Prime College of Pharmacy
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Prime College of Pharmacy

Prime Nagar, Erattayal, Near Govt Poly Technic, Kodumbu PO, Palakkad 678551, Kerala, Approved by PCI, & Govt of Kerala
Affiliated to Kerala University of Health Sciences, Thrissur & Directorate of Medical Education, Thiruvananthapuram.

Courses Offered

- M. Pharmacy - Pharmaceutics
  4 Semesters (Master of Pharmacy)
- B. Pharmacy - 8 Semesters
  (Bachelor of Pharmacy)
- D. Pharmacy - 2 years
  (Diploma in Pharmacy)

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Volume: 6, Issue: December 2020

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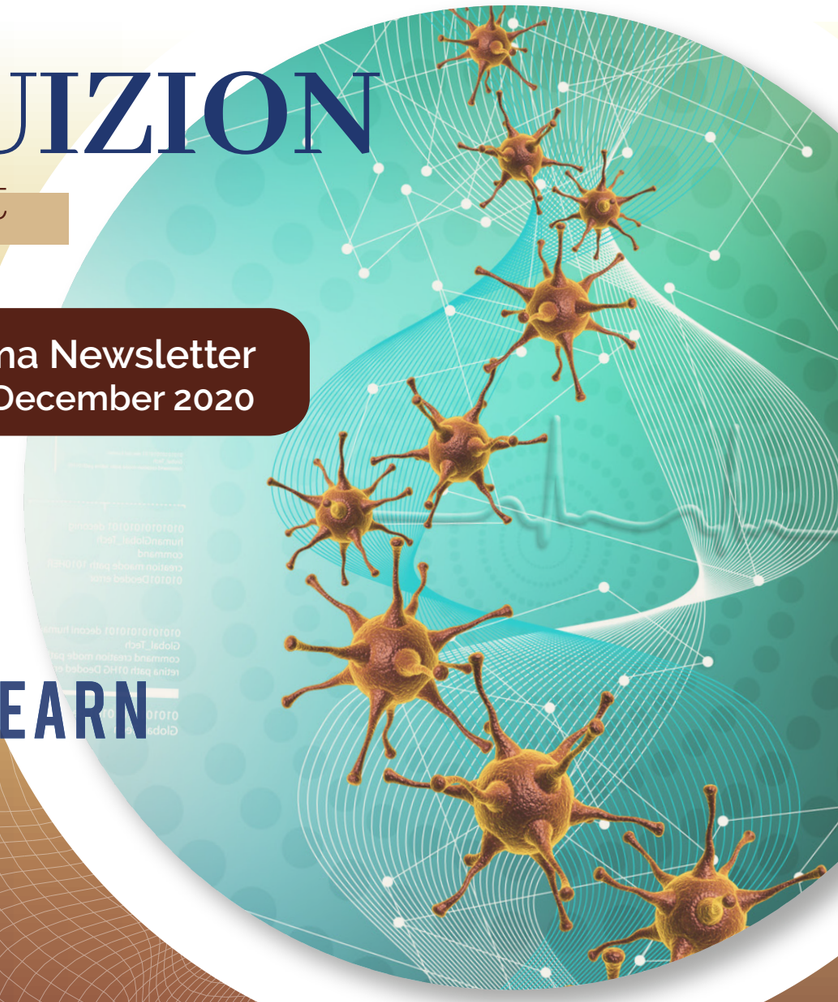
INTRUIZION

The Insight

Pharma Newsletter
December 2020



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Editorial Board

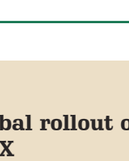
AstraZeneca advances mass global rollout of COVID-19 vaccine through COVAX

Berlin, The Standing Committee on Vaccination (STIKO) in Germany updated its reference and now recommended the COVID-19 vaccine from Astra Zeneca for all age groups, including people older than 65 years, the Robert Koch Institute (RKI) said.
The first of many millions of doses of AstraZeneca's COVID-19 vaccine have begun arriving in low and middle-income countries across the world through the multilateral COVAX initiative, the first steps in fulfilling the company's efforts to provide broad and equitable access to the vaccine.

For a complete vaccination, two AstraZeneca vaccine doses are necessary. According to STIKO, the time between the two vaccinations should be 12 weeks if possible, Xinhua news agency reported on Thursday.

STIKO previously recommended the vaccine only for people under 65 years and reiterated that the previous recommendation was "completely correct" based on the data available at that time. In addition to the Astra Zeneca vaccine, vaccines from BioNTech and Pfizer as well as Moderna are officially approved in Germany.

Mrs. Jyothi A
Asst. Prof.



Bengaluru-based scientists discovered possible cure for Alzheimer's disease

Alzheimer's disease was discovered in 1906, still the world has not found a way for detection of the disease and no treatment for prevention or cure of disease. Alzheimer's disease is the leading cause of dementia worldwide. A team of Bengaluru-based scientists led by T Govindaraju a Professor of Jawaharlal Nehru Centre for Advanced Scientific Research has discovered a possible cure for Alzheimer's disease. The breakthrough is a small molecule named TGR 63 that has shown the ability to disrupt the mechanism through which neurons become dysfunctional in Alzheimers. Animal studies with TGR63 has shown not only halt the progress of the disease but even reversal of neurodegeneration. The research has been ongoing for the past 10 years. Govindaraju said early diagnosis and starting of therapy before it get worsen are ways to tackle Alzheimer's.

Dr. Gifty M Jojo
Assoc. Prof.

J&J's 1-dose shot cleared, giving US 3rd Covid-19 vaccine

One dose was 85% protective against the most severe Covid-19 illness, in a massive study that spanned three continents - protection that remained strong even in countries such as South Africa, where the variants of most concern are spreading.

The US is getting a third vaccine to prevent Covid-19, as the FDA on Saturday cleared a J&J shot that works with just one dose instead of two. Health experts are anxiously awaiting a one-and-done option to help speed vaccinations, as they race against a virus that already has killed more than 510,000 people in the US and is mutating in increasingly worrisome ways. The FDA said J&J's vaccine offers strong protection against what matters most: serious illness, hospitalizations and death. Shipments of a few million doses to be divided among states could begin as early as Monday. By the end of March, J&J has said it expects to deliver 20 million doses to the US, and 100 million by summer. J&J also is seeking authorization for emergency use of its vaccine in Europe and from the WHO. Worldwide, the company aims to produce about 1 billion doses globally by the end of the year.

Mr. A. Mohamed Harish
Asst. Prof.

Thymoquinone (TQ) targets chemo-resistant cancer stem cells

TQ is the main active molecule of the essential oil extracted from Nigella sativa black seed, the plant derived molecule thymoquinone (TQ) has shown promising anti-cancer activity by inhibiting cancer cell growth and progression in vitro and in vivo. TQ has shown promising effects on various cancer types including breast, prostate, gastric, lung, colorectal, osteosarcoma and bladder cancer. TQ was shown to induce apoptosis in cancer cells by inducing reactive oxygen species, DNA damage, telomere shortening, immunomodulation through inhibition of NF-kappa B (NF-κB) and its regulated gene products and by targeting carcinogenic signaling pathways such as JAK/STAT and PI3K/Akt signaling. TQ was also shown to regulate epithelial to mesenchymal transition and to inhibit cancer metastasis by reducing matrix metal loproteinase secretion and the expression of TWIST

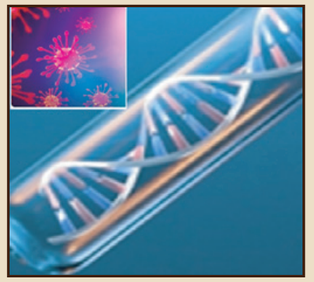
Mrs. Poornima M
Asst. Prof

Role of bioanalytical chemistry in improving health

Bioanalytical chemistry is the branch of analytical chemistry dedicated to the separation, detection, identification and quantification of biological molecules.Bioanalytical chemistry has been pivotal in furthering understanding of disease mechanisms, which in turn informs the development of novel therapies. Most recently, this has been exemplified in neuroscience research where new bioanalytical techniques have enabled researchers to obtain information regarding neuron function and neurotransmitter release that was previously unimaginable. For example, biosensors and microdialysis probes have made it possible to measure the movement of neurotransmitters across nerve synapses, so changes in various disease states can be quantified.

Alzheimer's disease has been the focus of much recent ground-breaking research. Recent discoveries using the latest bioanalytical technologies have raised hopes that early diagnosis and effective treatment may become reality. Oxidative stress and inflammation are known to play a key role in the etiology of Alzheimer's disease. Microchip electrophoresis now provides a powerful tool for the detection of biomarkers in biological samples. It enables the separation of multiple analyses in a single run so several bio markers can be detected in a single sample with high temporal resolution. In this way oxidative stress and inflammation can be readily monitored in vivo. Furthermore, used in combination with microdialysis, it enables real-time continuous in vivo monitoring of biomarkers of inflammation.

In addition to exploring disease processes, bio analytical techniques can facilitate disease control. This was recently exemplified during the COVID-19 global pandemic. With virus transmission escalating, it was apparent that screening to identify and isolate infected individual's key to containing the infection. Bioanalytical scientists quickly rose to the challenge, developing tests for COVID-19 from nose and throat swab samples. The introduction of the tests, however, revealed limitations in available bioanalytical procedures. Low levels of virus particles were not always detected, and results were not consistent between different sample types. Moreover, results could not be provided quickly enough using polymerase chain reaction (PCR) to detect viral RNA as the samples had to be transported to the laboratory for analysis, where resources were limited. This was addressed by the development of a portable rapid antigen immunoassay analysis using microfluidic and lab-on-a-chip technologies to facilitate more widespread testing. In addition, new diagnostic tools have been developed for predicting disease severity and therapeutic response in patients infected with COVID-19. This latest research will provide invaluable information for optimizing the use of healthcare resources whilst maintaining a high level of patient care.



Mrs. Deborah Evangeline
Assoc. Prof.

Astrazeneca gets approval to use anti diabetes drug for kidney disease

Astrazeneca has received marketing authorisation to use its anti-diabetic drug dapagliflozin for the treatment of patients with chronic kidney disease in India. The drug is the first medicine in SGLT-2i class to move into a new disease area by demonstrating efficacy and safety data for the treatment of patients with CKD, it added. The study results of dapagliflozin showed significant benefits in reducing CKD progression in patients with and without type-2 diabetes. Despite currently available therapies, a significant unmet need for effective management of CKD continues to exist globally. With the approval of dapagliflozin for CKD in India, an already effective type-2 diabetes and select heart failure treatment, can now be used by nephrologists in the management of CKD. CKD is an emerging public health problem. The global disease burden report of 2015 pointed that CKD is the 12th most common cause of death with a 37.1 per cent rise in mortality over 10 years. It is a serious, progressive condition defined by decreased kidney function and kidney damage, affecting nearly 70 crore people worldwide, many of them still undiagnosed. The prevalence of CKD in India is estimated to be 17.2 per cent, given its 1 billion plus population, the rising incidence of CKD is likely to pose major problems for both healthcare and the economy in future years.

Mrs. Aiswarya A T
Asst. Prof.

'Walking' molecule superstructures could help create neurons for regenerative medicine, 3D-printed novel biomaterial mimics properties of living tissues

Imagine if surgeons could transplant healthy neurons into patients living with neurodegenerative diseases or brain and spinal cord injuries. And imagine if they could "grow" these neurons in the laboratory from a patient's own cells using a synthetic, highly bioactive material that is suitable for 3D printing.

A key ingredient to the discovery is the ability to control the self-assembly processes of molecules within the material, enabling the researchers to modify the structure and functions of the systems from the nanoscale to the scale of visible features. The laboratory showed that materials can be designed with highly dynamic molecules programmed to migrate over long distances and self-organize to form larger, "superstructured" bundles of nanofibers.

These superstructures can enhance neuron growth, an important finding that could have implications for cell transplantation strategies for neurodegenerative diseases such as Parkinson's and Alzheimer's disease, as well as spinal cord injury.

Walking molecules and 3D printing

The new material is created by mixing two liquids that mimic key-lock interactions among proteins, and also as the result of the concentration of these interactions in micron-scale regions through a long scale migration of "walking molecules.

The agile molecules cover a distance thousands of times larger than themselves in order to band together into large superstructures. Interestingly, the mechanical forces of 3D printing disrupt the host-guest interactions in the superstructures and cause the material to flow, but it can rapidly solidify into any macroscopic shape because the interactions are restored spontaneously by self-assembly. This also enables the 3D printing of structures with distinct layers that harbor different types of neural cells in order to study their interactions.

Signaling neuronal growth

Neurons are stimulated by a protein in the central nervous system known as brain-derived neurotrophic factor (BDNF), which helps neurons survive by promoting synaptic connections and allowing neurons to be more plastic. BDNF could be a valuable therapy for patients with neurodegenerative diseases and injuries in the spinal cord but these proteins degrade quickly in the body and are expensive to produce. biomaterial when the mimetic signal is present. This could also create an environment in which neurons differentiated from patient-derived stem cells mature before transplantation. One of the molecules in the new material integrates a mimic of this protein that activates its receptor known as Trkb, and the team found that neurons actively penetrate the large pores.

Mr. Shyam S Kumar
Assoc. Prof.

Johnson & Johnson has planned trials of its vaccine that will include infants.

J&J plans to test its coronavirus vaccine in infants and even in newborns, as well as in pregnant women and in people who have compromised immune systems.

PfizerBioNTech and Moderna, whose coronavirus vaccines are now being given to adults, plan to gradually test them in younger and younger age groups. Those vaccines are now being tested in children 12 and older. Johnson & Johnson will first test its vaccine in children older than 12 and under 18, but plans to immediately after begin a study that includes newborns and adolescents. The company then will test its vaccine in pregnant women, and finally in immunocompromised people. Like the other companies, Johnson & Johnson will analyze safety and immune responses.

Unlike the Covid-19 vaccines currently in use, which use a new technology involving messenger RNA, the Johnson & Johnson vaccine utilizes a method that has been widely tested for years. It relies on a disabled adenovirus, similar to viruses that cause the common cold, to deliver instructions to cells to briefly make copies of the virus's spike protein. The recipient's immune system then makes antibodies against the spike protein. The coronavirus needs its spike proteins to infect cells, so the antibodies can block a Covid infection before it starts.

Existing adenovirus vaccines include one for Ebola that has been safely administered to babies as young as 1 year old, and another for respiratory syncytial virus that was safely given to newborns. Nearly 200,000 people have received adenovirus vaccines, with no serious safety issues, Dr. Levy said. He said that Johnson & Johnson mentioned that safety record at the F.D.A. meeting.

Mrs. Reshma Francis
Asst.prof.

Women have a lower "normal" blood pressure range compared to men.

Currently, established blood pressure guidelines state that women and men have the same normal healthy range of blood pressure. But the new research shows there are differences in normal blood pressure between the sexes.
Latest findings suggest that this one-size-fits-all approach to considering blood pressure may be detrimental to a woman's health. Based on our research results, we recommend that the medical community reassess blood pressure guidelines that do not account for sex differences.
In the newest study, research team examined blood pressure measurements conducted across four community-based cohort studies, comprising more than 27,000 participants, 54% of whom were women.
In doing so, the research team identified that while 120 mmHg was the threshold of risk in men, 110 mmHg or lower was the threshold of risk in women. Systolic blood pressure levels that were higher than these thresholds were associated with risk for developing any type of cardiovascular disease, including heart attack, heart failure and strokes.
Investigators also found that women had a lower blood pressure threshold than men for risk of each specific cardiovascular disease type, including heart attack, heart failure, and stroke.

Antidepressant may prevent worsening of covid-19 infection

The antidepressant fluvoxamine appears to prevent COVID-19 infections from worsening and may help keep patients out of the hospital.
In the clinical trial, Fluvoxamine compared with a placebo in 152 adult outpatients infected with the coronavirus. None of the participants who received fluvoxamine saw "clinical deterioration" after 15 days, while six patients who received placebo did. Of those 6, 4 were hospitalized, for periods ranging from 4 to 21 days. One was on a ventilator for 10 days.
The researchers say the results are statistically significant and that fluvoxamine warrants further study as a COVID-19 treatment.
The patients who took fluvoxamine did not develop serious breathing difficulties or require hospital ization for problems with lung function. Most investi gational treatments for COVID-19 have been aimed at the very sickest patients, but it's also important to find therapies that prevent patients from getting sick enough to require supplemental oxygen or to have to go to the hospital.

Mr. D. Ranjith Kumar
Assoc. Prof

Pfizer gets full US FDA nod for lorbrena as first-line treatment for alk-positive meta static NSCLC

FDA approved Pfizer's supplemental New Drug Application (sNDA) for LORBRENA (lorlatinib), expanding the indication to include first-line treatment of people with anaplastic lymphoma kinase (ALK)-positive non-small cell lung cancer (NSCLC). LORBRENA is now indicated for adults with meta static NSCLC whose tumors are ALK-positive as detected by an FDA-approved test. The FDA action also converts the 2018 accelerated approval to full approval. The application was approved under the FDA's Real-Time Oncology Review (RTOR) pilot program.

LORBRENA is a third-generation ALK inhibitor specifically designed to inhibit the most common tumor mutations that drive resistance to current medications and to address metastases in the brain, a frequent site for disease progression in ALK-positive NSCLC. The expanded approval of LORBRENA is based on the results from the pivotal Phase 3 CROWN trial, which showed a 72% reduction in risk of progression or death vs XALKORI (crizotinib) in a previously untreated patient population as assessed by BICR. CNS involvement was assessed in all patients. There were 17 patients in the LORBRENA arm and 13 in the XALKORI arm with measurable brain metastases based on baseline brain imaging. Among these patients, the intracranial objective response rate, as assessed by BICR, was 82 % in the LORBRENA arm and 23% in the XALKORI arm.

The most common AEs of any Grade and Grade 3-4 worsening laboratory abnormalities occurred in ≥ 20% of people treated with LORBRENA and serious AEs occurred in 34% of people treated with LORBRENA. Permanent discontinuation of LORBRENA due to AEs occurred in 6.7% of people. AEs leading to dose interruptions and dose reductions occurred in 49% and 21% of people treated with LORBRENA, respectively. In 2018, the FDA approved LORBRENA for the treatment of patients with ALK-positive metastatic NSCLC whose disease has progressed on crizotinib and at least one other ALK inhibitor for metastatic disease; or whose disease has progressed on alectinib or ceritinib as the first ALK inhibitor therapy for metastatic disease. This indication was approved under accelerated approval based on tumour response rate and duration of response. Based on the CROWN data, the FDA has also converted the accelerated approval to full approval.

Ms. Shahanaz M
Asst. Prof.

Making Chromatography "Greener"

Green analytical chemistry (GAC) aims to develop new "greener" methods that have a significantly reduced impact on the environment as well as minimal implications for those working with analytical techniques.
The concept of GAC has already been successful in encouraging significant "green" developments in analytical techniques, resulting in the establishment of micro extraction, microwave-assisted extraction (MAE) techniques, and ultrasound-assisted extraction Currently, there is a strong focus on developing chromatography techniques, innovating new methods that do not rely on toxic solvents. Sample preparation and separation are considered to be the most environmentally damaging, offering researchers a window of opportunity to make chromatography much "greener" by updating these steps.

Updating Sample Preparation
This is considered as the most environmentally damaging step. This approach use simple matrices including water, alcoholic beverages, and petroleum products instead of harsh chemicals have been developed to replace the previously environmentally detrimental method in certain scenarios. One non- solvent sample preparation technique is that of dispersive liquid-liquid micro extraction (DLLME). DLLME uses a very small amount (below 100 μL) of a nonpolar solvent combined with around 1 mL of less toxic dispersive solvent. Extractions using this method can be assisted with ultrasounds that are used to eliminate the need for a disperser solvent. Solidification of floating organic drop (SFO) has been developed as an alternative to DLLME. This method uses alcohols including nonanol, decanol, or undecanol as extraction solvents. The SFO does not require the sample to be exposed to such high temperatures, reducing its impact.

Updating the Separation Process
Liquid chromatography is generally less "green" than gas chromatography because it requires solvents. Acetonitrile is a volatile organic compound that is commonly used in LC. New methods have replaced this substance with propylene carbonate-ethanol water mixtures that are less environmentally damaging.Researchers have confirmed that an ethyl acetate–ethanol mixture can effectively be used as a replacement for acetonitrile.

Finally, studies have also shown that using a solution of 0.04% triethylamine in water can also effectively act as an eco-friendly mobile phase, demonstrating a high level of analyte separation.

Mrs. Greeshma S
Asst. Prof.

Herbal Treatment for COVID -19

Herbal medicines are frequently used by many people in the community. According to the characteristics of the SARS-CoV-2 virus, a molecular mechanism of the host is involved in the immune response. The four herbal medicines that could prevent or supplement the treatment of COVID-19 patients.

Echinacea purpurea. (E. purpurea) is one of the most popular herbal medicines in Europe and North America because it shows promising effects against viral infections. Its common name is Purple cone flower. Preparation of E. purpurea can be made in the form of extracts, tinctures, teas, and sprays. Many Native Americans use this kind of herb for respiratory infections. It contains several bioactive compounds like chicoric acid and caffeic acids, alkylamides, and polysaccharides used to treat covid-19.

Curcumin- Turmeric is an herbal plant called rhizomatous and is also known as Curcuma longa (C. longa). Turmeric also belongs to the ginger (Zingiberaceae) family and the Curcuma genus. Most common kind of curcuminoid that is used as a medication is curcumin. Some other studies demonstrated SARS CoV-2 Affecting the alveolar type II cell, activating the innate immune cells, release of many pro inflammatory cytokines, augmenting CRS ECHINACEA IL-1, IL-10, TNF-α, IL-2, IL-7 Chemokines TLR 3 TLR 7 + RNA virus.

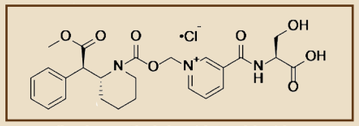
Cinchona sp. Cinchona trees (Chincona L., Raiatea) from the Andean mountain forests have valuable benefits as a particular component of the trees contains bioactive compounds that can heal fever. Nowadays, quinine sulphate has become one of the most wanted drugs in the society for COVID-19 treatment. A large amount of data suggested that several antimalarial drugs had been investigated and then concluded that they had some advantages against viral infection. For example, chloroquine showed an antiviral effect against the SARS-CoV infection. A clinical trial proved that hydroxy chloroquine improves the SARS-CoV-2 viral load in COVID-19 patients when combined with the drug Azithromycin.

Xanthorrhizol is an immunosuppressant used because of its ability to inhibit proinflammatory cytokines. Patients with COVID-19 are susceptible to CRS. So, the use of xanthorrhizol may lower the proinflammatory response in a patient with COVID-19 with or without CRS.

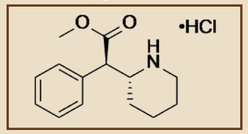
Dr. Janarthanan. T
Assoc. Prof.

AZSTARYS in Attention Deficit Hyperactivity Disorder (ADHD)

AZSTARYS, is approved by US-FDA for the treatment of Attention Deficit Hyper activity Disorder (ADHD) in patients 6 years of age and older. AZSTARYS capsules contain dexmethyl phenidate, and serdexmethylphenidate. The capsules are intended for oral administration and each capsule contains a fixed molar ratio of 30% dexmethy phenidate and 70% serdexmethylphenidate.
AZSTARYS contains 26.1/5.2, 39.2/7.8, or 52.3/10.4 mg of serdexmethylphenidate/ dexmethylphenidate (equivalent to 28/6, 42/9, or 56/12 mg of serdex methylphenidate chloride/ dexmethylphenidate hydro chloride, respectively) The combined molar dose of serdexmethylphenidate and dexmethylphenidate in each dosage strength of AZSTARYS is equivalent to 20, 30, or 40 mg dexmethylphenidate hydrochloride, respectively (equivalent to 17.3, 25.9 or 34.6 mg dexmethylphenidate free base, respectively). The chemical name of serdexmethylphenidate chloride is 3-(((1S)-1-carboxy-2-hydroxyethyl)carbamoyl)-1-((((2R)-2-(2-(1R)-methoxy-2-oxo-1-phenylethyl) piperidine-1-carbonyl)oxy)methyl)pyridinium chloride. Its molecular formula is C25H30N3O8+ •Cl- , and its structural formula is:



Serdexmethylphenidate chloride



Dexmethylphenidate hydrochloride

Mechanism of action:
Serdexmethylphenidate is a prodrug of dexmethylphenidate. Dexmethylphenidate HCl is a CNS stimulant. The mode of therapeutic action in ADHD is not known.
Indication:
Used for the treatment of Attention Deficit Hyperactivity Disorder in patients 6 years of age and older.
Dosage forms and strengths
AZSTARYS capsules are available as:
• 26.1 mg/5.2 mg (serdexmethylphenidate/dexmethylphenidate) – blue cap/grey body, imprinted with "286" on cap and "KP415" on the body
• 39.2 mg/7.8 mg (serdexmethylphenidate/dexmethylphenidate) – dark blue cap/grey body, imprinted with "429" on cap and "KP415" on the body
• 52.3 mg/10.4 mg (serdexmethylphenidate/dexmethylphenidate) – orange cap/grey body, imprinted with "5612" on cap and "KP415" on the body.

Contraindications
AZSTARYS is contraindicated in patients with known hypersensitivity to serdexmethylphenidate, methyl phenidate, or other components of AZSTARYS, bronchospasm, rash, and pruritus, hypersensitivity reactions such as angioedema and anaphylactic reactions have been reported in patients treated with other methylphenidate products, receiving concomitant treatment with monoamine oxidase inhibitors (MAOIs), or within fourteen days following discontinuation of treatment with an MAOI, because of the risk of hypertensive crisis.

Adverse reactions
Drug abuse and dependence, known hypersensitivity to methylphenidate or other ingredients of AZSTARYS, hypertensive crisis with concomitant use of monoamine oxidase inhibitors, serious cardio vascular reactions, blood pressure and heart rate increases, psychiatric adverse reactions, priapism, peripheral vasculopathy including Raynaud's phenomenon, long-term suppression of growth.

Mrs. Sumathy A
Assoc. Prof.

GSK and Vir Biotechnology expand coronavirus collaboration to advance new therapeutics for influenza

R&D therapies for coronaviruses, provides GSK exclusive rights to collaborate with Vir on the development of potential best-in-class monoclonal antibodies (mAbs) for the prevention or treatment of influenza. These include VIR-2482, an IM administered investigational mAb designed as a universal prophylactic for influenza A that has completed a Phase 1 trial, as well as next generation antibodies for the prevention or treatment of influenza during a three-year research period. GSK will have the exclusive option to co-develop VIR-2482 after Vir completes and reports Phase 2 trial outcomes. The companies will also engage in two additional research programmes. The first is an expansion of their current functional genomics collaboration to develop potential pan-coronavirus therapeutics to now include other respiratory virus targets. Under the second programme, the companies will collaborate to develop up to three neutralising monoclonal antibodies identified using Vir's antibody technology platform to target non-influenza pathogens during a three-year research period.

Mrs. Kaviya N
Asst. Prof.