JSS ACADEMY OF HIGHER EDUCATION AND RESEARCH MAURITIUS

A Degree Awarding Institution registered with the Higher Education Commission, Mauritius

JSS Health & Education Newsletter

Issue VIII

May – August 2023

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About JSS Academy of Higher Education and Research, Mauritius (JSSAHERM)

The JSS Academy of Higher Education and Research, Mauritius (JSSAHERM) was established in 2018 with degree awarding powers and is an approved and registered institution with the Higher Education Commission, Mauritius.

JSSAHERM is located on a sprawling eight- acre freehold campus at Bonne Terre, Vacoas, the only one of its kind in the country, including some 15, 000 sq. mts of built- up area with necessary academic, learning, and recreational infrastructure. The campus also comprises of hostels for boys' and girls' students, sports facilities such as Volleyball, Basketball, Football and in- door games. There are also residential units for staff and guests.

Building on its philosophy of quality education at affordable costs, JSSAHERM aims to present itself as the destination of choice for higher education and training in Mauritius and the Indian Ocean region.

JSSAHERM launched the Bachelor of Pharmacy (BPharm) programme in 2020. The Bachelor of Pharmacy and Doctor of Pharmacy programmes of JSSAHERM have received Pre-accreditation from the Accreditation Council for Pharmacy Education (ACPE), USA, making JSSAHERM the first institution in the African region to get ACPE pre-accreditation.

JSS Mahavidyapeetha (JSSMVP), Mysuru, India is the sponsoring society of JSSAHER, Mauritius. JSSMVP has established more than 350 educational institutions in India, Dubai, Mauritius, and USA, with a total student population over 50,000 and a staff strength of over 12,000.

The parent institution for the establishment of JSSAHERM, is the JSS Academy of Higher Education & Research, Mysuru (JSS AHER, Mysuru, India), formerly known as the JSS University. JSSAHER, Mysuru, India has been ranked in 351 to 400 rank band by THE 2023 ranking. THE Subject Ranking 2023, JSSAHER, Mysuru is ranked in the band of 125 - 150 in the world and becomes the first institution in India in the subject 'Clinical and Health'.

The School of Pharmacy, JSSAHERM started its Newsletter "Health & Education" in the year 2021 (Triannual issues) with the aim to cover general information related to health care & pharma sector, the latest happenings in the world of science, scientific articles of students and staff members on health and life sciences, invited papers and views, drug-related information and event corner of the JSSAHERM etc.

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Volume III Issue II May-August 2023

Inside this Issue

Forward

The President of the Republic of Mauritius

Message of H.E. Mr Prithvirajsing ROOPUN, G.C.S.K.

It is my immense pleasure to extend my best wishes to the administrative team, staff and students of the JSS Academy of Higher Education & Research, Mauritius on the publication of its eighth edition of the "Health & Education" Newsletter.

This Newsletter provides insightful articles on the Health Care & Pharma sector and scientific subjects like *"Cystic fibrosis: Understanding a Genetic Respiratory Disorder," "Microrobots: Revolutionizing Drug Delivery for Targeted Treatment," "Malaria,"* among various others. I commend the editorial team for their efforts in exploring diverse topics that engage, educate, and inform its readers.

Established in 2018 by the esteemed JSS Mahavidyapeetha (JSSMVP), Mysuru, India, I am glad to learn that the JSS Academy of Higher Education and Research Mauritius provides quality education and training in the medical and pharmaceutical domains not only to students of Mauritius but also to those of the African region.

As Mauritius endeavors to become a regional hub for high quality education and training, institutions such as the JSS Academy of Higher Education and Research are essential components of this transformative vision.

I commend the JSS group for their dedication to establishing a quality Higher Education Institution in Mauritius. May the institute continue to prosper and excel in all its endeavors.

Mr Prithvirajsing Roopun, G.C.S.K.
President of the Republic of Mauritius

Accreditation of the Doctor of Pharmacy (Pharm D) programme of JSS Academy of Higher Education and Research, Mauritius

The JSS Academy of Higher Education and Research, Mauritius is already offering the Bachelor of Pharmacy (B Pharm) and Master of Pharmacy (M Pharm) programmes.

We are glad to announce the accreditation of our Doctor of Pharmacy (Pharm D) programme by the Higher Education Commission of Mauritius (HEC). Our Pharm D (as our B Pharm programme) has also been pre-accredited by the Accreditation Council for Pharmacy Education of the US (ACPE), showing that the programme is of an international standard.

The above accreditations are the culmination of the work hard work and perseverance of our staff, collaborators and supporters from our parent institutions. We are thankful to the Pharmacy Council of Mauritius for approving the contents /curriculum of the Pharm D programme and the HEC and ACPE for the accreditations.

A Doctor of Pharmacy (Pharm D) degree prepares pharmacists to be clinical scientists and medication experts in the healthcare system, providing quality patient care, scientific research and policy innovation and who are much beyond dispensing and selling drugs over the counter.

The JSSAHERM Pharm D programme has been designed with the aims and objectives to:

1. Provide pharmacists with comprehensive advanced knowledge, skills and competencies in clinical sciences and pharmacy practice to enhance their ability to deliver the best and customised pharmaceutical care to patients.

2. Enable graduates to closely monitor patient drug therapy and make recommendations on the selection of the best medication for a patient's condition, the correct dose, and the duration of therapy.

3. Empower and equip Doctor of Pharmacy graduates to:

    i. Help the patient with drug information, and to make them understand the importance of therapy given, and also to help the Physicians in choosing the right drug for the patient, avoid any irrational drug use.

    ii. Understand the pathophysiology of human disease at molecular, cellular, systems, and whole organism levels.

    iii. Explain how physical, psychological, social, cultural, and environmental processes contribute to the etiology, pathogenesis, and manifestations of human health and disease.

    iv. Monitor the patient's drug therapy (regimen) using patient-specific, drug-specific, and disease-specific parameters at appropriate intervals and frequencies.

v. Promote the correct and appropriate use of medicinal products and devices, maximizing the clinical effect of medicines, i.e., using the most effective treatment for each type of patient; minimizing the risk of treatment-induced adverse events, minimising the expenditures for pharmacological treatments and provide the best treatment alternative for the greatest number of patients.

vi. Have thorough knowledge about drugs i.e.,
   a. What is the drug given?
   b. When it should be given?
   c. Why it should be given?
   d. How it should be given?
   e. Check for medical errors in the prescription.

vii. Estimate medication activity (therapeutic and toxic) at the molecular, cellular, systems, and whole organism levels.

viii. Design prevention, intervention, and educational strategies for individuals and communities to manage chronic disease and improve health and wellness

ix. Practice, develop and implement evidence-based patient care, programs and protocols, based upon analysis of epidemiological, pharmaco-economic, and medication-use data and risk-reduction strategies.

x. Interpret laboratory investigations to support drug therapy in decision-making on the rational use of drugs.

xi. Describe how population-based care influences patient-centered care and influences the development of practice guidelines.

xii. Provide counselling to healthcare professionals, including doctors on drug and poisoning information and establish drug and poison information centres at the National level.

xiii. Participate in ward rounds with doctors and other healthcare professionals and provide counselling to patients at their bedsides.

xiv. Design National and Hospital Formularies

xv. Provide drug referrals

Prof (Dr) Praveen Mohadeb
CEO and Vice-Chancellor
JSSAHERM.

Peace of Mind and Mental Wellbeing

Mental health is defined as a state of well-being in which an individual realizes his or her own potential, can cope with the normal stresses of life, can work productively and fruitfully, and is able to make a meaningful contribution to their community.

Having a mind at ease or peace of mind can help us on our journey towards good mental health and wellbeing.

What is peace of mind and how does it benefit our mental health?

Peace of mind is:

- an internal state of calm
- a sense of harmony and emotional stability
- an ability to acknowledge but regulate one's emotions
- mental serenity and tranquillity
- being comfortable in 'one's own skin'
- being content without being complacent
- the ability to still experience joy even in the presence of challenges
- a quiet mind

What is the impact of mental ill health on our peace of mind?

There are some mental health challenges that can make it difficult to maintain our peace of mind.

Stress, worry and anxiety: Chronic stress can steal our peace of mind. When we are excessively stressed or if we are struggling with anxiety we will be restless mentally and ill at ease. Anxiety is a common experience for many of us and we often worry about relationship or family tensions, work challenges, finances, our health, our future plans, wishes, hopes and unfulfilled dreams. Worry usually involves repetitive negative thoughts around our problems, often focusing on how big the problems are rather than on any potential solutions. Worry can make us fearful and scared and we often react in fear if we feel our problems are threatening our sense of safety or security. All this can make it difficult to get and maintain our peace of mind.

Depression: Depression will result in someone feeing very low or sad or irritable and easily angered. Depression will result in a loss of interest, motivation and drive for life. Depression can cause debilitating fatigue, poor sleep, poor appetite as well as difficulties interacting with others which can affect our relationships. Depression can make us feel helpless and powerless and hopeless. All this will weigh on the mind and steal our sense of peace.

Alcohol and substance use: excessive use of alcohol and recreational use of drugs of abuse will have mind altering effects that can result in mental health challenges that will disturb our peace of mind. Alcohol and substances can, however, also be used to escape the challenges that are stressing or worrying us in search of peace of mind. This self-medication will sadly only give temporary relief from our troubles and may create more mental, physical and social problems that will further steal our peace of mind.

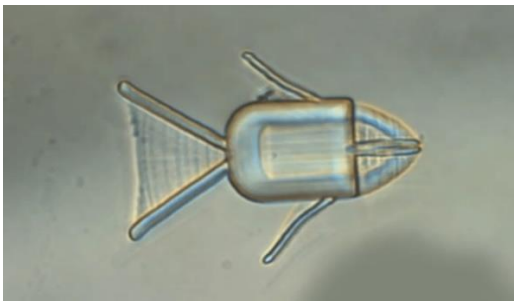
What can I do to find greater peace of mind?

- **Acknowledge and express difficult emotions in a healthy way:** Acknowledge the painful or difficult emotions we are experiencing that may be causing mental or emotional turmoil and find trusted people to talk to. Reach out for professional help if needed.
- **Manage your thoughts:** The person you talk to the most is yourself and constant self-criticism and negative self-talk can result in a lack of internal peace. It is critical to guard our minds and thoughts, confront unhealthy negative self-talk in our journey towards peace of mind.
- **Mind your perspective:** How you see the world and the challenges you face will have an impact on peace of mind. The proverbial glass can be seen as half empty or half full depending on how you choose to see it. A hopeful, positive outlook on life is mentally protective and will help us as we seek peace of mind. May we have serenity to accept what we cannot change, courage to change what we can and wisdom to know the difference.
- **Be adaptable and mentally flexible:** we cannot eliminate stress and challenges from our lives but we can change how we respond and react to these challenges. Mental flexibility and having a problem-solving approach to life will greatly help us in challenging circumstances and help preserve our peace of mind in the midst of calamity. Blessed are the flexible, they will not be broken by the challenges of life.
- **Simplify your life:** mental and physical clutter will challenge our peace of mind. Being more present and mindful as we live life and de-cluttering even our physical spaces can help us regain our peace of mind. Spending less time on our technological devices will help us connect better with our friends and families and will give us a chance to connect with nature as well.
- **Seek peace with others:** one common cause of internal lack of peace is being in conflict with others or having important relationships that aren't in a good state. Healing of relationships is can be the start of internal healing and finding peace of mind.

Compiled By: Mr. Nitin Busguth, Assistant Professor, JSSAHERM

Microrobots: Revolutionising Drug Delivery for Targeted Treatment

Advancements in medical technology continue to push the boundaries of healthcare, and one such breakthrough is the development of microrobots for drug delivery. These microscopic, sophisticated robots or devices hold the potential to revolutionize the field of medicine by enabling targeted and enhanced precise delivery of therapeutic agents.



Understanding Microrobots in Drug Delivery:

Microrobots, also referred to as nanorobots or nanobots, are tiny robotic devices typically ranging in size from one to a few micrometers. These devices can be remotely controlled and are designed to navigate through the human body, delivering drugs to specific target sites with remarkable precision. They release drugs at specific times or in response to certain stimuli, allowing for personalized and optimized treatment regimens. Since they can deliver medications directly to the affected tissues or cells, the systemic side effects are minimized and drug efficacy is increased.

1. Enhanced Precision and Targeted Delivery:

Microrobots offer a level of precision not previously attainable with traditional drug delivery methods. They can be engineered to navigate through complex biological environments, such as blood vessels or organs, to reach specific target sites. This targeted delivery minimizes the exposure of healthy tissues to medications, reducing side effects and optimizing treatment outcomes. By incorporating stimuli-responsive materials, such as temperature-sensitive polymers or pH-responsive coatings, microrobots can release drugs in response to specific triggers within the body, such as changes in temperature, pH levels, or the presence of specific enzymes.

2. Overcoming Biological Barriers:

The human body possesses various biological barriers that can hinder drug delivery. Microrobots provide a solution to this challenge by maneuvering through these barriers to reach their intended destinations. For example, they can traverse the bloodstream, cross cell membranes, or penetrate dense tissues, allowing them to deliver medications to previously inaccessible areas. They can navigate through the brain's intricate network (BBB) using strategies such as transient disruption of the barrier or exploiting natural transport mechanisms and deliver therapeutics to specific regions, holding promise for conditions like Parkinson's disease, Alzheimer's disease and brain tumors.

3. Controlled Release of Medications:

Microrobots offer the capability of controlled and on-demand drug release. By incorporating drug payloads within their structures, these robots can be programmed to release medications in response to specific triggers. This controlled release mechanism ensures precise dosing, sustained drug levels, and potentially minimizes the need for repeated administrations

4. Targeted Cancer Therapy:

Microrobots hold tremendous potential in revolutionizing cancer treatment by delivering drugs directly to tumor sites with enhanced precision. These devices can navigate through the complex tumor microenvironment, overcoming physiological barriers such as dense extracellular matrix and abnormal blood vessel structures. Through active or passive targeting mechanisms, microrobots can accumulate at the tumor site, facilitating localized drug delivery. This approach minimizes systemic toxicity and improves therapeutic efficacy by selectively targeting cancer cells while sparing healthy tissues.

5. Enhanced Precision in Diagnostics:

Microrobots can be equipped with diagnostic tools, such as sensors or imaging agents, to provide real-time monitoring and accurate diagnosis at the cellular or molecular level. By integrating sensing capabilities and imaging agents, these devices enable real-time monitoring and accurate diagnosis of disease states. For instance, microrobots equipped with biosensors can detect specific biomarkers associated with diseases, providing rapid and sensitive diagnostic information. The ability of microrobots to access hard-to-reach areas within the body, combined with their imaging capabilities, allows for detailed visualization and characterization of cellular and molecular processes. This improved diagnostic precision enables early detection of diseases and facilitates personalized treatment planning.

Challenges and Future Perspectives:

Challenges include ensuring biocompatibility, long-term stability of the microrobots within the body, scalability of manufacturing processes, and regulatory considerations. Additionally, research efforts are focused on enhancing the navigation and propulsion mechanisms of microrobots, improving their sensing capabilities for real-time diagnostics, and advancing their integration with emerging technologies such as artificial intelligence and robotics.

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3. Meng, L., Xia, W., Xu, X., Xue, Z., Hou, W., Liu, H., Sun, L., & Cao, W. (2018). Magnetic microrobots as drug carriers

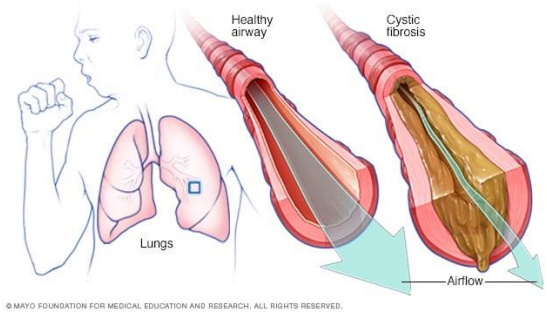
Written By:
Mr. Chetramsingh Chummun, 4th Year B Pharm Student, JSSAHERM

Cystic Fibrosis: Understanding a Genetic Respiratory Disorder

In the realm of medical mysteries, Cystic Fibrosis (CF) remains an everlasting enigma. A complete fascination to scientists, captivating the hearts of patients and sparked a relentless pursuit of understanding and providing effective treatments. Cystic fibrosis takes us on a rollercoaster ride in the human body, revealing the intricacies of the respiratory and digestive systems.

Unraveling the Genetic riddle

Cystic fibrosis is a genetic disorder which involves a mutation in the Cystic Fibrosis Transmembrane Regulator (CFTR). This gene primarily regulates the normal balance of the salt and water movement within the cells, mutations in CFTR throws the body's delicate equilibrium off balance.



Symptoms: Multifaceted symphony of CF and its diagnosis

Cystic Fibrosis does not only affect the respiratory system, but also the digestive tract and other crucial organs. It is a serious metabolic disorder that affects thousands of individuals.

The primary victims of the CF's unruly mucus endure symptoms such as

- Recurring lung infections
- Wheezing, coughing, shortness of breath and even damage to the airways (bronchiectasis)
- Difficulty in gaining weight and growing. (blockage of pancreatic ducts due to mucus)
- Jaundice
- Diabetes
- Osteoporosis
- Infertility in 97-98%of males: due to the absence of Vas Deferens in their anatomy, typically responsible in the delivery of the sperm to make up the semen

An individual can be diagnosed with this conundrum disorder by testing for the sweat. A CF patient will typically release sweat that mostly constitute of salt.

A newborn screening test, genetic testing and clinical evaluations.

Inspirational journeys on Cystic Fibrosis patients

To truly grasp the realities and triumphs in the face of Cystic fibrosis, it is crucial to explore the truly incredible individuals suffering from this condition.

Take for instance Ryan Barry a vibrant young man who shares his life over the notorious platform known as TikTok, dealing with this disorder and spreading awareness about his condition. Despite the countless hospital visits for trials, the exorbitant number of medicines

that he requires to maintain his routine and multiple medical complications related to the disease, he still finds this everlasting will to live with utter joy.

Through media, Ryan Barry familiarizes his viewers with his abundant knowledge over the disorder and treatment, which involves a High Frequency Chest Wall Oscillation. (HFCWO)

This apparatus consists of an inflatable vest that is connected to a machine. The underlying principle of this machine is to create vigorous movements that will cause the oscillations or vibrations against the chest wall at varying frequencies. Those vibrations will promote the breaking down of the sticky mucus, easing the way out for its excretion out of the body.

The HFCWO offers multiple benefits that can enhance the airway clearance, reducing significantly the risk of developing any respiratory infections that the disorder normally promises. It alleviates the coughing and shortness of breath as well as the wheezing.

Cystic Fibrosis requires a comprehensive approach to treatment and medications also play a vital role in managing the condition. A combination of medications targets respiratory symptoms, digestive issues and underlying infections. Those can involve the

- Bronchodilators: opening the airways, can include inhalers and nebulizers
- Mucolytics: such as "Dornase Alfa" to help thin and loosen the thick mucus in the airways
- Hypertonic Saline: increasing hydration within the airways
- Antibiotics
- Pancreatic enzymes: such as CREON which helps digest food as the pancreas do not produce enough enzymes
- Nutritional supplements: cystic fibrosis patients need a lot of energy as they require to breathe. It is estimated that female patients require to consume at least 3000 calories and males needs 3700 calories. While the normal consumption is 2000 calories and 2500 calories respectively.

While Cystic Fibrosis continues to present obstacles, the resilience and strength demonstrated by individuals living with CF as well as the unwavering dedication of researchers, healthcare providers and support networks, inspire and hope for continued progress. By spreading awareness, supporting research efforts and fostering a compassionate and understanding community we can empower individuals with cystic fibrosis to live fulfilling lives embracing each day with determination and commitment to conquer challenges ahead.

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1. *Mayo Clinic (2021)*. What is Cystic Fibrosis? Available at: https://www.mayoclinic.org/diseases-conditions/cystic-fibrosis/symptoms-causes/syc-20353700

Written By:
Ms. Rania Saarah Ahmed, 2nd Year B Pharm Student, JSSAHERM

Importance of Fitness and Exercise in Day-to-day Life

Fitness refers to your own optimal health and overall well-being. Being fit is not only about the physical health but also about the mental health. It defines every aspect of your health. Smart eating and active living are fundamental to fitness.

There are five types of physical fitness;

- **Cardiorespiratory fitness**
- **Musculoskeletal**
- **Flexibility**.
- **Balance**
- **Speed**

Exercise is distinct from fitness because it is what you do to improve your fitness. Exercising regularly, everyday if possible, is the most important thing that you can do for your health. Most people tend to focus on one type of exercise and think that it is enough. It is important to get all four types of exercise that are ENDURANCE, STRENGTH, BALANCE, and FLEXIBILITY. Doing one kind can also help to improve your ability to do others and variety helps reduce boredom and risk of injury.

1. Endurance exercise

This is referred to aerobic exercises that increase your breathing and heart rates. These activities help in keeping you healthy, improve your fitness and allow you to do your daily tasks. Endurance exercises improve the health of your heart, lungs, and circulatory system. They can also prevent many diseases that are common in adults, for example; diabetes, colon, breast cancers, heart diseases and others.

Some example of physical activities that build endurance;

- Brisk walking
- Jogging
- Yard work
- Dancing
- Swimming
- Biking
- Hiking

2. Strength exercise

Strong muscles help you stay independent and make everyday activities feel easier. Strength exercises build strong bones and muscles and more muscles help in balancing your body and prevent from frequent falls and fractures. You are less likely to fall when you have strong hip and legs. Some people choose to use weights to increase their muscle strength and some uses resistance bands, stretchy elastic bands that come in different strengths.

Example of strength exercises;

- Lifting weights
- Gripping a tennis ball
- Overhead arm curl
- Wall push-ups

3. Balance exercise

This exercise can help you from falling that is a common problem in old people that can have serious consequences. Your balance can also be improved by doing some lower body strength exercises.

Example of balance exercise;

- Tai Chi
- Standing on one foot.
- The heel-to-toe walk.
- The balance walk.
- Standing from a seated position.

4. Flexibility exercise

Stretching can improve your flexibility. Flexibility is the ability of tendons, muscles and ligaments to stretch. Flexibility exercise allows you to do any movement even as an old person.

Example of flexibility exercise;

- Stretching
- Yoga
- Tai Chi
- Pilates

Health benefits of exercise.

1. Exercise boosts your mood.
2. Exercise can help with weight loss.
3. Exercise strengthen the bones and muscles.
4. Exercise can reduce the risk of chronic disease.

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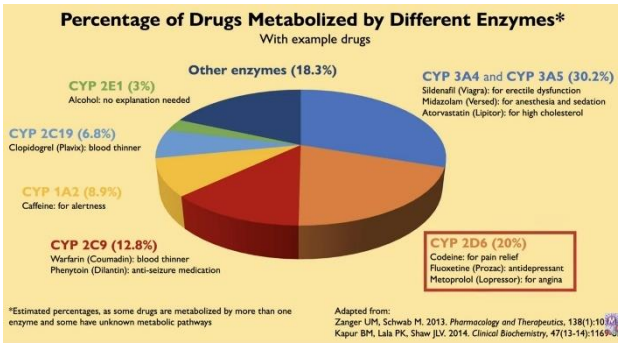
1. *Centres for Disease Control and Prevention (2023)*. Benefits of Physical activity. Available at: https://www.cdc.gov/physicalactivity/basics/pa-health/index.htm
2. *Medical News Today (2021).* What does being physically fit mean? Available at: https://www.medicalnewstoday.com/articles/7181

Written By:
Ms. Jemima Sunnassee, 1st Year B Pharm Student, JSSAHERM

Pharmacogenomics- Genes and Medicines

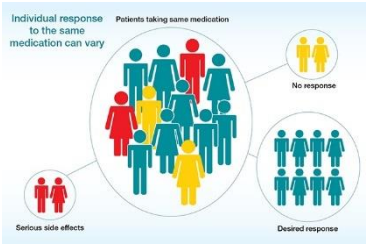
Pharmacogenomics is the study of how an individual's genetic inheritance affects the body's response to drugs. Testing for how a person metabolizes drugs is called pharmacogenomics testing or PGx testing for short. This is a prime component of individualized medicine, selecting specific medications for each person based on personalized information. Pharmacogenetic testing can help determine how a person metabolizes potentially hundreds of common medications, depending on how many genes are tested on a particular laboratory panel.

When drugs enter our body, they are metabolized and are structurally modified by enzymes which either activate or deactivate these medications. The most well-known family of drug metabolizing enzymes are the cytochrome P450 enzymes. There are over 50 different isozymes of CYP 450 enzymes, 7 of which are involved in metabolizing over 80% of medications.



For a better understanding, let's focus more on CYP2D6. The CYP2D6 gene sequence varies between people. These genetic variants, or alleles, result in slight structural changes in the CYP2D6 enzyme, which alter how effective the enzyme is at metabolizing drugs. They can be broadly classified as normal function, decreased function, and non-functional. Since each human being inherits a copy of each gene from each parent, each person will have two CYP2D6 alleles. A person can be classified as rapid, intermediate, or metabolizers based on what combination of CYP2D6 alleles they inherited.

- rapid (normal) metabolizer- has one functional and one non-functional allele
- intermediate metabolizer- has a decreased function and a non-functional allele
- poor metabolizer- has two non-functional allele

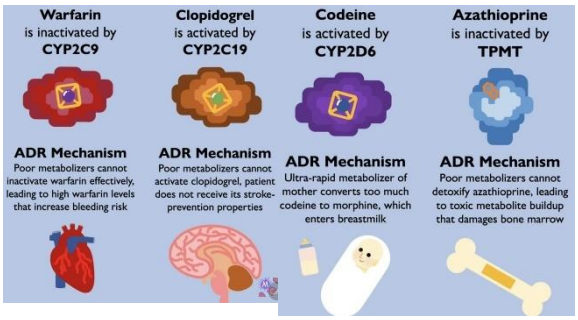


The majority of people are rapid metabolizers. In rare cases, a person can be classified as an ultra-rapid metabolizer. These people have three normal alleles of CYP2D6 rather than two, due to a gene duplication. Hence, they metabolize certain drugs extremely rapidly and efficiently because they have more enzymes. Changes in metabolism can alter the effectiveness and toxicity of a drug.

Drugs can either be activated or inactivated after they are metabolized. For example, codeine is a weak painkiller but is still used because CYP2D metabolizes around 10% of the codeine into morphine, a potent opioid analgesic. Thus, the dosage of codeine for an ultra-rapid metabolizer will differ from that for an intermediate metabolizer, in terms that it will be lower, and an opioid overdose can be prevented.

But we cannot know that until we do genetic testing. Almost all drugs are metabolized by a combination of CYP450 enzymes and phase II enzymes such as Thiopurine S-methyltransferase (TPMT) and UDP-glucuronosyltransferase (UGT). Many of these enzymes have genetic variations that can change their function, altering the effectiveness and toxicity of the drug.

This specific testing can give pharmacists and health care providers better insight into adverse drug reactions and drug interactions as they review the medications patients take. These reviews help identify potential and correct medication-related problems., especially in patients who take multiple prescriptions and over-the-counter medications along with herbal and dietary supplements.



Pharmacogenomic tests look for changes or variants in these genes that may determine whether a medication could be an effective treatment for you or whether you could have side effects to a specific medication that could be fatal such as Stevens-Johnsons syndrome, a rare but serious skin disorder.

Challenges and Limitations

- One single pharmacogenomic test cannot be used to determine how you will respond to all medications.
- Pharmacogenomic tests are not available for all medications.
- Pharmacogenetic panel testing can be quite expensive.
- Most drugs have complex metabolic pathways involving multiple enzymes which makes it difficult to predict a patient's response.

However, pharmacogenetic testing results are a permanent part of a patient's medical history, unlike blood tests, whose results change over time, the pharmacogenomic tests will not change. Testing can guide therapy, optimizing medications to achieve the best outcomes. Advance in pharmacogenomics combined with the use of genomic data can help create targeted therapies. Imagine the use of pharmacogenomic data to prescribe each individual patient the most effective and least harmful drug based on their genetic makeup, that is, precision medicine, the number of adverse drug reactions would significantly decrease.

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Written by:
Ms. Madina Zina Elaheebucus, 4th Year B Pharm Student, JSSAHERM

Neurotechnology: Breaking the Frontiers

The brain. Albeit being the most complex organ of the body, it still stands as the most important one too. On this account, it comes as no surprise to learn of the extensive research being carried out by myriad scientists around the world on this mystifying 3 pounds of matter. From EEGs to neuroprosthetics, advancements in neurotechnology show no signs of coming to an end. This particular field of neuroscience aims at comprehension of the nervous system and engaging with it in an attempt to cure mental and nervous disorders by making use of technological instruments.

The latest breakthrough in neurotechnology involves capitalizing on mathematical tools and basic analytical softwares to elucidate intermingled neuronal impulses from several parts of the brain which are fired during conventional daily activities. State-space analysis, the protagonist of this story, has made it possible for scientists to disengage from tricky programming systems and invasive techniques which were previously being used to project an image of brain activity. The way forward seems quite clear: this technology faces evident exploitation in the near future to provide visual images of the various pathways undertaken by neuronal signals to and from the brain.

The representation of the brain activity consists of assorted shapes and lines, including circles, dots, and curves among others to portray the ever-changing nature of the brain. It also opens the door for drawing a distinction between the states of the brain as it transitions from being stationary (processing consistent data) to dynamic (managing separate data in different moments).

Nevertheless, the question remains; how can neurotechnology serve its purpose in treating human diseases of the brain? Read along to find out.

Neural Interfaces and **Brain-Machine Interfaces (BMI)** seem to be one of the most promising inventions to have been developed by researchers in this field. It appears almost mystical for a tiny scrap of metal to have the power to revive damaged senses of the human body, but yet it is so. These automated devices have long proved themselves and are currently performing their function to restore vision in patients suffering from age-related macular degeneration (AMD), as well as granting a disabled person the ability of controlling a digital device solely through their thoughts. Not to be overlooked is also their use as audio-enhancing devices through cochlear inserts.

Where it was previously deemed hopeless for paralyzed patients with spinal cord injuries to ever walk again, neurotechnology has once again proved its appeal.

The method involves inserting a device ingrained with multiple electrodes into the spinal cord of the patient, an invasive but worthwhile procedure to ameliorate motor function. The catch? At the minimum, 6 centimeters of the spinal cord should be functioning as usual for the electrodes to be inserted.

By contrast, mental health is in no way overlooked. **Transcranial magnetic stimulation (TMS)** and **Neurofeedback (NFB)** are just some of the principles that have been designed to combat exhausting mental illnesses like depression, insomnia, attention deficit hyperactivity disorder (ADHD) and epilepsy, just to name a few. In an attempt to animate the brain, TMS employs powerful magnets to assist the patient in fighting against extreme depression. On the other hand, NFB mostly depends on the patient's will to be treated since it enables them to see a virtual image of their brain activity and choose to work towards the desired result.

Alzheimer's Disease, another fairly heard of mental disease, consists of challenging symptoms like dementia. Neurotechnology has led to the introduction of a non-invasive, memory-improving **deep brain stimulator** which plays an influence on the cholinergic pathway and on the circuits linking the hypothalamus and hippocampus in the brain. Beyond that, this technique also proves to be efficient in alleviating tremors experienced by patients with Parkinson's Disease almost entirely.

This is merely the tip of the iceberg. Neurotechnology is without doubt one of the best advances that the world has seen in the scientific field. With further exploration, the minor imperfections which remain will certainly be eliminated and it will prove to be an indispensable form of treatment for a broad range of disorders and disabilities.

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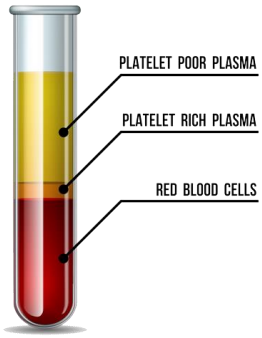
Written By:

Ms. Salvi Wahidna, 3rd year BPharm Student, JSSAHERM

Platelet-Rich Plasma (PRP) Use in Facial Rejuvenation

Platelet-rich plasma is a platelet concentrate that has been widely used to accelerate the regeneration of human skin tissues. Its preparation methods vary from method to method, depending on the concentration of the various ingredients involved, including proteins.



Instead of massive randomized, placebo-controlled trials, case studies are the primary source of positive reports. Through various growth factors and cytokines in the case of skin rejuvenation, collagen production and the proliferation of fibroblasts in aging skin can be promoted according to the PRP theory,

Growth factors with serum insulin-like activity, such as insulin-like growth factor, plasma infectious proteins, and fibrin, are also present in high concentrations in PRP. These include platelet-derived growth factor, transforming growth factor, endothelial vascular endothelial growth factor, and platelet-derived growth factor.

PRP boosts messenger ribonucleic acid expression in human dermal fibroblasts as well as G1 cell cycle regulatory proteins, type I collagen, matrix metalloproteinase-1, and MMP-2 expression.

A few years ago, some initial clinical trials with platelet concentrates showed benefits in patients attending plastic and orthopaedic surgery departments. On the other hand, interest has also decreased due to serious problems, such as cost, the amount of blood needed, the requirement for specialized equipment and qualified workers, and the lack of clinically relevant benefits.

Therefore, a new simple preparation containing an autologous platelet-derived material called **Selphyl** enables the rapid and inexpensive formation of a platelet matrix-derived fibrin matrix. It can be used to treat deep nasolabial folds and speed up the healing process following skin treatments. Improvements are more noticeable when the number of injections is higher.

A three-month study of 24 patients who underwent face and neck rejuvenation with monthly PRP injections showed moderate results on subjective and objective measures. In a study with

20 volunteers who received a single intradermal PRP injection, the results showed that it was well tolerated and able to revitalize the facial skin, which makes wrinkles prominent. Another study showed that combining PRP therapy with fractional resurfacing increased skin elasticity and collagen thickness and reduced erythema.

Combining PRP with fractional lasers or sub-incisions to treat atrophic acne scars has been shown to shorten healing time and reduce redness and swelling while promoting the proliferation of keratinocytes, collagen and fibroblasts.

When using PRP, the patient may experience side effects before the procedure. The most common **side effects** are: pain in the injured area, infection, wound healing, allergic reaction, blood clots, skin discoloration, and in rare cases, blindness.

PRP is considered a new type of treatment and some studies show its effectiveness in aesthetic dermatology. The most interesting application of PRP is in combination with other therapies. Future studies should include both control groups and incorporative evaluations to reduce intersubject variability and clarify the safety and efficacy of PRP in clinical applications.

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Written By:
Ms. Chunalvee Ramparsad, 4th Year BPharm Student, JSSAHERM

Psychoneuroimmunology

Usually people have always tended to separate the mind from the physical body and the soul from the brain. For a long time, psyche has always been arbitrarily put aside from biology; little did we know that, in fact, the psychological dimension is an integral part of our health. Upon the discovery of neuro-hormones of the brain, a connection between the body and the mind has been finally established.

In order to have a better understanding of how this link has been made, we should review the fundamental principles lying behind this.

First, health is defined as the whole state of physical, moral and social well-being and not only the absence of comorbidities or diseases. Maintenance of homeostasis is ensured by three important communication and integrative systems;

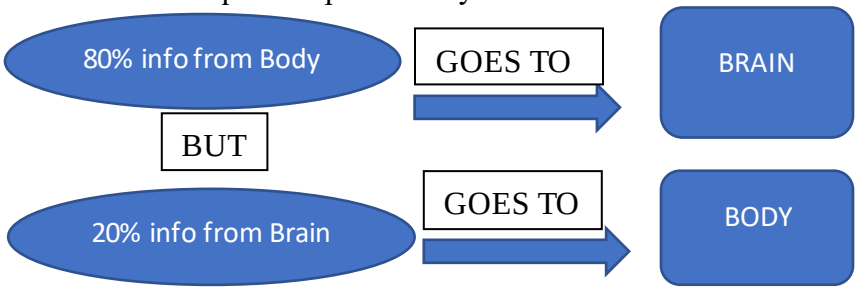
- Autonomic Central Nervous System
- Endocrine System
- Immune System

with the help of:

- Hormones
- Mediators
- Neurotransmitters
- Other molecules,

whose secretions arise and are controlled by various parts of our body.

Neuroscience has proved that these three systems' functioning are very dependent of each other's with a unique and precise way of communication.



This schema shows that it is in fact the body, which controls the mind and not all the way round. Our body feelings, sensations determine our thoughts and that in turn can influence our metabolism and other physiological processes.

The Fritz Zorn Syndrome is the strong belief in the exclusive psychogenesis of cancers. It is the belief that thoughts can be powerful enough to win over diseases with the constant denial of its biological truth. Fritz always claimed that cancer, his lymphoma was a disease of the soul, which he developed on his own because of the torments (psychological and socio-political) he suffered due to his parents. Studies have shown that emotional shocks or psychological stress does impact, trigger or even worsen some auto-immune diseases such as 'Basedow' disease and several infectious diseases, especially viral ones.

Suggesting that some diseases have psychological origin goes back to 18th century when doctors would automatically diagnose conditions with unknown origin/causes as hypochondriac, nervous or even hysterical diseases.

Psychoneuroimmunology helps us to have a better understanding of the very complex relationship between the brain, the immune system and endocrine system. It can sometimes even establish a bridge between emotions and diseases. For example, PNI can be effectively demonstrated through Psoriasis. The latter shows how the Immune system, the CNS, mental health and stress levels are all interconnected. Psoriasis is a chronic condition where there is extra production of skin cells due to release of cytokines from immune system and they build-up over the skin surface, which may lead to itchiness and also pain.

Stress can trigger sickness response in our body just as an usual infection would. Only here, it arises from the brain rather than from immune cells, and in response to stress, the brain release cytokines, which are inflammatory. Eventually if a person is subject to chronic stress, inflammatory mediators will also be present and released for a longer period of time, which may eventually worsen or trigger diseases.

Chronic psychological stress in people suffering from psoriasis tend to worsen the disease and trigger more episodes of the disease. Upon detection of stress, the hypothalamus triggers cortisol production, which in turn triggers release of cytokines.

Additionally, further studies have proven that we can increase the risk of developing cancers in mice if they are subject to a rotating cage with increasing speed. PNI studies the importance of psychological factors in the genesis of various diseases that is: neoplastic, auto-immune, and infectious. A linear relationship between stress, cortisol, decline of immune system and tumoral growth is observed. This has led to the fact that psychiatric depression is inevitably amalgamated to immune depression. The cancers implanted in rats were found to be very dependant of immune system, which is not necessarily the case for solid tumours in men. However, it should not be assumed that PNI plays no role in immune system-linked diseases just because its role in cancers in men are hard to be put in evidence.

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Written By:
Ms. Eileen Ramasawmy, 2nd Year BPharm Student, JSSAHERM

FDA Approved Drugs

S.N	Drug	Indication	Date of Approval
1	Zynyz (retifanlimab-dlwr) Intravenous infusion	To treat metastatic or recurrent locally advanced Merkel cell carcinoma.	22/03/2023
2	Rezzayo (rezafungin) Intravenous infusion	To treat candidemia and invasive candidiasis.	22/03/2023
3	Joenja (leniolisib) Oral administration	To treat activated phosphoinositide 3-kinase delta syndrome.	24/03/2023
4	Qalsody (tofersen) Intrathecally-Lumbar puncture	To teat amyotrophic lateral sclerosis in adults who have a SOD1 gena mutation.	25/04/2023
5	Elfabrio (pegunigalsidase alfa-iwxj) Intravenous infusion	To treat confirmed Fabry disease.	09/05/2023
6	Veozah(fezolinetant) Oral administration	To treat moderate to severe hot flashes caused by menopause.	12/05/2023
7	Miebo (perfluorhexyloctane) Opthalmic administration	To treat signs and symptoms of dry eyes.	18/05/2023
8	Epkinly (epcoritamab-bysp) Subcutaneous injection	To treat relapsed or refractory diffuse large B-cell lymphoma (not otherwise specified) and high-grade B-cell lymphoma after two or more lines of systemic therapy.	13/05/2023
9	Xacduro (sulbactam, durlobactam) Intravenous infusion	To treat hospital-acquired bacterial pneumonia and ventilator-associated bacterial pneumonia caused by susceptible isolates of *Acinetobacter baumannii-calcoaceticus complex*.	23/05/2023
10	Paxlovid (nirmatrelvir, ritonavir) Oral administration	To treat mild-to-moderate COVID-19 in adults at high riskfor progression to severe COVID-19.	25/05/2023

11	Posluma (flotufolastat F 18) Intravenous infusion	To use with positron emission tomography imaging in certain patients with prostate cancer.	25/05/2023
12	Inpefa(sotagliflozin) Oral administration	To treat heart failure.	26/05/2023
13	Columvi (glofitamab-gxbm) Intravenous infusion	To treat diffuse large B-cell lymphoma, not otherwise specified, or large B-cell lymphoma arising from follicular lymphoma after two or more lines of systemic therapy.	15/06/2023
14	Litfulo(ritlecitinib) Oral administration	To treat severely patchy hair loss.	23/06/2023
15	Rystiggo (rozanolixizumab-noli) Subcutaneous injection	To treat generalized myasthenia gravis in adults who are anti-acetylcholine receptor- or anti-muscle-specific tyrosine kinase antibody-positive.	26/06/2023
16	Ngenla (somatrogon-ghla) Subcutaneous injection	To treat growth failure due to inadequate secretion of endogenous growth hormone.	27/06/2023
17	Opill (Norgestrel) Tablets	It is a progestin-only, over-the-counter birth control pill for the prevention of pregnancy.	13/07/2023
18	Beyfortus (Nirsevimab-alip) injection	To prevent Respiratory Syncytial Virus (RSV) lower respiratory tract disease in neonates and infants.	17/07/2023
19	Balfaxar (prothrombin complex concentrate, human-lans) lyophilized powder for injection	For warfarin reversal in urgent surgery or invasive procedures	21/07/2023
20	Zurzuvae (zuranolone) capsules	For the treatment of postpartum depression (GABA-A receptor positive modulator)	04/08/2023

Drug Profile: Veozah

Class: Neurokinin receptor antagonists

Indication:

VEOZAH is indicated for the treatment of moderate to severe vasomotor symptoms due to menopause.

Clinical purpose:

Veozah is a nonhormonal prescription medicine used to reduce moderate to severe vasomotor symptoms (hot flashes and night sweats) due to menopause.

Before a woman enters menopause, a balance exists between the estrogen hormones and a brain chemical called neurokinin B (NKB), that works to regulate the body's temperature. During menopause, estrogen levels decline and this balance is disrupted, leading to vasomotor symptoms.

Veozah contains a drug called fezolinetant. Fezolinetant is a neurokinin 3 (NK3) receptor antagonist that works to reduce the frequency and intensity of hot flashes by restoring the balance between estrogen and NKB by blocking NKB in the temperature control center of the brain.

Veozah is used for the treatment of moderate to severe vasomotor symptoms due to menopause. Vasomotor symptoms are intense feelings of heat ("hot flashes" or "hot flushes"), night sweats, and feelings of warmth in the face, neck, and chest that can occur frequently in women transitioning through menopause.

Menopause is the natural change in a woman's life when her period stops, usually between the ages 45 and 55. Up to 80% of menopausal women are thought to experience hot flashes, which can include periods of sweating, flushing and chills lasting for several minutes.

Incidental effects:

VEOZAH is contraindicated in women with any of the following conditions:

• Known cirrhosis

• Severe renal impairment or end-stage renal disease

• Concomitant use with CYP1A2 inhibitors

Common Veozah side effects include:

- stomach (abdominal) pain
- diarrhea
- difficulty sleeping (insomnia)
- back pain
- hot flashes or hot flushes

VEOZAH is contraindicated in individuals with severe renal impairment or end-stage renal disease. Veozah can cause serious side effects, like increased liver blood test values.

Elevations in serum transaminase [alanine aminotransferase (ALT) and/or aspartate aminotransferase (AST)] levels greater than three times the upper limit of normal (ULN) occurred in 2.3% [exposure adjusted incidence rate (EAIR) of 2.7 per 100 person-years] of women receiving VEOZAH and 0.9% (EAIR of 1.5 per 100 person-years) of women receiving placebo in three clinical trials. No serum elevations in total bilirubin (greater than two times the ULN) occurred. Women with ALT or AST elevations were generally asymptomatic. Transaminase levels returned to pretreatment levels (or close to these) without sequelae with dose continuation, and upon dose interruption, or discontinuation.

Drug interactions:

VEOZAH is a substrate of CYP1A2. Concomitant use of VEOZAH with drugs that are weak, moderate, or strong

CYP1A2 inhibitors, increase the plasma C_{max} and AUC of VEOZAH.

VEOZAH is contraindicated in individuals using CYP1A2 inhibitors.

Overdose:

Treatment of overdose consists of discontinuation of VEOZAH therapy with institution of appropriate symptomatic care.

Pharmacology:

Mechanism of Action:

VEOZAH is a neurokinin 3 (NK3) receptor antagonist that blocks neurokinin B (NKB) binding on the kisspeptin/neurokinin B/dynorphin (KNDy) neuron to modulate neuronal activity in the thermoregulatory center. Fezolinetant has high affinity for the NK3 receptor (Ki value of 19.9 to 22.1 nmol/L), which is more than 450-fold higher than binding affinity to NK1 or NK2 receptors.

Pharmacodynamics:

Treatment with fezolinetant did not show any clear trends in sex hormones measured (follicle-stimulating hormone, testosterone, estrogen, and dehydroepiandrosterone sulfate) in menopausal women. Transient decrease of luteinizing hormone (LH) levels was observed at peak concentrations of fezolinetant.

Cardiac Electrophysiology

At a dose 20 times the maximum approved recommended dose, fezolinetant does not prolong the QT interval to any clinically relevant extent.

Pharmacokinetics:

In healthy women, fezolinetant Cmax and AUC increased proportionally over a dosage range from 20 to 60 mg once daily

Steady-state plasma concentrations of fezolinetant were reached after two once daily doses, with minimal fezolinetant accumulation.

Absorption

The median (range) time to reach fezolinetant Cmax is 1.5 hours in healthy women.

Distribution

The mean apparent volume of distribution of fezolinetant is 189 L. The plasma protein binding of fezolinetant is 51%. The blood-to-plasma ratio is 0.9.

Elimination

The effective half-life of fezolinetant is 9.6 hours in women with vasomotor symptoms. The apparent clearance at steady-state of fezolinetant is 10.8 L/h.

Metabolism

Fezolinetant is primarily metabolized by CYP1A2 and to a lesser extent by CYP2C9 and CYP2C19. A major metabolite of fezolinetant, ES259564, was identified in plasma. ES259564 is approximately 20-fold less potent than the parent. The metabolite-to-parent ratio ranges from 0.7 to 1.8.

Excretion

Following oral administration of fezolinetant, 76.9% of the dose was excreted in urine (1.1% unchanged) and 14.7% in faeces (0.1% unchanged).

Events' Corner

Event 1: World Health Day 2023

Day 1: Thursday 6th April 2023: Inaugural Function and Mindful Fitness

A ceremony to kick-off activities to mark World Health Day 2023, was organised at the JSS Academy of Higher Education and Research, Mauritius (JSSAHERM). The first copy of the JSS Health and Education Newsletter for the year 2023 was also issued on that occasion.

The Minister of Health and Wellness, Dr Kailesh Kumar Singh Jagutpal; the Mayor of the Municipal Council of Vacoas-Phoenix, Mr Praveen Kumar Ramburn; the Chief Executive Officer and Vice Chancellor of JSSAHERM, Professor (Dr) Praveen Mohadeb; and other personalities were present.

In his address, Minister Jagutpal commended the School of Pharmacy of the JSSAHERM for taking the initiative of celebrating World Health Day at their institution. He indicated that the celebrations will span over three days and will comprise activities such as Yoga, Mindful Meditation, Zumba sessions, Online Continuous Professional Development under the theme "Leadership in Pharmacy" and free checkup at La City, Trianon with various health checks on Non-Communicable Diseases.

Dr Jagutpal observed that this year's theme for World Health Day, observed annually on 07 April, is 'Health for All'. "This theme demonstrates that it is essential for everyone around the world to get access to information and health care services properly," he pointed out. In this regard, he indicated that the objective of the Government is to further strengthen Universal Health Coverage in the Republic of Mauritius. "Our objective is to ensure that adequate health services are made available to the whole population across the whole span of life starting from pre-conception to old age," he added.

The JSSAHERM, the Health Minister underscored, is an institution that showed through the organisation of World Health Day how committed it is to the health of the population. "It is not only an institution that provides training in health subjects and pharmaceutical subjects, but also provides facilities and conducts information campaigns on how we can contribute to make the lives of people better," Dr Jagutpal remarked.

On this score, the Health Minister reiterated his commitment to give all the encouragement needed by the institution so as to ensure that the work being done is well supported.
"Pharmaceutical sector is a constantly evolving one, and I believe that with the pharmacy programmes it is providing, the institution will deliver a much-needed supply of trained professional workforce, contributing to the 'Pharmaceutical Hub' which is one of the visions of our government," he said.

As regards to the health sector, Dr Jagutpal observed that there has been a considerable improvement in the healthcare sector and the Government tries its best to create a healthy nation. "This however also needs the efforts of each and every one to take care of their health, to practise physical exercises, to stay away from tobacco and to have a healthy diet, amongst others," he added.

The CEO of JSSAHERM, Professor Mohadeb, further highlighted that the institution is evolving rapidly as a health-based post-secondary education institution in Mauritius and in the region, treading on the same path as their parent institution in India. "Our vision is to be a world class centre of excellence in the Indian Ocean so as to enhance the quality of life for the benefit of society in diverse nations through education, training, research and innovation," he added.

Glimpse of the event:

Day 1 celebrations were closed off in the last segment deemed "Mindful Fitness" which consisted of a thrilling Zumba and Yoga session guided by the talented Ms. Sowmya from the Indira Gandhi Centre for Indian Culture, Mauritius (IGCIC). Students and staff alike were encouraged to participate in this session and most of them were up to the challenge.

Day 2: Friday 7th April 2023: CPD webinar on "Leadership in Pharmacy"

On 7th April 2023, JSS Academy of Higher Education and Research, Mauritius organized a CPD webinar on 'Leadership in Pharmacy' approved by the Pharmacy Council of Mauritius for two (2) CPD Credit Points. This webinar allows participants all around the world to join. At the end of the webinar E-certificate shall be issued to all attendees.

The learning objectives of this webinar were:

- Governing leadership in Pharmacy and determining its essential role in health care and pharmacy practice
- Determine the role of positional and non-positional leaders in creating change
- Defining the next step in one's own leadership journey as a pharmacist

Prof (Dr) Ashish Wadhwani and Prof (Dr) Praveen Mohadeb were on the hand of Welcome Address and Opening Remarks respectively.

The first speaker was Prof (Dr) B Suresh, Pro Chancellor and Director (TED) JSSAHER Mysuru who talked about 'Leadership in Pharmacy and its impact on the Healthcare Sector' where he elaborated how vision is important to be a good leader as well as the importance of Pharmacy Act and its Regulation and how and why they were implemented. He also talked about the importance of teamwork to achieve our goal as pharmacist.

The second speaker was Prof (Dr) Sudeendra Bhat, Professor, Dept. of Pharmaceutics & Controller of Examination, JSSAHER Mysuru who talked about 'Leadership Essentials for Pharmacists' where he enlightens us how management is different from leadership. He also talked on the qualities required to be a good pharmacist especially qualities in communication (the 6Cs) and how your voice and body language plays an important role in contributing to be a good leader.

During the presentation, participants were allowed to post their queries in the Q&A segment. Some of the questions were answered on the platform itself while other important questions addressed to the speakers were taken up by student representative, Ms Neelakshi Joyram at the end of the session following with the closing remarks. At the end of this webinar, the aim of this session was met where 300 attendees joined and participated.

Day 3: Saturday 8th April 2023: Free Health Camp

In hopes of offering Service to the Society, a free health camp was organized by the JSSAHER Mauritius at La City, Trianon, as part of the World Health Day celebrations.

The combined efforts of three organisations, namely JSSAHER Mauritius, Sihha Medical Centre, Port Louis and Lions Club of Albion led to the fruitful results of the camp, demarcated by the mass of 203 people who made a visit on that day and by the health check-ups amounting to a total figure of 1132 tests. Another upshot not to be disregarded is the distribution of gifts (Glucometer, Oral Care products and Vitamin Supplements among others) to the public of an estimated net worth of Rs 500,000.

The event kicked off at 10.00 AM, signifying the start of the comprehensive health examination of the visitors, with media coverage ensured by various news channels such as the Mauritius Broadcasting Corporation (MBC), Wazaa FM, MNews, GIS Mauritius, Radio Maurice and

Top FM. Along with the students and staff of JSSAHER Mauritius, the representatives of Sihha Medical Centre performed the health tests.

The free health assessments included:

- Blood Pressure
- Blood Glucose Level
- Body Mass Index (BMI)
- Body Fat
- Eye Check-up
- Ear Check-up
- Dental Check Check-up and Oral Care Tips
- Complete Blood Count (CBC)
- Mammography
- Patient Counselling

Since one of the main purposes of this event was to spread awareness among the general public about numerous common health issues, the distribution of pamphlets to examinees was another activity carried out during that day with joint and bone health, anaemia, and diabetes being some of the few health topics discussed in the leaflets.

The event, which went on like clockwork, drew to a close at 02.30 PM and with this, the celebrations for the commemoration of the World Health Day 2023 were wrapped up.

To end the day, students Ms. Elaheebocus, Ms. Ramparsad, Ms. Wahidna, Mr Henrage and staff Dr Khayati Moudgil participated in a live interview on RadioMoris, where they talked about JSS AHERM and the free health camp.

A glimpse of the event:

Event 2: Visits

Event 2.1: Visit of Mysuru Officials and Delegation to JSSAHERM

Event 2.2: Visit to Royal Green Clinic

On 9th May 2023, JSS AHERM faculty members paid a visit to the state-of-the-art premises of the Royal Green Clinic, Moka. The faculty members met with a fellow JSS alumni Mr. Uttam Dinaran who is the Chief Pharmacist. Mr Dinaran guided them through the exceptional set of community amenities and facilities that the clinic offers.

Royal Green Clinic provides services to the geriatric population of Mauritius. It welcomes external senior citizens, offering them the opportunity of participating in the social and wellness activities of its Clubhouse and Wellness Centre, together with delicious meals. Royal Green Clinic not only maintains the physical and mental health, but also the bond and trust, which makes this hospital unique.

It is safe to say that a collaboration between the JSS Academy of Higher Education and Research, Mauritius and the Royal Green Clinic is in progress, with the aim of allowing students to discover the top-notch healthcare and the fully-fledged facilities available.

Event 3: Celebrations of 77th Independence Day of India on 15th August 2023

77th Independence Day of India was proudly celebrated on 15th August 2023 (marking 76 years of freedom) between 10.30-11.00 a.m. in the premises of JSSAHERM. Dr. Y. Goutham, Assistant Professor hoisted the Indian flag with the participation of faculties and supporting staff. The theme for this year's celebration is "Nation First, Always First".

Students' Learning Experience- Internship

Internship of Ms. Misbah Dhuny at Clinique du Bon Pasteur

Monday, June 26 marked the beginning of my journey as a pharmacist intern at Clinique du Bon Pasteur. My internship lasted for 4 weeks and I worked from Monday to Friday, 9 am to 4 pm, under the pharmacist, Mrs Noorina Chuttoo, who was my preceptor at the site.

As an observer during my first week, I learnt about the overall structure of the pharmacy, that is, the in-patient and out-patient departments. I got to know my co-workers; the pharmacy dispensers who were kind enough to show me everything I needed to know about the pharmacy.

During my first 2 weeks, my work was restricted to the pharmacy itself and it consisted of the following:

- Learning about everything used in the in-patient pharmacy department, mainly the injectables, extension sets and cannula used for drug administration in wards.
- Learning about the over the counter medications, the antibiotics and the schedule 2 and 3 drugs which are used in both in-patient and out-patient pharmacy departments.
- Interacting with in-patients, filling their prescriptions and counselling them about the correct use of their medications.
- Reviewing the pharmacological classification of drugs, according to different pathologies.
- Learning about the hospital information system used.
- Discussing the in-patient cases with my fellow friend, Umar, from case files that would come to the pharmacy before discharging the patients.
- Learning more about surgeries performed at the clinic.

My last 2 weeks at the clinic were the times when I had the opportunity to learn new things, make use of my knowledge from 6 semesters of BPharm and discover a whole new dimension of the medical field. In fact, I had the chance to do ward rounds, interact with the nurses and patients, review treatment charts and test reports, monitor the vitals of some patients and learn how to insert a venous cannula from the nurses.

The most indelible experience I had as a pharmacist intern at Clinique Bon Pasteur was certainly the visit to the operation theatre. There, I got to know more about the drugs used during surgeries, the equipment, sterilization method employed as well as cleaning protocols observed before and after each surgery. Moreover, I visited the para pharmacy of the clinic, where I could learn more about cosmetic products; their active constituents as well as their use to treat different dermatological conditions.

This internship was undoubtedly very enriching and fruitful. My perspective on the healthcare sector in general has greatly changed during that short time period. Working with nurses, I realized that they are equally important professionals as doctors and pharmacists in ensuring the good health of patients.

Internship of Ms. Sophia Angeli Tan Wee at Port Mathurin Pharmacy

I started my internship in the school break just after my 4th semester in my island of birth in Rodrigues. I personally opted for a pharmacy there as I wanted my first experience in the work field to be in the country where I intend to work after my studies. I started my internship on the 26th of June and it ended on the 29th of July making it a total of 5 weeks. I worked at the community pharmacy from 09.30-16.30 for 5 days a week adding up to a total of 150 hours of internship that is the minimum time that the university requires giving us the time to adapt to the work environment and grasp all the information given to us by our pharmacist.

My first day started very smoothly. I was given a warm welcome by the pharmacist who made sure that I was not feeling too stressed about my first day. She then proceeded to cover up the following points which I feel was very important:

1. the types of drugs available in the pharmacy over the counter (OTC), prescription, controlled drugs.
2. presentation of the different staffs and their role in a pharmacy
3. the types of pharmaceutical products
4. types of dosage forms
5. Information present in a label

Here at the pharmacy the drugs are arranged using the alphabetical classification. During my internship on each day, I was assigned a specific section of the pharmaceutical products where I had to study the different ingredients and use of each product, for example, vitamins. I followed the pharmacist during each of her counseling and dispensing. As from the second week of my internship, I started preparing labels for dispensed products following the instructions of the pharmacist. I then started to dispense the products and interpreted the different prescriptions under the supervision of the pharmacist, verifying its legality and accuracy.

On the following weeks of my internship, I was taught about the treatments and details about the different common cases in Rodrigues Island namely; Dengue fever, UTIs, skin diseases (eczema, fungal infection, psoriasis) and scabies.

During my internship, I learnt a lot about the importance of community pharmacy in health screening. I was given the opportunity to put in practice the theory about blood pressure monitoring and blood glucose monitoring. My internship allowed me to learn a lot about empathy and how to deal with delicate situations so as not to stress the patient nor make them feel uncomfortable.

Working in the community pharmacy allowed me to understand the role and responsibilities of a community pharmacist and how to ensure the proper running of the pharmacy. I strongly believe that this internship enabled me to know in which direction I am heading.

Memorandum of Understanding/Agreements

The JSSAHER Mauritius also signed MoUs with the following placement sites:

1. Pharmaceutical Association of Mauritius (PAM)
2. Noor Pharmacy
3. MedActiv

This MoU focuses on Community Pharmacy Practice and management such as;

- procurement and inventory management,
- dispensing of medicines,
- computer applications
- pharmaceutical and patient care practices and
- any other specific best practices followed by the hospital/company

This MoU further enlightens the need to engage in Hospital Pharmacy such as:

- Participating in ward rounds, reviewing patient treatment charts, allowing patient reviews and monitoring ADRs
- Assessing possible drug interactions and performing dose divisions
- Inventory management and performing medication audits
- Use of Hospital Information System (HIS) to indent, issue, and print labels, prior to dispensing of medications

PHARMACEUTICAL ASSOCIATION OF MAURITIUS

PAM

JSSAHERM Faculty Publications and Conferences Attended (May-August 2023)

1. International Conference: Summer School on Ethnopharmacological Relevance: From Bench to Shelf, Including Intellectual Property and Bioprospecting Acts 15-19 May 2023, University of Pretoria, South Africa

The Volkswagen Summer School was hosted from 15 to 19 May 2023 at the Future Africa Campus of the University of Pretoria, in collaboration with Dr. Cica Vissiennon from the University of Leipzig, Germany; was a huge success.

A total of 24 scholars were selected to attend this summer school, of which 18 hailed from African countries and 6 from European countries. The summer school included talks from 19 speakers from various countries, including from South Africa, Greece, Switzerland, Germany, Sudan, Egypt, Ghana, Uganda, Mauritius and Burkina Faso. They shared their in-depth knowledge in their respective fields of expertise, focussing specifically on topics concerning the road from the laboratory to commercialisation of natural products. Ms Jazmin Ponce Gomez from the University of Leipzig, Germany, presented to the attendees a very intriguing lecture on how to build a business model, which eventually assisted them to get an insight on designing their own business models.

Prof (Dr) Ashish Wadhwani and Dr Khayati Moudgil represented JSSAHERM at VM Summer School as speakers and presented the topic "BIOPROSPECTING FOR NOVEL DRUGS FROM MEDICINAL PLANTS" where they shared their research experience working with medicinal plants against various diseases.

Speakers and attendees of the VW Summer school 2023 at the Future Africa Campus of the University of Pretoria

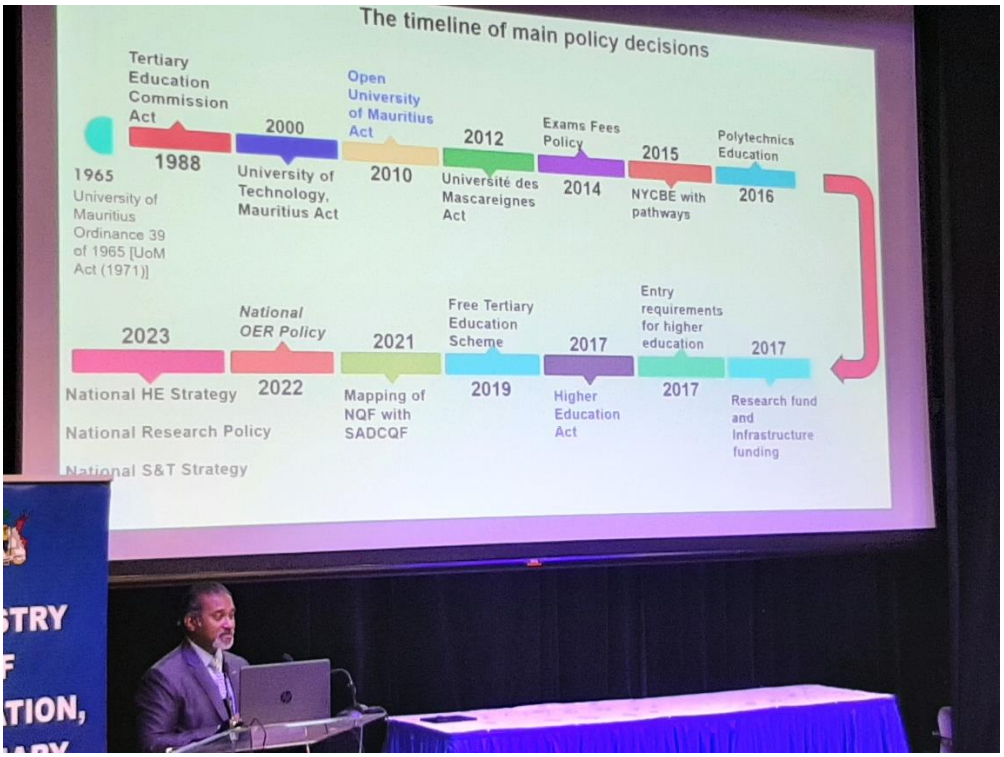
2. **International Conference:** Prof Dr Ashish Wadhwani gave a virtual talk in International conference on the research work entitled "Development of Insulin-Loaded Microneedle: A Closed-Loop Transdermal Drug Delivery System for the Management of Diabetes"

3. **Pre-Conference Workshop on "The Futures of Higher Education in Mauritius"**

The Ministry of Education, Tertiary Education, Science and Technology in collaboration with the Higher Education Commission organised a Preparatory Consultation Workshop on the 29th and 30th of March 2023 at University of Mauritius, The Core Building, Ebene, gathering stakeholders from the Ministry of Education, Tertiary Education, Science and Technology, Higher Education Commission, public and private higher education institutions and relevant higher education organisations.

Prof Dr. Praveen Mohadeb, Prof Dr. Jaishree Vaijanthappa and a student representative, Mr Chetramsingh Chummun, participated in the 2-day Pre-Conference Workshop.

The purpose of this workshop was to take stock of the outcomes of the survey: "The Futures of Higher Education" in Mauritius and to prepare for the main conference which was to be held in May 2023. The objective of the Conference is to develop the National Strategy for Higher Education in Mauritius and the Higher Education roadmap 2040. The workshop brought together educators, administrators, policymakers, and thought leaders to discuss and envision the future landscape of higher education.



Day 1- Wednesday 29th March 2023

The welcoming address alongside the objectives of the workshop were delivered by Prof Dr Kiran Bhujun, Director Tertiary Education & Scientific Research, Ministry of Education, Tertiary Education, Science & Technology. The outcome of the survey was presented and discussed by Prof (Dr) Mrs Romeela Mohee, Commissioner Higher Education Commission. Insightful and engaging presentations by Dr Jamil Salmi, a Global Tertiary Education Expert and by Professor Mpine Makoe, Commonwealth of Learning Chair of Open Education Practices and Resources, Director of African Council of Distance Education (ACDE), were next on the program schedule.

Dr Jamil Salmi gave a thoughtfully crafted presentation offering a deep dive insight into the subject matter of "What is a National Higher Education Strategy" and elaborating on the different dimensions of what the plan should consist of. This thought – provoking seminar sparkled stimulating discussions among the participants.

Prof Mpine Makoe gave key insights on the "Scenarios on Futures of Higher Education" with the aim of fostering dialogue and exploration of emerging trends and challenges in the realm of higher education. The speaker emphasized the need for continuous adaptation and innovation in higher education.

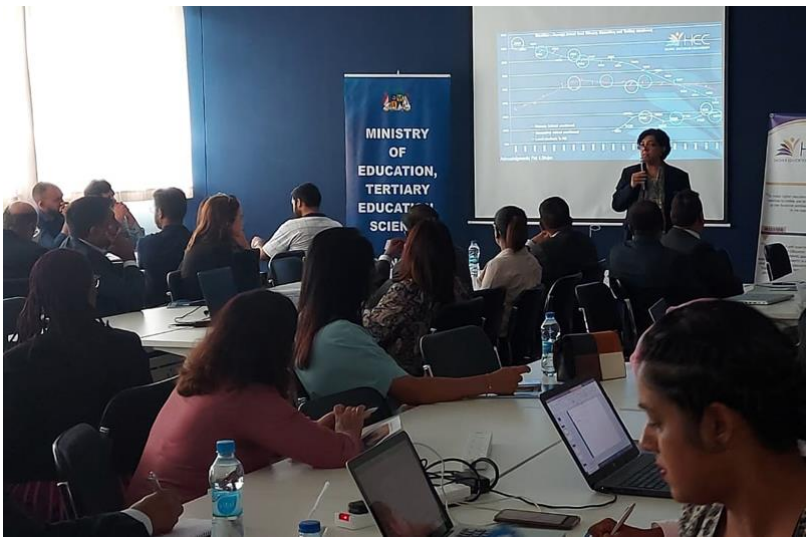
Day 2- Thursday 30th March 2023

The following day consisted of stakeholder's interaction session by clusters. The clusters comprised of head of institutions, administrators, technical staff and students. This fostered a productive exchange of ideas on 5 selected themes:

1. Technology-Driven Higher Education
2. Agile Regulator Framework and Quality Assurance

3. Pathways and micro-credentials as part of Higher Education
4. The role of research in HE as an enabler to support socioeconomic advancement
5. Internationalisation and cross-border Higher Education

Each cluster presented a report on the above themes. The reports consisted of pertinent issues as well as innovative approaches to remedy the challenges related to the themes. The aim of this activity was to provide the Ministry of Education as well as the Higher Education Commission with pragmatic views and recommendations emerging from these reports, to take into account for the development of the National Strategy for Higher Education in Mauritius and the Higher Education roadmap 2040.



4. Pre-Conference on "The Futures of Higher Education in Mauritius"

The Ministry of Education and Higher Education Commission jointly organised a pre-conference on "The Futures of Higher Education in Mauritius" at JSS Academy of Higher Education and Research, Mauritius, on Friday 12th May 2023.

The agenda revolved around the perks of tertiary education and reflecting upon the advent of technology on higher education. The pre-conference was marked by a series of questions asked to both students and staff to ponder and give opinions on how higher education can be improved over the years and some possible innovations.

Additionally, the concept of green campuses, innovation, creativity and originality in promoting favourable teaching environments have been emphasised. Students are encouraged to develop analytical and critical skills as a plus to active learning.

Glimpse of the event:

4. Two-Day Conference on "The Futures of Higher Education in Mauritius"

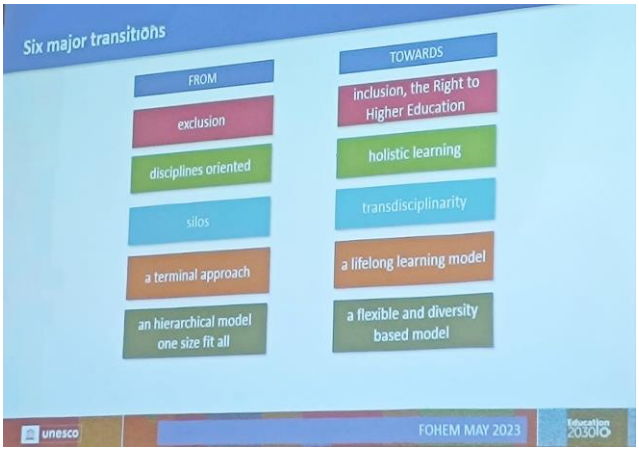
As part of the last phase of "the Futures of Higher Education in Mauritius" project, the Ministry of Education, Tertiary Education, Science and Technology, in collaboration with the Higher Education Commission, organized a final 2-day consultative workshop on the 17th and 18th May 2023 at Hennessy Park Hotel, Ebene to recapitulate and further discuss on the points raised and proposals put forward during previous stakeholder consultations. The CEO and Vice-Chancellor of JSSAHER Mauritius, Prof Dr. Praveen Mohadeb, attended the conference accompanied by two student representatives, namely Mr. Chetramsingh Chummun and Ms. Salvi Wahidna.

Day 1- Wednesday 17th May 2023

A welcome address by the Co-Project Director, Prof (Dr) Kiran Bhujun, was at the head of the agenda for the opening day of the conference. The audience was guided through the trends of new admissions into primary and secondary schools as well as tertiary education institutions over the course of the years, through which the speaker substantiated the need for a new national strategy regarding higher education in Mauritius.

After a short intervention by Prof Romeela Mohee, Higher Education Commissioner and Co-Project Director, the audience was addressed by the Honourable Vice Prime Minister, Minister of Education, Tertiary Education, Science and Technology, Mrs Leela Devi Dookun-Luchoomun, who expressed her views on the current state of affairs of higher education in Mauritius and finally declared the conference open.

Prof Mpine Makoe, Commonwealth of Learning Chair in Open Education Practices and Resources, was the next spokesperson of the day and she focused on validating the input received from all stakeholders assisting the conference. The rest of the workshop was taken over by Dr. Peter Wells, Head of Education at the UNESCO Regional Office for Southern



Africa, who led a guided thinking session around the gist of six major transitions that Mauritius should ponder and act on to develop the much sought-after national higher education strategy.

Day 2- Thursday 18th May 2023

Once the discussions of the previous day had been run through by Prof Mohee, an online guided thinking session with Dr. Jamil Salmi, World Bank higher education coordinator, was on cue. 'From Roadmap to National Strategy' and 'From a National Strategy to a Roadmap' were the topics on which the audience was acquainted with as Dr. Salmi illustrated the 2035 vision that the world foresees for higher education. The floor was then left to Prof Mpine Makoe who engaged the audience in thinking of the new Higher Education strategy for Mauritius until 2040. She encouraged the audience to exchange their views regarding the strengths, weaknesses, threats, and opportunities of the higher education system of Mauritius and debated whether they should be taken forward or eliminated.

The end of the conference was marked by the co-project directors offering a token of thanks to Prof Mpine Makoe followed by Prof Bhujun's concluding speech in which he expressed his appreciation to all members present and reiterated that their contribution to this project would absolutely not go in vain.

5. Leadership Course Programme

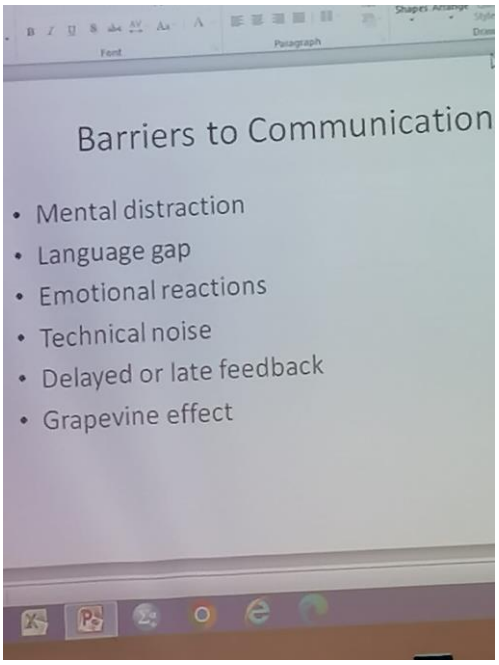
Mrs Manisha Ramchurn, Assistant Professor at JSS Academy of Higher Education and Research Mauritius, attended a leadership course programme offered by Exfin on Thursday 22nd June 2023.

Such conference proved to be a very enriching experience, where traits of a leader were discussed; and the debate over whether leaders are born or made.

Leaders generally have a set of behaviors; they have a vision, they set a mission and they have clear goals and objectives.

Moreover, leaders have an action plan to implement and monitor and also continuously control.

Many further topics were discussed such as planning, business models, decision making, how to inspire as well as insights were given on self-awareness including the mirror test.



JSSAHERM Meritorious Scholarship

The scholarship event is an important phase after the completion of each cohort's studies, annually. It is a prestigious award only given to those students who have scored above 90% and who have topped in their respective classes.

Prof (Dr) Praveen Mohadeb, CEO and Vice-Chancellor along with Mr K P Naveen, Registrar of JSSAHERM granted this award to 3 toppers this year.

Ms. Umaira Oodally and Ms. Misbah Dhuny from Cohort 1, both secured the highest grades in the third year of their studies.

Ms. Salvi Wahidna from Cohort 2, on the other hand, again secured the highest grades in the second year of her studies.

Ms. Salvi Wahidna receiving JSSAHER Meritorious Scholarship

Ms. Umaira Oodally and Ms. Misbah Dhuny receiving JSSAHERM Meritorious Scholarship

Upcoming Events

JSS Academy of Higher Education and Research, Mauritius is pleased to announce the following upcoming events:

1. **World Pharmacist Day** – 25th September 2023

2. **International Conference in association with Non-Aligned Countries Movement Science and Technology Centre (NAM S&T centre), New Delhi, India**
   21st to 23rd November 2023

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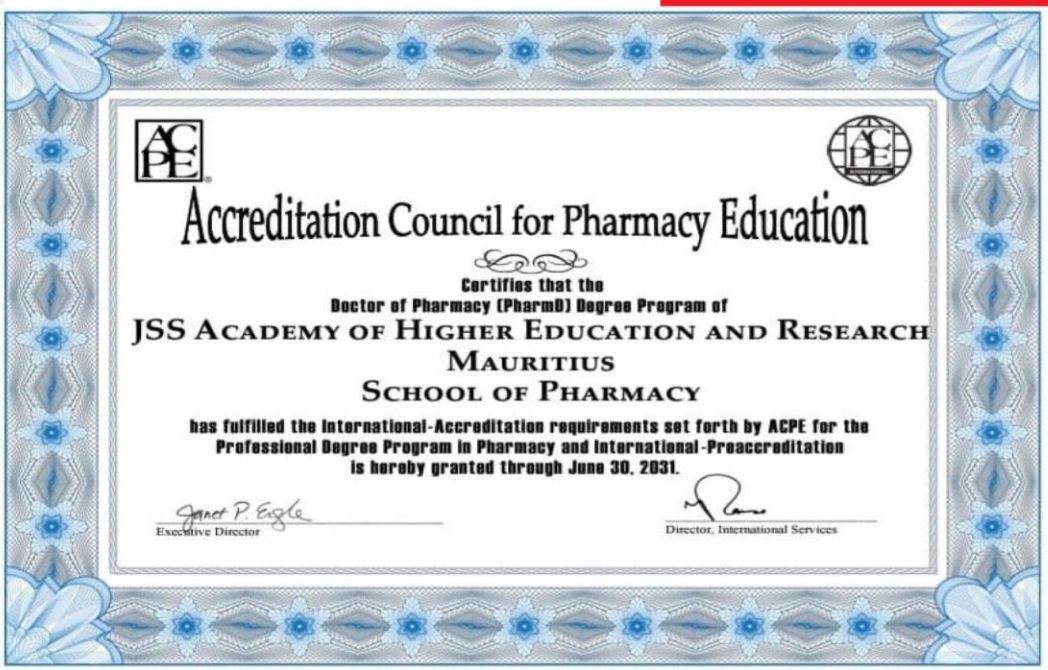

Accreditation Council for Pharmacy Education

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Doctor of Pharmacy (PharmD) Degree Program of
JSS Academy of Higher Education and Research
Mauritius
School of Pharmacy

has fulfilled the International-Accreditation requirements set forth by ACPE for the Professional Degree Program in Pharmacy and International-Preaccreditation is hereby granted through June 30, 2031.

Janet P. Eagle
Executive Director

Director, International Services

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- M.Sc Microbiology (F/T & P/T)
- M Pharm (Pharmaceutics) (F/T &P/T)
- M Pharm (Pharmacy Practice) (F/T & P/T)
- M Pharm (Pharmacology) (F/T & P/T)
- M Pharm (Regulatory Affairs) (F/T & P/T)
- MBA Hospital Administration (F/T & P/T)
- Doctor of Pharmacy (PharmD) (F/T & P/T)

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The Chief Editor

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