



**GNCP's**

# ***Research Booklet 2018-2019***



*Compiled by*

**PUBLICATION COMMITTEE**

The Sikh Education Society's

**GURUNANAK COLLEGE OF PHARMACY**

Near Dixit Nagar, Behind C. P. Foundary,  
Nari, Kamptee Road, **Nagpur** - 440026 (M.S)

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*Printed By-*  
*Principal, GNCP, Nagpur*

*Designed By-*  
*Dr. Subhash R. Yende*

## PUBLICATIONS

### BOOK/BOOK CHAPTER

**1. Dr. Sumit Arora and Dr. Prakash Itankar. Pharmacognosy of Medicinal Plants, SBW Publishers, New Delhi, 2019, ISBN – 978-81-85708-93-5.**

**ABOUT THE BOOK**  
It gives us an immense pleasure in bringing out the first edition of our book "Pharmacognosy of Medicinal Plants". The book will be good for reference to all pharmacy students, as it is designed through inclusion of feedback and opinion from the students of Pharmacy, especially those who are preparing for various competitive exams such as GPAT, NIPER, etc. This book is also helpful for teachers of Pharmacy Graduate and Diploma institutes. Our book comprises pharmacognostic account of 54 medicinally important crude drugs containing alkaloids, glycosides, tannins, terpenoids, resins, etc. Special feature of this book which gives it an edge over other available books is special emphasis on cultivation method presented in the form of flowchart, diagrammatic representation, labeling all microscopical features in an image form, uses of crude drugs along with their mechanism of action shown in the flowchart and different characters for the identification of adulteration.



**ABOUT THE AUTHOR**  
**Dr. Prakash Rambhauji Itankar, Ph.D., M. Pharm. (Pharmacognosy), D.N.Y.S. (Diploma in Naturopathy and Yogic Science),** presently serving as Assistant Professor (Sl. Gr.) at Department of Pharmaceutical Sciences, Rashtrasant Tukadoji Maharaj Nagpur University, Nagpur. He is a recipient of Prestigious "Ethnopharmacology Outstanding Service award 2015" of Society for Ethnopharmacology India (Affiliated to International Society for Ethnopharmacology, UK). He has 06 yrs of Industrial and 18 years of academic experience. He has 52 National and International Publications, filed 04 patents and guided 05 students for Ph. D. He has guided 72 M. Pharm. Students and has Co-Guided M. D. Ayurveda students. He is working for socializing the traditional claims through ethnopharmacology and scientific validation of drugs from natural origin or their formulations. He is also engaged in research for exploring new drug molecules, novel combinations, novel dosage forms, seeking patents, inhibiting entrepreneurship, supporting and bridging the gap of scientific ambiguity amongst the traditional practitioners and end users.



**Dr. Sumit Kishan Arora, Ph.D., M. Pharm. (Pharmacognosy),** is presently working as Assistant Professor at Gurunanak College of Pharmacy, Nari, Nagpur. He has total 08 years of teaching experience in diploma as well as degree. He was gold medalist of RITM Nagpur University, Nagpur in B. Pharm and M. Pharm. He completed his Ph.D. under the CSIR scheme from Department of Pharmaceutical Sciences, Rashtrasant Tukadoji Maharaj Nagpur University, Nagpur. He has published 10 papers in national and international journals. His main area of research includes standardization and isolation of phytoconstituents. He is also associated with various curricular and co-curricular activities in the field.

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Durgam, 110002 (INDIA)



Pharmacognosy of Medicinal Plants

Dr. Prakash Itankar  
Dr. Sumit Arora

## Pharmacognosy of Medicinal Plants



**Dr. Prakash Itankar | Dr. Sumit Arora**

**2. Shobha Ubgade, Vaishali Kilor, Alok Ubgade, Abhay Ittadwar** Chapter authored on the topic "Nanosuspensions as nanomedicine: Current status and Future Prospect" has been published in the book entitled "*Medicinal Chemistry with Pharmaceutical Product Development*" edited by Debarshi Kar Mahapatra and Sanjay Kumar Bharti; published by Apple Academic Press, Toronto 2019; Chapter 4, page no.105-154. ISBN-13:978-1-77188-710-6; 13:978-0-42948-784-2.



### CHAPTER 4

#### NANOSUSPENSIONS AS NANOMEDICINE: CURRENT STATUS AND FUTURE PROSPECTS

SHOBHA UBGADE, VAISHALI KILOR, ABHAY ITTADWAR, and ALOK UBGADE

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#### 4.1 INTRODUCTION

The "Next big thing is really small." will not be an amplification for the success of nanotechnology in multiple domains across the world. The medical field is no exception and adoption of the technology at nanoscale has led to the emergence of "Nanomedicine." Nanomedicine is defined as "the monitoring, repair, construction, and control of human biological systems at the molecular level, using engineered nanodevices and nanostructures" [1]. Most broadly, nanomedicine is the process of diagnosing, treating, preventing disease and traumatic injury, relieving pain, and preserving and improving human health, using molecular tools and molecular knowledge of the human body. In short, nanomedicine is the application of nanotechnology to medicine [2]. Applications of nanotechnology in medicine are potentially enormous. It is recognized that as particles get smaller, the surface area increases with a greater proportion of atoms/molecules found at the surface compared to those inside [3]. Drug delivery of poorly soluble molecules has seen a significant change after the inception of nano-sized particles. Nanoparticle technology has become a well-established approach for formulating poorly soluble drugs. Nanonization which is a successor of the micronization process reduces the particle size

## RESEARCH/REVIEW ARTICLE

1. **N.P. Sapkal**, A. Daud. Oral Thin Films: Novel Manufacturing Technology & Its Challenges. **On Drug Delivery Magazine**. 2018; 89: 66-68.

2. **M.M. Bodhankar** and **S. Chikhale**. Various approaches towards enhancement of bioavailability of Curcumin- A potent Phytochemical, *World Journal of Pharmaceutical Research*. 2018, 8 (1), 606-626.



**WORLD JOURNAL OF PHARMACEUTICAL RESEARCH**

SJIF Impact Factor 8.074

Volume 8, Issue 1, 606-626.

Review Article

ISSN 2277- 7105

### VARIOUS APPROACHES TOWARDS ENHANCEMENT OF BIOAVAILABILITY OF CURCUMIN – A POTENT PHYTOCHEMICAL

**Dr. Mitali Milind Bodhankar\* and Shubham Chikhle**

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Article Received on  
15 Nov. 2018,  
Revised on 06 Dec. 2018,  
Accepted on 27 Dec. 2018  
DOI: 10.20959/wjpr20191-13932

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#### ABSTRACT

Herbal medicine is the oldest form of health care known to mankind. Turmeric (*Curcuma longa* Linn), a nature's precious and most popular Indian spice belonging to family zingiberaceae is cultivated throughout the Indian sub continent because of its excellent medicinal properties. Curcumin is a specially gifted molecule provided by Mother-Nature to protect humans from chronic health problem. Although curcumin has shown therapeutic efficacy against many human ailment, one of the major problems with the curcumin is its poor bioavailability, which



**3. M. K. Bhurchandi, A. M. Ittadwar, J. G. Chavan.** Subchronic Exposure to Radiofrequency Electromagnetic Radiation Affects the Biochemical, Physiological, Behavioral Functions: A Review. *International journal of Pharmacy and Pharmaceutical Sciences* 2018; 13(2): 166-183.



Human Journals

Review Article

September 2018 Vol.:13, Issue:2

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## Subchronic Exposure to Radiofrequency Electromagnetic Radiation Affects the Biochemical, Physiological, Behavioral Functions: A Review



**Keywords:** Radiofrequency electromagnetic field, (rfemf), biochemical effects, physiological effects

### ABSTRACT

During the last few decades, there has been immense exposure to electromagnetic radiation through mobile phones, Wi-Fi towers, and other devices. Many studies have been conducted regarding their biological effects, pathological, physiological,

**4. S.K. Arora and P.R. Itankar.** Extraction, isolation and identification of flavonoid from *Chenopodium album* aerial parts. *Journal of Traditional and Complementary Medicine* 2018; 8: 476-482.

*Journal of Traditional and Complementary Medicine* 8 (2018) 476–482



Contents lists available at [ScienceDirect](http://www.elsevier.com/locate/jtcme)

Journal of Traditional and Complementary Medicine

journal homepage: <http://www.elsevier.com/locate/jtcme>



## Extraction, isolation and identification of flavonoid from *Chenopodium album* aerial parts

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### ARTICLE INFO

#### Article history:

Received 18 January 2017

Received in revised form

21 September 2017

Accepted 2 October 2017

Available online 6 February 2019

### ABSTRACT

*Chenopodium album* L., (*C. album*) (family: Chenopodiaceae) is an annual shrub widely grown in Asia, Africa, Europe and North America. It is commonly known as Bathua (in Hindi), pigweed, fat hen or lamb-quarters. The leaves of *C. album* are applied as a poultice to bug bites, sunstroke, rheumatic joints and as mild laxative. The flavonoids contained in *C. album* aerial parts were extracted, identified and characterized. Sequential soxhlet extraction was subjected to preliminary phytochemical screening and



**5. A.N. Mungle, A.M. Ittadwar and D.N. Begde.** Natural alternatives to treat cancer: a study on anticancer activity of *lawsonia inermis* linn. **International Journal of Pharmaceutical Sciences and Research** 2019; 10(2): 869-874.

Mungle et al., IJPSR, 2019; Vol. 10(2): 869-874.

E-ISSN: 0975-8232; P-ISSN: 2320-5148

IJPSR (2019), Volume 10, Issue 2

(Research Article)



INTERNATIONAL JOURNAL  
OF  
PHARMACEUTICAL SCIENCES  
AND  
RESEARCH



Received on 13 June 2018; received in revised form, 30 November 2018; accepted, 06 December 2018; published 01 February 2019

# **NATURAL ALTERNATIVES TO TREAT CANCER: A STUDY ON ANTICANCER ACTIVITY OF *LAWSONIA INERMIS* LINN.**

A. N. Mungle <sup>\*1</sup>, A. M. Ittadwar <sup>1</sup> and D. N. Begde <sup>2</sup>

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## **Keywords:**

Anticancer, *Lawsonia inermis*,  
Henna, MTT Assay

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**ABSTRACT:** Henna (*Lawsonia inermis*) is widely used cosmetically and medicinally. Literature survey reveals that the plant henna also has anticancer activity. Most of the anticancer activities of *Lawsonia inermis* plant are carried out using total leaves extract, and purified individual compounds also. The cytotoxicity profile of the extracts, as well as purified fractions, was determined by MTT assay on HeLa cell line. As the total ethanolic extract demonstrated growth inhibition in cancer cells, attempts were made to isolate the active compound from total ethanolic extract, with potent activity. Lawsone, 2-hydroxy-1, 4-naphthoquinone is the active constituent of *Lawsonia inermis* (Henna), *L. alba*, and other species of Lythraceae family. It is reported to possess various medicinal properties. The present study reports the anticancer activity of lawsone, naphthoquinone derivative isolated from the henna leaves, and its predictive conformation by spectral studies. Isolated lawsone was tested for the anticancer activity, which showed significant results.

**6. S.R. Dudhakohar and S.R. Walde.** Phyto-Chemical extraction and anti-microbial activity of *Selaginella bryopteris*. **World Journal of Pharmacy and Pharmaceutical Sciences** 2018; 7(11): 1670-1675.

	<b>WORLD JOURNAL OF PHARMACY AND PHARMACEUTICAL SCIENCES</b>		
	SJIF Impact Factor 7.421		
	Volume 7, Issue 11, 1670-1675	Research Article	ISSN 2278 – 4357

## **PHYTO-CHEMICAL EXTRACTION AND ANTI-MICROBIAL ACTIVITY OF SELAGINELLA BRYOPTERIS**

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Article Received on  
18 September 2018,  
Revised on 08 October 2018,  
Accepted on 29 Oct. 2018,  
DOI: 10.20959/wjpps201818-12709

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## **ABSTRACT**

The present study was performed to determine the preliminary anti-microbial activity of *Selaginella Bryopteris* belonging to family *Selaginellaceae*. The antibacterial activity of the methanolic extract was done some standard bacterial strains such as *Staphylococcus aureus*, *Bacillus subtilis* and *Escherichia coli*. The testing was done by the agar cup plate method. Zone of Inhibition of extract was compared with standard Gentamicin. Results indicate that 50 mg/ml methanolic extracts showed the maximum inhibitory effects against *E. coli* (7mm).

**7. T.M. Rasala, S. Dani, S.B. Waikar, A.M. Ittadwar.** Formulation and Evaluation of Aloe Vera Gel and Film from Fresh Pulp of the Leaves of *Aloe barbadensis*. **American Journal of Pharmacy & Health Research** 2018; 6(11): 1-9.



**AMERICAN JOURNAL OF PHARMACY AND HEALTH RESEARCH**

**Research Article**  
www.ajphr.com  
2018, Volume 6, Issue 11  
ISSN: 2321-3647(online)

## **Formulation and Evaluation of Aloe Vera Gel and Film From Fresh Pulp of the Leaves of Aloe Barbadensis**

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### **ABSTRACT**

The historians have recorded many applications of aloe species both in the medical field as well as in cosmetics. It is used to heal burns, to prevent blisters for the treatment of wounds and in various kinds of damaged skin. Burns are serious traumas related to skin damage, causing extreme pain and natural drugs such as Aloe vera is beneficial in formulations for wound healing. The aim of this work is to develop and evaluate polymeric films containing Aloe Vera crude extracts to smoothen and treat minor wounds caused by burns. Polymeric films containing different quantities of HPMC and polyvinyl alcohol (PVA) were characterized for their mechanical properties. The polymeric films, which were formulated, were found to be thin, flexible, resistant, and suitable for application on damaged skin, such as in burns & wounds. The formulated gel was evaluated for evaluations parameters were thickness, tensile strength and water vapour permeability. general appearance, homogeneity, pH, spreadability test, washed test and skin irritation test. Film

**8. S.A. Ubgade, V.A. Kilor, V. Bahekar, A.M. Ittadwar.** Formulation development of immediate release pellets of Tadalafil:Solidification Approach for Nanosuspension. **International Journal of Applied Pharmaceutics** 2019; 11(4): 124-131.



**International Journal of Applied Pharmaceutics**

ISSN- 0975-7058

Vol 11, Issue 4, 2019

Original Article

## **FORMULATION DEVELOPMENT OF IMMEDIATE RELEASE PELLETS OF TADALAFIL: SOLIDIFICATION APPROACH FOR NANOSUSPENSION**

**SHOBHA UBGADÉ\*, VAISHALI KILOR, VIDYA BAHEKAR, ABHAY ITTADWAR**

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*Received: 01 Feb 2019, Revised and Accepted: 26 Apr 2019*

### **ABSTRACT**

**Objective:** Nanosuspension is known to enhance the saturation solubility and dissolution velocity of poorly soluble drugs owing to the increased surface area of nanosized particles. Stability of these solubility enhancing systems can be improved by converting them into solidified forms. To simultaneously achieve enhanced dissolution and improved stability, an attempt has been made to increase the dissolution rate of poorly soluble drug tadalafil by formulating immediate release pellets of its nanosuspension.

**Methods:** Tadalafil nanosuspensions were prepared using high shear homogenization technique and hydroxypropyl methylcellulose (HPMC) E 15, sodium dodecyl sulphate (SDS) as stabilizers. Prepared nanosuspensions were subjected to the characterization of particle size distribution, zeta potential, drug loading and saturation solubility. Optimized nanosuspension was solidified by preparing immediate release pellets: for improved stability, where tadalafil nanosuspension was used as a binder. Pellets were prepared by extrusion-spheronization technique using κ-carrageenan as a pelletizing aid.

**Results:** Prepared immediate release pellets disintegrated within 03 min. *In vitro* dissolution studies showed 85% drug release within 45 min in pH 1.2 buffer from immediate release pellets containing tadalafil nanosuspension.

**Conclusion:** It can be concluded that formulation of nanosuspension of poorly soluble drug and its use as a binder for the preparation of immediate release pellets markedly improved the dissolution rate.

**Keywords:** Tadalafil, Nanosuspension, Immediate release, Dissolution enhancement, Solidification

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DOI: <http://dx.doi.org/10.22159/ijap.2019v11i4.32331>



9. R. Rachana Devendra, M.V. Sharma, **S.R. Walde**, K.A. Tawalare and A.Y. Gotmare. Effect of sanjeevani vati an ayurvedic medicine in typhoid fever - a clinical study. **European Journal of Pharmaceutical and Medical Research** 2019; 6(8): 341-346.



*ejpmr*, 2019, 6(8), 341-346

EUROPEAN JOURNAL OF PHARMACEUTICAL  
AND MEDICAL RESEARCH

[www.ejpmr.com](http://www.ejpmr.com)

SJIF Impact Factor 4.897

Research Article

ISSN 2394-3211

EJPMR

### EFFECT OF SANJEEVANI VATI AN AYURVEDIC MEDICINE IN TYPHOID FEVER - A CLINICAL STUDY

Dr. R. Rachana Devendra<sup>1\*</sup>, Dr. Mrityunjay V. Sharma<sup>2</sup>, Dr. Sheelpriya R. Walde<sup>3</sup>, Dr. Kiran A. Tawalare<sup>4</sup> and Dr. Ashish Y. Gotmare<sup>5</sup>

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Article Received on 25/05/2019

Article Revised on 15/06/2019

Article Accepted on 05/07/2019

10. Pooja Hemane, Vinita Kale and Tirupati Rasala. Formulation and Evaluation of Antiseptic Film Forming Liquid for Skin Injury. **European Journal of Pharmaceutical and Medical Research** 2019; 6(4): 381-386.



*ejpmr*, 2019, 6(4), 381-386

EUROPEAN JOURNAL OF PHARMACEUTICAL  
AND MEDICAL RESEARCH

[www.ejpmr.com](http://www.ejpmr.com)

SJIF Impact Factor 4.897

Case Report

ISSN 2394-3211

EJPMR

### FORMULATION AND EVALUATION OF ANTISEPTIC FILM FORMING LIQUID FOR SKIN INJURY

Pooja Hemane\*, Dr. Vinita Kale<sup>1</sup> and Tirupati Rasala<sup>2</sup>

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Article Received on 29/01/2019

Article Revised on 18/02/2019

Article Accepted on 10/03/2019

#### ABSTRACT

**Objective-**The localized treatment of body tissues, skin diseases, injury and wounds requires that the particular pharmaceutical components be maintained at the site of treatment for an effective period of time but dermatological administration of creams, foams, gels and lotions are considered to reside for a relatively short period of time at the targeted site. To overcome this problem here the approach chosen for the new dosage form is a in-situ film forming polymeric formulations. On the skin surface this formulation solidifies into a film which is able to deliver the active moiety to the skin. **Materials-**Materials used for this dosage form are Eudragit L-100, Polyethylene glycol, Isopropyl alcohol, 6.8 phosphate buffer and Povidone-iodine (API). **Methods-** Methods used are Solvent casting method and Spray method. **Conclusion-**The formed film was sufficiently substantial to provide a sustained drug release to the skin and prevent the deposition of dust particles which reduces the chances of further infection. **Result-**Prepared films were evaluated by evaluation parameters appearance, thickness of film, drying time, moisture absorption, water vapor transmission, folding endurance, weight variation, in vitro drug diffusion study.

**KEYWORDS:** In-situ film, Drug diffusion, Solvent Casting, Skin, Sustained release.

11. **Nidhi Sapkal**, Mangesh Gawande, Minal Bonde, Anwar Daud. Studies on effect of formulation and processing parameters on stability of Ketorolac Tromethamine Orally Dissolving Films. *International Journal of Applied Pharmaceutics*. 2019; 11(4): 230-235.



International Journal of Applied Pharmaceutics

ISSN- 0975-7058

Vol 11, Issue 4, 2019

Original Article

## STUDIES ON EFFECT OF FORMULATION AND PROCESSING PARAMETERS ON STABILITY OF KETOROLAC TROMETHAMINE ORALLY DISSOLVING FILMS

**NIDHI P. SAPKAL<sup>1\*</sup>, MINAL N. BONDE<sup>2</sup>, MANGESH GAWANDE<sup>2</sup>, ANWAR S. DAUD<sup>2</sup>**

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Received: 13 Jan 2019, Revised and Accepted: 10 May 2019

### ABSTRACT

**Objective:** The objective of the proposed work was to study the effect of various formulation and process parameters of solvent casting method on the physical and chemical stability of Ketorolac Tromethamine (KT) in the orally dissolving film dosage form.

**Methods:** KT-excipient interaction study was carried out both in solid state and by processing samples through the solvent casting technique. The samples were evaluated using IR spectroscopy (IR) and X-ray diffractometry (XRD). Solvent casting method was used to prepare KT films using different film-forming polymers, and solvents. The drying temperature and pH of the dispersion were also varied to study the effect of these parameters on the stability of KT. All the formulations were analysed chemically initially and after one month of storage at 40 °C/75% RH.

**Results:** During KT-excipient interaction study in solid state KT was found to be stable. No significant changes were observed in its impurity profile. Interaction between different polymers and KT was observed after the solvent casting process as revealed by IR and XRD analysis. The interaction was further confirmed in the film formulations upon chemical analysis. The polymers showing interaction with KT in XRD and IR were making it unstable chemically and were responsible for its chemical degradation as revealed by chemical analysis. It was also revealed that KT is most stable when processed using water as the solvent. KT was found to be stable when processed at a higher temperature and at acidic pH during film formation. It was found that chemical stability is more when Polyethylene oxide (PEO) and water under acidic pH are used and films are dried at a higher temperature.

**Conclusion:** Both formulation parameters and processing conditions of the solvent casting technique affects the stability of drugs and hence should be studied as part of pre-formulation studies while developing orally dissolving films of drugs.

**Keywords:** Ketorolac, Tromethamine, Orally dissolving films

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DOI: <http://dx.doi.org/10.22159/ijap.2019v11i4.32026>

## PRESENTATIONS

- **Priya Dule, Vaishali Kilor, Nidhi Sapkal, Minal Bonde, Anwar Daud;** Development of PEO drug loaded filaments using Hot Melt Extruder for 3D printing of pharmaceuticals presented poster at Young Scientist Conference held during India International Science Festival held at Lucknow during 5<sup>th</sup> to 8<sup>th</sup> Oct, 2018.
- **Priya Dule, Vaishali Kilor, Nidhi Sapkal, Minal Bonde, Anwar Daud.** Preparation and evaluation of drug loaded polymer filaments for 3D printing of tablets. Presented poster at NBRcom -2018, held at Rishikesh on 15<sup>th</sup> Oct, 2018.
- **Vinita Kale, Pooja Yadav, Shalakra G. Sahare, Rajat S. Pahwa\*, A.M. Itadwar;** Chewable lozenges formulation for alertness during driving; presented poster at National Conference On Integrative Approach Towards Ayurved Practice (29th - 30th Sep 2018).
- **Vinita Kale, Rohini Rakshak, Pradeep Dugane; Modified starch as film forming material for pharmaceutical/ cosmetic application;** presented poster at International Conference On Multifunctional Advanced Material Icmam-2018, organized by Kamla Nehru Mahavidyalaya, Nagpur and Dharampeth M. P. Deo Memorial Science College, Nagpur held at Kamla Nehru Mahavidyalaya, Nagpur during 5<sup>th</sup> to 7<sup>th</sup> October, 2018
- **Vinita Kale, Shubhangi Mohije, Ashish Zanvar; Development of Chitosan- Gelatin composite as film forming excipient** presented poster at International Conference On Multifunctional Advanced Material Icmam-2018, organized by Kamla Nehru Mahavidyalaya, Nagpur and Dharampeth M. P. Deo Memorial Science College, Nagpur held at Kamla Nehru Mahavidyalaya, Nagpur during 5<sup>th</sup> to 7<sup>th</sup> October, 2018



RESEARCH GUIDANCE
-------------------

**M. Pharm. Students**

Sr. No.	Name of student	Topic	Name of guide
<b>M. Pharm. (Pharmaceutics)</b>			
1	SIMRAN RAJENDRA PAL	Formulation and evaluation of solid dosage form using natural rosin as an excipient	Dr. S. B. Waikar
2	SHUBHANGI S. DAHALE	Formulation and evaluation of tablets using Boswellia serrata gum as an excipient	Dr. S. B. Waikar
3	SHRADDHA R. SHAHU	Formulation and evaluation of sustained release dosage form using gum copal and gum dammar as an excipients	Dr. S. B. Waikar
4	RACHANA B.KSHIRSAGAR	Formulation and evaluation of transdermal patch for prevention and treatment of thrombophlebitis	Mr. A.H. Deshpande
5	VIDHYA R. PATIL	Formulation and evaluation of wax beads by melt solidification technique	Mr. A. H. Deshpande
6	ROHIT KUMAR	Formulation and evaluation of microparticulate drug delivery system of 'melissa officinalis oil' (lemon balm oil)	Mr. A. H. Deshpande
7	RAJAT S. PAHWA	Development of foam granulation powders : To study the effect of compression behaviour	Dr.V. V. Kale
8	ROHINI M. RAKSHAK	Development and evaluation of oral diskettes for dental disorders for paediatric populations.	Dr.V. V. Kale
9	SHUBHANGI S. MOHIJE	Development and evaluation of medium chain triglycerides as permeability enhancer for poorly permeable drug/s	Dr.V. V. Kale
10	PRIYANKA T. BHAISARE	Development of discriminating dissolution method for sildenafil citrate tablet formulations	Dr. V. A. Kilor
11	ADITI M. BAPAT	Investigation of effect of various stabilizers on the stability of lansoprazole nanosuspension.	Dr. V. A. Kilor
12	SUVARNA A. ASARE	To prepare topical formulation of <i>Calotropis gigantea</i> leaf extract for the treatment of inflammation	Dr. V. A. Kilor
13	SHALAKHA G. SAHARE	Combination therapy for the treatment of Bacterial Vaginosis containing Probiotics	Dr. M. M. Bodhankar
14	PRANITA R. KALE	Novel Approach to colonic delivery in the treatment of ulcerative Colitis.	Dr. M. M. Bodhankar

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