MARRI LAXMAN REDDY GROUP OF INSTITUTIONS

Marri Laxman Reddy Institute of Pharmacy

(Approved by AICTE & PCI, New Delhi, JNTUH Affiliated)
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"The Person Who Takes Medicine Must Recover Twice, Once From The Disease and Once From The Medicine"

- William Osler

INSIDE THIS:

PharmaScout

MLRIP's official e-mag

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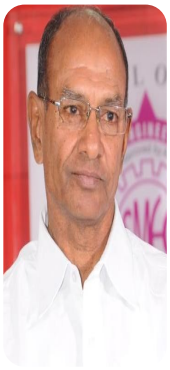


Sri Marri Laxman Reddy

Chairman

MLR Group of Institutions

He has been in the field of education for more than three decades. He is an exemplary personality and extraordinary visionary and a constant inspiration to the younger generation. He is a veteran athlete of international repute. He emphasizes the importance of physical health for academics and overall personality development.

Sri Marri Rajshekar Reddy

Founder-Secretary

MLR Group of Institutions

He is a person of great acumen and remarkable abilities. He is a dynamic leader and strives hard to make every dream a reality. He is an initiator, innovator, and executor of novel plans for the progress of the institutions. He is the motivational and driving force of all the activities in the campus.

PRINCIPAL'S DESK

Dr. Nakka Jyothi
Professor & Principal

As we gather here for another installment of our college newsletter, I am reminded of the profound sense of community that defines our institution. Together, we have embarked on a journey of discovery, growth, and achievement, and it is with great pride that I reflect on our collective accomplishments.

In the ever-changing landscape of higher education, MLRIP has remained steadfast in its commitment to excellence, innovation, and service. It is through the dedication of our faculty, the hard work of our staff, and the passion of our students that we continue to push the boundaries of knowledge and make meaningful contributions to society.

As we look back on the past academic term, we are filled with gratitude for the countless opportunities we have had to learn, to grow, and to connect with one another. From groundbreaking research to creative endeavors, from community outreach to extracurricular activities, our college community has demonstrated time and again its capacity for greatness.

Looking ahead, I am filled with excitement for the possibilities that lie before us. Together, we will continue to embrace change, to adapt to new challenges, and to seize the opportunities that come our way. Through collaboration, perseverance, and a shared commitment to excellence, there is no limit to what we can achieve.

I would like to take this opportunity to express my deepest appreciation to each and every member of our college community for your hard work, your dedication, and your unwavering commitment to our shared mission. It is through your efforts that MLRIP continues to thrive as a center of learning, discovery, and innovation.

As we embark on the next chapter of our journey together, let us remain united in our pursuit of knowledge, our commitment to excellence, and our dedication to serving others. Together, we will continue to inspire one another, to challenge one another, and to make a positive impact on the world around us.

"DATA RX: UNVEILING THE POWER OF BIG DATA ANALYTICS IN PHARMA

Dr. Maha Lakshmi Kodadi, M. Pharm, Ph. D., Professor, Dep. of Pharmaceutics

Ch. Samatha, B. Pharm II Year

Like every other industry things are changing very fast in the pharma sector. With only 20 years of drug patent window, there is very little time for organizations to earn ROI. There is a clear ask for innovative technology solutions to speed up the process of ensuring profits.

Big data analytics has emerged as a game-changer in the pharmaceutical industry, revolutionizing various aspects of drug discovery, development, manufacturing, marketing, and sales. Here are some key areas where big data analytics is making a significant impact in the pharmaceutical sector

The process of drug development is lengthy and complex combined with several processes, applications and approvals. Unquantified and unstructured data is produced from multiple systems in various forms. Advances in storage, network and computing technologies have enabled pharma companies to overcome this problem and economically and efficiently harness this Big Data and turn it into a potent source of business strength. Big Data is enabling joint analyses of clinical and pre-clinical data from disparate sources and also lends transparency to translational research to achieve personalized Medicine.

Pharma companies are now being under pressure to adopt ground breaking drug technologies and enterprise-wide M&A to diversify the product portfolio to maintain revenue streams. Conclusions drawn from typical clinical trials are now not adequate enough for drug value assessment and decision making. There is, therefore, a need for data-driven insights with real-world clinical evidence. Translational research along with comparative effectiveness is becoming imperative to understand a drug's impact in real life.

Implementation of Big Data infrastructure enables faster data processing, which, in-turn, allows organizations to support scientific analytics and derive more focused business outcomes for next-gen research. Big Data architecture includes a radical integrated repository, along with scalable collaborative interfaces and advanced analytics with flexible deployment options. It is predicted that the market for Big Data technology and services will reach $16.9 billion in 2015, up from $3.2 billion in 2010, an annual growth rate of 40 percent. Owing to this growth the pharma industry is becoming more patient centric and realizing value of patient outcomes, improved safety and efficacy, connected research and care through better data insights.

The figure below highlights the multiple advantages of implementing Big Data in pharma R&D.

With "data-to-insights" cycle coming into play, pharma companies can emphasize more on a stack of tools such as Hadoop, NoSQL Databases, Map Reduce, In-memory Analytics, Enhanced Cloud Computing and Storage.

Transformation by use of data across Clinical continuum demand novel data exchange models for futuristic clinical outcome, coordinated research and care.

In the essence, better data handling, easy-to-learn/use modeling tools, and an array of analysis algorithms will help organizations build a framework to extract useful features from large datasets to further understand business insights and decrease time to information which will be the key to maximizing ROI.

Big data enabled consolidation and collaboration among different internal and external healthcare stakeholders will benefit pharma companies by breaking the silos that separate internal functions and enhance integrated, consistent research and care management.

FOOT CARE FOR PEOPLE WITH DIABETES

Dr. Alambaram Vaishnavi, Pharm. D, Asst. Professor, Dep. of Pharmacy Practice
Giddi Prizly, Pharm. D II year

The feet are at risk for damages and problems in people with diabetes mellitus. That is because 2 key risk factors come together. There is poor circulation of blood to the feet (called "peripheral vascular disease"). And, there is loss of feeling in the feet (complication called "peripheral neuropathy"). These lead to a high rate of foot problems for people with diabetes. And, an amputation can be a feared result. Today we know more about how to prevent it. There are also new wound care methods and equipment. So, you can rule out amputation in most cases.

The feet can get injured from:

- Something that breaks your skin (such as a cut)
- A penetrating wound (such as stepping on a tack)
- Walking barefoot on a hot surface
- Constant pressure in one spot (as from a tight shoe)
- Repeated stress or infection

The tips that can help you avoid injuries. These tips can also help keep them from getting worse when they do occur.

- Bathe your feet daily. Wash carefully with warm water and soap; rinse and dry thoroughly. Make sure you dry completely between the toes.
- Be careful as you trim your toenails. File straight across. Think about going to see a podiatrist; he or she can do your regular foot care.
- Do not use products for corn or callus removal; be sure never to try to trim calluses yourself. Try to figure out pressure points that might be causing a callus. Then, be sure to stop that pressure. See a foot doctor for treatment.
- Moisturize feet that are dry. If the skin on your feet is dry, a moisturizing cream will help. But, you should apply it sparingly. Never apply it between the toes.
- Inspect your feet daily. Be on the lookout for: cuts; red spots, warm spots, or hot spots; calluses or corns; ingrown toenails; change in color; or any other abnormalities.
- Never go barefoot; always wear shoes to cover your feet.
- Finally, make sure your shoes fit right. Shoes that are too tight can cause blisters and calluses; shoes that are too loose can also cause ulcers or blisters as they rub against the foot. Make sure socks aren't rubbing, either.

When you examine your feet every day, see if there is anything of concern:

- a new sore
- an irritated spot that is not getting better
- a break in the skin.

If it does, then you should see your doctor or health care professional. There are many ways to treat foot problems. They are: medicine; bed rest, with raising of the legs or feet; scraping or cutting away dead tissue; putting on a cast; special shoes; or surgery. You would need an amputation only in some severe cases; this is when there is out of control disease (either infection or gangrene).

Diet Plan for Diabetic Foot Ulcer Patient

- Try to maintain a well-planned diet:
- Choose low glycemic index foods
- Add omega-3 fatty aci
- Focus on antioxidant -rich foods
- Ensure adequate protein consumption
- Observe your sodium intake

Student's Corner

WITNESSING GENE THERAPY IN MEDICAL FIELD

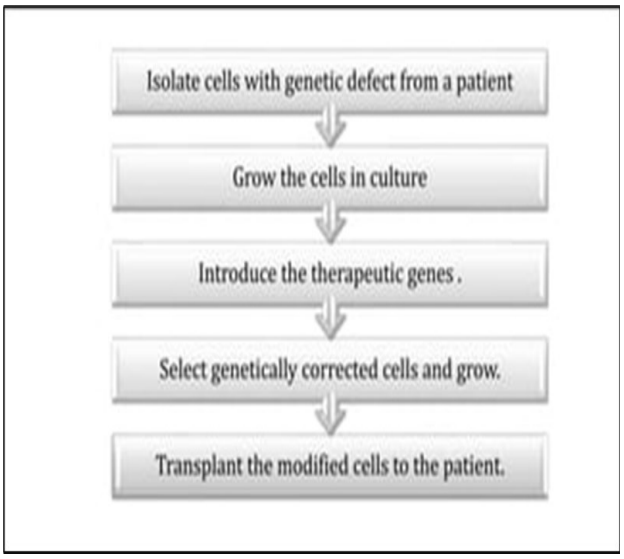
Dr. S. Bala Murali Mohan, Pharm. D, Asst. Professor, Dep. of Pharmacy Practice
Swetha Siddabhathula, B. Pharm I Year

Gene therapy is the introduction of genes into existing cells to prevent or cure a wide range of diseases. It is a technique for correcting defective genes responsible for disease development. The first approved gene therapy experiment occurred on September 14,1990 in US, when Ashanti Desilva was treated for ADA-SCID. it's the unique technique that uses gene to prevent or recover any diseases. The technique of gene therapy may allow doctors to treat a disorder by inserting a gene into patient's cell instead of using drugs or surgery. The gene therapy has currently examined only for diseases that have no other cure techniques.

APPROACHES IN GENE THERAPY:

In vivo gene therapy: direct delivery of genes into the cells of a particular tissue in the body.

Ex vivo gene therapy: transfer of genes to cultured cells and reinsertion.



Researchers have been exploring the solution to genetic diseases by modifying and repairing the disease-causing gene, that is, gene therapy.

Gene therapy is one of the most revolutionary medical technologies developed with DNA recombination technology and gene cloning technology. It is a biomedical treatment method based on changing human genetic material. For genetic diseases, gene therapy can directly repair or even replace the disease-causing genes at the molecular level, restoring defective protein. After decades of development, gene therapy has shown great potential in treating significant diseases caused by genetic defects and genetic abnormalities such as malignant tumors, acquired immunodeficiency syndrome, and cardiovascular diseases.

In this, we brief about the delivery systems of gene therapy and drugs used by gene therapy-

GENE THERAPY DRUGS:

At present, gene therapy drugs mainly include plasmids DNA,small interfering RNA (siRNA), microRNA (miRNA), short hairpin RNA (shRNA), antisense oligonucleotide (ASO), and CRISPR/Cas9 system. With the development of gene therapy and the improvement of innovative vectors, gene therapy drug products have

DRUG	TARGETING	DELIVERY ROUTE	CELL MODEL	DISEASE MODEL	HIGHLIGHT
siRNA	GL-3	DNA nanoclew	Hela	Cancer	Biocompatible spherical nucleic acid
siRNA	VEGF	AuNP nanoconstructs	PC-3	Anti-angiogenic cancer	Combination therapy; photothermal therapy
siRNA	Hsp27	Amphiphilic phospholipid peptide dendrimers (AmPPDs)	PC-3	Castration-resistant prostate cancer	Optimal balance between the hydrophobic tail and hydrophilic dendritic portion
CRISPR/Cas9	EGFP	PEGylated nanoparticles	Hela	Cancer	Genome editing; cell-penetrating peptide

Student's Corner

WITNESSING GENE THERAPY IN MEDICAL FIELD

been resoundingly approved by the Food and Drug Administration (FDA).

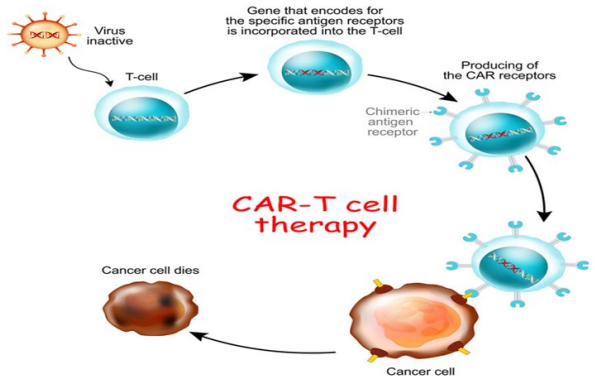
DISEASES TREATED WITH GENE THERAPY:

1. CANCER THERAPY:

Cancer is one of the major diseases that endanger human health. Current cancer treatment methods, such as chemotherapy, radiotherapy, and surgical treatment. Gene editing technology can regulate the expression of genes in prostate cancer cells and provides great help for exploring the functions of related genes in prostate cancer.

2. DUCHENNE MUSCULAR DYSTROPHY:

CRISPR/Cas9 system-mediated gene editing can restore the coding frame of the DMD gene by introducing small insertions or deletions and induce exon skipping and correct nonsense mutations through gene recombination. With the continuous development and improvement of the CRISPR/Cas9 gene editing system, the application of this technology for the repair of DMD mutations has rapidly developed.



3. PARKINSON'S DISEASE:

The advantage of gene therapy is that it can deliver gene therapy drugs to specific brain regions to change functions and treat Parkinson's disease (PD) while avoiding off-target effects. Currently, there are three main gene therapy strategies for the treatment of PD: (1) restoring the synthesis of striatum dopamine; (2) providing neurotrophic support to promote the survival of neurons in neurodegenerative sites; (3) regulating the subthalamic nucleus excitatory neuron activity.

4. OTHER GENETIC DISEASES:

Hemophilia A (HA) is an X-linked recessive genetic disease. In this used CRISPR/Cas9 technology to genetically edit the F VIII gene of the induced IPSCs to restore the inverted chromosome fragments to the wild state, differentiate the IPSCs into endothelial cells, and transplant the endothelial cells into mice with hemophilia.

Huntington's disease (HD) is an autosomal dominant genetic disease, and the most fundamental treatment is gene therapy. It currently includes gene editing that directly corrects huntington's gene mutations at the DNA level and inhibits the production of mutant huntinatin (mHTT) proteins at the mRNA level.

In addition to the above genetic diseases, gene therapy clinical experimental studies including diabetic retinopathy (DR), glaucoma, β-mediterranean anemia, age-related macular degeneration (AMD), and cardiovascular disease (CVD).

Genetic diseases seriously threaten human health and have always been one of the refractory conditions facing humanity. Currently, gene therapy drugs such as siRNA, shRNA, antisense oligonucleotide, CRISPR/Cas9 system, plasmid DNA and miRNA have shown great potential in biomedical applications. The critical point of gene therapy is to select specific genes that have therapeutic effects on the disease based on understanding the molecular mechanism of disease occurrence.

Pharma#Throwback

FRIEDRICH WILHELM ADAM SERTÜRNER

(19 JUNE 1783 – 20 FEBRUARY 1841)

Dr. Gabriela Keerthana Gondhi, Pharm. D, Asst. Professor, Dep. of Pharmacy Practice
N. Bhargavi, B. Pharm II Year

German pharmacist and a pioneer of alkaloid chemistry. He is best known for his discovery of morphine which he isolated from opium in 1804 and for conducting tests, including on himself, to evaluate its physiological effects.

Sertürner was born, the fourth of six children, to Joseph Simon Serdinier and Marie Therese Brockmann on 19 June 1783, in Neuhaus, North Rhine-Westphalia (now part of Paderborn). The family may have had origins in Sardinia. His father called himself an architectus, serving surveyor and engineer to the prince bishop. After his father died, he became a pharmacist's apprentice at the Cramersche Hofapotheke in Paderborn. He completed the apprenticeship in four years and passed the qualifying examination on August 2, 1803.

Sertürner worked on the isolation of morphine from opium from 1804. He called the isolated alkaloid "morphium" after the Greek god of dreams, Morpheus. He published a comprehensive paper on its isolation, crystallization, crystal structure, and pharmacological properties, which he studied first in stray dogs and then in self-experiments.[6] Morphine was not only the first alkaloid to be extracted from opium, but the first ever alkaloid to be isolated from any plant. Thus Sertürner became the first person to isolate the active ingredient associated with a medicinal plant or herb.The branch of science that he originated has since become known as alkaloid chemistry.

In 1806 Sertürner moved to Einbeck, working as a pharmacists' assistant to Ratsapotheker Daniel Wilhelm Hinck (1783 -1813). In 1809, Sertürner opened the first pharmacy he owned, in Einbeck. Between 1812 and 1814 he dabbled in work to improve guns and cannons for the army and navy. In 1813 his right to run the pharmacy had to be contested and he lost the case in 1817. He however got his brother-in-law Heinrich Karl Daniel Bolstorff to take over his pharmacy and move to Hamelin where he worked as Ratsapotheke succeeding Johann Friedrich Westrumb (1751-1819). He continued to investigate the effects of morphine. After the publication of his paper "Ueber das Morphium als Hauptbestandteil des Opiums" in 1817, his work on morphine became more widely known and morphine became more widely used.[8] In 1821 he married Eleonore Dorette von Rettberg of Einbeck and would have six children. In 1822, Sertürner bought the main pharmacy in Hamelin (Rathaus Apotheke), where he worked until his death on 20 February 1841. Around 1831 he was involved in studying a cholera epidemic that affected Hamelin and recognized an organismic cause for the disease. He suffered from arthritis during his last years and it is said that he took morphine for relief. There have been suggestions that he may have become addicted. The autopsy noted that his entire body gave the appearance of dropsy. He was buried in Einbeck. His son Victor took up the position of Ratsapotheke after his death.

Recognition:

In 1817 Sertürner was awarded an honorary doctorate from Jena University.The degree was initiated by Goethe who also had Sertürner inducted into the Jenaer Societät für die gesammte Mineralogie as an honorary member. Gay Lussac brought attention in France to the work of Sertürner. In 1831, Sertürner received the Montyon Prize from the Institut de France with the title 'Benefactor of Humanity'. In 1924, a street in Münster was named after him as Sertürnerstrabe.

Medicine Watch

Tirzepatide

Dr. Amreen Sultana, Pharm. D, Assistant Professor, Dept. of Pharmacy Practice

Drug name : Tirzepatide

Brand name: Moujaro,zepbound.

Manufacturing companies:

Dr. Reddy's laboratories,

Xi'an ZB Biotech Co.,Ltd.

Xi'an Tian Guangyuan Biotech CO., Ltd

Apino Pharma Co., Ltd.

Drug class : Anti diabetics, Glucose - dependent insulinotropic polypeptide (GIP) receptor and glucagon -like peptide -1(GLP-1) receptor agonists.

Indications:

1. Type II Diabetes Mellitus

2. Chronic weight management for adult patients that are obese or over weight with at least one weight -related comorbid conditions such as type 2 diabetes and hypertension.

Dose: Adult dose: Initial dose -2.5mg SC once a week and after 4 weeks ,

dosage should be increased to 5mg SC once a week.

Maximum dose :15mg SC once a week.

Dosage Modifications

Renal impairment

Any stage, including end-stage renal disease: No dosage adjustment required

Hepatic impairment

Any stage: No dosage adjustment required

Mechanism of action:

Tirzepatide is a GIP receptor and GLP-1 receptor agonist. It is an amino acid sequence including a C20 fatty diacid moiety that enables albumin binding and prolongs the half-life. Tirzepatide selectively binds to and activates both the GIP and GLP-1 receptors, the targets for native GIP and GLP-1. GLP-1 is a physiological regulator of appetite and caloric intake. Nonclinical studies suggest the addition of GIP may further contribute to the regulation of food intake.

Absorption:

Bioavailability: 80%

Peak plasma concentration: 8-72 hr

Steady-state achieved: 4 weeks

Distribution:

Protein bound: 99% (primarily to albumin)

Vd: ~10.3 L (T2DM); ~9.7 L (overweight/obesity)

Metabolism:

Metabolized by proteolytic cleavage of the peptide backbone, beta-oxidation of the C20 fatty diacid moiety, and amide hydrolysis

Elimination:

Half-life: ~5 days

Clearance: 0.061 L/hr (T2DM); 0.56 L/hr (overweight/obesity)

Excretion: Metabolites via urine and feces

Contraindications:

Tirzepatide should not be used in people with a personal or family history of medullary thyroid cancer or in people with multiple endocrine neoplasia syndrome type -2.

Side effects:

Blood glucose <54 mg/dL (added to basal insulin) (14-19%) , nausea (12-18%) , diarrhea (12-17), decreased appetite (5-11%).

Drug interactions:

Indomethacin , Ionspegsomatropin,

Somatropin, Antiviral medications for HIV or AIDS

Aspirin and aspirin-like medications

Beta-blockers like atenolol, metoprolol .

About MLRIP

VISION To be an educational institute of par excellence and produce competent pharmacy professionals to serve the community through research and the ever-increasing needs of Industry.

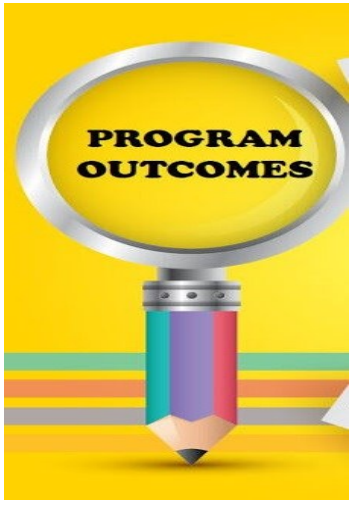
MISSION

1. Imparting quality education and innovative research for various career opportunities.
2. Creating conducive academic environment to produce competent pharmacy professionals.
3. Indoctrination of students adorned with high human values and make them aware of their responsibility as health care professionals.

Program Educational Objectives (PEO)

PEO 1: To produce graduates with sound theoretical knowledge and technical skills required for their career opportunities in various domains.
PEO 2: To incite the students towards research and to address the challenges with their innovative contributions for the benefit of the mankind.
PEO 3: To instill the essence of professionalism, ethical commitment to become a health care professional with sound integrity and adherence to the core human values in the service of the society.

1. **Pharmacy Knowledge:** Possess knowledge and comprehension of the core and basic knowledge associated with the profession of pharmacy, including biomedical sciences; pharmaceutical sciences; behavioral, social, and administrative pharmacy sciences; and manufacturing practices.



2. **Planning Abilities:** Demonstrate effective planning abilities including time management, resource management, delegation skills and organizational skills. Develop and implement plans and organize work to meet deadlines.

3. **Problem analysis:** Utilize the principles of scientific enquiry, thinking analytically, clearly and critically, while solving problems and making decisions during daily practice. Find, analyze, evaluate and apply information systematically and shall make defensible decisions.

4. **Modern tool usage:** Learn, select, and apply appropriate methods and procedures, resources, and modern pharmacy-related computing tools with an understanding of the limitations.

5. **Leadership skills:** Understand and consider the human reaction to change, motivation issues, leadership and team-building when planning changes required for fulfillment of practice, professional and societal responsibilities. Assume participatory roles as responsible citizens or leadership roles when appropriate to facilitate improvement in health and well-being.

6. Professional Identity: Understand, analyze and communicate the value of their professional roles in society (e.g., health care professionals, promoters of health, educators, managers, employers, employees).

7. **Pharmaceutical Ethics:** Honour personal values and apply ethical principles in professional and social contexts. Demonstrate behavior that recognizes cultural and personal variability in values, communication and lifestyles. Use ethical frameworks; apply ethical principles while making decisions and take responsibility for the outcomes associated with the decisions.

8. **Communication:** Communicate effectively with the pharmacy community and with society at large, such as, being able to comprehend and write effective reports, make effective presentations and documentation, and give and receive clear instructions.

9. **The Pharmacist and society:** Apply reasoning informed by the contextual knowledge to assess societal, health, safety and legal issues and the consequent responsibilities relevant to the professional pharmacy practice.

10. **Environment and sustainability:** Understand the impact of the professional pharmacy solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.

11. **Life-long learning:** Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.