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pharmagyaan

Quarterly newsletter
Faculty of pharmaceutical sciences,
PES University

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FDA APPROVED DRUGS OF 2019

Nourianz (Istradefylline)

- Adenosine A2a receptor antagonist
- Treatment for Parkinsons diseases
- Approved on Aug 28

Xenleta (Iefamulin)

- Semisynthetic pleuromutilian antibiotic
- Treatment for Community acquired bacterial pneumonia
- Approved on Aug 19

Rinvoq (Upadacitinib)

- JAK inhibitor
- Treatment forrheumatoid arthritis
- Approved on Aug 16

wakix Tab

- Histamine 3 receptor antagonist
- Treatment Narcolepsy (ESD)
- Approved on Aug 14

Pretomanid Tab

- Nitroimidazooxazine antimycobacterial
- Treatment for pulmonary XDR-TB and MDR-TB
- Approved on Aug 14

Turalio cap

- Kinase inhibitor
- Treatment for TGCT
- Approved on Aug 2

jynneos injection

- vaccine
- small pox and monkey pox Approved on Sept 24

Rybelus Tab

- GLP – 1 receptor agonist
- Treatment forT2DM
- Approved on Sept 20

Ibsrela Tab

- Sodium-hydrogen exchanger3 inhibitor(NHE-3)
- Treatment for IBD - Constipation
- Approved on Sept 12

Gvoke inj

- Liquid glucagon
- Treatment for hypoglycemia (> 2yrs)
- Approved on Sept 10

Inrebic Cap

- JAK 2 inhibitor
- Treatment for myelofibrosis
- Approved on Aug 16

TEIXOBACTIN: A NEW ANTIBIOTIC KILLS PATHOGENS WITHOUT DETECTABLE RESISTANCE

Teixobactin belongs to the class of antibiotics produced by a soil microorganism by name Eleftheria terrae. This compound is isolated through a new tool, the iChip used to screen compounds active against Staphylococcus aureus. Teixobactin is active against gram-positive bacteria. This is also effective against Staphylococcus aureus including Methicillin-Resistant Staphylococcus aureus, pneumonia (Streptococcus pneumonia), Mycobacterium tuberculosis, Clostridium difficile and Bacillus anthracis.

The mode of action of Teixobactin involves inhibition of peptidoglycan biosynthesis in S. aureus by binding to lipid II and lipid III. One of the major global concerns is antibiotic resistance in gram-negative bacteria such as Escherichia coli and Klebsiella. The entry of antibiotics into the gram-negative cell envelop is difficult and if, it has crossed it is exported through the multidrug efflux pumps. Therefore, this seems to be ineffective against gram-negative organisms.

For the use of teixobactin in humans, clinical trials have to be carried out where the toxicological studies should show no adverse reactions, drug interactions after administering the drug. It is also thought to be effective in treating tuberculosis as it is effective against Mycobacterium tuberculosis.

With teixobactin, the delay is due to technical hurdles to mass-produce and the challenges in investment. But the discovery of teixobactin is exciting and serves as important proof of principle to newer agents. Over the next 5 years there will tremendous interest in the development of teixobactin.

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REFERENCE

1) Ling LL, Schneider T, Peoples AJ, Spoering AL, Engels I, Conlon BP, Mueller A, Schaberle TF,Hughes DE, Epstein S, Jones M. Anew antibiotic kills pathogens without detectable resistance. Nature. 2015 Jan;517(7535):455.
2) McCarthy MW. Teixobactin: a novel anti-infective age. Expert review of anti-infective therapy. 2019; vol 17, no. 1-3.

POSSIBLE CARCINOGENESIS BY RANITIDINE

Ranitidine is one of the most widely used amine H2 blockers for gastric acid abnormalities. Recent studies revealed that ranitidine has the potential for being a primary cause of cancer by releasing N-nitroso-dimethylamine (NDMA), which is a potent carcinogen. The U.S Food and Drug Administration has reported such a finding in commonly used brands of ranitidine such as Zantac.

Ranitidine decreases gastric acid secretion and is approved as an OTC medication for relief from heartburn associated with acidic food or delayed food ingestion and as a prescription medication for treatment and management of Peptic Ulcer Disease (PUD) and Gastroesophageal Reflux Disease (GERD). Chemically being an amine, the drug has shown to undergo endogenous nitrosation in the presence of nitrite in gastric pH, resulting in the formation of NDMA, which is categorized as a probable carcinogen by the WHO.

Although previous studies were focused on assessing the probable release of N-nitrosamine by ranitidine by evaluating its concentration in gastric juice, the production of the metabolite by other systemic mechanisms was not considered and hence any such risk of cancer was dismissed due to negligible concentration of NDMA in gastric juice. However, recent studies have revealed the presence of increased concentration of this potent carcinogen in the urine, following ranitidine administration, predisposing the patients to risk of bladder cancers. Concurrently, NMDA was found in certain ranitidine formulations, suspected to be an impurity.

The widespread use of ranitidine calls for more comprehensive risk assessment studies to re-establish its safety or to establish its carcinogenetic property.

K.Deepti
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References:

1. Janet W.M.D. Statement alerting patients and health care professionals of NDMA found in samples of ranitidine, sept 13 2019

2. Teng Z and William A.M., Oral Intake of Ranitidine Increases Urinary Excretion of N-nitrosodimenthylamine., Carcinogenesis 2016, 37(6):625-634

AI IN FUTURE HEALTHCARE

Medicine has always been appended by advancements in science and associated development in technology. The concepts like bloodletting, acupuncture, and crystal healing to name a few have been appended to fringe pseudoscience in a few years in contrast to the centuries that they were practiced in the mainstream. Similarly, with the recent advancements made in computational concepts like machine learning and neural nets which is a computer data model that contains data on which a supercomputer will look into to detect patterns and new insights into, at a scale in which humans can never compete.

One of the companies that are solving problems in the pharmaceutical and diagnosis area of medicine is DeepMind. DeepMind was founded in 2010, acquired by Google in 2014. Its founder wanted DeepMind to solve consciousness to create a true AI. And to do that they work on all things including healthcare. Just 6 years after it was founded DeepMind defeated Lee Sedol using AlphaGo. Lee Sedol is an 18-time world champion in the ancient game of Go, which is more complicated than chess and has more board configurations than atoms in the universe. Healthcare isn't a game and treatment given to a patient can be fatal, thus it has to be cautiously assessed.

In 2018, DeepMind demonstrated performance in making a referral recommendation that reaches or exceeds that of experts on a range of sight-threatening retinal diseases after training on only 14,884 scans and won a competition with AlphaFold that correctly predicts the complex three-dimensional shapes into which proteins can be folded into. In 2019 DeepMind using continuous prediction and monitoring reported a 48-hour head start in detecting acute kidney injury than currently possible. This development can improve the quality of life of 100,000 patients in the UK alone. All of this is of course done by computer scientists, clinicians, doctors and experts in the pharma industry.

As Eric Topol, a cardiologist and researcher put it "AI can help bring back something that has been partially lost in healthcare in the day to day quest to treat or cure the patient i.e. treating patients with more empathy, a more human touch". More companies are using AI in healthcare than ever and Google might be best equipped, but as most doctors, clinicians and pharmacists know Google isn't a disease isn't the best way to learn or diagnose. The future is here And AI can assist us in the hard-fought victories against ailments of the body and mind.

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REFERENCE:-

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1. Tomašev N, Glorot X, Rae JW, Zielinski M, Askham H, Saraiva A, Mottram A, Meyer C, Ravuri S, Protsyuk I, Connell A. A clinically applicable approach to continuous prediction of future acute kidney injury. Nature. 2019 Aug;572(7767):116.

2. Deep Medicine: How Artificial Intelligence Can Make Healthcare Human Again

SPACE MEDICINE

CLINICAL PHARMACIST AT NASA

Pharmacists have been working with the National Aeronautics and Space Agency (NASA) since the beginning of the century, so clinical pharmacist's involvement in the colonization of mars in inevitable. Tina Bayuse was the first pharmacist to work for NASA and now she is leading a team of 4 at the Johnson Space Centre (JSC) in Houston. As a child, Bayuse was always interested in space travel. One day, she had an opportunity to attend a presentation on 'how the efficacy of drugs differ in space from the earth', that sparked her interest in the field and encouraged her to collaborate with NASA. She obtained a pharmacy rotation in JSC's pharmacology lab and worked on drug monographs for the space shuttle medical kits. This led to the creation of the first clinical pharmacist's position within NASA.

At NASA, pharmacists mainly focus on preparing "Convenience" and "Contingency" medical kits for astronauts at the International Space Station. The main difference between the two kits is that the convenience kits contains medicines that one would usually take on a trip, while the contingency kit is stocked for emergencies and contains items like antibiotics and cardiac life support. Clinical pharmacists decide what goes into the kit and then pack them into flight kits.

The way that medication in space works may be more than a little different from the way they work on earth. Pharmacists at NASA have to choose a medication based on volume and mass, which is sometimes problematic, with some formulations including soluble powder or liquids.

Additionally, clinical pharmacists must think about how astronauts take their medications in space. For instance, using an injectable in an emergency is out of the question if they are wearing a spacesuit. Lastly, there are a lot of uncertainties in space, including how the medication will act outside the earth's orbit. Hence, the role of the clinical pharmacist becomes a crucial component of space travel.

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REFERENCE:-

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Page E; How Tina Bayuse became the first pharmacist at NASA. Pharmaceutical Journal, 5th January 2016.20200530

Nano-scale 'glass' bottles could enable targeted drug delivery

Tiny silica bottles filled with medicine and a special temperature-sensitive material could be used for drug delivery to kill malignant cells only in certain parts of the body, according to a study published recently by researchers at the Georgia Institute of Technology.

The research team devised a way to create silica-based hollow spheres around 200 nanometers in size, each with one small hole in the surface that could enable the spheres to encapsulate a wide range of payloads to be released later at certain temperatures only. In the study, which was published on June 4 in the journal Angewandte Chemie International Edition, the researchers describe packing the spheres with a mixture of fatty acids, a near-infrared dye, and an anticancer drug. The fatty acids remain solid at human body temperature but melt a few degrees above. When an infrared laser is absorbed by the dye, the fatty acids will be quickly melted to release the therapeutic drug.

"This new method could allow infusion therapies to target specific parts of the body and potentially negating certain side effects because the medicine is released only where there's an elevated temperature," said Younan Xia, professor and Brock Family Chair in the Wallace H. Coulter Department of Biomedical Engineering at Georgia Tech and Emory University. "The rest of the drug remains encapsulated by the solid fatty acids inside the bottles, which are biocompatible and biodegradable." The researchers also showed that the size of the hole could be changed, enabling nanocapsules that release their payloads at different rates.

"This approach holds great promise for medical applications that require drugs to be released in a controlled fashion and has advantages over other methods of controlled drug release," Xia said. "This controlled release system enables us to deal with the adverse impacts associated with most chemotherapeutics by only releasing the drug at a dosage above the toxic level inside the diseased site," said Jichuan Qiu, a postdoctoral fellow in the Xia group.

AMAN ROSHAN

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Reference:

Jichuan Qiu, Da Huo, Jiajia Xue, Guanghui Zhu, Hong Liu, Younan Xia. Encapsulation of a Phase-Change Material in Nanocapsules with a Well-Defined Hole in the Wall for the Controlled Release of Drugs. Angewandte Chemie International Edition, 2019; 58 (31): 10606 DOI: 10.1002/anie.201904549

A NOTE FROM AN INTERN

BEING A CLINICAL PHARMACIST TRAINEE

BY: LAALASA.G
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Every Pharm.D graduate must attain a significant clinical knowledge, in order to provide a better therapeutic care for every patient, irrespective of their financial status. The real time experience that we obtain during our internship will ensure us to re-evaluate our understanding of clinical aspects.

Although clinical pharmacy has been zoned out because of other prominent healthcare professions, if we the Pharm.D graduates equip ourselves with relevant skills, we will have an impactful hold in the health sector. This will in turn result in the development of clinical pharmacy as a profession.

Currently, we are practicing internship at Rangadore Memorial Hospital (RMH), which provides us with an encouraging environment in learning more about Evidence Based Medicine (EBM).

Apart from this, we work in collaboration with Dr. Divya, clinical pharmacist at RMH in carrying out following activities

Prescription audit, where we review the prescriptions for identifying the medication error such as wrong dose, wrong frequency, drug interaction, adverse reaction, irrational use of drugs, etc.,

Medication history interview, where we overview the patient records for the past medical and medication history, surgical history, allergies to certain medication, etc.

Patient counseling, where we educate the patients or their care takers with respect to the disease and the medications to be taken.

In conclusion, both Theoretical and practical knowledge are two faces of the same coin, one without the other will have less value. So, having good practical skills in conjugation with theoretical knowledge aid us in being more efficient.

We are thankful to Dr. Srinivasan, HOD, Dept. of Pharmacy Practice and our preceptors Dr. Apoorva Dev, Dr.Vineela N, Dr. Ashwini M for the immense support and encouragement.

World Pharmacist Day

SEPTEMBER 25TH 2019

The role of Pharmacist has always been undermined, thus to break the dogma, the International Pharmaceutical Federation (FIP) in the year 2009 formulated 25th September as the "World Pharmacist day". It was done to highlight the profession of Pharmacy among the community.

On this occasion, the PES University organized a Free Health Camp at Vivekananda Park in Girinagar, Bangalore. The camp included Counseling regarding the BMI index, Blood glucose levels, and Blood pressure. Students from 2nd and 4th Pharm.D took active participation in it. Around 200 people turned up to the camp. It was a successful attempt in spreading awareness among the community people regarding pharmacy profession and its importance in health sector.

The feedback that we, students received was beyond one's anticipation; the people were satisfied with the service provided to them.

Asima Kubra
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Upcoming events

1 . CELEBRATION OF PHARMACY WEEK FROM OCTOBER 20TH TO 26TH .

2 . PESCP 6TH INTERNATIONAL CONFERENCE – OCTOBER 18 & 19.

– Strategies to Tackle Antimicrobial Resistance

BOOKPOST

IF UNDELIVERED RETURN TO:
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TO: