PHARMA MONARCH

DEPARTMENT OF PHARMACEUTICS - NEWS LETTER

An Official Publication of

DEVAKI AMMA MEMORIAL COLLEGE OF PHARMACY

(Affiliated to Kerala University of Health Sciences, Thrissur and Approved by AICTE & PCI, New Delhi)

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Volume 02 **Issue 01** **July 2018**

FROM THE EDITOR'S DESK .....

Greetings to all our Readers!

With renewed energy, we are enthused to bring this issue of our newsletter, **"Pharma Monarch"**.

It is said, ***"Leadership is the Capacity to Translate Vision into Reality"***. Most of us do learn the hard way that leadership is not merely to have a vision. Anyone can dream to be a leader but an effective leader needs to know how to lay down plans and actions so that the vision can be fulfilled.

Dear friends, our newsletter has a sole purpose of making you equipped and informed about where you are going to stand in pharmacy in few days, and make you capable of leadership in all avenues.

We have tried to take definite steps, as a team, to compile and present to you in this issue, the current happenings in our Pharmaceutics Department, and to guide and keep you updated. Whatever knowledge we get, whatever achievements made by us, we bring it in front of you and this is amazing experience for every faculties and students and getting a satisfaction that everyone is doing well and become more keen regarding our work.

We, the Editorial Board, will work with great enthusiasm in every aspect by publishing this newsletter.

As an Editorial Head, I take this opportunity to congratulate the editorial board members and students for their efforts made and the contributions given to bring out this newsletter, a compendium of all the blooming ideas which constantly surface within the department and wish them all the best for their future.

Hoping with new suggestions and progressive success.

Happy reading!

Best Regards,
Prof. Dr. R. Nethaji,
Editor-in- Chief

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In the remembrance of
Shri. K.V. Sankaranarayanan
(01.01.1948 - 12.07.2013)
Founder, Devaki Amma Memorial Institutions

ABOUT THE COLLEGE

Devaki Amma Memorial Trust has established Devaki Amma Memorial College of Pharmacy in the year 2003 with an objective of catering the needs of aspiring population in the neighbourhood and thereby providing quality pharmacy education. The college is located in the northern part of Kerala and is offering D. Pharm., B. Pharm., M. Pharm (Pharmaceutical Chemistry, Pharmaceutical Analysis, Pharmaceutics and Pharmacology) and Pharm. D programmes. The institution is having affiliation with Directorate of Medical Education, Thiruvanathapuram, Kerala University of Health Sciences, Thrissur and approved by Govt. of Kerala, AICTE and Pharmacy Council of India. The college provides excellent coaching for students by qualified and experienced faculties. It organizes frequent guest lectures and seminars by drawing experienced persons from academics and industries, which gives exposure to the students in the field of pharmacy and to make them currently updated. The college is selected by a Centre for research. The placement record proves our potential. Our institution is certified by "Joint Accreditation System of Australia and New Zealand (JAS - ANZ)" an ISO: 9001: 2008 institution.

DEPARTMENT PROFILE

The Department of Pharmaceutics was established in the year 2011 and it offers M. Pharm. (Pharmaceutics) programme. The Department trains the students in the areas like Pharmaceutical technology, Pharmaceutical dosage forms, Biopharmaceutics and Pharmacokinetics aspects of the drug as well as their dosage forms. The department is expertise in the research areas such as Preformulation studies, development of different pharmaceutical dosage forms, Nanotechnology drug delivery systems, Mucoadhesive drug delivery system, Buccal & Colon drug delivery system, Transdermal drug delivery system and evaluation of developed dosage forms with respect to *in-vitro* and *in-vivo* parameters etc. The department emphasizes the importance of Optimization techniques in pharmaceutical formulations and Good manufacturing practice norms to the students.

The Department is well equipped research lab with some ultramodern equipments like Dissolution Test Apparatus (8 Basket), Disintegration Test Apparatus (2 Basket), Brookfield Viscometer, Rotary Vacuum Evaporator, Stability Chamber, Bottle Filling Machine, Refrigerated Centrifuge, Microcentrifuge, B.O.D Incubators, Shaker Incubators, Gel Electrophoresis, Paper Electrophoresis, Trinocular Microscope etc. and also equipped with important instruments like Planetary Mixer, Double Cone Blender, Table Sieve Shaker, Tray Dryer, Hand Operated Tablet Compression Machine, Multi-station Tablet Compression Machine (8 Stations), Coating Pan, Polishing pan, Manual Hand Operating Capsule Filling Machine, Bottle Filling Machine and Propeller Type Mechanical Agitator etc., is a milestone of this department.

The Department has started Ph. D. in Pharmaceutics in the year 2017 under Kerala University of Health Sciences, Thrissur. Any eligible candidates shall register their Ph.D. under this department and carry out their research. This Department has a Biotechnology Lab with well-established aseptic area and study in depth about the cultivation, avoidance and elimination of microorganisms in medicine. Apart from Pharmaceutics laboratories, separate machine room has also been established with various machines used in the pharmaceutical industries at different stages of production, quality control and packing. Under the Industry Institution Partnership Cell (IIPC) the department has tie-up with pharmaceutical companies, and a regular training programme for the students is arranged under this IIPC. More than 25 research publications are released from the department. The Department has organized a Two Days National Seminar with financial grant obtained from Kerala State Council for Science, Technology and Environment, Thiruvananthapuram.

DEPARTMENT ACTIVITIES

RESEARCH ACTIVITIES

POST GRADUATE RESEARCH PROJECTS

The Department has successfully completed the research projects for Post Graduate students and they are listed as follows:

Project Title	Students Name	Guided by
Formulation and Evaluation of Mucoadhesive Microspheres of Losartan Potassium	Mr. Binulal C	Dr. R. Nethaji
Development and Evaluation of Gastro-retentive Cefadroxil Floating Microspheres	Mrs. Sunusha E	Dr. R. Nethaji
Studies on Formulation and Development of Antimicrobial Termitaria Cream and its Evaluation	Ms. Aghi Binoy	Mrs. Raslamol K

UNDER GRADUATE RESEARCH PROJECTS

Department have also undertaken some research projects at under graduate level and successfully completed in this academic year and listed as follows:

Project Title	Students Name	Guided by
Current Trends and New Approaches in Diabetes Mellitus- An Overview	Akshaya K P, Jyothi Krishna M P & Lamees Kallayil	Mr. P. Manikandan
Anti-Denque Activity of Traditional Plants - A Systematic Review	Abdul Haseeb, Labeeba Thacharpoyil, Parengal Tahsin Mohiuddin & Shahana Thesni CK	Mrs. Vidya S
An Investigational Review on Anti-Denque Activity of Traditional Plants	Amritha T, Jyothy Joseph & Shafeeda Mol PP	Mrs. Anjali Narayanan

ONGOING RESEARCH PROJECTS

The Department is inspired by identifying future needs of human resources to be felt by fast developing academics and scientific research in the area of Pharmaceutics.

Project Title	Students Name	Guiding by
Formulation and Evaluation of Mucoadhesive Tablets of Pantoprazole Sodium	Ms. Neema K Ramesh	Dr. R. Nethaji
Preparation and Characterization of Nanoparticles containing Cefuroxime Axetil	Mrs. Vandana G	Dr. R. Nethaji
Formulation and *In-vitro* Characterization of Ranitidine Hydrochloride Loaded Floating Microsphere for the Treatment of Gastric Ulcer	Mrs. Aswathi UP	Mr. P. Manikandan
Formulation and Evaluation of Emulgel containing *Chromolaena Odorata (L)* King and Robins Leaves Extract	Ms. Swetha S	Mr. P. Manikandan

RESEARCH PUBLICATIONS

The faculty members are encouraged to involve in research activities. They too involved in research and carried out various activities, which are evidenced by their paper publications in reputed international journals.

Dr. R. Nethaji *et al.*

Preparation and Evaluation of Losartan Potassium Mucoadhesive Microspheres. *World Journal of Pharmacy and Pharmaceutical Sciences,* Vol.7, Issue 7, 2018, 1098-1115.

Study on the Impact of Patient Counselling in Improving Quality of Life in Diabetic Patients. *International Journal of Science and Research,* Vol.6, Issue 8, August 2017, 646-649.

Mr. P. Manikandan *et al.*

Prostate Cancer: Insights of Current Treatment, Prevention and Management. *Saudi Journal of Medical and Pharmaceutical Sciences*, Vol.4, Issue 1A, 2018, 28-35

CONFERENCES PARTICIPATION & PRESENTATION

Our teaching faculties were sponsored to take part as a delegate in various National and International conferences to update the current trends and developments in the field of their specialization. It is evidenced by our faculties are attended their conferences are as follows:

Dr. R. Nethaji, Professor, are participated and presented his research papers at World Congress on Pharmaceutical Sciences on "Preparation and Characterization of Gastro retentive Floating Microspheres of Ciprofloxacin" partners by Indian Pharmaceutical Association, Dona Paula, Goa, held on 5th - 7th July 2017.

Poster Presentation (WCPS -2017)

Mr. P. Manikandan, Asst. Professor, has participated as a delegate in the ICMR sponsored National conference on "Current Status and Future Scope for Nanomaterials and Nanotechnology in Drug Discovery and Development" organized and conducted by Himachal Institute of Pharmaceutical Education & Research, Nadaun, Himachal Pradesh, held on 23th &24th February 2018.

SEMINAR ORGANIZED

In order to develop a holistic personality of students, we greatly stress on developing skills and confidence of the students for pharmacy field. We have arranged one day seminar on "Pharmaceutical Product Development – An Industrial Perspective" by research personalities from Pharmaceutical Industry.

Two eminent speakers were **Mr. Dhatchana Moorthy N,** Research Scientist, Department of Biotechnology, Orchid Pharma Limited,Nungambakkam, Chennai & **Mr. P. Karthick,** Quality Assurance (Formulations), Orchid Healthcare, Kancheepuram Dt, was invited on 16th December 2017. Mr. Dhatchana Moorthy N, was delivered the topic entitled "Biopharmaceuticals - An insight into Product Development" and also focuses on the challenges and scope of Pharma research. Followed by Mr. P. Karthick, delivered on ""Current Good Manufacturing Practices (cGMP) - 2017", and enlighten on importance of GMP in Pharmaceutical industrial research. Overall the seminar was coordinated by our department faculties.

Snapshot of one day seminar held on 16.12.2017

Inaugural Session

High Profile Talks During Session

Effective Guidance's

Memento's Presentation to Chief Guests

NEW FACE

Pharmaceutics Department is pleased to announce a new faculty to our family. **Ms. Teena Thomas** has accepted the position of Lecturer, from 8th January 2018 onwards. She was earned his B. Pharm, from Pushpagiri College of Pharmaceutical Sciences, Thiruvalla, and postgraduated from St. James College of Pharmaceutical Sciences, Chalakudy.

She secured with distinction as well as first rank in M.Pharm and appreciated during the convocation. Her research interests include an anti-cancer formulations, targeted drug delivery systems and natural biological active compounds. Ms. Teena Thomas will teach in the pharmaceutics sequence and will focus her attention the first year on continuing her service. Welcome, ***Ms. Teena!***

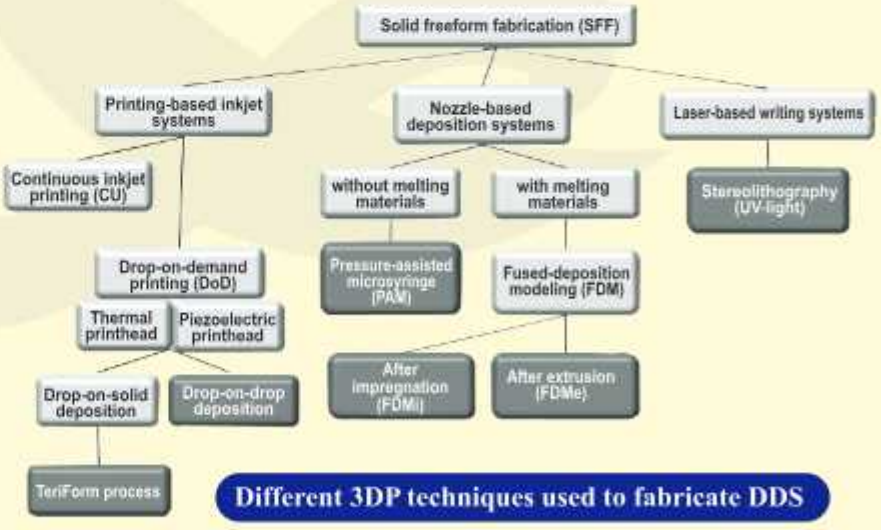
Award Ceremony

PHARMA ARTICLES

3D PRINTING - A NEW TOOL FOR PHARMACEUTICAL DRUG DELIVERY SYSTEMS

MR. P. MANIKANDAN, ASST. PROFESSOR

The concept of drug delivery has evolved over the years from immediate-release oral dosage forms to targeted-release drug delivery systems. Indeed, the necessity of controlling drug release profile to modulate the absorption, distribution, metabolization and elimination of the drug rapidly appeared as a key factor for improving therapeutic efficacy and increases the patient's compliance. Three dimensional printing (3DP) technology is a novel technique have promoted enormous innovations in many diverse fields, including pharmacy and it's can apply with open-source software at a relative lower material cost. The recent introduction of the first FDA approved 3D-printed drug has fuelled interest in 3DP, which is set to revolutionize healthcare. However, in the pharmaceutical industry this technology is still in its infancy and it's potential yet to be fully explored. 3DP is increasing attention in pharmaceutical formulation development as an effective strategy to overcome challenges of conventional dosage forms. For instance, the conventional manufacturing unit operation involving milling, mixing, granulation and compression can result in disparate qualities of the final products with respect to drug loading, drug release, drug stability and pharmaceutical dosage form stability. 3DP has enabled unprecedented flexibility in the design and manufacturing of complex objects, which can be utilized in personalized and programmable medicine.



Different 3DP techniques used to fabricate DDS

Various techniques, such as fused deposition modeling (FDM), binder deposition, inkjet printing, material jetting, powder bed fusion, photopolymerization, pen-based 3D printing and molding, have been reported. FDM has been recently attracted towards the production of solid oral formulations. However, commercially available FDM printers are extremely limited with regards to the materials that can be processed to few types of thermoplastic polymers, which often may not be pharmaceutically approved materials nor ideal for optimizing dosage form performance of poor soluble compounds. Such a technique holds huge potential for the manufacturing of pharmaceutical products and currently under investigation. Moreover, the rapidly evolving research on 3D printed DDD has enabled us to determine several challenges related to the manufacturing and marketing. There is potential to improve patient-specific future drug therapies using printing technologies. The technological advancements, new scientific concepts, interdisciplinary work and regulatory guidelines will continue to support and strengthen the prospects of 3D printing in the manufacture of medical products. 3DP is a unique prototyping technology over past 35 years and has great potential to

revolutionize the field of drug delivery with its inherent advantages to fabricate complex solid dosage forms with variable densities and diffusivities, complex internal geometries, multiple drugs and excipients. 3DP can successfully address the issues relating drug delivery of poorly water-soluble drugs, peptides, potent and multi-drugs, etc. However, there are some problems that restrict the applications of 3DP in commercial market, such as the selections of suitable binders, excipients and the pharmaco-technical properties of final products. Three-dimensional printing offers advantages, such as increasing the cost efficiency and the manufacturing speed, since a rapid prototyping (RP) can be done in a matter of minutes. However, there is still a significant barrier to ensure that 3D printed medicines have the same efficacy, safety, and stability as the pharmaceuticals conventionally manufactured by the Pharmaceutical Industry. Regarding the establishment of guidelines, laws, quality systems and safety of use and consumption of 3D printed medicines, it's a great challenge for the regulatory authorities entailing great obstacles, given the traditional requirements by the pharmaceutical sector. The use of various types of printing technologies offer potential solutions for personalized medicine and tailored dosage forms to meet the needs of individual treatments of the future. However, printing technologies are developing fast and have the potential to allow the use of versatile materials to manufacture sophisticated drug-delivery systems and bio functional constructs for personalized treatments.

3DP technology which ensures feasibility of realizing rapid release, sustained release, controlled release, multiple drug delivery system and personalized medicine based on structure design. It is essential to achieve structures wherein drug stability is ensured, the drug loading capacity is appropriate and the desired controlled release profile can be attained. Attention must also be paid to the development of appropriate fabrication machinery that allows 3D drug delivery systems (DDS) to be produced in a simple, reliable and reproducible manner. The use of 3DP in pharmaceutical formulation development is an effective strategy to overcome challenges of conventional pharmaceutical unit operations, since the conventional manufacturing operation can result in disparate qualities of the final products with respect to drug loading, drug release, drug stability and pharmaceutical dosage form stability. 3DP offers significant potential benefits in the field of drug delivery and pharmaceutical/medical device manufacture.

UPCOMING PHARMA EVENTS.....

- ICMR Sponsored 3rd International Conference on Innovation in Pharmaceutical Sciences, on 3rd&4th August 2018, at School of Pharmacy, Guru Nanak Institutions Technical Campus, Hyderabad.
- Indian Pharma Expo and Business Excellence Award, on 7th -9th, August 2018, at New Delhi.
- National Seminar entitled "Pharmacy & Healthcare: Traditional Knowledge to Modern Techniques" on14thSeptember 2018, at Jadavpur University.
- 3rd International Conference on Academic & Industrial Innovations: Transitions in Pharmaceutical, Medical and Biosciences, on 22nd& 23rd October 2018, at Goa.

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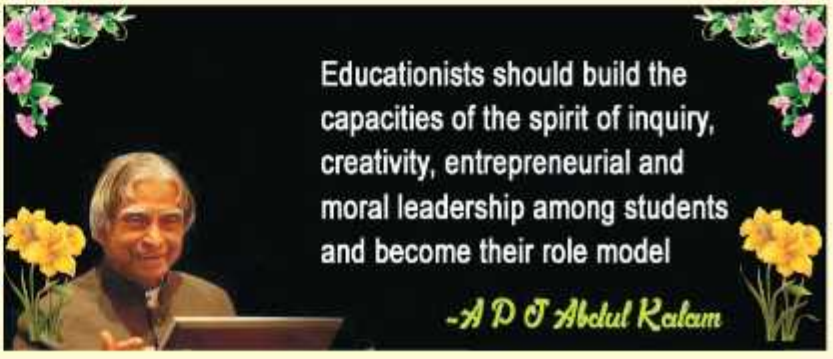

GLIMPSES OF DEPARTMENT


Dissolution Studies - Drug Release Test


Viscosity Measurement - Fluid Friction


Tablet Punching Machine - Multiple Station


Sieve Analysis - Mean Particle Size


Laminar Air Flow - Sterile Maintain


Granulation, Compression & Coating Area


Quality Control Area - Assess Formulation Characters


Capsule Section - Caplet


Semisolid Section - Partly Solid


Liquid Section- Fluidic


Ampoule Section - Phial


Microbiology Sector - Discover Micro-organisms effect

"THE BEST AND MOST EFFICIENT PHARMACY IS WITHIN YOUR OWN SYSTEM."

~ ROBERT C. PEALE

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