fast. So we are optimistic that both injectable and nasal strategy will work protecting people's lives in the future, any variant comes also we can handle," he said in a recently held event. Ella said the firm completed clinical trials of the nasal vaccine with about 4,000 volunteers and there is no single instance of side effect or adverse reaction reported so far. The Drug Controller General of India gave its nod to conduct clinical trials for BBIL's intranasal vaccine as booster dose.

Separately, the DCGI also granted permission to the firm to conduct phase-3 clinical trial to compare the immunogenecity and safety of BBV-154 (intranasal) with Covaxin. This trial has been permitted to be conducted at nine sites.

Justifying the reason for a nasal vaccine for coronavirus, he said any injectable vaccine only protects the lower level (of the body). That's why people who were vaccinated with injectable vaccines may still get RT-PCR positive, whereas the nasal jab gives protection to the whole body.

Replying to a query, he predicted that the country may face higher hospitalisations with the emerging coronavirus variant BA.5 as the new form may "evade the vaccine".

Mr. Mohamed Harish. A
Asst. Prof.

Key blood clotting protein could be ‘warning light’ for COVID-19 cases

University of Aberdeen team suggest results indicate that protein PAI-1 could be an early indicator of severe COVID-19

A protein that could be an early indicator of severe COVID-19 has been identified by scientists at the University of Aberdeen.

Patients who get seriously ill following a COVID-19 infection frequently show evidence of a severe form of lung disease and in around 30% of patients blood clots are evident. Blood clots arise due to deposits of fibrin within the lung contributing to pneumonia and respiratory distress. These fibrin deposits restrict the amount of oxygen absorbed into the lung.

Patients with severe disease require oxygen support, which in very severe cases requires mechanical ventilation. In addition, blood clots are found throughout the body of those that are severely ill in both small and large vessels, frequently leading to deep vein thrombosis, stroke and other thrombotic complications. Analysed profiles of 113 patients hospitalised in Aberdeen with severe COVID-19, 24 patients with non-COVID-19 respiratory infection and a control group with no symptoms.

Patients with COVID-19 had significantly higher levels of a protein called PAI-1 – plasminogen activator inhibitor 1 – compared to those with non-COVID-19 respiratory infections and those with no infection at all.The study results indicate that PAI-1 could be a potential early indicator of severe COVID-19 outcome. Furthermore, the results from the group indicate that an existing clot-busting drug, Tenecteplase, could be used to treat the condition.

Professor Nicola Mutch, from the University of Aberdeen, explained: “Our challenge is to understand why patients with severe cases of COVID-19 are so prone to the development of these clots in big and small blood vessels throughout the body. In this study we have identified PAI-1 as a key protein involved in the persistence of blood clots in severe COVID-19 disease. PAI-1 is associated with a poorer outcome in patients.”

Mr. Shyam S Kumar
Assoc. Prof.

New needle-free nasal vaccine shows promise for COVID-19

New research shows that a needle-free mucosal bacteriophage (phage) T4-based COVID-19 vaccine is effective against SARS-CoV-2 infection.

In recent years, the Food and Drug Administration authorized mRNA- and adenovirus-based SARS-CoV-2 vaccines. These vaccines are intramuscularly injected in 2 or more doses and are effective in preventing COVID-19, but they do not induce efficient mucosal immunity or prevent viral transmission. In experiments conducted in mice, intranasal administration of 2 doses of the phage T4-COVID-19 vaccine 21-days apart induced robust mucosal immunity, in addition to strong systemic humoral and cellular immune responses. The intranasal vaccine induced broad virus neutralization antibody titers against multiple variants and triggered Th1-biased cytokine responses, strong CD4+ and CD8+ T cell immunity, and high secretory IgA titers in sera and bronchoalveolar lavage of vaccinated mice. All these responses were much stronger in intranasally vaccinated mice than that induced by the injected vaccine. Furthermore, the nasal vaccine provided complete protection and sterilizing immunity against the mouse-adapted SARS-CoV-2 MA10 strain, the ancestral WA-1/2020 strain, and the most lethal Delta variant in mouse models. The T4-COVID-19 vaccine elicited broad virus-neutralizing antibodies against SARS-CoV-2 variants in sera and bronchoalveolar lavage, did not affect the gut microbiota, exhibited minimal lung lesions in vaccinated and challenged mice and is stable at ambient temperature "This intranasally administered vaccine generates superior mucosal immunity in mice in addition to inducing robust humoral and cell-mediated immune responses, and provides complete protection and sterilizing immunity against SARS-CoV-2 variants. It is a strategically important next-generation COVID-19 vaccine for ending this pandemic," "This modular, needle-free, phage T4 mucosal vaccine delivery platform is an excellent candidate to design efficacious mucosal vaccines against other respiratory infections and for emergency preparedness against emerging epidemic and pandemic pathogens."

Ms. Athira T R
Asst. Prof.

The Holy Grail of new drug development

The announcement by Zydus Cadila in early June that their new drug to treat diabetics who also suffer from high cholesterol has passed all stages of clinical trials is an important landmark for the Indian pharmaceutical industry. This is not the first new chemical entity (NCE) developed by an Indian company. Ranbaxy, DRL, and Biocon are some of the companies that developed NCEs earlier. But none of these NCEs reached the market (so far), mainly due to hiccups faced at one of the later stages of trials.

Zydus Cadila reports that it has already spent $250 million on development of this drug. Their hope is that this drug will be a $1billion blockbuster. Should other companies try to emulate Zydus Cadila? It’s too early to say. Zydus Cadila has done its trials in India and only sought approval from Indian drug regulators, so far. But the real test is convincing the US Food and Drug Administration (FDA).

Sun Pharma launches dry eye treatment product in Canada

Sun Pharma, has introduced Cequa (cyclosporine ophthalmic solution 0.09 per cent w/v), a calcineurin inhibitor immunomodulator. The product is the first dry eye treatment available in Canada that is delivered with nanomicellar (NCELL) technology, which improves the bioavailability and physicochemical stability of cyclosporine to increase ocular tissue penetration, Cequa, with its nanomicellar technology and increased strength of cyclosporine, can be an important addition to our treatment options as eye care professionals strive for more personalised treatment. Dry eye disease occurs when the quantity and/or quality of tears fails to keep the surface of the eye properly lubricated. The disease causes a scratchy sensation or a feeling that something is in the eye.