

SHREENATH
PHARMA
MAGAZINE

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About Us

Shreenath Pharmamagazine started in 2019 with a vision of bridging the gap between academic institutes and industries. The magazine is a monthly publication. This publication is devoted to science and practice of pharmacy in all its branches. The main guiding force behind this publication is Mr. Janak Jalundhwala who envisioned a platform for budding pharmacists to showcase their innovative research and strategic minds to small, medium and big size industries.



Shreenath Pharmamagazine offers a unique blend of pharma news, interviews, case studies, comments on critical issues faced by pharmaceutical industries. The magazine would also list out important upcoming events which will be beneficial for delegates from industries as well as academics. Our broad editorial lense along with the philosophy of advisory board to deliver sharp, informed and entertaining coverage from pharmaceutical institutes and industries allows pharmamagazine to communicate on matters most relevant to the readers.

Small and medium sized pharmaceutical manufacturing industries not having a full scale R and D facility of their own also face many hurdles which can be resolved by academic research. This magazine serves as a medium to communicate the requirements of the industries to the academicians. It also would communicate research works conducted in various institutes to the industries. The magazine would include not just research but also some interviews and articles by the various pharmacists. The highlights would also include upcoming pharma events and some latest news. It will also have some fun activities like brain teasers and jokes. It also features campus news from various pharmaceutical institutes.

This magazine is distributed complimentary online by emails and social medias like LiknedIn and Facebook. It will also be available on the website (www.shreenathpharmamagazine.com) It is distributed to all the subscribers, members of Associations like Tarapur Industrial Manufacturers Association (TIMA), Indian Pharmaceutical Association – Students' Forum, Pharmocracy. It is also circulated to offices of Indian Pharmaceutical Association, Indian Drug manufacturers Association and Pharmaceutical institutes based in and around Mumbai.



From the Editor's Desk

Dear Readers,

In this pandemic situation, we have come up with certain basics that a pharmacist can do. Further more I would advice to follow the link www.fip.org/coronavirus where they are constantly updating information regarding the virus in accordance with WHO.

Coming to the ninth issue of this magazine, I once again thank all my readers and contributors. In this issue you will find interview of Mr. Rahul Vasvani. 'Donepezil' is the molecule of the month and a mind boggling article on genetic modification emphasizing on a new pathway through kidney gene therapy awaits a read.

Wishing you all to stay safe! Stay healthy!

Happy reading!

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Himachal Pradesh Pharma companies take a hit

Heavily reliant on China for API supplies, the industry is reeling following the Covid 19 epidemic. Effects are being particularly felt by the small units in Himachal's pharma hub, and drugs are getting costlier as a result.

The Indian pharma companies import more than 65 percent APIs from China owing to cheap availability. With the lack of liquidity already plaguing the markets, the API shortage has crippled the small manufacturers, who say that they are on the verge of exhausting their inventory if the situation does not improve.

Reference:<https://www.tribuneindia.com/news/hp-pharma-takes-coronavirus-hit-49186>

Study reveals how drug meant for Ebola may also work against coronaviruses

A group of University of Alberta researchers who have discovered why the drug remdesivir is effective in treating the coronaviruses that cause Middle East respiratory syndrome (MERS) and severe acute respiratory syndrome (SARS) expect it might also be effective for treating patients infected with the new COVID-19 strain.

"Until now, there has not been a published explanation of why remdesivir may work against coronaviruses" said virologist Matthias Götze.

Remdesivir was first used on a patient with the novel coronavirus earlier this year in the United States. The patient was given the drug on the seventh day of illness, and showed marked improvement the following day, with symptoms eventually disappearing altogether. The next step is to wait for results from ongoing clinical trials with remdesivir.

Reference:<https://www.worldpharmanews.com/research/5152-study-reveals-how-drug-meant-for-ebola-may-also-work-against-coronaviruses>

IOL, Indian maker of Ibuprofen rallies as coronavirus disrupts China supply

IOL Chemicals and Pharmaceuticals Ltd., the world's biggest producer of ibuprofen, is set for its best month due to a gap in supply in the market due to Covid 19. IOL has the capacity to manufacture 12,000 tons of ibuprofen each year at its factory in Punjab. The plant is currently running at 80% production.

Reference:<https://www.livemint.com/market/stock-market-news/indian-maker-of-ibuprofen-rallies-as-coronavirus-disrupts-china-supply-11582612657421.html>

DoP asks DGFT to ban the export of 12 drugs & key ingredients

The Department of Pharmaceuticals (DoP) has asked the Directorate General of Foreign Trade (DGFT) to ban the export of 12 drugs and their key ingredients due to an outbreak of the novel coronavirus in China, from where these are almost entirely imported.

The 12 drugs include the antibiotics chloramphenicol, metronidazole, tinidazole, erythromycin and neomycin, as well as vitamins B1, B12 and B6. The department also asked for a ban on the export of the hormone progesterone.

Reference:<https://www.livemint.com/industry/manufacturing/pharma-dept-asks-dgft-to-ban-export-of-12-drugs-key-ingredients-11582142325180.html>

Researchers make asthma breakthrough

Researchers from Trinity College Dublin have uncovered a critical role for a protein (Caspase-11). Caspase-11 can cause cells to die, which is a very inflammatory event as the cells then release their contents, which can irritate tissues in our body. We have found that Caspase-11 is a key driver of inflammation in the airways in asthma. This causes the signs and symptoms of asthma which most notably involves difficulty breathing. Caspase-11 - or its human equivalent, which is Caspase-4 - has never been implicated in asthma before so researchers think it holds great promise as a possible target for new drugs to treat this common, debilitating disease.



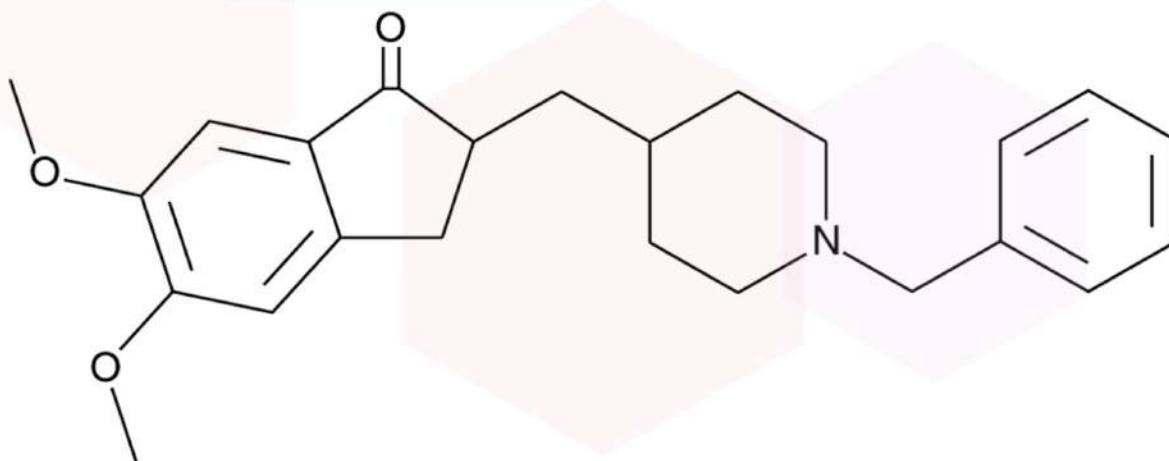
Reference:<https://www.pharmatutor.org/pharma-news/2020/researchers-make-asthma-breakthrough>

MOLECULE OF THE MONTH

DONEPEZIL

In 2016, the global burden of dementia was estimated to be 43.8 million, demonstrating a significant increase from a global prevalence of 20.2 million in 1990. Donepezil, also known as Aricept, is a piperidine derivative acetylcholinesterase inhibitor used in the management of the dementia of Alzheimer's Disease, and in some cases, is used to manage other types of dementia.

Donepezil was first approved by the FDA in 1996, and its extended-release form was approved in combination with Memantine in 2014 to manage moderate and severe forms of Alzheimer's dementia. Though it does not alter the progression of Alzheimer's disease, donepezil is effective in managing the symptoms of its associated dementia.



Donepezil is indicated for the management of mild to moderate Alzheimer's Disease at doses of 5 mg or 10 mg. It is also indicated for the management of moderate to severe Alzheimer's Disease in a higher dose of 10 mg or 23 mg administered once daily. Off-label uses include the management of vascular dementia, Parkinson's Disease-associated dementia, and Lewy body dementia, among others. When combined with memantine, the extended-release form of donepezil is indicated to treat the symptoms of moderate to severe dementia.

PHARMACODYNAMICS:

By inhibiting the acetylcholinesterase enzyme, donepezil improves the cognitive and behavioral signs and symptoms of Alzheimer's Disease, which may include apathy, aggression, confusion, and psychosis.

MECHANISM OF ACTION:

The commonly accepted cholinergic hypothesis proposes that a portion of the cognitive and behavioral decline associated with Alzheimer's are the result of decreased cholinergic transmission in the central nervous system. Donepezil selectively and reversibly inhibits the acetylcholinesterase enzyme, which normally breaks down acetylcholine. The main pharmacological actions of this drug are believed to occur as the result of this enzyme inhibition, enhancing cholinergic transmission, which relieves the symptoms of Alzheimer's dementia. In addition to the above, other mechanisms of action of donepezil are possible, including the opposition of glutamate-induced excitatory transmission via downregulation of NMDA receptors and the regulation of amyloid proteins, which have demonstrated significant effects on the disease process of Alzheimer's. Other possible targets for donepezil may also include the inhibition various inflammatory signaling pathways, exerting neuroprotective effects.

PHARMACOKINETICS:

Donepezil is slowly absorbed via the gastrointestinal tract after oral administration. T_{max} is 3 to 4 hours with a bioavailability of 100% and steady-state concentrations are attained within 15 to 21 days of administration. The volume of distribution of donepezil is 11.8 ± 1.7 L/kg for a 5-mg dose and 11.6 ± 1.91 mL/kg for a 10-mg dose. It is largely distributed in the extravascular compartments. Donepezil crosses the blood-brain barrier and cerebrospinal fluid. The volume of distribution at steady-state according to the FDA label for donepezil ranges from 12 - 16 L/kg. Donepezil is 96% protein-bound. Donepezil is metabolized by first pass metabolism in the liver, primarily by CYP3A4, in addition to CYP2D6. After this, O-dealkylation, hydroxylation, N-oxidation, hydrolysis, and O-glucuronidation occur, producing various metabolites with similar half-lives to the unchanged parent drug.

TOXICITY:

Signs and symptoms of overdose with cholinesterase inhibitors such as donepezil can include severe nausea and vomiting, bradycardia, hypotension, perspiration, seizures, muscle weakness respiratory depression, and collapse. Significant muscle weakness may result in death if the respiratory muscles are affected by donepezil overdose

Reference:<https://www.drugbank.ca/drugs/DB00843>

-A.Magdum

New drug technique injects genes into kidneys

Researchers have developed a novel drug carrying system, and used it to deliver genes directly into the kidneys of mice, an advance that may pave the way for effective gene therapy techniques. The scientists from Mayo Clinic, an American non-profit organisation academic medical centre, studied the effectiveness of delivering three different sized vectors, or carriers, to mouse kidneys via an intravenous route.

These included the protein package enveloping three viruses, including the small adeno-associated virus (AAV) vectors, larger adenovirus vectors, and lentiviral vectors, repurposed and engineered for drug delivery. According to the study, published in the journal *Mary Ann Liebert, Inc.*, some of the vectors could leak out of the kidney, creating the possibility for off-target tissue effects. When gene delivery was observed in the kidney, the researchers found that its activity was not present evenly throughout the organ, and focussed in a cluster of small blood vessels at the end of kidney tubules.



Since the kidneys filter out large molecules in the blood stream, the scientists also tested two different direct injection routes to the organ, and found these to be superior to intravenous injections. Concluding the research, the scientists said the potential for direct injections may open new possibilities for treating kidney diseases with gene therapy. However, they said additional improvements to the delivery technique are needed. "These data demonstrate the utility of direct kidney injections to circumvent the kidney size exclusion barrier. They also identify the effects of vector size on on-target and off-target transduction," the researchers wrote in the study.

Reference:<https://www.theweek.in/news/health/2020/01/01/New-drug-delivery-technique-can-inject-genes-into-kidneys.html>

We are no longer slaves to our own genes...

Josiah Zayner, the scientist who left NASA to bring genetic engineering to consumers, has edited his DNA to make himself a 'superhuman' and live-streamed it all, while he was at it.

Zayner has made the headlines for constantly pushing the boundaries of science outside of traditional environments, whether by injecting himself with a concoction of a donor's DNA to help get rid of his irritable bowel syndrome, or by brewing glowing beer with the help of jellyfish protein that makes things glow.

This time, the global leader in the biohacker movement claims he's the first person trying to modify his own genome with CRISPR. "This is the first time in history that we are no longer slaves to our genetics," Zayner said, while he removed myostatin, a hormone that inhibits muscle growth, by using the gene cutting technology, CRISPR.



Potentially, this will modify his muscle gene to give him bigger muscles. "I want to live in a world where people get drunk and instead of giving themselves tattoos, they're like, I'm drunk, I'm going to CRISPR myself," Zayner told BuzzFeed News in an interview. "It sounds crazy, but I think that would be a pretty interesting world to live in for sure."

Other biohackers are also ready to start experimenting by altering own genes, reports New Scientist. "I think we could do substantial changes to ourselves right now," Zayner said. "You could go a little crazier than scientists have been willing to let on."

CRISPR researcher Robin Lovell-Badge of London's Francis Crick Institute told New Scientist that Zayner's gene editing is 'foolish' and that it could result in long-term problems. But University of Manchester bioethicist John Harris said: "There's a long history of scientists experimenting on themselves," though he warned of adverse reactions.

Zayner's experiments come at a time when gene therapies are starting to make their way into mainstream healthcare. Earlier this year, the FDA approved the first gene therapy for cancer, that uses a patient's own immune cells to attack the cancer cells. Two months later, a second cancer-killing gene therapy was approved.

Both of the treatments involves the patient's white blood cells being taken out of the body and re-engineered to target and kill cancerous cells only in the body. Once this has been completed they are placed back into the patient, and the T-cells get to work and begin combatting against the cancer. CAR-T cells are built with proteins where they seek out cancer protein cells in the body that they destroy.

Although CRISPR is highly regulated, it's not illegal to edit your own DNA. Zayner's goal is to bring genetic engineering to consumers, and by posting a DIY Human CRISPR Guide online and selling \$20 DNA that promotes muscle growth, he's providing the world with the means they need to become a 'superhuman' like him.

Reference:<http://www.frontlinegenomics.com/news/16595/first-diy-crispr-human-gene-editing-bio-hacker/>

-A.Magdum

TALK THE TALK

Mr. Rahul Vasvani

**B.Pharm(Prin.K.M.Kundnani
College of Pharmacy) Currently
pursuing M.Pharm in Toxicology
Very enthusiastic about research
and public awareness related
activities**



You are currently pursuing a Masters Degree. Was an M Pharm always part of the plan?

Not really. Plans began to emerge at the end of the third year. I had developed a strong liking for Pharmaceutical Chemistry (and analysis) and Pharmacology-Toxicology. Doing M.Pharm provides the facility of specializing in a subject one likes and conducting research in the same, hence I decided M.Pharm was the way to go.

Have you experienced a shift in expectations and/or responsibilities after stepping into bigger shoes?

Yes of course. Unlike B.Pharm studies, M.Pharm is a job for which one receives a stipend. There are two objectives of this job,

- To educate and increase one's professional competence
- To conduct research that adds value to human life.

However, whether to live upto the spirit of these objectives is completely up to an individual.

Does research in your field have scope in India?

Depends on where one intends to do research. Industry level research activities in Pharmacology & Toxicology are quite low in India as several companies have shut down their R&D units. But, academic institutions in India carry out active research in the field of Pharmacology & Toxicology. There are excellent options available for PhD studies (Research). For those looking for short-term research jobs, there is always the option of Junior Research Fellowships (JRF). Being GPAT, GATE, CSIR- UGC NET qualified gives one an edge for PhD and JRF positions.

“Hobbies and Extra-curricular activities are important for everyone. They teach us how to play well with others. Playing well with others is a skill that one needs whether or not one wishes to pursue a social job because all jobs need social skills.”

Is there any course or activity you'd suggest to an undergraduate to have an edge over the competition?

Walking an extra mile in the direction one is headed is the only way to have an edge. For example, if research and academia interests a person, then they should approach faculty members and carry out some research of their own and present their findings in conferences and if possible even have their results published. Independent of what interests a person, participating in extra-curricular activities is always necessary. If one wishes to move down the management line, one should seek internships for such activities. If one wishes to become a drug inspector then one should work part-time in a Pharmacy store to understand facets of record-keeping and other related legalities hands-on. But, having a CV with stellar paraphernalia and poor GPA is the equivalent of having a sports car without an engine.

What do you plan to do after the completion of your M.Pharm degree?

I intend to pursue a JRF and then move onto completing my PhD. This is because I find the idea of doing good scientific work and training others satisfying. Having said this, I must state that-while these are my current intentions, life has a way of unfolding, changing plans and interest in the most unimaginable of ways. I wish to follow a path of academia, and like everything in life-this too is not set in stone.

How do you feel about extracurricular hobbies and/or activities?

Hobbies and Extra-curricular activities are important for everyone. They teach us how to play well with others. Playing well with others is a skill that one needs whether or not one wishes to pursue a social job because all jobs need social skills. If one wishes to pursue a degree in a foreign university, extra-curricular

activities are looked at positively. If one seeks out a job, extra-curricular activities again are looked at positively. This is because no institute or company in this era is looking for a dull, monotonous workaholic. Character and personality are believed to play a much greater role in personal success than any skill that can be measured on a standardized test. That being said, these soft-skills are meaningless without adequate technical knowledge and one must excel in this area.

What advice would you give to a B.Pharm graduate?

The world of medicines is changing rapidly in terms of newer entities, testing methodologies and technologically superior innovations. The B.Pharm syllabus may not be able to cover all these within a short time period. Hence it is always advisable to develop the strong habit of reading. Subscribe to good magazines which can provide you all this information in a capsule form. Read up newer research and developments. Discuss with your teachers to get additional insights and update yourself to be Industry ready once you step out with a B.Pharm degree. It is most important to master programs without which it is virtually impossible to operate in any job today: Excel, Powerpoint, Word and many more...

Make the best of your years in college:

- a.) Sit on the first few rows of a class: The more the distance between you and the faculty member/blackboard/projector screen, the lesser is your attention.
- b.) Try to and pay attention: With active effort in class, most of one's workload disappears.
- c.) Be respectful: The teaching faculty members shape your lives in far-deeper ways and for far-longer than you can possibly imagine and it helps to respect and take guidance.
- d.) Participate in extra-curricular activities: These develop your personality and teach you multiple social skills

CORONAVIRUS SARS-CoV-2

HOW CAN PHARMACISTS ADVISE?



No symptoms (cough, fever or breathing difficulties)



No travel history to affected areas or contact with infected people

- Offer reassurance
- Very unlikely to have SARS-CoV-2 infection risk
- Highlight preventive measures
- Provide evidence-based information and advice (oral and/or written)



Symptoms (cough, fever or breathing difficulties)



No travel history to affected areas or contact with infected people

- Offer reassurance
- Unlikely to have SARS-CoV-2 infection risk
- Highlight preventive measures
- Provide evidence-based information and advice (oral and/or written)



No symptoms (cough, fever or breathing difficulties)



Recent travel history to affected areas or contact with infected people

- Offer reassurance
- Risk of SARS-CoV-2 infection may exist
- Highlight preventive measures and recommend home quarantine for 14 days
- Trace contacts history
- Provide evidence-based information and advice (oral and/or written)
- In case symptoms appear in the 14 days following return from travel or contact with infected person, contact emergency number or reference hospital



Travel plans to affected areas or contact with infected people

- Offer reassurance
- Risk of SARS-CoV-2 infection may exist
- Recommend home quarantine for 14 days upon return from travel
- Inform about the situation and ways of transmission
- Highlight preventive measures
- Provide evidence-based information and advice (oral and/or written)



Symptoms (cough, fever or breathing difficulties)



Recent travel history to affected areas or contact with infected people

- Offer reassurance
- Risk of SARS-CoV-2 infection may exist
- Contact health authorities to initiate care protocol
- Inform about the procedure of isolation, diagnosis and treatment
- Highlight measures to prevent further transmission
- Provide evidence-based information and advice (oral and/or written)

Adapted from "Coronavírus 2019-nCoV: Intervenção da farmácia", Associação Nacional das Farmácias (Portugal)

Upcoming Events

PHARMACAD – M. PHARMA / MBA ENTRANCE



Admissions Open For:

- GPAT, NIPER, BITS HD, ICT, Manipal Entrance, NMIMS. (2021 / 2022)
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