

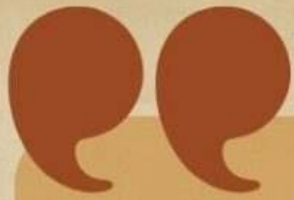


PRAAS 2020-21

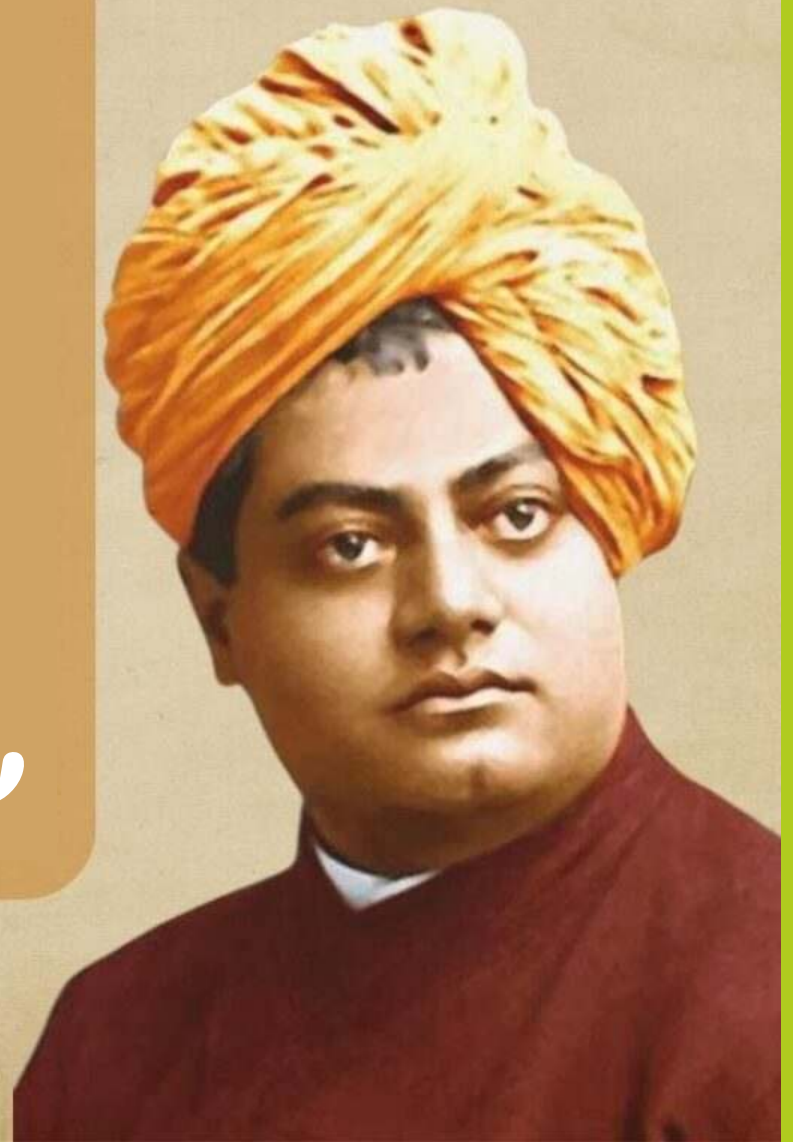
“It Is Easy  
To Get A  
Thousand  
Prescriptions  
But Hard  
To Get One  
Single Remedy.”



TECHNOCRATS INSTITUTE  
OF TECHNOLOGY-PHARMACY



**Education**  
IS THE  
MANIFESTATION  
OF THE  
PERFECTION  
ALREADY IN MAN.”











**Famous Indian  
Rapper Raftaar**



**Rock & DJ Night with  
Millind Gaba**



**Director  
Prakash Jha**



# TECHNOCRATS INSTITUTE OF TECHNOLOGY-PHARMACY

**Technocrats Group Campus, BHEL, Bhopal- 462021 MP, India**

**Ph. No.- 2805101, 2751693, 2713736**

**E-mail : [technocrats.pharmacy@gmail.com](mailto:technocrats.pharmacy@gmail.com) | website : [www.titpharmacy.net](http://www.titpharmacy.net)**





# *Vision of Institution*

To grow as an institute of excellence for Pharmacy Education and Research and to serve the humanity by sowing the seeds of intellectual, cultural, ethical, and humane sensitivities in the students to develop a scientific temper, and to promote professional and technological expertise.

# *Mission of Institution*

M 1: To inculcate ethical, moral, cultural and professional values in students.

M 2: To provide state of art infrastructure facilities to the staff and students so as to enable them to learn latest technological advancements.

M 3: State of art learning of professionalism by the faculty and students.

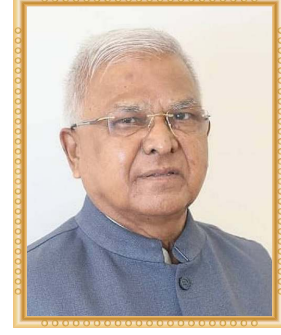
M 4: To produce well learned, devoted and proficient pharmacists.

M 5: To make the students competent to meet the professional challenges of future.

M 6: To develop entrepreneurship qualities and abilities in the students.



राजभवन  
भोपाल- 462052



श्री मंगूभाई छगनभाई पटेल  
राज्यपाल

# Message

मुझे यह जानकर प्रासन्नता हो रही है कि टेक्नोक्रेट्स इंस्टीट्यूट ऑफ टेक्नोलॉजी-फार्मैसी भोपाल द्वारा वार्षिक पत्रिका “प्रयास -2020-21” का प्रकाशन किया जा रहा है।

शिक्षण संस्थाओं द्वारा पत्रिका का प्रकाशन विद्यार्थियों के लिए विचारों व भावों को अभिव्यक्त करने का सशक्त माध्यम है। इस प्रकार की पत्रिकाएं विद्यार्थियों को निखारने में सहायक होती है। मुझे आशा है कि पत्रिका में देशप्रेम और चरित्र निर्माण जैसे विभिन्न पहलुओं से संबंधित पठनीय सामग्री का समावेश किया जायेगा जिससे देश में ज़िम्मेदार युवा पीढ़ी का निर्माण सुनिश्चित हो सकेगा।

शुभकामनाएं।

मंगूभाई पटेल  
( मंगुभाई पटेल )





शिवराज सिंह चौहान  
मुख्यमंत्री

## Message

प्रसन्नता का विषय है कि टेक्नोक्रेट्स इंस्टीट्यूट ऑफ टेक्नोलॉजी-फार्मैसी भोपाल द्वारा वार्षिक पत्रिका “प्रयास - 2020-21” का प्रकाशन किया जा रहा है।

तकनीकी शिक्षा प्राप्त कर रहे विद्यार्थियों की सृजनात्मक अभिव्यक्ति के लिये पत्रिका का प्रकाशन एक सराहनीय प्रयास है। साहित्य, संस्कृति और भाषा के ज्ञान के साथ-साथ यांत्रिकी वातावरण को सरस व समरस बनाने में भी इस तरह की पत्रिकाओं का महत्वपूर्ण योगदान होता है।

आशा है, पत्रिका “प्रयास - 2020-21” महाविद्यालय परिवार के विचारों की संवाहक बनकर उपयोगी व महत्वपूर्ण दस्तावेज बनेगी।

हार्दिक शुभकामनाओं सहित।

शिवराज सिंह चौहान



# Message



**Smt. Yashodhara Raje Scindia**  
Minister of Technical Education M.P.

I am delighted to learn that Technocrats Institute of Technology-Pharmacy Bhopal is publishing its college magazine “PRAYAS 2020-21”.

I appreciate the efforts and hope this will create healthy as well as innovative atmosphere among the institution’s beneficiaries, especially the youth joining the educational field.

This reputed institution has done a commendable job by imparting quality education in the field of Technical Education. By doing this it has greatly helped the youth of the state to catch up with time and excel in their respective fields.

With all my warm greeting I wish them all good luck and send my congratulations to the Management and the editorial team.

**Smt. Yashodhara Raje Scindia**  
Minister of Technical Education M.P.





प्रो. (डॉ.) वीरेन्द्र कुमार  
संचालक

## Message

अत्यंत हर्ष का विषय है कि टेक्नोक्रेट्स इंस्टीट्यूट ऑफ टेक्नोलॉजी-फार्मैसी भोपाल द्वारा वार्षिक पत्रिका “प्रयास-2020-21” का प्रकाशन किया जा रहा है।

संस्था की पत्रिका का प्रकाशन विद्यार्थियों की बहुमुखी प्रतिभा को आगे लाकर पहचानने और उनके सम्पूर्ण व्यक्तित्व विकास के लिये आवश्यक है।

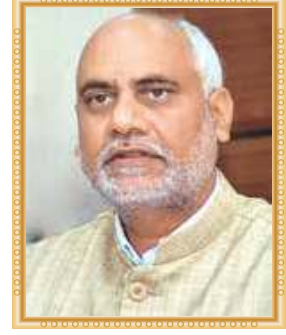
पत्रिका में ही उस महाविद्यालय के कार्यकलापों, छात्र-छात्राओं एवं शिक्षकों की प्रतिभाओं, उनका बौद्धिक स्तर एवं आदर्शों का प्रतिबिम्ब झलकता है।

मुझे पूर्ण विश्वास है कि आपका यह प्रयास अपने उद्देश्यों में पूर्ण रूप से सफल रहेगा एवं भावी पीढ़ी के लिये पथ प्रदर्शक का कार्य करेगा।

प्रो. (डॉ.) वीरेन्द्र कुमार



# Message



**Prof. Sunil Kumar**  
Vice-Chancellor

मुझे यह जानकर प्रसन्नता हुई कि टेक्नोक्रेट्स इंस्टीट्यूट ऑफ टेक्नोलॉजी-फार्मैसी भोपाल द्वारा वार्षिक महाविद्यालय पत्रिका “प्रयास-2020-21” का प्रकाशन किया जा रहा है।

महाविद्यालयीन पत्रिका किसी भी संस्था के लिये दर्पण की तरह होती हैं। मैं आशा करता हूं कि वार्षिक पत्रिका संस्था की शैक्षणिक उपलब्धियों को रेखांकित करने एवं छात्रों को सांस्कृतिक एवं साहित्यिक एवं अन्य शैक्षणेत्तर गतिविधियों में अपनी प्रतिभा प्रदर्शन के लिए उपयुक्त मंच उपलब्ध कराएगी।

पत्रिका के सफल प्रकाशन के लिए सम्पादक मण्डल, शिक्षकगण एवं छात्र-छात्राओं मेरी अनेक शुभकामनाएं।

मैं आशा करता हूं कि संस्था निरन्तर उन्नति एवं प्रगति के पथ पर अग्रसर होगी एवं तकनीकी शिक्षा के क्षेत्र में देश, प्रदेश एवं समाज को अपना योगदान देती रहेगी।

(प्रो. सुनील कुमार)





**Chairperson**  
TIT Group of Institutions

## *Message*

Obviously, I am feeling an immense pleasure to orate that our college is going to publish a yearly magazine “PRAYAS 2020-21”, which does not only bestow academic excellence but also highlights overall multidimensional and moralistic developments of the college.

This magazine also throws light on the personality, working capacity and achievements of students, faculties and managements.

No doubt, I am again very much obliged to mention that the students and faculty-members gave good and moralizing articles for publication in this magazine.

In nutshell, I am of course, very much thankful to all the members, who taught the students very nicely, who gave their a highly remarkable contribution. I again wish them for their bright future and happy life.

**Chairperson**  
TIT Group of Institutions

# Message



**Vice Chairman**  
TIT Group of Institutions

Obviously, I am feeling an immense pleasure to orate that our college is going to publish a yearly magazine “PRAYAS 2020-21”, which does not only bestow academic excellence but also highlights overall multidimensional and moralistic developments of the college.

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**Vice Chairman**



**Managing Director**  
TIT Group of Institutions

## Message

Indeed it is a matter of great pleasure that Technocrats Institute of Technology-Pharmacy is going to publish its annual institutional magazine “PRAYAS 2020-21”.

Furthermore, I am really very sure that this college magazine will provide a platform to the students to sharpen their writing skills by strengthening academic activities of college.

I extend my best compliments, hearty blessings to faculty members, staff members and rising sun of the nation i.e. students for their bright future and happy life. I also hope that they will strive for the creation of academic and professional excellence in the coming years.

In the end, I am feeling much pleasure to extend my warm greetings and wishes to all the faculties. Students and other staff members who gave their unique contribution for successful release of their annual magazine

---

**Managing Director**



# Message



**Dr. Anurag Choubey**  
Director Administration

I congratulate the team of students and teachers whose precious efforts have made this edition of “PRAYAS 2020-21” accessible to us. It gives me immense pleasure to experience the warmth of this literary tradition in resonance with the glorious past of the institution. Rhyming with the change that is the law of nature, the magazine portrays the trajectory of transformation achieved in different spheres. I feel privileged to for hold the post of Director Administration and Director Academics of this reputed temple of learning that houses the stakeholders who thrive to maintain the dynamic spirit of learning and discovering through such endeavours. The Institute is firm in its resolve to providing support to academic events and publication of literary writings.

I wish “PRAYAS 2020-21” will scale greater heights with active participation of students and staff members of this institution.

A handwritten signature in blue ink, consisting of a stylized 'A' followed by a horizontal line and a small flourish.

**Dr. Anurag Choubey**  
Director Administration

# Message



**Dr. B K Dubey**  
Director Pharmacy

It is a matter of great pride and satisfaction for Technocrats Institute of Technology, Bhopal (M. P.) to publish the 2020-21 issue of our annual magazine “PRAYAS 2020-21”. The institute has made tremendous progress in all the areas pertaining to co-curricular, extra-curricular development of the students and capacity building of the staff. I am sure that this issue of our annual magazine will send a positive signal to the staff, students and the people who are involved as well as interested in the technical education and technology-based activities. A magazine is like a mirror which reflects the clear picture of all sorts of activities undertaken by an institution and develops appropriate writing skills among students in particular and teaching faculty in general. I express my deep sense of gratitude to Dr. Deepak Basedia, HOD (Pharmacy) under whose guidance this magazine issue work has been undertaken and completed within the stipulated time. I also express my heartfelt congratulations to all the faculties, staff members and students of the editorial board for the arduous task executed most effectively. I am hopeful that this creative effort shall not only develop the taste for reading among the students but also develop a sense of belongingness to the institution as well.

**Dr. B K Dubey**

# HOD *Message*



**Dr. Deepak Basedia**  
HOD Pharmacy

Pharmacy is one of the most trusted and noble profession and remains one of the most fascinating fields in the sciences. During the last few years due to phenomenal growth and advancement of science and technology, concept of pharmacy has drastically changed in recent times and today pharmacist is also closely involved as one of the most important member, working hand in glove in majority of the health delivery system along with pharmaceutical industry.

Technocrats Institute of Technology-Pharmacy Bhopal, established in the year 2002 approved and recognized by AICTE and PCI, Govt. of India. The institute offers courses in B. Pharm and M. Pharm. The college has well-equipped laboratories and excellent infrastructure to make the students acquire knowledge that would help them to face the competitive world. Students are provided the best quality education through traditional and modern teaching methods. National Seminars, Workshops and Industrial visits are conducted in the college at regular intervals which enable the students to gain new updated knowledge. The institute also focuses on personality development, confidence building, research exposure and enhancement of communication skills, apart from various cultural events and activities.

The role of a college magazine is therefore vital in promoting what an institution offers. It brings out into the open things hitherto unrevealed. It brings to light the names of the unsung heroes and their mighty deeds. I am happy that there is a dedicated team of staff and students who have brought out the “PRAYAS 2020-21”, annual magazine of our college. I congratulate them for their successful venture and pray that each year brings more and more triumph to “PRAYAS 2020-21”.

A handwritten signature in blue ink, consisting of a stylized 'D' followed by a horizontal line.

**Dr. Deepak Basedia**



# Message



**Mr. Shailendra Prasad Tiwari**

Chief Editor  
Technocrats Institute of  
Technology-Pharmacy

Being the Editor In charge of college magazine “PRAYAS 2020-21”, it gives me great pleasure to bring to you this issue. The annual Magazine PRAYAS 2020-21, is designed to present to its readers the year’s various activities by the students and faculty in academic, cocurricular, extra-curricular as well as research & developments that have gone by, the magazine also showcases the talents of our faculty members and students. With a sense of pride and satisfaction I would like to say that with the active support of the management, faculty and students. The “PRAYAS 2020-21” is published which is a truly literary & creative document of the talents of our faculty, technical staff and students. The Magazine committee is composed of the student editor, sub editors & staff advisors. The varieties of articles in research field give us a sense of pride that our students and teachers possess creative potential and original thinking in ample measures. Each article is entertaining, interesting and absorbing. Along with those interesting general articles, stories, poems of the magazine will develop confidence, motivation, zencouragement, passion, perfection and dedication in readers. It also contained more about pharmaceuticals, research which sharpen their strength in areas like academic, non-academics of staff and students. I congratulate the editorial team for making “PRAYAS 2020-21”, innovative and inspiring.

Wish you all best luck

A handwritten signature in blue ink, consisting of a stylized 'S' followed by a horizontal line.

**Mr. Shailendra Prasad Tiwari**

## **Program Educational Objectives (PEOs) for B.Pharm Course**

PEO 1: To inculcate quality pharmacy education and training through innovative Teaching Learning Process.

PEO 2: To promote professionalism, team spirit, social and ethical commitment with effective interpersonal communication skills to boost leadership role assisting improvement in healthcare sector.

PEO 3: To enhance Industry-Institute-Interaction for industry oriented education and research, which will overcome healthcare problems of the society.

PEO 4: To adapt and implement best practices in the profession by enrichment of knowledge and skills in research and critical thinking.

PEO 5: To generate potential knowledge pools with interpersonal and collaborative skills to identify, assess and formulate problems and execute the solution in closely related pharmaceutical industries and to nurture striving desire in students for higher education and career growth.

## PROGRAM OUTCOMES

- 1. Pharmacy Knowledge:** Possess knowledge and comprehension of the core and basic knowledge associated with the profession of pharmacy, including biomedical sciences; pharmaceutical sciences; behavioral, social, and administrative pharmacy sciences; and manufacturing practices.
- 2. Planning Abilities:** Demonstrate effective planning abilities including time management, resource management, delegation skills and organizational skills. Develop and implement plans and organize work to meet deadlines.
- 3. Problem analysis:** Utilize the principles of scientific enquiry, thinking analytically, clearly and critically, while solving problems and making decisions during daily practice. Find, analyze, evaluate and apply information systematically and shall make defensible decisions.
- 4. Modern tool usage:** Learn, select, and apply appropriate methods and procedures, resources, and modern pharmacy-related computing tools with an understanding of the limitations.
- 5. Leadership skills:** Understand and consider the human reaction to change, motivation issues, leadership and team-building when planning changes required for fulfillment of practice, professional and societal responsibilities. Assume participatory roles as responsible citizens or leadership roles when appropriate to facilitate improvement in health and well-being.
- 6. Professional Identity:** Understand, analyze and communicate the value of their professional roles in society (e.g. health care professionals, promoters of health, educators, managers, employers, employees).
- 7. Pharmaceutical Ethics:** Honour personal values and apply ethical principles in professional and social contexts. Demonstrate behavior that recognizes cultural and personal variability in values, communication and lifestyles. Use ethical frameworks; apply ethical principles while making decisions and take responsibility for the outcomes associated with the decisions.
- 8. Communication:** Communicate effectively with the pharmacy community and with society at large, such as, being able to comprehend and write effective reports, make effective presentations and documentation, and give and receive clear instructions.
- 9. The Pharmacist and society:** Apply reasoning informed by the contextual knowledge to assess societal, health, safety and legal issues and the consequent responsibilities relevant to the professional pharmacy practice.
- 10. Environment and sustainability:** Understand the impact of the professional pharmacy solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.
- 11. Life-long learning:** Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change. Self-assess and use feedback effectively from others to identify learning needs and to satisfy these needs on an ongoing basis.

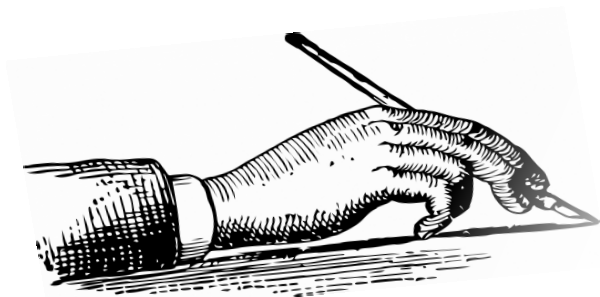


## *Editorial Board*



## *Student Editorial Board*





# Editorial Board

## Advisory Board

Dr. B.K. Dubey  
Dr. Deepak Basadia  
Dr. Dilip Bharti  
Dr. Mukesh Patel  
Prof. Bhushan Korde

## Student Editorial Board

Tanuj Yadav  
Vivekanand Rai  
Avantika Kesri  
Vishnu Dhakar  
Aashita Raut

## Chief Editor

Prof. Shailendra Prasad Tiwari

## Editor

Prof. Shailendra Tiwari  
Prof. Mayur Chourasiya  
Prof. Sandra Gautam  
Prof. Mansi Gupta  
Prof. Ritu Kushwah  
Prof. Pushpa Simayia

# *Oath of a Pharmacist*

At this time, I vow to devote my professional life to the service of  
all humankind through the profession of pharmacy.

I will consider the welfare of humanity and relief of human  
suffering my primary concerns.

I will apply my knowledge, experience, and skills to the best of  
my ability to assure optimal drug therapy outcomes for the  
patients I serve.

I will keep abreast of developments and maintain professional  
competency in my profession of pharmacy.

I will maintain the highest principles of moral, ethical, and legal  
conduct.

I will embrace and advocate change in the profession of  
pharmacy that improves patient care.

I take these vows voluntarily with the full realization of the  
responsibility with which I am entrusted by the public.



# Code of Ethics for Pharmacists

## Preamble

Pharmacists are health professionals who assist individuals in making the best use of medications. This Code, prepared and supported by pharmacists, is intended to state publicly the principles that form the fundamental basis of the roles and responsibilities of pharmacists. These principles, based on moral obligations and virtues, are established to guide pharmacists in relationships with patients, health professionals, and society.

## Principles

**I. *A pharmacist respects the covenantal relationship between the patient and pharmacist.***

*Interpretation:* Considering the patient-pharmacist relationship as a covenant means that a pharmacist has moral obligations in response to the gift of trust received from society. In return for this gift, a pharmacist promises to help individuals achieve optimum benefit from their medications, to be committed to their welfare, and to maintain their trust.

**II. *A pharmacist promotes the good of every patient in a caring, compassionate, and confidential manner.***

*Interpretation:* A pharmacist places concern for the well-being of the patient at the center of professional practice. In doing so, a pharmacist considers needs stated by the patient as well as those defined by health science. A pharmacist is dedicated to protecting the dignity of the patient. With a caring attitude and a compassionate spirit, a pharmacist focuses on serving the patient in a private and confidential manner.

**III. *A pharmacist respects the autonomy and dignity of each patient.***

*Interpretation:* A pharmacist promotes the right of self-determination and recognizes individual self-worth by encouraging patients to participate in decisions about their health. A pharmacist communicates with patients in terms that are understandable. In all cases, a pharmacist respects personal and cultural differences among patients.

**IV. *A pharmacist acts with honesty and integrity in professional relationships.***

*Interpretation:* A pharmacist has a duty to tell the truth and to act with conviction of conscience. A pharmacist

avoids discriminatory practices, behavior or work conditions that impair professional judgment, and actions that compromise dedication to the best interests of patients.

**V. *A pharmacist maintains professional competence.***

*Interpretation:* A pharmacist has a duty to maintain knowledge and abilities as new medications, devices, and technologies become available and as health information advances.

**VI. *A pharmacist respects the values and abilities of colleagues and other health professionals.***

*Interpretation:* When appropriate, a pharmacist asks for the consultation of colleagues or other health professionals or refers the patient. A pharmacist acknowledges that colleagues and other health professionals may differ in the beliefs and values they apply to the care of the patient.

**VII. *A pharmacist serves individual, community, and societal needs.***

*Interpretation:* The primary obligation of a pharmacist is to individual patients. However, the obligations of a pharmacist may at times extend beyond the individual to the community and society. In these situations, the pharmacist recognizes the responsibilities that accompany these obligations and acts accordingly.

**VIII. *A pharmacist seeks justice in the distribution of health resources.***

*Interpretation:* When health resources are allocated, a pharmacist is fair and equitable, balancing the needs of patients and society.

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The endorsement of this document was reviewed in 2017 by the Council on Pharmacy Practice and by the Board of Directors and was found to still be appropriate.

Copyright American Pharmacists Association. Adopted by the membership of the American Pharmaceutical Association on October 27, 1994. Endorsed by the American Society of Health-System Pharmacists House of Delegates on June 3, 1996 (ASHP Policy 9607). Proceedings of the 47th annual session of the ASHP House of Delegates. *Am J Health-Syst Pharm.* 1996; 53:1805. ASHP Reports.

# Toppers

## FINAL YEAR



**Sumbul Khan**  
9.25 CGPA



**Syed Kashif Ali**  
8.9 CGPA



**Anshul Pandey**  
8.7 CGPA

## THIRD YEAR



**Neeraj Kumar Pal**  
9 CGPA



**Ritesh Bharte**  
8.2 CGPA



**Shailesh Pal**  
8

## SECOND YEAR



**Nikita Chandrabhan**  
9.03 CGPA



**Aniket Singh**  
8.83 CGPA



**Anamika Tiwari**  
8.69 CGPA

## FIRST YEAR



**Shristi Soni**  
9.54 CGPA



**Piyush Raj**  
9.34 CGPA



**Kumar Gaurav**  
9.1 CGPA

# *Congratulation* **GPAT QUALIFIERS**

Congratulations to all **GPAT**  
selected Pharmacy students  
for their supercilious achievement!!!

Heartfelt Congratulations to all the qualified students of pharmacy of Technocrats Institute of Technology - Pharmacy, Bhopal in GPAT . All the best to the students for future endeavours.



## MICROWAVE SYNTHESIZER: AN EFFECTIVE PARADIGM OF GREEN CHEMISTRY

Green Chemistry is crucial in ensuring that our next generation of chemicals, materials, and energy is more sustainable than our current generation. One such strategy is Microwave synthesis, which entails switching out conventional heating methods for more contemporary ones, including microwave irradiations, to minimize the carbon impact. This review places particular emphasis on the idea of Microwave-Assisted Organic Synthesis (MAOS) as well as the sensible application of the Catalyst Microwave Synthesiser, a crucial instrument for environmentally friendly chemistry.

### Microwave Synthesis

**Tool for Green Chemistry:** Thanks to microwave synthesis, chemists have extra time to exercise their creativity, try new hypotheses, and create new procedures. Chemists can now carry out the identical process in minutes rather than spending hours or even days synthesizing a single compound. The issue with solvent waste disposal has been solved by conducting procedures without a solvent under microwave irradiation. Under solvent-free circumstances, combining microwave irradiation with mineral-supported catalyzed reactions results in clean chemical processes with faster reaction rates, higher yields, improved selectivity, and easier manipulation.

**Microwave Synthesis V/S Conventional Synthesis:** Traditional reaction heating methods like oil baths, sand baths, and heating mantles are slow and produce a hot reaction vessel surface where substrates, products, and reagents frequently degrade over time. The temperature of the reaction vessel is higher than the temperature of the reaction mixture, depending on the thermal conductivity of the various materials that must be penetrated. In contrast, microwave radiation is delivered remotely into the chemical reactor and penetrates through the reaction vessel's walls to directly heat the reactants and solvents, as illustrated in Fig. 1

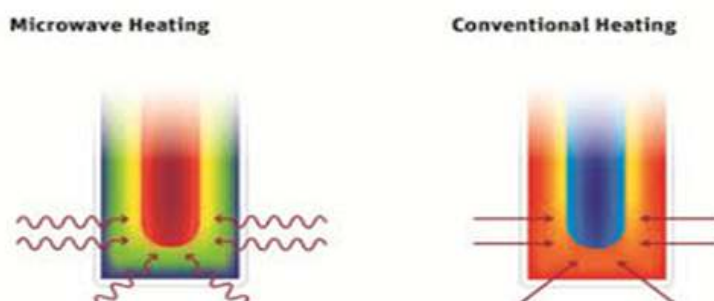
### Catalyst Microwave Synthesizer Components:

**High power source** – A magnetron is a Thermionic diode that produces microwaves due to its directly heated cathode and anode. .

**Waveguide feed** is a rectangular channel that allows microwaves to travel from the magnetron to the microwave cavity. It has metal sheet-made reflecting walls. These barriers improve the efficiency of the oven by preventing radiation leakage. The oven cavity is constructed to get much energy primarily electric energy.

**Reaction vessel** - For microwave-induced organic reactions, a tall, loosely-covered beaker with a capacity higher than the volume of the reaction mixture serves as the reaction vessel.

**Conclusion & Future Perspective:** In addition to increasing product yields and reaction rates, microwave heating has proven to be a useful technique for synthetic chemists since it provides a secure and practical way to heat reaction mixtures to high temperatures. This new technology has developed as a green chemical pathway in addition to being safer since it satisfies some of the key requirements of green chemistry. Several applications in organic synthesis, where procedures with greater yields and purified products are highly needed, have already been created using it as a promising technique. The ability to use the MAOS technique has allowed the pharmaceutical industry to propose increasingly diverse goals for some innovative medications and Active Pharmaceutical Ingredients (APIs).







## PROTEIN PRENYLATION AND THEIR APPLICATIONS

Prenylation occurs in all eukaryotic cells. Rhodotorucine A, a yeast mating factor peptide, was prenylated for the first time in 1979 in Japan. More fungal peptides will be identified in five years. Sex hormones with a C-terminal farnesyl group were released. Unknown yet stoichiometric and stable, this change is a fundamental component of the process, a list of mate-inducing variables. First-ever discovery of mammalian prenylation. Functional protein requires prenylation. The farnesyl (15- carbon) or geranylgeranyl (20-carbon) group is transferred to protein cysteine residues in three steps. Specialized prenylbinding domains help protein-protein binding. Farnesylation and geranyl geranylation are crucial for protein membrane anchoring. These post-translational changes are catalysed by FTase or PT-I. (GGTase-I). These enzymes identify a CaaX pattern, where "C" is the cysteine to be prenylated.

Prenylation helps diversify flavonoids, coumarins, and isoflavonoids. Prenylated chemicals exhibit anti-cancer, antispasmodic, anti-bacterial, anti-fungal, anti-inflammatory, and anti-androgen action. Prenylated chemicals are useful for making medications and functional foods due to their antidisease effects. Prenylation of aromatic chemicals like indole, ketones, and aldehydes may lead to molecule discovery. azoles, anilines, thiols, indole, - carbonyl bromides, and aryl bromide undergo prenylation. Prenylation yields (-)-17- hydroxy-citrinin and (+)-streptavidin. Comparing the projected amino acid sequences of these two proteins, additional Ras proteins, mating factors, and lamin B and prelamin A revealed a shared carboxy-terminal region. A CAAX box contains cysteine, an aliphatic amino acid, and a carboxy-terminal amino acid. The yeast mating hormone a-factor structure was farnesylated and carboxymethylated at the carboxy-terminal cysteine (""). This discovery predicted that ras protein's carboxy-terminal cysteine would be farnesylated.

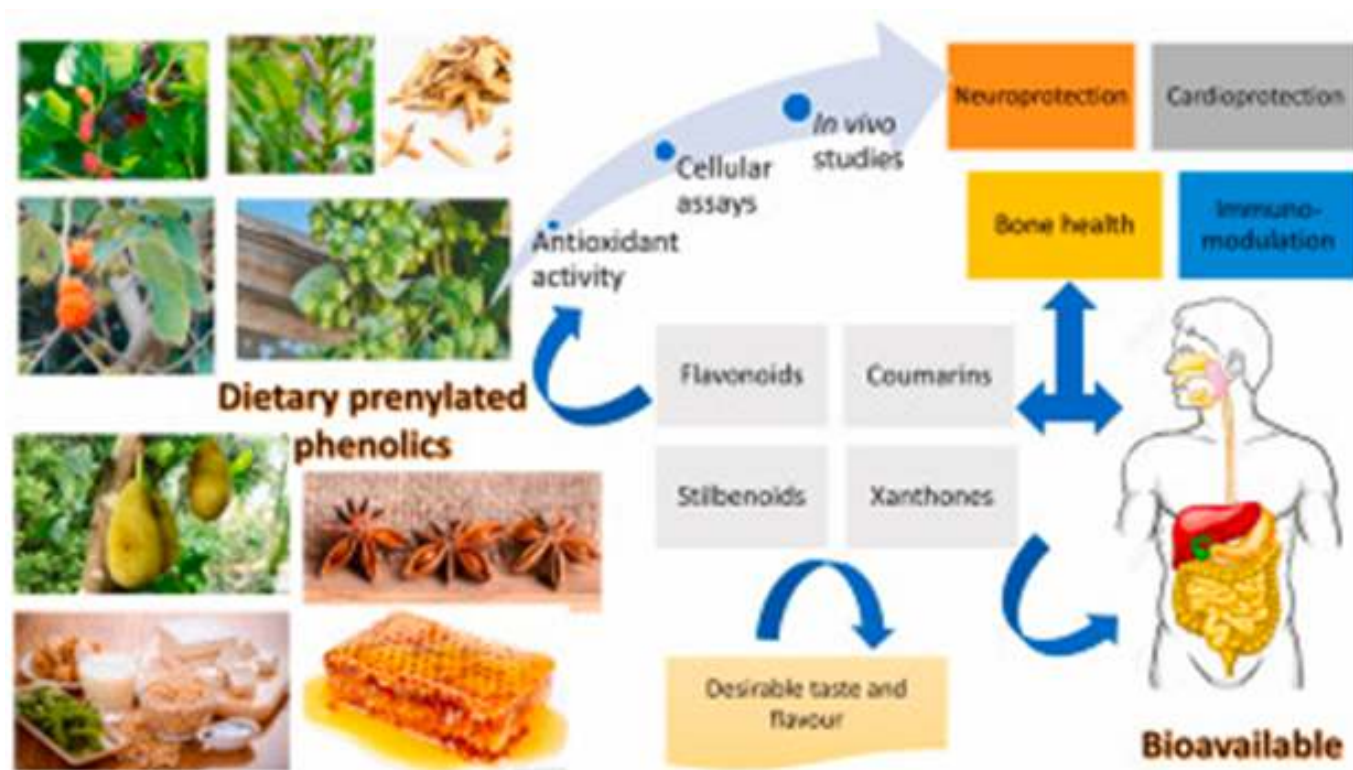
Prenylation helps diversify flavonoids, coumarins, and isoflavonoids. Prenylated chemicals exhibit anti-cancer, antispasmodic, anti-bacterial, anti-fungal, anti-inflammatory, and anti-androgen action. Prenylated chemicals are useful for making medications and functional foods due to their antidisease effects. Prenylation of aromatic chemicals like indole, ketones, and aldehydes may lead to molecule discovery. azoles, anilines, thiols, indole, - carbonyl bromides, and aryl bromide undergo prenylation. Prenylation yields (-)-17- hydroxy-citrinin and (+)-streptavidin. Comparing the projected amino acid sequences of these two proteins, additional Ras proteins, mating factors, and lamin B and prelamin A revealed a shared carboxy-terminal region. A CAAX box contains cysteine, an aliphatic amino acid, and a carboxy-terminal amino acid. The yeast mating hormone a-factor structure was farnesylated and carboxymethylated at the carboxy-terminal cysteine (""). This discovery predicted that ras protein's carboxy-terminal cysteine would be farnesylated. Prenylation increases the lipophilicity of proteins for effective membrane anchoring.

Prenylated proteins are involved in cell signalling and regulation. The first prenylated polypeptide was the mating factor from *Rhodospiridiumtoruloides*, an undecapeptide with a C-terminal S-farnesyl-cysteine methyl ester. These mating factors are farnesyl groups coupled to peptide cysteines. Farnesyltransferase and geranylgeranyl transferase type 1 (GGTase-I) attach single isoprenoid groups to proteins. Prenylation increases the lipophilicity of proteins for effective membrane anchoring. Prenylated proteins are involved in cell signalling and regulation. The first prenylated polypeptide was the mating factor from *Rhodospiridiumtoruloides*, an undecapeptide with a C-terminal S-farnesyl-cysteine methyl ester. These mating factors are farnesyl groups coupled to peptide cysteines. Farnesyltransferase and geranylgeranyl transferase type 1 (GGTase-I) attach single isoprenoid groups to proteins. Biotechnology application: The ability of FTase to change a single cysteine residue in the CterminalCaaX motif and incorporate isoprenoid analogs with bioorthogonal functions has been utilized for site-specific protein modifications in recent years. This is feasible because a CaaXbox at the C-terminus of practically any protein is enough to make it an effective FTase substrate. Functionalization of the resultant proteins by bioorthogonal processes provides a simple way to produce a large range of site-specific protein conjugates. For immobilization of proteins (GFP or



G.S.T.) onto solid surfaces such as glass slides or agarose resin, the Poulter and Distefano groups employed azide- and alkyne-functionalized F.P.P. analogs in FTase-catalysed reactions followed by click reactions or Staudinger ligations. Maynard and colleagues used a similar technique to immobilize mCherry protein tagged with 25 onto a patterned azide-functionalized surface produced by microcontact printing.

Waldmann and colleagues used a photo-chemical thiolene reaction between farnesylated recombinant proteins and surface-exposed thiols from functionalized surfaces to immobilize functional proteins in an orientated and selective manner (mCherry and Ypt1). Poulter and colleagues have immobilized the glutathione S-transferase enzyme and antibody-binding protein G to self-assembled monolayers on gold surfaces in a highly organized, regioselective manner. They also developed immobilized recombinant antibody-binding protein L sandwich antibody arrays for trapping antibodies for direct and sandwich-type immunofluorescent detection of ligands in a microarray manner. In general, where oriented protein immobilization is required, the prenylation-based immobilization strategy has several potential biomedical and biotechnology applications, such as protein arrays and diagnostic applications based on immunoassays, Surface Plasmon Resonance (S.P.R.), or electrochemical methods. A nanoscale-sized defined tetrahedron architecture composed of four oligonucleotides and four GFP molecules, therapeutically relevant proteins GIP and H.I.V. NC attached to oligonucleotides, and DNA-protein cross-links as D.N.A. lesions to study D.N.A. repair, and replication are just a few of the protein-DNA conjugates that have been synthesized using this method.





## FLAVONOIDS AS PHOTOPROTECTIVE AGENTS

We all know that the primary function of sunscreen is to forestall sun-induced erythema. Skin cancer caused by the sun may be prevented by using sunscreens that block more sun rays before they reach the skin. U.V. light is divided into three types Ultraviolet C (U.V.C.), which ranges from 100 to 290 nm; ultraviolet B (UVB), 290 to 320 nm; and ultraviolet A (UVA), 320 to 400 nm. Solar U.V. radiation on Earth's surface is typically 90 to 99% UVA and 1 to 10% UVB, causing erythema and photocarcinogenesis. Contact with cell D.N.A. causes photocarcinogenesis by forming cyclobutene pyrimidine dimers and thymine glycols. However, the research on UVA's function is crucial for several other reasons. The buildup of UVA radiation primarily causes the formation of cancer-causing Reactive Oxygen Species. R.O.S. and reactive nitrogen species are generated when the skin is exposed to U.V. radiation. Hydroxyl radicals, superoxide anion, peroxy radicals, active precursors singlet oxygen, hydrogen peroxide, and ozone are the most frequent R.O.S. created by U.V. light. The antioxidant and chelating actions of flavonoids, a type of secondary phenolic found in plants, are well-documented. The beneficial health effects of these substances were known for a long time before anyone ever identified them as natural compounds. Antioxidant enzyme activation and free radical and metal chelate transport are two mechanisms by which flavonoids exert their beneficial effects in living systems. Flavonoid structure consists of two benzene rings (A and B) linked by a heterocyclic pyran or pyrone (with a double bond) ring (C). Based on the bond connecting the B ring and the C ring, as well as the oxidation state and functional groups of the C ring,

**Flavonoids can be broken down into six distinct groups:** Flavones, Flavonols, Flavanonols, Isoflavones, Flavanols, and Anthocyanidins.

**Rutin:** Rutin, commonly known as rutoside and quercetin-3-Orutinoside, is a flavonoid glycoside derived from quercetin. Many authors confirmed the sun protection factor UVB (SPFUVB) and protection factor UVA (PF-UVA) in pharmaceutical formulations, including simply rutin as the main active component as well as in combination with additional photoprotective agents using a transmittance technique established by Diffey et al. (1989). SPF-UVB 4.72 0.20 and FPUVA 4.92 0.20 were found in rutin formulations. Rutin's protective factor increased when it was combined with physical filters like titanium dioxide (TiO<sub>2</sub>) and zinc oxide (ZnO)[1].

**Quercetin:** Quercetin (3,3',4',5,7-pentahydroxyflavone) was discovered that a flavonoid that absorbs in both the UVA and UVB areas, with additional absorption into the UVA region. Evans-Johnson et al. (2013) observed that topical administration of a combination of polyphenols derived from almonds (isorhamnetin, epicatechin, kaempferol), with quercetin at a greater concentration than the others, greatly diminishes apoptosis produced by UVA radiation in dermal fibroblasts, hence maintaining skin shape and cell differentiation, and tends to reduce keratinocytes proliferation. The potential mechanisms may include the absorbance of U.V. radiation, elimination of free radicals generated from this radiation, and modulation of cell signaling and endogenous antioxidant defenses.

**Chrysin:** Chrysin (5,7-dihydroxyflavon) is a natural flavonoid found in plants and foods like honey and propolis and is said to fight inflammation and carcinogenesis; however, it is rarely used in skin care products. The same study discovered that chrysin protects keratinocytes from U.V. radiation damage. The results demonstrated that chrysin could inhibit apoptosis (R.O.S.) generation and the expression of the enzyme cyclooxygenase-2 (COX-2) generated by UVA and UVB radiation[1,2]

**Flavanol cocoa (catechin and epicatechin):** Epicatechin and catechin were flavanols that were used in varying doses. Before and throughout the intervention, photo chemoprotection and skin condition markers were assessed. UV-induced erythema was decreased by 15% and 25% in the H.F. groups after 6 and 12 weeks, respectively, but there was no change in the L.F. group[1].



## वह कॉलेज लाइफ

जब पहली दफा था कॉलेज में आया एक अलग दर्द था... सीने में समाया  
ना जाने कैसे होंगे सीनियर्स.. कैसे बनेंगे तो  
इसी सोच में आंखों को... कितनी रातें जगाया  
धीरे-धीरे माहौल में..... फिर ढलता चला गया  
इश्क का असली मतलब... तो यही समझ में आया  
जब कभी मुश्किलों से.... मेरा सामना जो हुआ  
तो दोस्तों ने मुझसे पहले.... उस मसले को सुलझाया  
वो कभी लेक्चर के बीच में.... बातें करना  
तो कभी दोस्तों के साथ.... मजाक उड़ाना  
किसी का नाम लेकर.... किसी को तंग करना  
और दूसरे से पेयरिंग होने पर ... उसे देवदास कहना  
कसम से यह बातें... बहुत याद आएंगी!  
क्योंकि यादों में हमारे... सिर्फ यादें रह जाएंगी!

By: Vishnu Dhakad

2nd Year

## ANGEL IN TEENS: - A PHASE OF OR A PROBLEM?

The behavior of teens with anger and defense issues exhibit extends far beyond the typical disrespectful behavior, eye – rolling slammed doors, and arguments between teen and their parent anger is a normal part of adolescence and can be a healthy emotional response to outside stressors. Teens with serious anger issues are consumed with anger. These individuals can be defend and may turn to violence, self-harm, Risky behavior, and illegal activity as a way to cope with their strong emotions.

Angry teenager, Causes and Contributing factors

There are many factors that can contribute to anger issues and defiance in teens every teen emotional regulation skill set, capacity, and maturity is different. Some teens simply need more help in learning how to healthy manage their emotions and cope with stress. Other teens experience intense anger as a symptom of a mental health issue, traumatizing life experience. Some of these common triggers of severe anger in teens include: -

- Low Self-esteem
- Traumatic event
- Adoption issues
- Divorce
- Abuse



**Other Polyphenols with photoprotective activity Hydroxycinnamic acid derivatives (coumaric acid, ferulic acid, caffeic acid, caffeic acid phenylethyl ester):** Because of their chemical structures, compounds generated from hydroxycinnamic acid and its homologs and derivatives, present in fruits, vegetables, coffee, and wine, are suitable candidates for photoprotection. For each of these substances, the SPF-UVB technique developed by Diffey et al. (1989), the UVA/UVB ratio, and the critical wavelength were assessed, which are included in Table 1[2].

Photoprotective Agent	SPF Value	Critical Wavelength
Coumaric acid	9.3 UVA/UVB	0.17 and c 335 nm
Caffeic acid	28.0 UVA/UVB	0.43 and c 365 nm
Caffeic acid Phenylethyl ester	15.8 UVA/UVB	0.52 and c 370 nm

By: **Dr. Deepak Basedia**

## AYURVEDIC PERSPECTIVE FOR THE MANAGEMENT OF THE LIVER CIRRHOSIS

Our body consists of different organs, and each has a specific function. When it comes to the liver is the most important organ because it plays a role in the body's excretion process of drugs and xenobiotics. Hence it protects by detoxifying foreign substances from the body. Apart from these processes, most physiological activities, such as Growth, and energy metabolism, are linked to the liver. But when it comes to liver disease like Liver cirrhosis, it is the end stage of chronic liver disease. The formation of regenerative nodules in the liver parenchyma characterizes cirrhosis. If this condition is left untreated, it can lead to many problems, some of which can be life-threatening or even fatal. Some allopathic remedies are listed in table 1. Herbals for ayurvedic treatment are, safest choice, with no side effects. Choosing ayurveda ensures that the liver is healed at the cellular level. Natural herbs improve blood circulation and help the body rid itself of extra fat and impurities

### Ayurvedic Remedies for Liver Cirrhosis:

Ayurvedic herbs have a lot of advantages when it comes to liver detoxification and disease elimination. In Ayurveda, the liver is referred to as the Yakriti. Pitta is the dosha that is most involved in the liver's function. The majority of liver problems, including cirrhosis, are caused by worsening Pitta conditions. In Ayurveda, cirrhosis of the liver is described as Kumbha Kamala.

### Yakrit Plihantak Churna:

It is a herbal blend of particular herbs that help the liver operate better. It aids the liver in the removal of poisons. It avoids liver failure by regenerating the liver cells. The herb combination is a good treatment for all types of liver issues. It is made entirely of herbs and has no chemicals. Dose: Boil 1 tablespoon of powder in 400mL of water until the liquid is reduced to 50mL. Drink the water after straining it. The residue should be left alone. It should be done twice a day.

### Liver Detox Formula:

It comprises the best liver-stimulating herbs on the market. Toxins are converted and neutralized into safe by-products. Liver detox formula is a blend of herbs that can help restore and boost liver function. It can be taken daily to help maintain the liver. Dose: 2 capsules twice daily with warm water after meals.





Herbs Used during Ayurvedic Treatment: Herbs and supplements should never be taken by pregnant or lactating women because the liver processes practically everything you eat, people with liver illness must be extra cautious. As a result, you should use herbs with caution and only under the guidance of your physician. Some herbal recipes are available for a complete cure for liver disease(2)

## Recipe 1:

Zingiber officinale rhizome, Coriandrum sativum seeds, Solanum virginianum fruit, Solanum melongena roots, Polyalthia longifolia heartwood: 11 g each, add 0.8L of water heated down to 0.1 L on slow fire. Use it after adding rock salt and Piper longum seed powder.

## Recipe 2:

Holarrhena antidysenterica seeds, Macrotyloma uniflorum seeds, C. bonduccotyledons, Lralancifolia seeds, Terminalia chebula fruits, Ferula assafoetida gum Acorus calamus rhizome, Aristolochia indica roots, Macrotyloma uniflorum seeds and take equal amounts of rock salt. The powder is roasted ground and dissolved in hot water. Citrus aurantifolia fruit juice and small amounts of oil are added.

By: **Dr. Mukesh Patel**

## Women empowerment.....

Women empowerment is all about making women both socially and financially independent.

It is process in which women make their own independent decision.

When women are entitled to decide it gives them a sense of empowerment and more worth.

Providing proper education to a girl child is the main agenda of women empowerment.

It is also including educating working women and engaging them in job.

Empowered women can contribute to nation building by joining various sectors.

Educated men can feed a family but educated women can speed its growth....

By: **Anjali**  
4th Year

## WHY ME?

WHY ME?

IF YOU HAVE TO ASK WHY ME? WHEN YOU'RE  
FEELING REALLY BLUE,

WHEN THE WORLD HAS TURNED AGAINST YOU  
AND YOU DON'T KNOW WHAT TO DO,

WHEN IT POURS COLOSSAL RAINDROPS, AND  
THE ROAD'S A WINDING MESS,

AND YOU'RE FEELING MORE CONFUSED THAN  
YOU EVER COULD EXPRESS,

WHEN THE SADDENED SUN WON'T SHINE,  
WHEN THE STARS WILL NOT ALIGN,

WHEN YOU'D RATHER BE INSIDE YOUR BED,

THE COVERS PULLED ABOVE YOUR HEAD,

WHEN LIFE IS SOMETHING THAT YOU DREAD,

AND YOU HAVE TO ASK WHY ME? ...

THEN WHEN THE WORLD SEEMS RIGHT AND  
TRUE

By: **Badal Kushwah**  
2nd Year



# Alumni Speak

## 1



**Aman Namdev**

*At the very outset, I extend my sincere thanks to the esteemed faculty at TIT-PHARMACY, who cultivated the quest for continuous learning through a plethora of theoretical and practical training sessions. The entire staff always has showcased professionalism and extended immense help wherever required by considering students' development as a focal point. The overall environment in TIT- PHARMACY has helped me foster and hone my skills as an individual by participating in several technical and sports competitions, allowing me to portray leadership and cultivating a sense of confidence in my overall being. On the personal front, I have gained friends from colleagues into an extended family for a lifetime, going to good places in their careers. The paradigm shifts to the new normal did not deter the sheer enthusiasm of the faculty, and the training sessions happened as they used to with the same vigor during the COVID-19 times. TIT- PHARMACY is a one-stop learning destination that I would recommend to every aspiring Pharma graduate.*

## 2



**Ashish Baramate**

*TIT- PHARMACY has prepared me to face the worst or toughest course of action that I'll meet. These four years have been wonderful for me. I have made friends and connections. I have grown academically and professionally. TIT- PHARMACY will teach you to excel academically; there are no second thoughts on that subject, but it will also prepare you to face the outside world and show you the competition level you will face in the future. Due to the pandemic, 1.5 years of academics continued from home. During that time, I missed my college life a lot. Surely, I covered some part of it after the Lockdown was uplifted. I hope you all would enjoy your time in St. John, I'll like to convey a message to future students enjoy your UG life at TIT- PHARMACY, live to your fullest don't get scared about your future. You all are getting shaped knowingly – unknowingly, and surely will succeed in the future.*

# Alumni Speak

## 3

**Ashutosh Mishra**



*Most of the time, I always wanted to be on the other side of my college gate, and when the day came, I found many memories left deep inside the gates of TIT- PHARMACY, which still linger in my heart. Basking in the sun with friends, short naps during the lecture; teasing friends; last day exam preparations; small moments of success; care and love of friends and faculty. Blank viva's; birthday celebrations; taking extra supplements to increase the length of answers; waiting for cultural programs; future planning and the passion for becoming 'A Pharma Graduate' one day. All these moments ended the day we left and turned into memories that still ring a bell on our Happy Days! So, the journey can always turn into happy days, not the race. Things may end, but memories will last forever. Thank you, TIT- PHARMACY, for believing in me and making my Undergraduate program memorable. I will cherish the memories, and my relationship with you will always remain special and near to my heart. Thank you for everything, TIT- PHARMACY.*

## 4

**Jyoti Patel**



*My journey during college days was splendid, and all kudos to TIT- PHARMACY for making it a meaningful part of my life. With my four years of stay here, I would honestly say that if you want to discover your potential and be encouraged, there is no better place than TIT- PHARMACY. The dynamic management and professors here put their trust in the students and continuously supported us to reach heights. The best part about being in TIT- PHARMACY was exposure to practical knowledge through lab sessions and various competitions. This valuable exposure helped me gain a deeper understanding of the concepts learned in theory. The vast opportunities and the competitive environment have always helped to bring out the best of me. And how can I forget the friends that I have made during this precious time of my life? The TIT- PHARMACY pages of my life diary stand evergreen, and my relationship with this place will remain forever. Wholehearted thanks for everything!*

# Alumni Speak

## 5

**Ravindra Baraskar**



*I express my deepest gratitude to TIT-PHARMACY for helping me acquire the abilities that helped me pursue my Master's. I am truly grateful to my professors and peers for fostering an environment conducive to learning and development. During my undergraduate years, I received advice and guidance that inspired me and gave me the direction I needed to reach my objective. They also provide a huge platform for sports and cultural activities. My respected professors nourished and shaped me into a vibrant person, and I am deeply grateful to them. I would also like to thank my friends for helping me develop my individuality. Being a part of TIT- PHARMACY fills me with joy and pride.*

## 6

**Richa Bhatt**



*My journey to NIPER began from TIT-PHARMACY, when, during Lockdown, one of my seniors and my Professor told me to start preparing for GPAT/NIPER. I started preparing for the entrance with no clue where to start and what to study, considering that we have to cover the entire B. Pharm syllabus for the entrances. Initially, as happens with every aspirant, there were phases of doubts about oneself, getting overwhelmed with the huge syllabus and the competition. But to achieve anything in life, you always start with the smallest steps first, which ultimately takes you towards your bigger goal in life. And the most important thing I have realized is, "First, it happens in the mind and then in reality." So, practicing and maintaining positive self-talk is essential, believing that you have already achieved what you aim for. I wish you all the best in your future endeavours, and keep giving your best rest; everything will fall into place.*



## RESEARCH AND PAPERS

1. PATENT- 2020-2021

**Dr. Balkrishna Dubey** 202221015019

A Microwave Mediated Synthesis and Cytotoxic Evaluation of Novel Substituted Derivatives.

2. PATENT 2020-2021

**Dr. Deepak Kumar Basedia** 202221015019

A Microwave Mediated Synthesis and Cytotoxic Evaluation of Novel Substituted Derivatives.

3. Mr. Bhushan Korde, Anti -microbial Evaluation of twigs of Butea monosperma Lam. Drugs and cell therapies in hematology 2021.

## PAPERS PUBLICATIONS

1. **Mr. Bhushan Korde** Development and Characterization of Niosomal gel of aceclofenac for the treatment of Arthritis, International Journal of Pharmaceutical Research, 2021.

2. **Neelmani Chauhan** Anti -microbial Evaluation of twigs of Butea monosperma Lam. Turkish Online Journal of Qualitative Inquiry 2021, 8(5)2883-2894 2021.

3. **Neelmani Chauhan** Stability indicating RP-HPLC method for the estimation of drug in Marketed Formulation 3890-3904 2021.



I am specialist in medicine

I manufacture and research medicines

I am a regulator of the medicines and ensure its quality

I am counselor to the patients

I ensure safe and effective medicines

**I am a Pharmacist: a healthcare professional**





# TECHNOCRATS INSTITUTE OF TECHNOLOGY-PHARMACY



**CULTURAL  
& EVENT CELL**



**CULTURAL  
& EVENT CELL**

