



Faculty of
Pharmacy

RAMAIAH UNIVERSITY OF APPLIED SCIENCES

ज्ञानं विज्ञानं च भक्तिसहितं



Volume 4
Issue 5

2023

Oct - Dec

SCINTILLA

QUARTERLY E-NEWS LETTER

DEPARTMENT OF PHARMACEUTICS

<https://pharmacy.msruas.ac.in/departments/department-of-pharmaceutics>

EDITORIAL

Dear Readers !!!

It brings us immense pleasure to present the latest edition of Scintilla, the quarterly e-newsletter from the Department of Pharmaceutics. This edition marks a celebration of our relentless pursuit of excellence, innovation, and knowledge dissemination within the realm of pharmaceutical sciences.

In this dynamic era of advancements, Scintilla stands as a testament to our commitment to fostering an environment of learning and dissemination. Our esteemed contributors, comprising faculty members, researchers, and students, have curated insightful articles, research highlights, and thought-provoking pieces that reflect the diverse facets of the pharmaceutical field.

We aim to encapsulate the latest trends, breakthroughs, and pioneering research initiatives within pharmaceutics. Moreover, Scintilla serves as a platform to acknowledge the accomplishments and milestones achieved by our faculty and students. Their achievements not only inspire us but also contribute significantly to the growth and recognition of our department on a global scale.

As we navigate through this edition, we invite you to delve into the wealth of knowledge, insights, and expertise shared by our contributors. We hope that the content presented will not only inform but also spark discussions, inspire innovations, and pave the way for further advancements in the field of pharmaceutics.

We extend our heartfelt gratitude to all contributors, reviewers, and supporters whose unwavering dedication has made this edition possible. Your commitment to excellence continues to drive our mission of advancing pharmaceutical research and education.

Thank you for your continued support and enthusiasm for Scintilla.

We are excited to embark on this journey of exploration and discovery with you.

Do remember - Next time you think of beautiful things, don't forget to count yourself in.

Do stay positive, better days are ahead.

Twinkles of JOY, PEACE and HEALTH until our next meeting

For any further queries and suggestions contact :



Ms. NIKITHA S



nikithas.ps.ph@msruas.ac.in



080-23608942



<https://www.linkedin.com/in/nikitha-s>

-4835aa16a/



Dr. S. Bharath
Chief Editor



SCINTILLA

QUARTERLY E-NEWS LETTER

Scintilla is the quarterly E-news letter of Department of Pharmaceutics, FPH, RUAS which seeks to provide to world outside, News, Views, and Creative expressions from the members of the Department. Scintilla comes directly from Latin, where it carries the meaning of "spark" - that is, a bright flash such as you might see from a burning ember or spark of specified quality or feeling, which is almost synonymous to department's intent, hence the name **SCINTILLA**

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Assistant Professor



Ms. S. NIKITHA
Assistant Professor

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DEPARTMENT PRIDE



Workshops/ Seminars attended

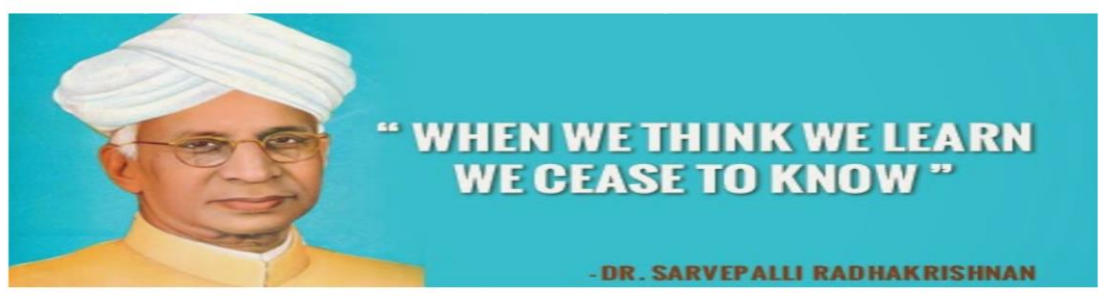
- ❖ **Dr. Sharon Furtado** has attended Seven Principles of Good Practices in Undergraduate Education Revisited – Transitioning into the Post-Pandemic times organized by Manipal College of Pharmaceutical Sciences 20th June 2023
- ❖ **Dr. Sharon Furtado** has attended how to engage learner in a classroom Teaching, conducted by Manipal College of Pharmaceutical Sciences 22nd June 2023
- ❖ **Dr. Sharon Furtado** has attended Grant Writing organized by Office of Research and Innovation and Centre of Professional Development & Training, Ramaiah University of Applied Sciences 12th to 14th July 2023
- ❖ **Ms Nikitha S** “Young TReE (Teaching Research and Empowering)”, the Faculty Development Program for Young Faculty of RUAS held between 10-12 July 2023 .
- ❖ **Mrs Shwetha K** has attended Seven Principles of Good Practices in Undergraduate Education Revisited – Transitioning into the Post-Pandemic times organized by Manipal College of Pharmaceutical Sciences on 20th July 2023
- ❖ **Dr. Aswathi R Hegde** has attended Seven Principles of Good Practices in Undergraduate Education Revisited – Transitioning into the Post-Pandemic times organized by Manipal College of Pharmaceutical Sciences 20th July 2023
- ❖ **Dr.B V Basavaraj** has attended Developing Insights, Framing and reframing the problem, mapping the context organized by NPTEL,IIT Madras 14th and 15th October 2023
- ❖ **Mrs. Shwetha K** has attended Bengaluru Tech Summit 2023 organized by Government of Karnataka, Bangalore Palace on 23th November 2023
- ❖ **Ms Nikitha S** has attended “**Pharmaceutical Industry Orientation Course**” during October, 2023.



AWARDS / LAURELS

Teacher's Day dates back to 1962 when **Dr Sarvepalli Radhakrishnan** became the President of India. On his birthday, September 5, his former students and friends requested him to allow them to celebrate his birthday. In response, Dr Radhakrishnan suggested that instead of celebrating his birthday, the day should be dedicated to honouring teachers and the noble profession of teaching.

Dr.Sandhya K V, Assistant Professor and **Dr. Sharon Caroline Furtado**, Asst.Professor received the **Best Teacher's Award** from the Chancellor, RUAS as a celebration of Teachers Day-2023





AWARDS / LAURELS



EXTRAMURAL

ICMR GRANT

PRINCIPAL INVESTIGATOR

DR. TANMOY GHOSH

ASST. PROFESSOR
DEPARTMENT OF PHARMACEUTICS, FPH

CO-PRINCIPAL INVESTIGATOR

DR. KESHA M DESAI

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Dept. of Pharmaceutics, FPH

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Associate Professor
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DR. SHRUTHI NAGARAJA

Professor
Dept. of Conservative Dentistry and Endodontics, FDS

DR. SHWETHA VENKATARAMANA

Associate Professor
Dept. of Oral Medicine and Radiology, FDS

DR. PUSHPALATHA C

Professor
Dept. of Pedodontics and preventive Dentistry, FDS

PROJECT TITLE

Development of Antimicrobial Polymer based Scaffolds loaded with RHBMP-2 for Bone Regeneration in Extraction tooth sockets

BUDGET

47 LAKHS





AWARDS / LAURELS



FACULTY OF PHARMACY



HEARTY CONGRATS
to
MS. NIKITHA S

**FIRST PRIZE IN
ORAL PRESENTATION**

Convention on Drug Discovery and Development

18 -19TH October 2023

Dayanandsagar University, Bangalore



Best wishes, Department of Pharmaceutics

GOOD
JOB!

AWARDS / LAURELS



WAY TO GO!



DR. ASHWATHI R HEGDE
Asst. Professor
Department of Pharmaceutics, FPH

2ND PRIZE IN POSTER COMPETITION

BBC CURE SYMPOSIUM

**"CANCER THERAPETUICS LANDSCAPE: RESEARCH AND
EMERGING APPROACHES"**

28th November 2023

Organized By

Department of Biotechnolgy, FLAHS,
RUAS

FORTHCOMING EVENT



**RAMAIAH
UNIVERSITY**
OF APPLIED SCIENCES

Faculty of Pharmacy



**INSTITUTION'S
INNOVATION
COUNCIL**
(Ministry of HRD Initiative)

**Department of Pharmaceutics
Faculty of Pharmacy**

Cordially invite you to attend the Guest Lecture on

Novel Manufacturing Application Tools In Pharma Sector

Dr. Geetha Thanga Mariappan

Research and Development of formulations - CRO Led team of scientists working on formulation development of solid orals/semisolids/liquids and soft gel capsules Development and scale-up of conventional drug delivery systems like immediate release and modified release tablets, capsules for NCEs and generics, powder for suspension, liquid filled hard gelatin capsules etc. Novel drug delivery systems like micro-emulsions, nanosuspensions, liposomes, niosomes, solid-lipid nanoparticles and floating beads etc. Biopharmaceutical and bioequivalence aspects of dosage forms as well as sample size determination and data review of bioequivalence studies in humans. Development of preclinical efficacy and toxicology formulations.

CAPEX plan, proposals for projects, managing Clients across US, UK, Europe and Worldwide



Dr. Geetha Thanga Mariappan
Techno Commercial Director & CEO
at Dipon Research International -
DiponEd BioIntelligence- CRS | Co-
founder, DiponEd Bio- CRS

Who should attend?

UG/PG students in the domain of Pharmacy, B.Sc. Biotechnology and Life Sciences, Dental and Medical Sciences

Convener

Dr. S. Bharath
Dean, FPH, RUAS

Chief Co-ordinator

Dr. Basavaraj BV
Prof & Head-Department of Pharmaceutics
Mob: 9880238650
basavaraj.ps.ph@msruas.ac.in

Co-ordinator

Dr. Sharon Furtado
Asst. Prof, Department of Pharmaceutics
Mobile:9880051542
sharoncaroline.ps.ph@msruas.ac.in



Strategies and tips, As a pharmacy graduate, staying updated and upgraded with current situation in Pharma industry

Mr. Ravikumar Angadi

Founder and Director
Attitude Plus Corporate Solutions
NLP Master Practitioner, Sales Mastery Trainer, Mind
Performance and Behavioural Change Coach



As a pharmacy graduate, there are several ways to stay updated and upgraded with the current situation in the pharmaceutical industry. Here are some resources, platforms, links, and techniques that can help you: Professional Organizations: Joining professional organizations related to pharmacy and the pharmaceutical industry is a great way to stay updated. These organizations often provide access to industry news, research, conferences, and networking opportunities. Some notable organizations include:- American Pharmacists Association (APhA)- American Society of Health-System Pharmacists (ASHP)- International Pharmaceutical Federation (FIP)- Pharmaceutical Research and Manufacturers of America (PhRMA) Journals and Publications: Subscribe to reputable pharmaceutical journals and publications to receive regular updates on the latest research, drug approvals, clinical trials, and industry trends.

Some well-known journals include:

Invited Guest Article

Council of Scientific and Industrial Research (CSIR)- National Institute of Pharmaceutical Education and Research (NIPER):- www.indiandrugsonline.org- Indian Journal of Pharmaceutical Education and Research (IJPER):- Journal of Pharmacy and Pharmacology (JPP):- Indian Journal of Pharmacology (IJP):- Indian Journal of Pharmaceutical Sciences (IJPS): - New England Journal of Medicine- Journal of the American Medical Association- The Lancet- Drug Discovery Today- Pharmaceutical Technology

Online News Sources: Stay connected with online news sources that specialize in pharmaceutical industry news. Some popular websites that provide up-to-date information include:- FiercePharma: www.fiercepharma.com- PharmaTimes: www.pharmatimes.com- **Pharmaceutical Executive:** www.pharmexec.com- **Pharmafile:** www.pharmafile.com

Webinars and Podcasts: Participate in webinars and listen to podcasts focused on pharmacy and the pharmaceutical industry. These platforms often cover current topics, emerging therapies, regulatory updates, and industry insights. Look for webinars and podcasts from professional organizations, industry experts, and reputable educational institutions.

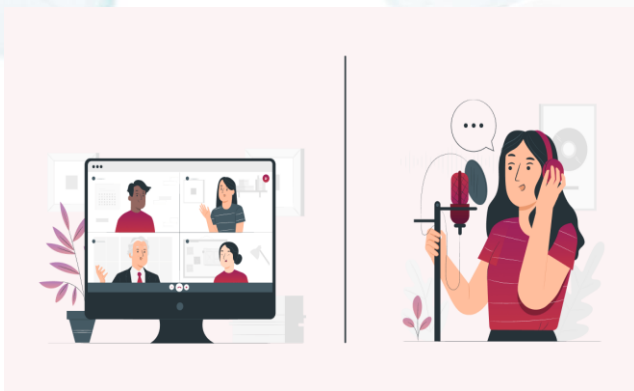


Fig 1. Webinars and Podcasts

Industry Newsletters: Subscribe to industry newsletters and email updates from reputable sources. These newsletters often provide curated content, industry insights, and upcoming event information. Examples include PharmaVoice, Pharma Manufacturing, and Pharmaceutical Online, www.pharmexcil.com, www.thehindu.com/business/Industry/pharma, The Economic Times www.business-standard.com/pharma, www.expresspharma.in, www.pharmabiz.com..etc many are there

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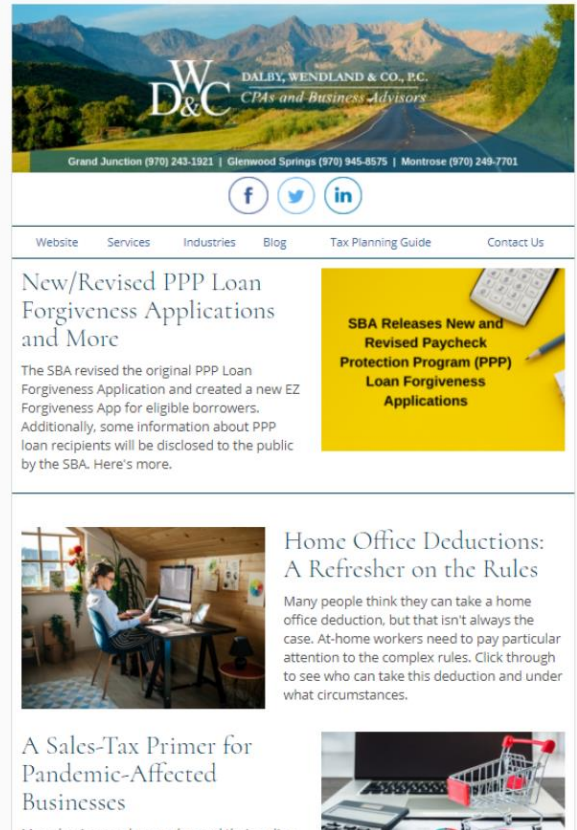


Fig 2. Industry Newsletters

Online Courses and MOOCs: Explore online learning platforms like Coursera, edX, and Udemy for courses related to pharmaceuticals, drug development, regulatory affairs, or specific therapeutic areas. Massive Open Online Courses (MOOCs) provide flexibility and access to high-quality educational resources.



Fig 3 Online Courses and MOOCs

Government Health Agencies : Stay updated on public health initiatives, policies, and guidelines by visiting websites of government health agencies such as the Centers for Disease Control and Prevention (CDC), World Health Organization (WHO), and National Institutes of Health (NIH).



Fig 4. Government Health Agencies

Continuing Education: Engage in continuing education programs and courses that provide updated knowledge and skills relevant to the pharmaceutical industry. These programs can be offered by universities, professional organizations, and online learning platforms. They cover a wide range of topics such as clinical pharmacy, drug development, regulatory affairs, and pharmacoeconomics.



Fig 5. Continuing Education

Key Industry Events: Attend key industry events, conferences, and symposiums related to pharmacy and the pharmaceutical industry. These events offer opportunities to network, learn from experts, and stay updated on the latest trends. Examples include the American Society of Clinical Oncology (ASCO) Annual Meeting and the American Pharmacists Association (APhA) Annual Meeting.



Fig 6. Key Industry Events

Invited Guest Article

Social Media:

Follow pharmaceutical industry influencers, professional organizations, and reputable experts on social media platforms like Twitter, LinkedIn, and Facebook. These platforms often share the latest news, research findings, and industry insights. Engage in discussions and connect with professionals in the field. ✓ LinkedIn:- Johnson & Johnson (Company):

www.linkedin.com/company/johnson-&-johnson-pfizer (Company):
www.linkedin.com/company/pfizer-pharmaceutical-society-of-india (Association):

www.linkedin.com/company/pharmaceutical-society-of-india Hashtags:
#PharmaIndustry # Pharmaceuticals, # PharmaNews

✓ Twitter:- @ Merck (Company) : twitter.com/Merck @ Novartis (Company): [@Novartis](https://twitter.com/Novartis)
twitter.com/PharmaVOICE (Publication):
twitter.com/PharmaVOICE / twitter.com/PharmaVOICE
#PharmaTwitter, #PharmaNews, #ClinicalTrials

✓ YouTube:- Johnson & Johnson (Company): www.youtube.com/user/jnjhealth
Novartis(Company): www.youtube.com/user/novartis
American Society of Clinical Oncology (ASCO): www.youtube.com/user/ASCODailyNews

✓ Instagram:- @pfizerinc (Company): www.instagram.com/pfizerinc
@jnj (Company): www.instagram.com/jnj-pharmaceuticals_intelligence

✓ Facebook Groups:- Pharmaceutical Industry Professionals:

www.facebook.com/groups/pharmaindustryprofessionals

- Pharmaceutical Sales Network: www.facebook.com/groups/PharmaceuticalSalesNetwork

Pharmaceutical Quality Control and Quality Assurance:

www.facebook.com/groups/PharmaceuticalQualityControlQA ✓

Reddit:r/pharmacy: www.reddit.com/r/pharmacy
r/pharmaceuticals: www.reddit.com/r/pharmaceuticals

r/AskDrugNerds: www.reddit.com/r/AskDrugNerds

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Fig 7. Social Media

Thought Leadership Platforms:

Explore thought leadership platforms like TED Talks, PharmaVOICE 100, and PharmaForum for insights from industry leaders, innovators, and experts. These platforms often feature interviews, presentations, and discussions on the future of the pharmaceutical industry



Fig 9. Industry Conferences and Events

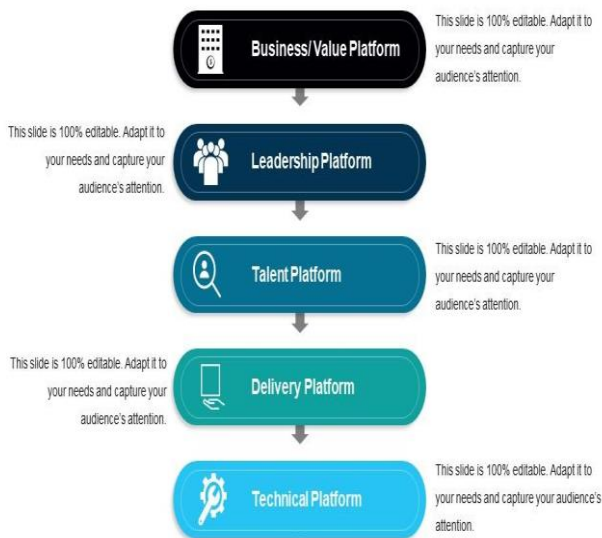


Fig 8. Thought Leadership Platforms

Industry Conferences and Events:

Attend conferences, seminars, and workshops related to pharmacy and the pharmaceutical industry. These events provide opportunities to network with industry professionals, learn about new advancements, and gain insights from experts.

Regulatory Agencies: Stay updated on regulatory guidelines and changes by regularly visiting the websites of regulatory agencies such as the U.S. Food and Drug Administration (FDA), European Medicines Agency (EMA), and World Health Organization (WHO). These agencies provide updates on drug approvals, safety alerts, and regulatory requirements.



Fig 10. Regulatory Agencies

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Research Databases: Explore research databases like PubMed, Embase, and Scopus to access the latest scientific publications, clinical studies, and drug development research. These databases can help you stay updated on new discoveries, treatment modalities, and therapeutic interventions.

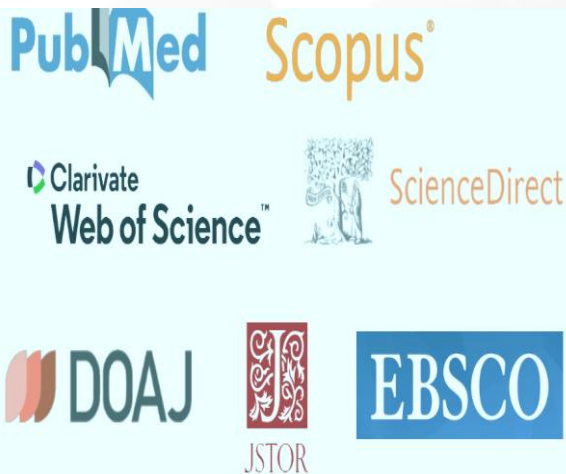


Fig 11. Research Databases

Develop Soft Skills: In addition to technical knowledge, focus on developing soft skills such as communication, leadership, and critical thinking. These skills are valuable in the pharmaceutical industry and can help you adapt to new challenges and opportunities.



Fig 12. Develop Soft Skills

Networking: Build a strong professional network by connecting with fellow pharmacists, industry professionals, and researchers. Attend local pharmacy association meetings, industry events, and conferences to meet new people and engage in discussions.

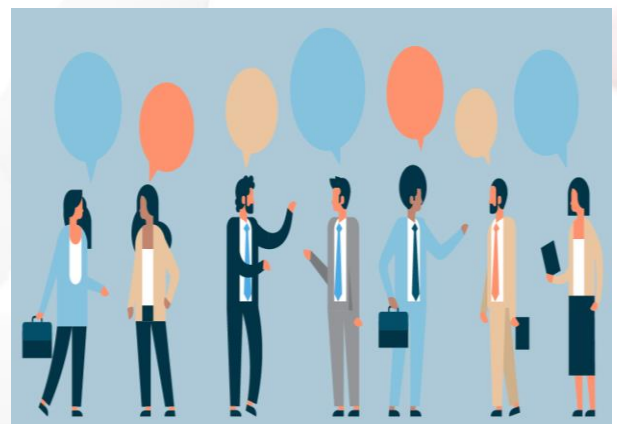


Fig 13. Networking

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Collaborate with Other Healthcare Professionals:

Build relationships and collaborate with professionals from other healthcare disciplines, such as physicians, nurses, and pharmacists specializing in different areas. This interdisciplinary collaboration can broaden your understanding of the industry and foster innovative thinking.



Fig 14. Collaborate with Other Healthcare Professionals



Fig 15. Utilize Mobile Applications

Utilize Mobile Applications:

Explore mobile applications related to pharmacy and the pharmaceutical industry. These apps can provide quick access to drug databases, clinical guidelines, medical calculators, and news updates. Examples include Epocrates, Medscape, and Lexicomp. Remember, staying updated in the pharmaceutical industry requires a multi-faceted approach. Combine a variety of resources, platforms, and techniques to ensure you have access to diverse perspectives, timely information, and opportunities for professional growth.

Invited Guest Article

“If I have seen further, it is by standing on the shoulders of giants.”

Isaac Newton

THE FUTURE IS TO BE FOUGHT NOT FEARED

PLASTIC NEVER DIES



It's true that plastic can take an incredibly long time to break down, leading to the perception that it never really "dies" in the traditional sense. Most plastics are not biodegradable in the way that organic materials like food scraps or paper are. Instead, they break down into smaller and smaller pieces through a process called photodegradation, which occurs when they're exposed to sunlight, heat, and mechanical stress. This process can take hundreds or even thousands of years, depending on the type of plastic.

However, while plastic doesn't truly biodegrade, it can undergo degradation into microplastics—tiny particles less than 5mm in size. These microplastics are a significant environmental concern as they can accumulate in ecosystems, potentially harming wildlife and entering the food chain.

Efforts are underway to find more sustainable alternatives to traditional plastics and to improve recycling and waste management systems to reduce plastic pollution and its long-term impact on the environment.





GLASS AS PHARMACEUTICAL PACKAGING

Ms. Sai Raksha
B.Pharm Sem VII
Faculty of Pharmacy



Pharmaceutical packaging

Container is a device which contains the product, Packaging provides protection, identification, information about the product and it prevents the product from physical damage, loss of content or ingredients and intrusion of unwanted components of the environment such as water vapour, oxygen and light. Pharmaceutical packaging helps in making the product attractable and marketable.

THERE ARE TYPES OF PACKAGING

- 1. PRIMARY PACKAGING-**
These are packaging which are in direct contact with product or pharmaceutical formulation. Primary packaging helps in protecting the product from harsh environment, chemical or mechanical hazards.
- 2. SECONDARY PACKAGING –**
The package that contains primary package is known as secondary packaging. Secondary packaging provides additional protection to the product and also provide the information about the product
- 3. TERTIARY PACKAGING-**
Tertiary packaging is the outer package of secondary packaging. it prevents the damage during bulk handling and shipping.



FIG 16. PACKAGING CONTAINER

[Good in a crisis](#) | [Category Focus - pharmaceutical](#) ([packagingnews.co.uk](#))

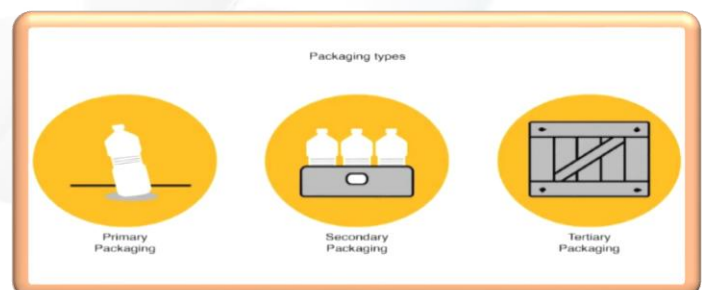


FIG 17. TYPES OF PACKAGING

[The Meaning of Packaging: Importance & Types](#) ([khatabook.com](#))

INTRODUCTION TO GLASS

Glass is an inorganic product, it is non crystalline, amorphous solid of fusion. it is cooled at right riding condition without crystallization. Glass plays a vital role in pharmaceutical packaging sector. Glass chemical composition starts from sand, which is in its pure form know as Quartz. It is composed of silica, silicon dioxide and alkaline earth metals in the form of oxides. Silica is principle ingredient of glass which is derived from sand, flint or quartz which can be melted at high temperature such as -17230C. lead, alumina and boron give glass certain physical property. Glass is amorphous structure which changes from crystalline to amorphous form.

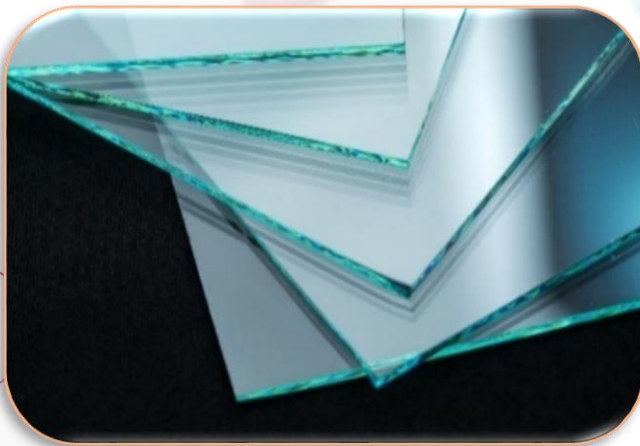


Fig 18. GLASS MATERIAL

[glass - Google Search](#)

HISTORICAL REVIEW ON GLASS AS PHARMACEUTICAL PACKAGING

Automation in glass bottle making, in 1904 Michel Owens is granted a patent for a glass shaping machine. A machine which produced more bottles than man in a week, more bottles could cost effectively be produced for mass packaging. In early 19th and 20th century many pharmaceutical glasses ware were introduced and used such as park Davis (early 20th century), French amber jars (19th century) and Wooster and Adams (19th century).

Tubular glass vials were introduced in 1912 by E Danner in USA (Libbey glass company), he developed first continuous tube drawing process which works horizontal directions. In 1929 a vertical drawing process was developed by L Sanches- Vello in France.

In 20th century pharmaceutical glass packaging device or article such as ampoules, cartridges, tubular vials and moulded vials are used. In 1500 BC, first hollow glass containers were produced by Egyptians which they used for ointments and storing oil



Fig 19. GLASS MAKING PROCESS



Fig 20. FIRST HOLLOW GLASS CONTAINER



Fig 21. GLASS STYLE CONTAINER

TYPES OF GLASS

In chemical classification glass they are classified has: -

TYPE I - BOROSILICATE GLASS: This type of glass is highly resistant glass and chemically inert, it has higher resistant to alkaline product. This type of glass shows reduced leaching when 6% boron is added. This type of glass is used for buffered and non-buffered solution and it is used for alkaline products.

TYPE II - TREATED SODA LIME GLASS: Containers made up of such glass are made up of commercial soda lime which has to be de-alkalised or treated to surface alkali. The de-alkalizing process is known as sulphur treatment which prevents weathering or blooming.

This type of glass container is used for buffered solution up to pH 7 and they are used to store large volume parentals, irrigating solutions and blood components

TYPE III - SODA LIME GLASS
This type glass containers are untreated and they are made up of commercial soda lime glass.

They are used for storing oleaginous products, powder solutions and non-aqueous parenteral products

TYPE IV - NON PARENTRAL GLASS

This type of glass is used for general purpose, they are made up of soda lime. Which are used for non-parenteral products like oral and tropical uses.

Physical classification of glass involves coloured glass , The amber colouration results from the addition of iron oxide of glass.

ADVANTAGE OF USING GLASS HAS PHARMACEUTICAL PACKAGING MATERIAL

glass is non-reactive to chemicals. Glass is economical and easily available. Glass will not reduce the contents purity even when its outside surface is exposed to other products or chemicals. Glass can be sterilized easily and can face high temperatures without effecting its physical nature

Glass is tough and durable, it can also be easily labelled and moulded into bespoke shapes and sizes

Glass is available in transparent and amber colour to produce container.

Glass is high resistance to leeching and has greater protection power.

DISADVANTAGE OF USING GLASS HAS PHARMACEUTICAL PACKAGING MATERIAL

- Glass containers are very fragile and can be easily broken
- Glass containers are heavy than other material containers
- There is risk of product contamination and there is release of alkali from broken glass.
- Transportation of glass has pharmaceutical container has high risk due to its fragility

TESTS DONE ON GLASS CONTAINER IN PHARMACEUTICAL PACKAGING

To define the quality of glass container according to the specific use one or many tests are compulsory. Hydrolytic resistance tests are carried out to differentiate the type of glass such as TYPE I, TYPE II, TYPE III. These tests are done to control hydrolytic resistance of glass.

Types of Glass	General description of glass	Types of test
I	Highly resistant Borosilicate glass	Powdered glass
II	Treated soda lime glass	Water attack
III	Soda lime glass	Powdered glass
IV	General purpose soda lime glass	Powdered glass



RECENT TRENDS IN GLASS HAS PHARMACEUTICAL PACKAGING

Glass plays a vital role for packaging because of its strength, transparency and chemical durability. Alkali borosilicate has been used for a while for long time for packaging but they are tending to have some issues like breakage, variation in hydrolytic performance so alkali borosilicate glasses are replaced with alkali aluminosilicate glasses. Alkali aluminosilicate glasses have similar thermal, mechanical and optical standards as alkali borosilicate glasses.

parenteral containers are very important to maintain sterility, get prevented from contamination and loss of sterility. For parenteral container loss of sterility and contamination can cause adverse effects on patients. Cracked containers in parentals cause risk of contamination. The root cause for cracked parenteral containers is due low internal energy annealing. laboratory tests show that aluminosilicate glass is highly effective at preventing the cracks on the containers. Pharmaceutical parenteral packaging glass container have composition of Type I borosilicate or Type II I Soda lime glass, by applying minor changes or adjustments, a borosilicate glass material was introduced which had improved chemical stability.

new glass was compared with a standard FIOLAX[®]. In extraction study with water at 121°C the new glass had high stability having low extractable.

The new glass showed least amount of leachable in accelerated ageing studies done using water, phosphate and carbonate buffer at 40°C for 12 months.



Fig 22. Redox testing solution in Fiolax[®] ampoules I4660

COATING FOR PHARMACEUTICAL GLASS PACKAGING FLUORINATED RESIN COATING FOR GLASSES

Borosilicate glasses used for pharmaceutical can be cracked during transport, product filling and handling which causes product loss or contamination to the product. To prevent this cracking the glass is coated with fluoropolymer-based resin. Fluon⁺ EA-2000 melt processable perfluoro resin improves the collision resistance of glass vials. The resin forms a in- built functional group which forms adhesive force within the polymer that forms a superior adhesion.

This coating helps in elimination of surface treatment and enhancing in heat and chemical resistance during sterilization. Fluon⁺ EA-2000 helps in improving the strength of the glass vials so the vials are prevented from damage during friction during production, storage and transportation. Fluorinated resin coatings like EA- 2000 needs 1-5 minutes for drying at 100°C then chemically strengthened glass which takes 10 hours. Collision test on borosilicate glass was performed with and without Fluon⁺ EA-2000 resin coating.

The glass having the Fluon⁺ EA-2000 resin coating was prevented by cracks on the surface.

Borosilicate glass vial **EA-2000 coating vial**



Cracks

No cracks

Fig 23. BOROSILICATE GLASS VIAL IS COMPARED WITH EA-2000 COATING VIAL

As we see the importance of glass in pharmaceutical packaging industry, we can witness the changing in glass as packaging material from 1500 BC to 20th century and also see the enhancement in glass has packaging material in recent trends.

Various types of glass are used for different product for pharmaceutical packaging material and different type of glass has to undergo various tests for its viability and to check its resistance.

To conclude glass plays a vital role in pharmaceutical packaging industry from ages till today and it will be seen with huge rise of demand in future with its enhancement, since glass will be better choice in pharmaceutical packaging industry with moving towards sustainable and ecofriendly characteristic of glass.

Glass plays a vital and key material in pharmaceutical packaging industry.



<https://www.zionmarketresearch.com/news/pharmaceutical-glass-packaging-market>

REFERENCE:

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Advancements in Biopharmaceuticals: Harnessing Nanobiotechnology for Enhanced Therapeutics

Ms. Janani Nagendran
B.Pharm V Sem



In recent years, the field of biopharmaceuticals has witnessed remarkable progress, revolutionizing the treatment of various diseases. A key driving force behind these advancements is the integration of nanobiotechnology into the development and delivery of novel therapeutic solutions. Nanobiotechnology offers unprecedented opportunities to enhance the efficacy, specificity, and safety of biopharmaceuticals, opening new avenues for targeted drug delivery, personalized medicine, and disease diagnostics. This article explores the intersection of biopharmaceuticals and nanobiotechnology, highlighting the potential benefits and recent breakthroughs in this exciting field.

Nanoparticles as Drug Delivery Vehicles: Nanoparticles have emerged as valuable carriers for biopharmaceuticals due to their unique physical and chemical properties. These tiny particles can encapsulate therapeutic molecules, protecting them from degradation, enhancing their stability, and facilitating controlled release. Additionally, nanoparticles can be functionalized with ligands or antibodies, enabling targeted drug delivery to specific cells or tissues. This precise delivery mechanism minimizes off-target effects and reduces overall dosage requirements, thereby mitigating potential side effects.

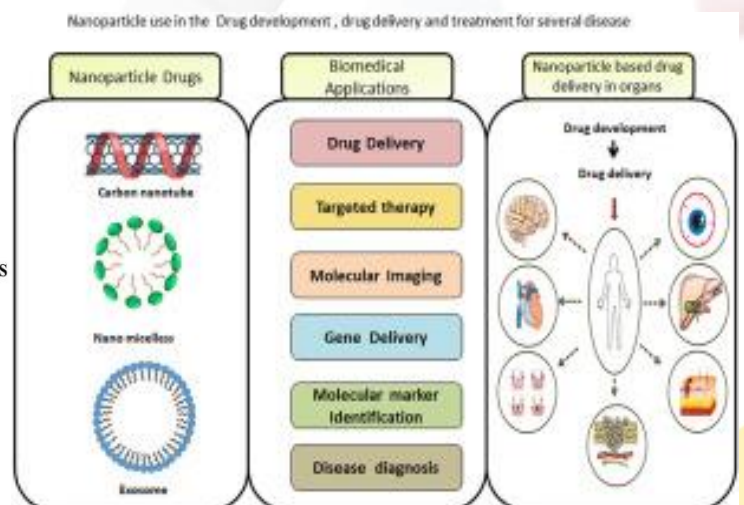
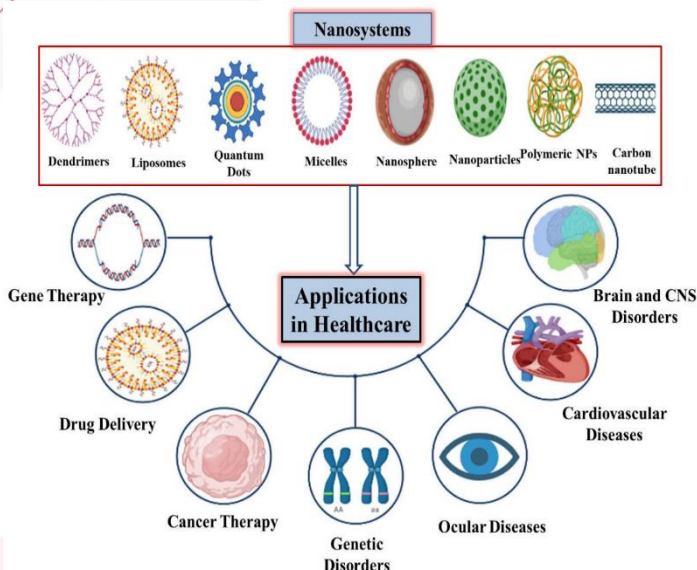


Fig 24. Harnessing Nanobiotechnology

TYPES OF DRUG DELIVERY SYSTEMS

LIPOSOMES

Liposomes are among the earliest and most extensively studied nano drug delivery systems. These lipid-based vesicles consist of one or more phospholipid bilayers enclosing an aqueous core.

They can encapsulate both hydrophilic and hydrophobic drugs. Liposomes act as efficient carriers for drugs that have poor solubility in water

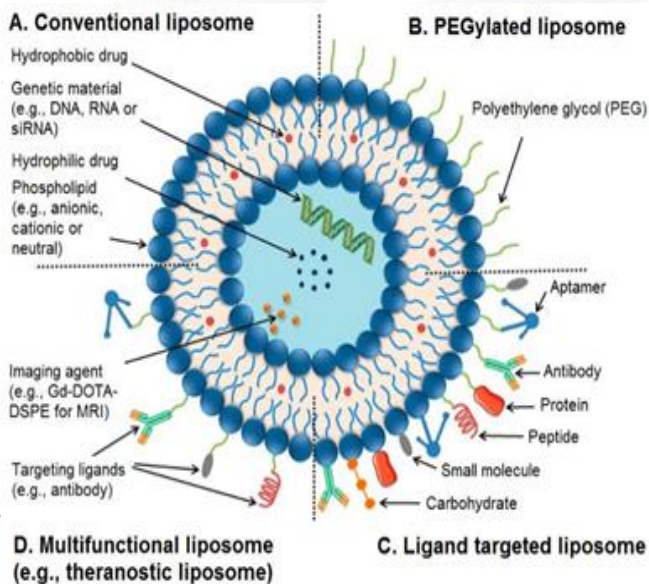


Fig 25. Types of liposomes delivery

Dendrimers are unique nanoscale macromolecules with highly branched structures. They offer precise control over drug loading and release due to their well-defined architecture.

Dendrimers can encapsulate drugs within their interior voids or chemically bind drugs to their surface.

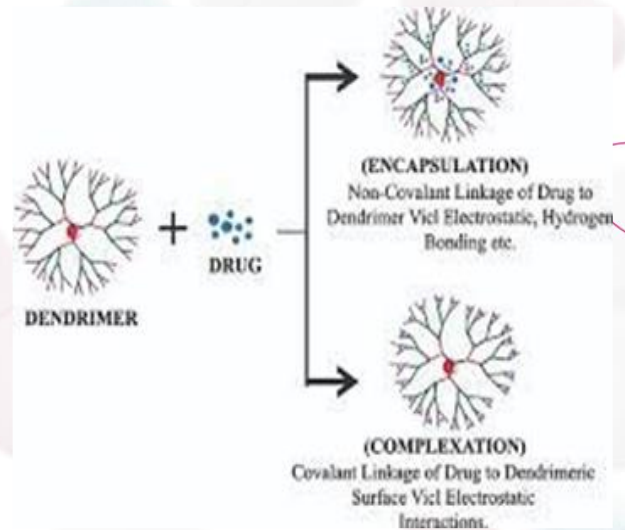


Fig 26. Dendrimers

NANOMICELLES

Nanomicelles are self-assembling nanostructures formed by amphiphilic molecules. In an aqueous environment, these molecules arrange themselves into a core-shell structure, with the hydrophobic drug encapsulated in the core and the hydrophilic shell exposed to the surrounding medium. particularly useful for delivering poorly water-soluble drugs, as they improve drug solubility

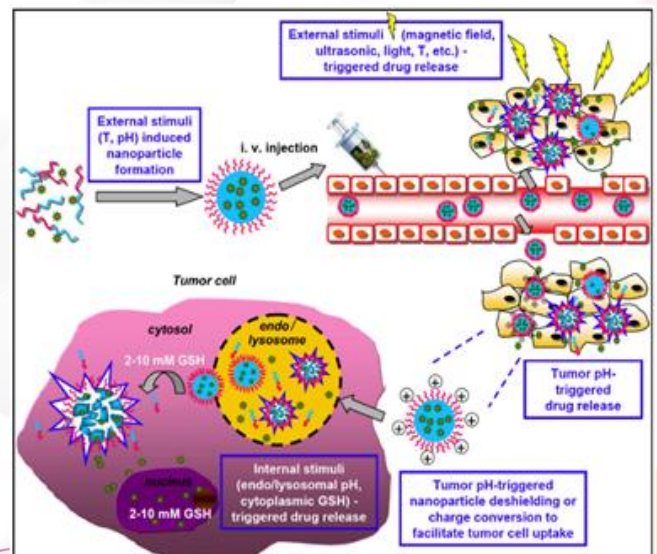


Fig 27. Nanomicelles

Carbon nanotubes are cylindrical carbon structures with exceptional mechanical and electrical properties. In drug delivery, functionalized carbon nanotubes can act as carriers for drugs and genes.

Their unique structure enables the attachment of targeting moieties and therapeutic payloads, making them promising candidates for targeted cancer therapy and neurological disorders.

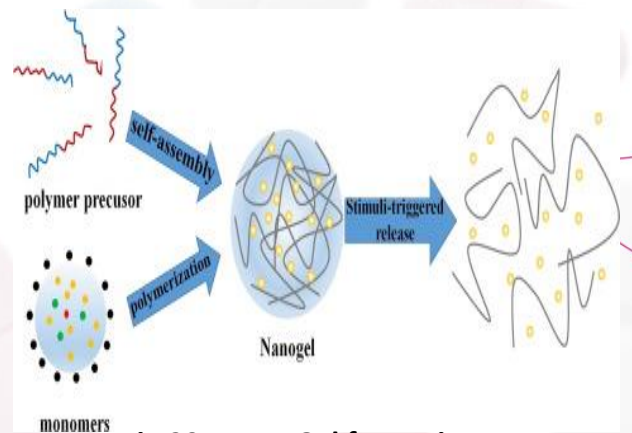


Fig 29. Nano Gel formation

Enhanced Therapeutic Efficacy:

Nanobiotechnology has paved the way for significant improvements in therapeutic efficacy. By encapsulating various biopharmaceuticals within nanoparticles, their bioavailability and absorption can be enhanced, ensuring better tissue penetration and prolonged circulation time. Furthermore, nanoparticulate DDS can facilitate the crossing of biological barriers, such as the blood-brain barrier, enabling the delivery of biologics to previously inaccessible sites.

This breakthrough opens up new possibilities for treating neurodegenerative disorders and brain tumors.

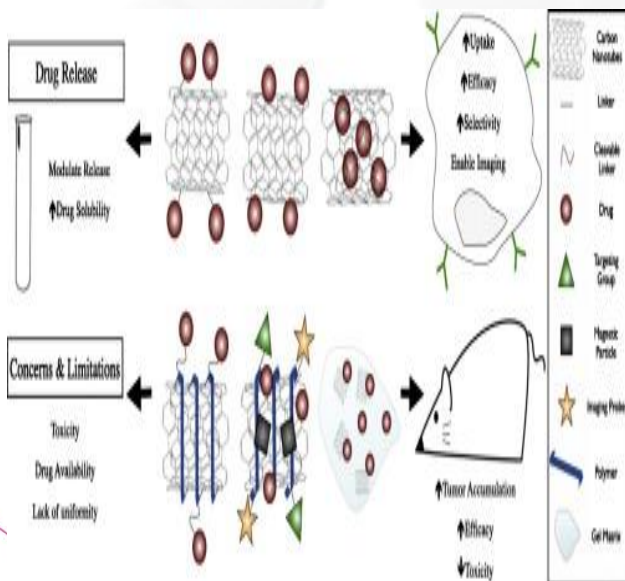


Fig 28. MOA of Nanomicelles

NANOGELS: Nanogels are three-dimensional networks of hydrogel nanoparticles. They possess high water content and can encapsulate both hydrophilic and hydrophobic drugs. Nanogels have shown promise in drug delivery due to their biocompatibility, tunable size, and controlled release capabilities.

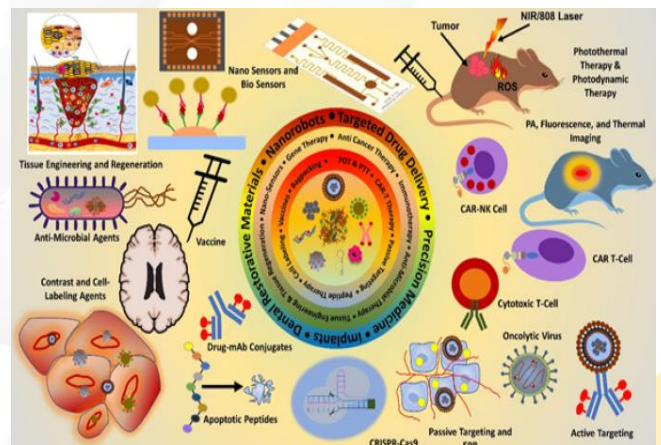


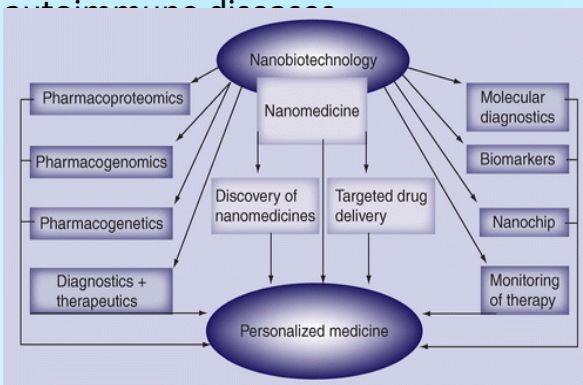
Fig 30. Enhanced Therapeutic Efficacy

“Doctors may kill you with their toxic prescription drugs if you let them.”

— Steven Magee

Personalized Medicine and Targeted Therapy:

The integration of nanobiotechnology in biopharmaceuticals has accelerated the development of personalized medicine and targeted therapy. Nanoparticles can be engineered to selectively bind to specific receptors or biomarkers present on diseased cells, enabling precise delivery of therapeutics. This targeted approach minimizes systemic exposure to drugs, reducing the risk of adverse effects and increasing treatment efficacy. Moreover, nanoparticles can be tailored to respond to specific stimuli, such as pH, temperature, or enzymes, releasing the therapeutic payload only in the desired location. This level of control and customization holds tremendous promise for treating various cancers, genetic disorders, and autoimmune diseases.



Diagnostic Applications: Beyond drug delivery, nanobiotechnology has revolutionized disease diagnostics. Nanoparticles can serve as sensitive probes for detecting biomarkers or pathogens in body fluids or tissues. By combining nanoparticles with advanced imaging techniques, such as magnetic resonance imaging (MRI), positron emission tomography (PET), or near-infrared (NIR) fluorescence imaging, early disease detection and accurate monitoring of treatment response become feasible. These nanoparticle-based diagnostics offer rapid, non-invasive, and highly sensitive approaches, allowing for timely interventions and improved patient outcomes.

Overcoming Challenges: While nanobiotechnology holds immense promise for biopharmaceutical development, several challenges need to be addressed. Safety concerns regarding the long-term effects of nanoparticles in the human body and their potential accumulation require thorough investigation. Additionally, the scalability and cost-effectiveness of nanoparticle production need to be optimized for large-scale manufacturing and commercial viability.



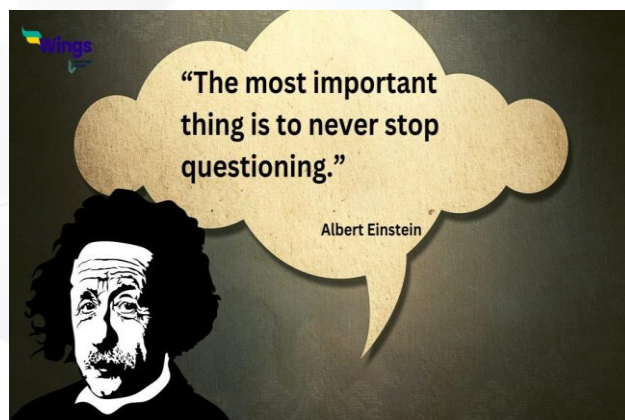
Conclusion:

The convergence of biopharmaceuticals and nano-biotechnology has revolutionized the medical field, offering remarkable opportunities to improve drug delivery, enhance therapeutic efficacy, enable personalized medicine, and advance disease diagnostics. By harnessing the unique properties of nanoparticles, researchers are pushing the boundaries of traditional pharmaceutical approaches, aiming for safer, more effective, and patient-centric treatments. As the field continues to evolve, it is expected that biopharmaceuticals based on nano-biotechnology will play an increasingly vital role in combating complex diseases and improving global healthcare outcomes.

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INK AND IDENTITY: THE ROLE OF LABELLING IN BRANDING SUCCESS

Mr. Kunal

B.Pharm VII Sem
Practice School, FPH
RUAS



PHARMACEUTICAL PRODUCT LABELING AND PRINTING

Pharmaceutical product labeling plays a vital role in product labeling in pharmaceutical industry. Label may be the only source of instruction on the product consumption, pharmaceutical labels usually require perfect and fine details and printed on certified substrate. The pharmaceutical labels contain contents of the product, directions to use the product and safety features, products identity, strength, quality, purity. Labels help in identify the product and describe them, they help in proper handling and storage of product

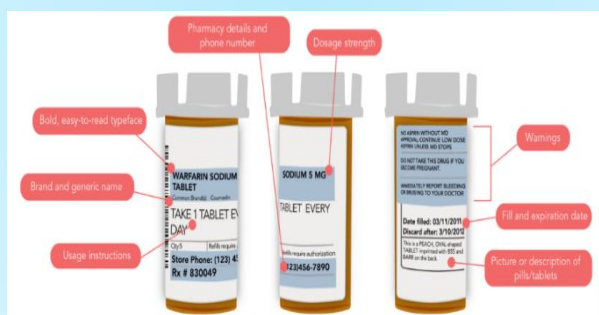


Fig 31. PHARMACEUTICAL PRODUCT LABEL

IMPORTANCE OF LABELING

The labeling process is one of the critical and vital part of pharmaceutical manufactured products. Label acts as a unique identifier to ensure authenticity of health care professionals.

Labeling is a printed information that provides identifications of product and detailed information of the product, labeling helps branding of a product.

Label gives information about official product name, active and inactive ingredients with quantity, use, warnings and allergic reactions which makes it convenient for use of product

HISTORY OF PHARMACEUTICAL PRODUCT LABELING AND PRINTING

It started in early 20th century where very basic labels were printed manually and attached to the containers, as time passed technology advanced printing methods got evolved which included offset later letter press and it got advanced in which digital printing got introduced. The advancement of these technologies allowed more detailed and standardized labeling which included drugs name, dosage, usage instructions and varies parameters of the product.

In mid-20th century Food and Drug Administration regulatory bodies required more comprehensive and standardized labeling and pharmaceutical product, this made improvement and development in labeling guidelines, labeling content and format. Later in 1980's was an era in which the introduction of barcoding technology such as UPC (University product code) was introduced, which made better tracking and inventory management of pharmaceutical product. This technology helped in patient safety by reducing medication error.

HERE ARE SOME OF THE GUIDELINES WHICH NEEDS TO BE FOLLOWED IN PHARMACEUTICAL LABELING AND PRINTING

Pharmaceutical industries should follow Quality Assurance program in various elements to meet the demand of GMP required in quality system regulation such as adhesion, legibility etc. QA program make sures that labeling is under controlled system so that proper labels are printed and used.

Various sections of Quality system regulations on labeling have a huge impact such as:

Section [21 CFR 820.80\(b\)](#) - inspection and testing of materials which includes labeling.

Section [21 CFR 820.70\(f\)](#) – for maintaining proper design and sufficient space for labeling operations.

Section [21 CFR 820.120](#) – it is for the specific requirements of labelling control, it applies to inspection, handling, storage and distribution of labelling. If these requirements are not met then FDA considers a device to be adulterated.

Section [21 CFR 820.30](#) – this is designed history file, specification are required in design history file for the physical design and content parameter of labelling.

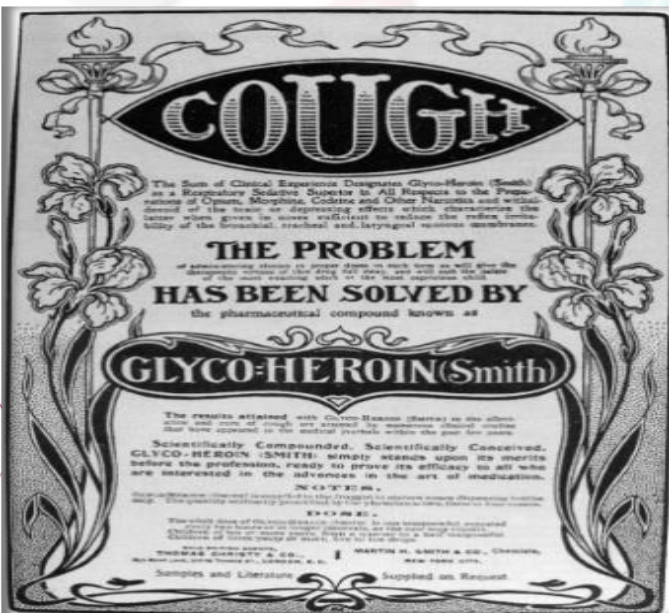


Fig 32. Labels during 20th century

In late 20th century and early 21th century there was rise of digital technology, this brought about integration of electronic labeling and printing systems which allows more customized and detailed labelling. This technology paved way for the inclusion of QR codes and Radio frequency identification technology for better product information.

“Don't take that horrible stuff. It's poison, it's poison.”

— Aldous Huxley

SPECIFIC REQUIREMENTS FOR LABELING

Receipt and Inspection – In receipts of all kinds of packaging and labeling materials which includes preprinted container should be examined and acceptance activity must be performed. Designated individual(s) are allotted to proofread labeling samples. The acceptance activity should be recorded in device history record as per [21 CFR 820.80\(e\)](#) and [21 CFR 820.120](#) to present that inspection and proofreading were performed.

Label Integrity – Designs and application of labels to the devices and containers should remain in place and legible during conditions like distributions, storage, use, user instructions.

Storage – All required labelling materials including pre-printed packaging materials, pre-printed containers and labels should be stored in a manner such that it doesn't mix up ([21 CFR 820.120](#)). Labels should be segregated and identified to prevent the mixing up of similar looking labels.

Changes – Changes to labelling should be made according to formal change control system similar to the specification [21 CFR 820.30\(i\)](#). Before implying the labels must be formally rechecked and authorized. While changes are done to the per primary aspects and documentation, the review group should check if any secondary things like labels or instructions are affected.

TYPES OF LABELS

Labels appear in a bottle or product, which gives best information about the product. Various materials like paper, fabric, plastic and foil are used for labels. Choices of the labels will depend on the need of the economy, some of the labels can directly printed on the containers of the product by silk screen or hot transfer process. Different kinds of labels

Paper labeling – Many labels are printed on papers because it is most economical method, but in case of paper labeling there is a limit to the colors and technique which can be used



Fig 33. Paper label of a pharmaceutical product

Foil labels – It is necessary to laminate foil with paper so that labels work properly in labeling machine, for best results the paper and foil should be together with measure 0.0025 to 0.003 inch



Fig 34. Foil label of a pharmaceutical product

Sleeve labels – They help in product protection and product identification; they have combination of designed prints usually metallic or surface prints for eye catching graphics. Sleeve labels virtually complexes the curves of any product shape. There are two types of sleeve labels – stretch band and shrink tubing



Fig 36. Sleeve labelled pharmaceutical product

Transfer labels – Many processes are present for transferring heat sensitive inks from preprinted strips to the container.

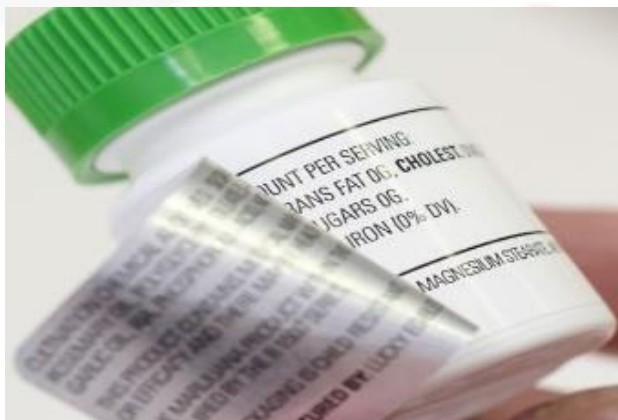


Fig 35. Transfer label of a pharmaceutical product

PHARMACEUTICAL LABEL PRINTING

Every label is not similar, different kinds of application need different digital technology and this is the reason printing is one of the vital reasons around the world. In pharmaceutical labels printing is done on certified substrates and need a specified attention for anti-counterfeiting and even for brand protection. For the protection of brands label converters needs to have an additional measure to protect their brand by micro texting images and so on

METHODS OF APPLYING LABELS

Hot melts – In this method glue is applied on the board, on the brush and the labels are placed up on the glue, later they are removed manually and stuck on the container, this is very simple method to apply a label

Semi-automatic labeling – In this method container is placed in position and the machine applies the label. Speed of the operation is based on how fast the operator can remove the old product and place the new one

Fully automatic labeling – Fully automatic labeling machine is useful to place the label in round shape around the product. Products of different diameters can be placed in the same machine. The vital feature of machine is if diameter of the body changes, then machine also operates conveniently

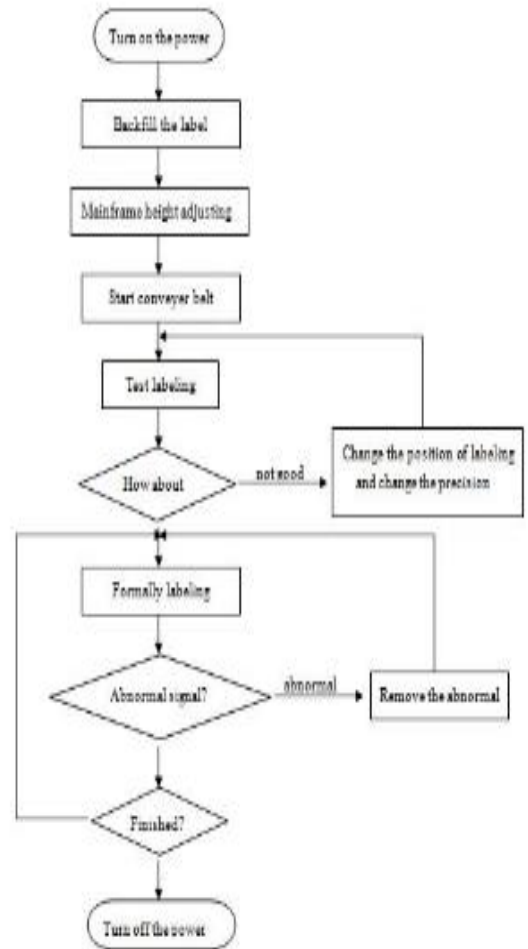


Fig 38. Semi-automatic method of applying label

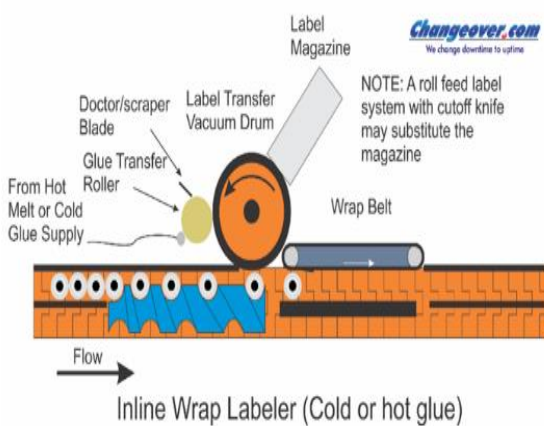


Fig 37. Hot melt method of applying label

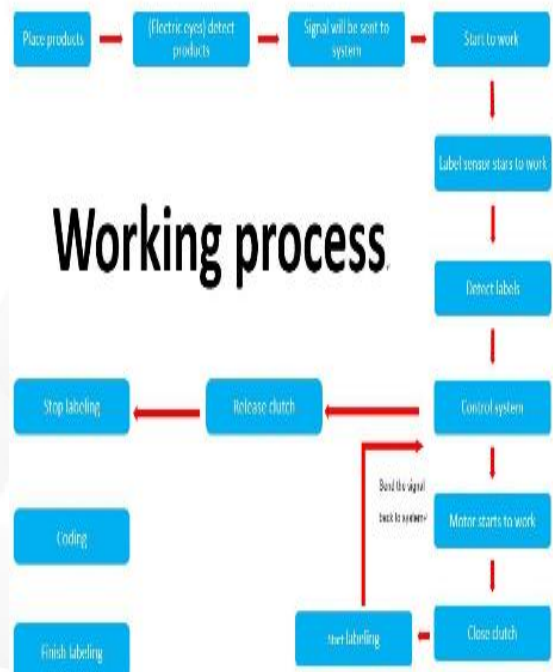


Fig 39. Fully automatic method of applying labels

CURRENT TRENDS IN PHARMACEUTICAL LABELING

Pharmaceutical labeling plays a role in pharmaceutical packing industry, pharmaceutical labeling has evolved to accommodate a new demand in pharmaceutical industry. Here is some of the latest trend of pharmaceutical labeling: -

Stringent Quality Certification – For quality control we see lot of certifications and automated inspections to prevent errors and eliminate the poor pharmaceutical labeling. Drug errors and medical errors which lead to fatalities are due to mislabeling and print defects, due to these pharmaceutical industries should follow ISO, cGMPs, 100% inspections and full automation in printing labels for pharmaceutical products to avoid labeling errors.

Counterfeiting Protection - Pharmaceutical industries are bringing adding convert images, descriptions and verifications strategies for labels to prevent from counterfeit protections.

Accessibility – Pharmaceutical labeling should have information which is necessary such as usage instructions, disposal instructions, allergy warning, emergency care contact information and expiry date due to rise in self-medication by patients. The printed information must be clear legible to the patients, this information makes the product patient friendly

QR CODES THE TREND SETTER

QR codes also known as Quick Response Codes are 2D barcodes that are printed on labels of product which contain information about the product. The QR codes can be scanned at any point to get the information digitally. QR codes on the pharmaceutical labels are effective, simple and gives significant impact in making the pharma industry more secure

QR code on label in each level of packaging stores data or information which is readable with software applications and also fascinates tracking and trading. The stored data or information should have



Fig 40. Paper label of a pharmaceutical product

Why should pharmaceutical companies include QR code on medicine or drug packaging- QR codes adds additional information of product details on the product labeling.

QR codes on label of the product when scanned shows video information about the product.

QR codes on label encourage the patients to ask questions.

Verifying product authentication can be done using QR codes on labels.

For over-the-counter drugs QR codes can be used to inform the patients about the product information.



Fig 41. QR codes

WHY DID GOVERNMENT MANDATE QR CODES

On 18th January 2022, the Gazette notification was issued by the Ministry of Health & Family Welfare, which says that “Every active pharmaceutical ingredient manufactured or imported in India should have a QR code on its label on each and every kind of packaging which contains data or information about the product with a software to facilitate their tracking and tracing”. Scan the QR code to get the label on your devices

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**EVERYTHING
IS
DESIGNED.
BUT A FEW
ARE
DESIGNED
WELL.**

- BRIAN REED





RISE OF COSMECEUTICALS IN PHARMA INDUSTRY

Ms. Ashle

B.Pharm VII Sem
Practice School, FPH
RUAS



INTRODUCTION:

With the introduction of "cosmeceuticals," a combination of medication and cosmetics, the pharmaceutical industry has undergone a radical change. The story of cosmeceuticals' rise in the pharmaceutical sector is examined in this article, along with the factors that led to this paradigm change and its significant effects on the two industries. Cosmeceuticals have developed to satisfy customer desires for products that focus on skin health more deeply by combining medicinal and cosmetic benefits. The industry's expansion has been made possible by legislative changes as well as the synergies between pharmaceutical and skincare technology. It reveals the history of cosmeceuticals, from traditional skincare methods to scientific discoveries in the 20th century and biotechnology advances in the 21st. The impact of cosmeceuticals on the skincare market, their classification according to function, and active ingredients are explored. The market expansion, collaborative efforts, packaging's role, and global market dynamics shed light on the influential factors shaping the cosmeceutical landscape.

The pharmaceutical sector has undergone a significant paradigm shift that has resulted in the birth of a novel mix of pharmaceuticals and cosmetics, which is fittingly labeled "cosmeceuticals." In addition to redefining consumer expectations, this marriage of science and beauty has created new opportunities for pharmaceutical businesses looking to expand their business models. This piece explores the fascinating story of cosmeceuticals' ascent within the pharmaceutical industry, revealing the forces driving this change and the significant effects it is having on both industries.

Unlike the traditional cosmetics, cosmeceuticals are made with active substances that are supposed to improve skin health in addition to their aesthetic qualities. The combination of therapeutic and cosmetic benefits has created a booming industry that is attracting the interest of both niche beauty brands and major pharmaceutical companies.

The origins of cosmeceuticals lie in consumers' increasing preference for products that provide more than surface-level improvements. The growing awareness of skincare among people has led to a rise in demand for products that address both superficial issues and underlying skin health. Pharmaceutical businesses have been forced by customer demand to look outside their conventional fields and investigate the unrealized potential at the nexus of science and beauty.

There's a noticeable synergy between advances in skincare science and pharmaceutical research, which is one of the factors driving the cosmeceuticals business. As our knowledge of skin biology expands, it is now possible and extremely promising to incorporate medicinal technologies into cosmetic formulations. A new era of skincare has emerged as a result of this synergy, with treatments intended to actively support skin health at the cellular level while also disguising blemishes.

Additionally, the regulatory framework pertaining to cosmeceuticals has changed, which has made it easier for the sector to expand. Regulatory agencies worldwide are adjusting to the distinct qualities of these hybrid items by offering frameworks and rules that take into account both cosmetic and medicinal features. Since this regulatory latitude, pharmaceutical businesses feel more confidence investing in R&D since they know their discoveries can successfully negotiate the challenging landscape of compliance.

HISTORY OF COSMECEUTICALS:

The fascinating journey of cosmeceuticals' history takes us to the nexus of science, skincare, and the growing need for efficacious beauty solutions among consumers. Natural substances like honey, olive oil, and plant extracts were used for skincare in ancient civilizations, which is where the concept of cosmeceuticals originated. But it was in the 20th century that cosmeceuticals really started to take shape thanks to ground-breaking scientific discoveries.

A significant advancement occurred in the 1960s with the identification of retinoids, or vitamin A derivatives. These substances had notable impacts on the skin, which led to a move away from products that only provided surface-level benefits. Research on dermatology explored antioxidants, beta hydroxy acids (BHAs), and alpha hydroxy acids (AHAs) during a period of rapid growth in the 1980s. Antioxidants offered defense against environmental damage, BHAs like salicylic acid treated acne, and AHAs enhanced the texture of the skin.

In the late 20th century, Dr. Albert Kligman of the University of Pennsylvania is described as the father of cosmeceuticals, a term he popularized. The word "cosmeceutical" became popular as the industry tried to set itself apart from conventional cosmetics with products that had therapeutic effects that could be demonstrated.

Collaborations between doctors and scientists, with a focus on evidence-based formulas, have become the norm for skincare brands.

The 21st century saw the combination of increased consumer awareness with biotechnology developments. Stem cell research promised regenerative effects, pushing the boundaries of skincare, while peptides emerged as powerful substances, boosting the creation of collagen. In order to classify products and maintain a balance between innovation and safety, regulatory bodies such as the FDA and EMA were instrumental in forming the current environment.

TYPES OF COSMECEUTICALS

Cleansers:

Cleansers play a crucial role in cosmeceuticals as they play a role much more than surface level cleaning. A cleanser helps prepare the skin by removing dirt and grime from the surface, balancing the PH of the skin, helps the skin prepare for active ingredients and also boosts the absorption of products in the skin better. The cleansers help to exfoliate the skin better and are catered to individuals needs and skin type, and they don't use harsh chemicals which can irritate the skin further if a person is suffering from any skin conditions.

Sun Protection:

Sunscreen is a topical photoprotective lotion that helps shield the skin from sunburn and, more significantly, prevents skin cancer. It is sometimes referred to as sunblock or sun cream. Sunscreens can be found as sticks, powders, gels, sprays, lotions, foams (such whipped or expanded foam), and other topical preparations. Sunscreens are frequently worn in addition to other forms of photo-protection, like umbrellas, sunglasses, sunhats, and specific sun-protective apparel.

The use of a broad-spectrum sunscreen with an SPF of at least 30 must be applied as per the modified teaspoon rule (MTR), which means that one teaspoon (=5 ml) should be applied to the face + scalp + neck, left arm/ forearm, right arm/forearm, and two teaspoons each to the right thigh/leg, torso, and left thigh/leg.

The first coat must be on the skin at least 25-30 minutes prior to expected sun-exposure and should be repeated every 2-3 hourly, depending on the prevalent seasonal and weather conditions. Sun-screen must be applied around the year, even indoors.

MOISTURIZERS:

The most effective solution for treating numerous skin diseases, such as atopic dermatitis, psoriasis, pruritus, and aging skin, is a moisturizer. These goods consist of humectants, occlusives, and emollients. Most moisturizers improve the efficiency of the skin barrier. The benefits of moisturizers include smoother, softer, more luminous, less wrinkled, and firmer skin. They restore the skin's normal barrier function, enhance the tactile characteristics of dry, aged skin, and lessen the release of inflammatory cytokines. Mineral oil, silicon, petrolatum, and glycerin-based moisturizers improve the functions of the skin's barrier. Moisturizers replenish the skin's water content and offer a calming protective layer.

Appropriate Skin Type for Humectant Use: Oily Skin

The fact that humectants are excellent skin moisturizers is well known. Humectants work best when combined with other moisturizers like occlusives and emollients for optimal hydration.

Because of this, they are most frequently used either by themselves or in combination with hyaluronic acid, glycerin, propylene glycol, urea, aloe vera, sorbitol, and alpha-hydroxy acids in products.

Appropriate Skin Type for Emollient Use: Normal , Dry ,Combination Skin

Emollients, a vital class of moisturizers, work to mend skin barrier cracks to provide the skin a smoother, softer texture. In addition to serving as a lubricant in many skincare products, restoring these fissures helps reduce water loss. Emollients work well for most skin types, but if you have naturally oily skin, use them sparingly. Emollients can be overly thick and cause additional breakouts when used in conjunction with oily skin. Choose moisturizing products with occlusive or humectant characteristics when combining emollients.

ANTI-AGING COSMECEUTICALS:

Anti-aging cosmeceuticals are specialized skincare products designed to combat and minimize the visible signs of aging. The products used help minimize the signs of aging and work towards repairing the damage caused due to ultra-violet rays over the years and help minimize photoaging by using components that hydrate the skin, help stimulate collagen production and enhance cellular turnover, which ensures healthy new cells are produced and the replace the old cells.

DEPIGMENTATION COSMECEUTICALS

A class of skincare products known as "depigmentation cosmeceuticals" is intended to treat hyperpigmentation and conditions such as melasma, uneven skin tone, and dark spots. Typically, the active components in these products work to produce a more even complexion by preventing the synthesis of melanin, the pigment that gives skin its color. In order to target different stages of the melanin production process and prevent or diminish excessive pigmentation, depigmentation cosmeceuticals frequently combine a number of scientifically established substances that help in improving the condition.

ACTIVE INGREDIENTS

ANTI-OXIDANTS

Antioxidants are essential components of cosmeceuticals since they are potent substances that support healthy skin and counteract the damaging effects of oxidative stress. These ingredients include vitamins, plant extracts, and other molecules which offer a number of advantages when added in skincare. Antioxidants help in neutralizing free radicals generated by UV exposure, thus preventing oxidative stress and contributing to the prevention of photoaging. It provides improvements in collagen synthesis and overall skin appearance, highlighting the anti-aging potential of antioxidants. They contain depigmenting agent, contributing to the reduction of hyperpigmentation and achieving a more even skin tone. They also help prevent premature aging, provide sun protection and help in hydration and moisture retention.

ACTIVE INGREDIENTS	ROLE	APPLICATIONS
Vitamin C (Ascorbic Acid)	Powerful antioxidant that neutralizes free radicals, stimulates collagen synthesis, and inhibits melanin production.	Used for brightening the skin, reducing hyperpigmentation, and promoting a more even skin tone. It also helps in preventing and reducing the signs of aging.
Vitamin E (Tocopherol)	Protects cell membranes from oxidative damage, enhances the effectiveness of other antioxidants, and provides anti-inflammatory benefits.	Often combined with vitamin C to boost its efficacy. Used for moisturizing, reducing inflammation, and promoting overall skin health.
Retinoids (Vitamin A derivatives)	Stimulates cell turnover, promotes collagen production, and has antioxidant properties.	Addresses fine lines, wrinkles, and uneven skin tone. Commonly used in anti-aging formulations to improve skin texture and reduce the signs of photoaging.
Coenzyme Q10 (Ubiquinone)	Provides antioxidant protection, supports cellular energy production,	Used in anti-aging products to improve skin firmness and texture. It may also have soothing effects on sensitive skin.
Green Tea Extract	Rich in polyphenols with antioxidant and anti-inflammatory properties.	Reduces redness, soothes the skin, and provides protection against environmental damage. Often used in products targeting sensitive or irritated skin.
Resveratrol	Potent antioxidant with anti-aging properties.	Used to neutralize free radicals, reduce inflammation, and address the signs of aging. Often found in products targeting mature or sun-damaged skin.
Ferulic Acid	Enhances the stability and efficacy of other antioxidants, provides antioxidant protection.	Commonly combined with vitamins C and E to improve their performance. Used in anti-aging formulations and products aiming to protect the skin from environmental stressors.
Niacinamide (Vitamin B3)	Has antioxidant and anti-inflammatory properties, helps regulate sebum production.	Addresses a variety of concerns, including uneven skin tone, enlarged pores, and fine lines. Suitable for different skin types, including sensitive skin.
Selenium	Essential mineral with antioxidant properties.	Provides antioxidant protection and supports the skin's natural defense mechanisms. Often included in formulations to enhance overall skin health.
Astaxanthin	Potent antioxidant with anti-inflammatory properties.	Commonly found in products targeting anti-aging and skin resilience.

PEPTIDES

Peptides play a crucial role in cosmeceuticals, representing a category of bioactive compounds that offer various benefits for the skin. These short chains of amino acids, often referred to as the building blocks of proteins, serve as key ingredients in skincare formulations. Peptides contain healing properties which in turn help stimulate collagen production and restore elasticity and firmness of skin.

Peptides exhibit anti-inflammatory properties which assist in soothing irritated skin and calming the inflammation, they can help prevent glycation, a process associated with aging that leads to the formation of advanced glycation end products (AGEs) in the skin. The versatility of peptides allows for the creation of customized formulations targeting specific skincare concerns, ranging from anti-aging to brightening and hydration.



Fig 42. Products with different peptides

ACTIVE INGREDIENTS	ROLES	APPLICATIONS
Matrixyl (Palmitoyl Pentapeptide-4)	Stimulates collagen production and promotes skin repair.	Used for reducing the appearance of fine lines and wrinkles. Matrixyl is often included in anti-aging formulations to enhance skin elasticity and firmness.
Argireline (Acetyl Hexapeptide-8)	A muscle-relaxing peptide that can temporarily reduce the appearance of expression lines.	Commonly found in products targeting expression lines, such as crow's feet and forehead wrinkles. It provides a topical, non-invasive alternative to addressing dynamic wrinkles.
Copper Peptides	Support collagen and elastin production, have antioxidant properties.	Used for promoting overall skin health, improving skin texture, and supporting wound healing. Copper peptides may be included in anti-aging and rejuvenating formulations.
Palmitoyl Tripeptide-1 and Palmitoyl Tetrapeptide-7 (Matrixyl 3000)	Work together to stimulate collagen synthesis and regulate inflammatory responses.	Used in anti-aging formulations to address fine lines and wrinkles. Matrixyl 3000 is believed to have synergistic effects on collagen production.
Palmitoyl Hexapeptide-12	A collagen-boosting peptide that promotes skin firmness.	Included in anti-aging products to improve skin elasticity and reduce the signs of aging.
Palmitoyl Oligopeptide	Enhances collagen and hyaluronic acid production	Used in anti-aging formulations to improve skin firmness and hydration.
Tripeptide-1	Supports collagen synthesis and has anti-inflammatory properties.	Used to promote skin firmness and elasticity. Tripeptide-1 may be included in formulations targeting aging and sagging skin.
Acetyl Tetrapeptide-2	Supports tissue renewal and promotes skin thickness.	Included in formulations targeting age-related changes in skin thickness and elasticity.
Neuropeptides (e.g., Hexapeptide-9)	Mimic the effects of neurotransmitters, potentially reducing the appearance of expression lines.	Found in products targeting dynamic wrinkles and expression lines. Neuropeptides aim to provide a topical alternative to injectables for wrinkle reduction.
Palmitoyl Tripeptide-38 (Matrixyl Synthe'6)	Stimulates the synthesis of collagen and hyaluronic acid.	Used in anti-aging formulations to address wrinkles and improve overall skin texture.

POLYSACCHARIDES:

Polysaccharides, large complex carbohydrates made up of sugar molecules, have gained popularity in cosmeceuticals for their multifaceted benefits in promoting skin health. The role and use of polysaccharides in cosmeceuticals are diverse, encompassing hydration, anti-aging, soothing, and protective properties.

Polysaccharides contribute to the texture, viscosity, and overall sensory experience of skincare products, improving spreadability and feel on the skin as well as providing UV protection. Polysaccharides have the ability to attract and retain water, providing intense hydration to the skin and also aiding in tissue repair.



Fig 43. Products with polysaccharides

ACTIVE INGREDIENTS	ROLE	APPLICATIONS
Hyaluronic Acid	A naturally occurring polysaccharide that attracts and retains water, providing intense hydration and plumping effects.	Used in moisturizers, serums, and dermal fillers to hydrate the skin, reduce the appearance of fine lines and wrinkles, and improve skin elasticity.
Beta-Glucans	Polysaccharides with antioxidant and soothing properties; they help strengthen the skin barrier and reduce inflammation.	Found in skincare products for their ability to calm sensitive skin, improve moisture retention, and support overall skin health.
Aloe Vera Polysaccharides	Derived from the Aloe vera plant, these polysaccharides contribute to the plant's moisturizing and soothing properties.	Commonly used in gels, creams, and lotions to soothe and hydrate the skin, especially after sun exposure or for irritated skin.
Xanthan Gum	A polysaccharide used as a thickening and stabilizing agent in cosmetic formulations.	Improves the texture and consistency of skincare products, providing a smooth and creamy feel.
Carrageenan	Extracted from seaweed, carrageenan is used as a thickener and stabilizer in skincare formulations.	Contributes to the texture and viscosity of products, such as creams and lotions, providing a pleasant application experience.
Konjac Glucomannan	Derived from the konjac plant, this polysaccharide has water-binding properties and is used for its hydrating effects.	Found in skincare products to enhance hydration, improve skin texture, and create a smoother appearance.
Chondroitin Sulfate	A glycosaminoglycan (a type of polysaccharide) that supports skin hydration and elasticity.	Used in skincare formulations to improve moisture retention,
Fucoidan	Extracted from brown seaweed, fucoidan has antioxidant and anti-inflammatory properties.	Used in skincare products for its potential to protect against environmental stressors, reduce redness, and promote a healthy complexion.
Glycosaminoglycans (GAGs)	Include hyaluronic acid, chondroitin sulfate, and heparin, among others. They contribute to skin hydration and support the structure of the extracellular matrix.	Found in anti-aging formulations to enhance moisture retention, improve skin firmness

METALS:

Metals contribute to the cosmeceutical industry by offering a range of benefits, from promoting skin health and combating signs of aging to providing protection against environmental stressors. However, it's crucial to consider the specific properties and concentrations of each metal, taking into account safety and efficacy in skincare formulations. As with any skincare ingredient, individual skin sensitivities and potential allergies should be considered when using products containing metals.

ACTIVE INGREDIENTS	ROLE	APPLICATIONS
Zinc	Zinc has anti-inflammatory and antioxidant properties. It helps regulate sebum production and supports wound healing.	Used in products targeting acne-prone skin, as well as in formulations for sunscreens and anti-aging products.
Copper	Copper is involved in collagen synthesis and has antioxidant properties. It supports skin elasticity and promotes wound healing.	Included in anti-aging formulations to improve skin firmness and elasticity. Copper peptides, specifically, are used in some products for their potential benefits.
Iron	Iron plays a role in oxygen transport and cellular metabolism. In cosmetics, iron oxides are used as pigments in makeup products.	Iron oxides provide color in foundations, eyeshadows, and other makeup items. They are often used to create natural and earthy tones.
Magnesium	Magnesium is essential for various cellular functions, including energy production. It can have calming effects on the skin.	Found in skincare products for its potential to soothe and relax the skin. Magnesium is sometimes included in formulations for sensitive or irritated skin.
Selenium	Selenium is an essential trace element with antioxidant properties. It helps protect the skin from oxidative damage.	Included in anti-aging formulations and products designed to support the skin's natural defense mechanisms.
Silicon	Silicon is involved in collagen synthesis and plays a role in maintaining skin elasticity.	Found in skincare products for its potential to improve skin texture and firmness. Silicon is sometimes included in hair and nail products as well.
Gold	Gold nanoparticles are used for their antioxidant properties and potential anti-inflammatory effects.	Included in luxury skincare products for their perceived anti-aging benefits. Gold nanoparticles may contribute to a radiant complexion.
Silver	Silver has antimicrobial properties, making it useful for controlling bacteria on the skin.	Found in some skincare products, especially those designed for acne-prone or sensitive skin. Silver can be incorporated into cleansers, toners, and wound care formulations.
Aluminum	Aluminum compounds are used in antiperspirants to help control sweat.	Found in deodorants and antiperspirants to reduce perspiration. Aluminum-free alternatives are also available for those concerned about potential health effects.

IMPACT OF COSMECEUTICALS ON THE INDUSTRY

Market Expansion:

The market for skincare and beauty products has grown since the introduction of cosmeceuticals, resulting in a wide range of options that go beyond conventional cosmetics. It has caused pharmaceutical companies to expand the range of products they offer by adding cosmeceuticals, in an effort to meet the growing demand from consumers for products that have both health and aesthetic benefits.

This has influenced pharmaceutical research and development, fostering innovation in the creation of novel delivery systems, active ingredients, and formulations that bridge the gap between cosmetics and pharmaceuticals. This, in turn, has led to leveraging biotechnology in the development of cosmeceuticals, contributing to the convergence of pharmaceutical and cosmetic research.

Collaborations:

The overlap between pharmaceutical and cosmetic companies has led to partnerships, collaborations and mergers which has driven an increase in the industry standards with pharmaceutical companies entering cosmetic spaces. Scientifically validated products are the norm lately which has risen the bar for clinical testing and efficacy standards leading to an increase in consumer awareness about the science and healthcare benefits of the products. The increase in technology has helped companies recognize the opportunities to develop specialized cosmeceuticals that target different skin concerns with targeted therapeutic formulations.

ROLE OF PACKAGING IN COSMECEUTICAL GROWTH:

The first impression of a product matters, and to grab the attention of consumers, the cosmeceutical industry presents its products in the market in varying formats which help differentiate the product and also leave a lasting impression. The packaging of the product convey different messages in regards to their products, where some include information about the product and brand describing the active ingredients used and their benefits.

The packaging of the product also gives it shelf appeal where sustainable packaging appeals with its impact on the environment and high-quality and luxurious packaging can enhance the perceived value of the product. The unique packaging leaves a lasting impression and the user friendly packaging are likely to be popular due to their practical and functional approach.

Cosmeceutical packaging is a potent instrument for influencing consumer behavior and, in turn, driving sales. Brands may improve their market position and increase sales by carefully crafting packaging that communicates product benefits, complies with consumer expectations, and sets them apart from rivals. Packaging is a crucial component of the entire marketing plan and needs to be well thought out in order to provide customers with an engaging and happy experience.


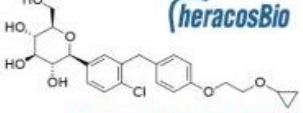
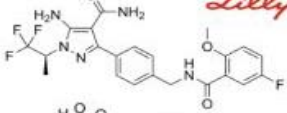


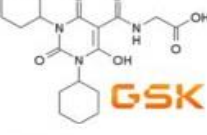
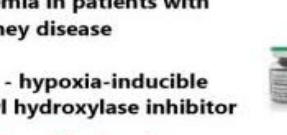

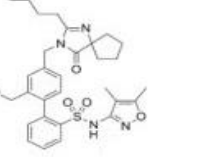

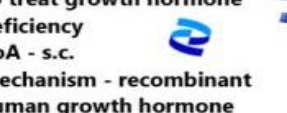


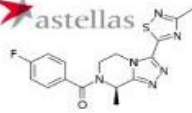
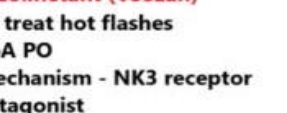
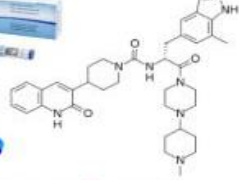


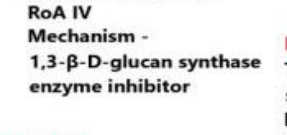
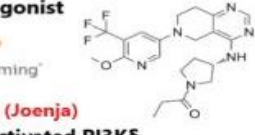


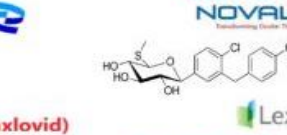

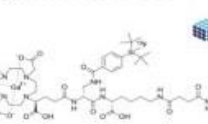
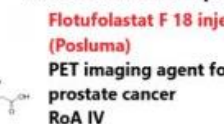


CONCLUSION

Cosmeceuticals have not only redefined beauty standards but have also become a driving force in reshaping the pharmaceutical landscape. This industry is dynamic, as seen by its historical progression from homeopathic treatments to state-of-the-art biotechnology advances. Higher standards and more efficacy have resulted from the pharmaceutical and cosmetic industries working together, as seen by the confluence of scientific rigor with aesthetic appeal. A bright future for cosmeceuticals is indicated by the market's global expansion, which is being driven by aging demographics and rising consumer awareness. The market is responding to the needs of a savvy and discriminating customer base by embracing multifunctional formulas and customized skincare trends. The influence of packaging on market expansion emphasizes how crucial sustainability and aesthetic appeal are. Cosmeceuticals are more than just products; they're a blend of science, creativity, and consumer-driven evolution that will influence pharmaceuticals and skincare in the years to come.

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2023 FDA NOVEL DRUG APPROVALS (2Q)

 <p>Lecanemab (Leqembi) To treat alzheimer's disease RoA IV Mechanism - amyloid beta (Aβ) directed mAb</p>	 <p>Bexagliflozin (Brenzavvy) To treat type 2 diabetes RoA PO Mechanism - SGLT2 inhibitor</p>	 <p>Pirtobrutinib (Jaypirca) To treat r/r mantle cell lymphoma (MCL) RoA PO Mechanism - BTK inhibitor</p>	 <p>Sulbactam/durlobactam (Xacduro) To treat bacterial pneumonia RoA IV Mechanism - B-lactam antibacterial B-lactamase inhibitor</p>
 <p>Efacestrant (Orserdu) To treat ER+ breast cancer RoA PO Mechanism - selective estrogen receptor degrader (SERD)</p>	 <p>Daprodustat (Jesduvroq) To treat anemia in patients with chronic kidney disease RoA PO Mechanism - hypoxia-inducible factor prolyl hydroxylase inhibitor</p>	 <p>Omaveloxolone (Skyclarys) To treat Friedreich's ataxia RoA PO Mechanism - Nrf2 pathway activator</p>	 <p>Velmanase alfa (Lamzedo) To treat alpha-mannosidosis RoA IV Mechanism - recombinant human lysosomal alpha-mannosidase</p>
 <p>Sparsentan (Filspari) To treat primary immunoglobulin A nephropathy RoA PO Mechanism - endothelin & angiotensin II receptor antagonist</p>	 <p>Tofersen (Qalsody) To treat ALS RoA IV Mechanism - SOD1 ASO</p>	 <p>Somatrogen (Ngenla) To treat growth hormone deficiency RoA - s.c. Mechanism - recombinant human growth hormone</p>	 <p>Glofitamab (Columvi) To treat DLBCL RoA IV Mechanism - CD20 and CD3 mAb</p>
 <p>Retifanlimab (Zynzyz) To treat Merkel cell carcinoma RoA IV Mechanism - PD-1 blocking mAb</p>	 <p>Fezolinetant (Veozah) To treat hot flashes RoA PO Mechanism - NK3 receptor antagonist</p>	 <p>Rezafungin (Rezzayo) To treat candidemia and invasive candidiasis RoA IV Mechanism - 1,3-β-D-glucan synthase enzyme inhibitor</p>	 <p>Zavegepant (Zavzpret) To treat migraine RoA Intranasal Mechanism - calcitonin gene-related peptide receptor antagonist</p>
 <p>Pegunigalsidase alfa (Elfabrio) To treat Fabry disease RoA IV Mechanism - recombinant human α-galactosidase-A</p>	 <p>Epcoritamab (Epkiny) To treat DLBCL RoA s.c. Mechanism - mAb bispecific CD20-directed CD3 T-cell engager</p>	 <p>Perfluorohexyloctane (Miebo) To treat dry eye disease RoA eye drops Mechanism - unknown</p>	 <p>Leniolisib (Joenja) To treat activated PI3Kδ syndrome (APDS) RoA PO Mechanism - PI3Kδ inhibitor</p>
 <p>Ritonavir</p>	 <p>Nirmatrelvir/ritonavir (Paxlovid) To treat COVID-19 RoA PO Mechanism - SARS-CoV-2 Mpro inhibitor and HIV-1 protease inhibitor</p>	 <p>Sotagliflozin (Inpefa) To treat heart failure RoA PO Mechanism - dual SGLT1/2 inhibitor</p>	 <p>Rozanolixizumab (Rystiggo) To treat myasthenia gravis RoA IV Mechanism - mAb neonatal Fc receptor (FcRn) blocker</p>
 <p>Flotufolastat F 18 injection (Posluma) PET imaging agent for prostate cancer RoA IV</p>	 <p>Ritlecitinib (Litfulo) To treat alopecia areata RoA PO Mechanism - JAK3 and TEC kinase inhibitor</p>	 <p>Rozanolixizumab (Rystiggo) To treat myasthenia gravis RoA IV Mechanism - mAb neonatal Fc receptor (FcRn) blocker</p>	 <p>Rozanolixizumab (Rystiggo) To treat myasthenia gravis RoA IV Mechanism - mAb neonatal Fc receptor (FcRn) blocker</p>

GENERATION GAP

A young man asked his grandfather, Grandpa, how did you live in the past without technology, without computers, without drones, without bitcoins, without internet connection, without TVs, without air conditioners, without cars, without mobile phones? Grandpa answered,

Just as your generation lives today. No prayers, no compassion, no respect, no GMRC, no real education, poor personality. There is no human kindness, there is no shame, there is no modesty, there is no honesty. We, the people born between the years 1930-1980, were the blessed ones.

Our lives are a living proof. While playing and riding a bike, we have never worn a helmet. After school we did our homework ourselves and we always played in meadows until sunset. We played with real friends, not virtual friends. If we were thirsty, we would drink from the fountain from the waterfalls,

faucet water, not mineral water. We never worried and get sick even as we shared the same cup or plate with our friends. We never gained weight by eating bread and pasta every day. Nothing happened to our feet despite walking barefoot. We never used food supplements to stay healthy.

We used to make our own toys and play with them. Our parents were not rich. They gave us love, not material gifts. We never had a cell phone, DVD, PSP, game console, Xbox, video games, PC, laptop, internet chat. But we had true friends. We visited our friends without being invited and shared and enjoyed the food with their family.

Parents lived nearby to take advantage of family time. We may have had black and white photos, but you can find colorful memories in these photos. We are a unique and the most understanding generation, because we are the last generation that listened to their parents.

And we are also the first ones who were forced to listen to their children. We are limited edition, take advantage of us, learn from us. We are a treasure destined to disappear soon.



RESEARCH & INNOVATION

Eli Lilly has announced positive top-line results from a late-stage study of its targeted therapy Retevmo (selpercatinib) versus the current first-line standard of care in certain non-small cell lung cancer (NSCLC) patients. The phase 3 LIBRETTO-431 trial has been evaluating Retevmo versus platinum-based chemotherapy plus pemetrexed with or without Merck's Keytruda (pembrolizumab) as an initial treatment for adults with rearranged during transfection (RET) fusion-positive advanced or metastatic NSCLC.

A pre-specified interim efficacy analysis showed that the study met its primary endpoint, with Lilly's therapy demonstrating a statistically significant and clinically meaningful improvement in progression-free survival.

As the company outlined, LIBRETTO-431 is the first randomised study to compare the safety and effectiveness of a targeted therapy to a PD-1 inhibitor plus chemotherapy in cancer patients bearing a specific biomarker.

David Hyman, chief medical officer at Loxo@Lilly, said: "The LIBRETTO-431 trial aims to answer an important question about the selection of initial treatment for people with advanced RET fusion-positive NSCLC and these results suggest Retevmo should be considered a first-line standard of care."

An estimated 2.2 million people worldwide are diagnosed with lung cancer each year. NSCLC accounts for up to 85% of all lung cancer diagnoses in the US, of which approximately 50% have actionable biomarkers.

Hyman said: "This clinically meaningful achievement of improved outcomes underscores the importance of timely and comprehensive genomic testing to inform initial treatment decisions for all patients with NSCLC.

"The results of this study provide further confirmation that RET status – like EGFR, ALK, and others in the family of lung cancer oncogenic drivers – should be known prior to initiating therapy."

He added that the company will be sharing the latest results in more detail with the oncology community. The readout comes less than two weeks after Lilly and Boehringer Ingelheim's Jardiance (empagliflozin) was approved by the European Commission (EC) as a treatment option for adults with chronic kidney disease.



DEPARTMENT BUZZ

Distinguished lecture series is an initiative to put together platform for students to be proactive and interact with professional from various domains. As a part of this series, we had a session on "Discover the drug within" by Mr. Punit Mehrotra who is a distinguished professional with 24 years of experience, holds credentials such as ICF-PCC, ACC, LEICP, ANLP. As a Global Credentialed Coach, he has specialized in executive, leadership, and career transition coaching. A visionary leader, he has received numerous national and international awards, including recognition from Times Ascent as one of the top 101 global coaching leaders. Honored at the World HRD Congress, he is also a Board Member and Vertical Head at ICF Mumbai, showcasing his commitment to transformative leadership. The session enlightened us with on the journey of life, each individual possesses an untapped reservoir of potential waiting to be unearthed. The metaphorical "drug within" signifies an exploration into one's inner self, a quest for hidden strengths, resilience, and capabilities. Ultimately, "Discover the Drug Within" is a call to action, an invitation to embark on a personal odyssey. It encourages individuals to view themselves not as passive recipients of external circumstances but as active participants in shaping their destinies

Distinguished Lecture Series - I



Distinguished Lecture Series

Interactive Session on

Discover the Super Drug Within !



Mr. Punit Mehrotra

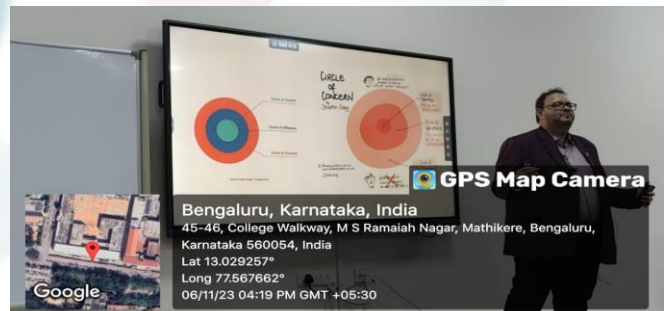
ICF-PCC, ACC, LEICP, ANLP
Global Credentialed Coach - Executive, Leadership, Career Transition | Transformation Facilitator | Mentor-AIC | Certified Talent Assessor & Strategist | Board Member & Vertical Head, ICF Mumbai | Speaker | Educationist

Mr Punit Mehrotra in his diverse and inspiring journey of 24 years has been an authentic, innovative, visionary, versatile and passionate leader and a professional executive, leadership, business, career and life coach with a panache to enable transformation at every level, from individuals and corporates to society at large. He has been awarded with several national and international accolades as well as industry excellence awards throughout his professional and academic journey. He has been honoured by Times Ascent amongst the 101 top most iconic global coaching leaders. He was honored with the ET Now Coaching and Development Leadership Excellence Award 2020 at the World HRD congress. He has been an illustrious leader nominated or the Novartis Global Leadership Discovery Program and underwent a year long journey of self discovery and leadership development with eminent global coaches. He accomplished several international coaching accreditations and certifications.



Convener
Dr.S Bharath
Dean, FPH

Co-ordinator
Dr.B V Basavaraj
HOD, Dept of Pharmaceutics



Rishav Kumar Jain, Executive, Regulatory Affairs in Micro Lab limited gave a talk on **Artificial intelligence (AI)** is making significant strides in transforming various aspects of pharmaceutical regulatory affairs. Here's how:

Drug Discovery and Development: AI accelerates the drug discovery process by analyzing vast amounts of biological and chemical data. It helps identify potential drug candidates, predict their behavior, and streamline the development process.

Regulatory Compliance: AI assists in ensuring compliance with regulations by analyzing immense datasets to detect patterns, anomalies, and potential risks. It aids in maintaining regulatory standards throughout the drug development lifecycle.

Regulatory Document Management: AI automates document management processes, ensuring accuracy and efficiency in handling regulatory documents. Natural language processing (NLP) helps extract relevant information from documents and assists in report generation. Despite these advancements, integrating AI into pharmaceutical regulatory affairs comes with challenges. Ensuring data privacy, addressing regulatory concerns about AI systems, and validating the reliability and accuracy of AI-driven processes remain crucial areas of focus.

Regulatory bodies are also adapting to these technological advancements by issuing guidelines to ensure the safety, efficacy, and ethical use of AI in pharmaceuticals.


RAMAIAH UNIVERSITY OF APPLIED SCIENCES Faculty of Pharmacy
INSTITUTION'S INNOVATION COUNCIL (Ministry of HRD Initiative)

Department of Pharmaceutics
 Faculty of Pharmacy

Cordially invite you to attend the Alumni Guest Lecture on

"Artificial Intelligence in Regulatory Affairs"

Mr. Rishav Kumar Jain, completed master's in Pharmaceutical science and bachelor degree from Faculty of Pharmacy, Ramaiah University of Applied Sciences, Bangalore. He has 16 months experience in OSD as Production executive and 6 months sterile, R&D department. And have been currently doing dossier submissions for Regulatory markets.



Rishav Kumar Jain
 Executive, Regulatory Affairs in Micro lab limited, Bangalore

Who should attend?
 UG/PG students in the domain of Pharmacy, B.Sc. Biotechnology and Life Sciences, Dental and Medical Sciences

Date and Time: 12th Aug, 2023, 3:00 pm onwards
Venue: Classroom -

Convener
 Dr. S. Bharath
 Dean, FPH, RUAS

Chief Co-ordinator
 Dr. Basavaraj BV
 Prof & Head, Department of Pharmaceutics
 Mob: 9890238650
basavaraj.on.ph@rmsruas.ac.in

Co-ordinator
 Dr. Sharon Furtado
 Asst. Prof, Department of Pharmaceutics
 Mobile: 9890051542
sharoncaroline_ps.ph@rmsruas.ac.in



National CGMP day Celebration

D Venkatesh Rao, Vice President at Quality Micro Labs Limited, Bgave a complete insight on **CGMP** refers to the Current Good Manufacturing Practice regulations enforced by the FDA. CGMP provides for systems that assure proper design, monitoring, and control of manufacturing processes and facilities. Adherence to the CGMP regulations assures the identity, strength, quality, and purity of drug products by requiring that manufacturers of medications adequately control manufacturing operations. This includes establishing strong quality management systems, obtaining appropriate quality raw materials, establishing robust operating procedures, detecting and investigating product quality deviations, and maintaining reliable testing laboratories. This formal system of controls at a pharmaceutical company, if adequately put into practice, helps to prevent instances of contamination, mix-ups, deviations, failures, and errors. This assures that drug products meet their quality standards. FDA inspects pharmaceutical manufacturing facilities worldwide, including facilities that manufacture active ingredients and the finished product. Inspections follow a standard approach and are conducted by highly trained FDA staff. If the failure to meet CGMP results in the distribution of a drug that does not offer the benefit as labeled because, for example, it has too little active ingredient, the company may subsequently recall that product. This protects the public from further harm by removing these drugs from the market. While FDA cannot force a company to recall a drug, companies usually will recall voluntarily or at FDA's request. If a company refuses to recall a drug,

RAMAIAH UNIVERSITY OF APPLIED SCIENCES **FACULTY OF PHARMACY**  

Department of Pharmaceutics organizes a Guest lecture on the occasion of National cGMP Day




SPEAKER
D. Venkateshwar Rao
Vice President - Quality
Micro Labs Limited
Bangalore

About National cGMP day: The purpose of "National cGMP Day" is to create awareness and sensitization about the critical role of cGMP in the pharmaceutical industry, ensuring the quality and safety of medicinal products.

About the speaker: Mr. Rao has over 26 years of experience in pharmaceutical production, Quality control, Quality Assurance and Regulatory Affairs. He has previously worked for Cipla, Apotex, Neuland and Dr. Reddy's in various capacities.

Who should attend: UG/PG students in the domain of Pharmacy, B.Sc. Biotechnology and Life Sciences

10 Oct 2023 **10:00 am onwards** **Seminar Hall, 3rd Floor, FPH**

Dr. R Deveswaran
Coordinator
Professor
Dept. of Pharmaceutics
FPH, RUAS

Dr. B V Basavaraj
Convener
Professor and Head
Dept. of Pharmaceutics
FPH, RUAS



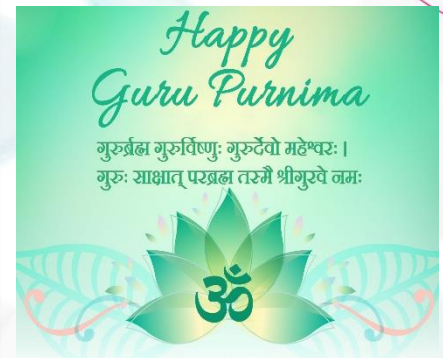
SCIENTIA CLUB

Guru Purnima celebrations

Gurus are always regarded as someone who enlightens us with knowledge and guides us in the journey of life. To celebrate their importance, people observe Guru Purnima to express their heartfelt gratitude to their mentors.

Guru Purnima also marks the birth anniversary of Veda Vyasa, the author as well as a character in the Hindu epic Mahabharata, as per the Panchang. It falls on a full moon day during Ashadha month, as per the Hindu Calendar. This year, Guru Purnima will be celebrated on July 3.

On this day, the founder of the Buddhist faith, Gautam Buddha, gave his first sermon after five weeks of achieving enlightenment under the Bodhi tree. Gautam Buddha went from Bodhgaya to Sarnath, Uttar Pradesh, and there he gave a sermon on the full moon day.



Let us thank those who shaped us to succeed in life



TEACHER'S DAY CELEBRATION



ಸರ್ವಾನಂದಗಳನ್ನಾ.
ಸರ್ವ ಸೌಖ್ಯಗಳನ್ನಾ.
ಭುಕ್ತಿ ಮುಕ್ತಿಗಳನ್ನಾ ಕೊಡುವ
ಗುರುಧ್ಯಾನವನ್ನು ಮಾಡಬೇಕು.

"What I lack in talent, I compensate with my willingness to grind it out. That's the secret of my life." – Guy Kawasaki

Independence day celebration



The **Independence Day of India**, which is celebrated religiously throughout the Country on the 15th of August every year, holds tremendous ground in the list of national days, since it reminds every Indian about the dawn of a new beginning, the beginning of an era of deliverance from the clutches of British colonialism of more than 200 years. It was on 15th August 1947 that India was declared independent from British colonialism, and the reins of control were handed over to the leaders of the Country. India's gaining of independence was a tryst with destiny, as the struggle for freedom was a long and tiresome one, witnessing the sacrifices of many freedom fighters, who laid down their lives on the line. India is one of the oldest civilizations in the world with a kaleidoscopic variety and rich cultural heritage. It has achieved all-round socio-economic progress since Independence.

Ms.Spoothy S, 1 year PG student gave an impressive patriotic speech to the gathering sparking the spirit of INDIANESS to ONENESS



WORD HUNT

Last date to submit : 31 Jan 2024

Directions

Complete the crossword puzzle by matching the clues in the table with a word listed in the word bank.

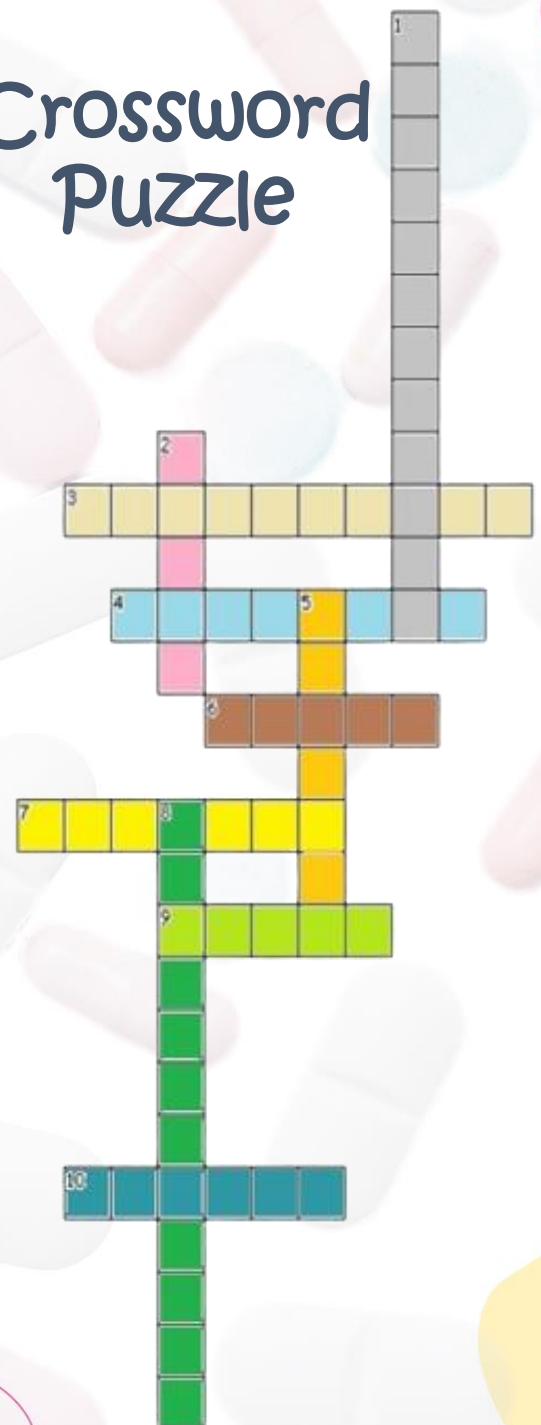
ACROSS

- 3 A person your parents can talk to with questions about medicine
4. A substance that is used to treat disease or injury
6. Only take medicines when given to you by an .
- 7 A SAFE place to store your medicines in the bathroom or kitchen
9. Never your medicines with others or take somebody else's medicine
10. Always keep medicines in their original or container

DOWN

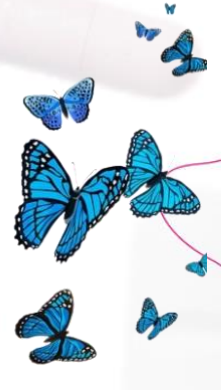
- 1 A type of medicine that a doctor prescribes to treat disease or injury
2. Always examine the medicine to identify instructions and who can take the medicine.
5. An UNSAFE place to store your medicines in the bathroom or kitchen
8. Always follow the --- on how to take a medicine

Crossword Puzzle





MINDUITION



Love is like
a butterfly:
It goes where it pleases
and it pleases where it goes.

the
Butterfly
IS PROOF THAT
Change
CAN BE
Beautiful

You do not just
wake up & become
the butterfly.
Growth is a process




The wings of transformation
are born of
patience and struggle.
- Janet S. Dickens



“
On the wings
of change, we
find our truth.”

LOVE • KNOW



“
Struggle and
determination
lead to great
things. Just ask
the butterfly.”

LOVE • KNOW

ರಾಮಯ್ಯ ಗೀತೆ

ಜ್ಞಾನಂ ವಿಜ್ಞಾನಂ ಚ ಭಕ್ತಿ ಸಹಿತಂ

ಜ್ಞಾನ ವಿಜ್ಞಾನ ವಿದ್ಯಾ ವಿನಯ ಭೂಷಣ
ಈ ರಾಮಯ್ಯ ಸಮೂಹ ಸಂಸ್ಥಾನ ।

ತಾರ ನೀಹಾರಿಕಯಾಗಲಿ ಈ ಮಾಲಿಕೆ

ಜಯವೆನ್ನುವ ಜಯವೆನ್ನುವ ಈ ಸಂಸ್ಥಾನಕೆ ॥ ಪ ॥

ದ್ರಷ್ಟಾರರು ಕಟ್ಟಿದ ಕನಸಿನ ಸಾಮ್ರಾಜ್ಯವಿದು

ದೀಪದೊಳು ಪ್ರದೀಪಗಳ ಬೆಳಗುವ ಶ್ರದ್ಧಾ ಸ್ಥಾನವಿದು ।

ಅರಿವಿನ ದಿಗಂತದಾಚೆಗೆ ಜಿಗಿಯುವ ಸಂಪನ್ಮೂಲವಿದು

ಗ್ರಹ ಗ್ರಹದಲಿ ಗೃಹ ನಿರ್ಮಾಣಕೆ ತಂತ್ರಜ್ಞಾನದ ಸೋಪಾನವಿದು ॥ 1 ॥

ಮಿತಿ ಇಲ್ಲದ ಅಮಿತ ಜ್ಞಾನಕೆ ಸಾಧನ ಕ್ಷೇತ್ರವಿದು

ಪ್ರತಿ ಪ್ರತಿ ಪ್ರತಿಭೆಯು ಸಾಧನ ಮಾಡಲು ಸ್ಪೂರ್ತಿಯ ಕೇಂದ್ರವಿದು ।

ಅಜ್ಞಾನದ ಕತ್ತಲೆ ನೀಗುವ ಸುಜ್ಞಾನದ ಸೂರ್ಯನ ರಶ್ಮಿಯಿದು

ಜಗದೋದ್ಧಾರದ ಹೊಂಗನಸನು ಹೊತ್ತಿಕೆ ಅರಿವಿನ ತಾಣವಿದು ।

ಅರಿವಿನ ಹಣತೆಯು ಬೆಳಕನು ಚೆಲ್ಲಿದೆ

ಅಸಂಖ್ಯಾತ ಕಿರಣಗಳು ಎಲ್ಲೆಡೆ ಹೊರ ಹೊಮ್ಮಿವೆ ॥ 2 ॥



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(Approved by PCI and AICTE)



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W www.ramaiah-india.org