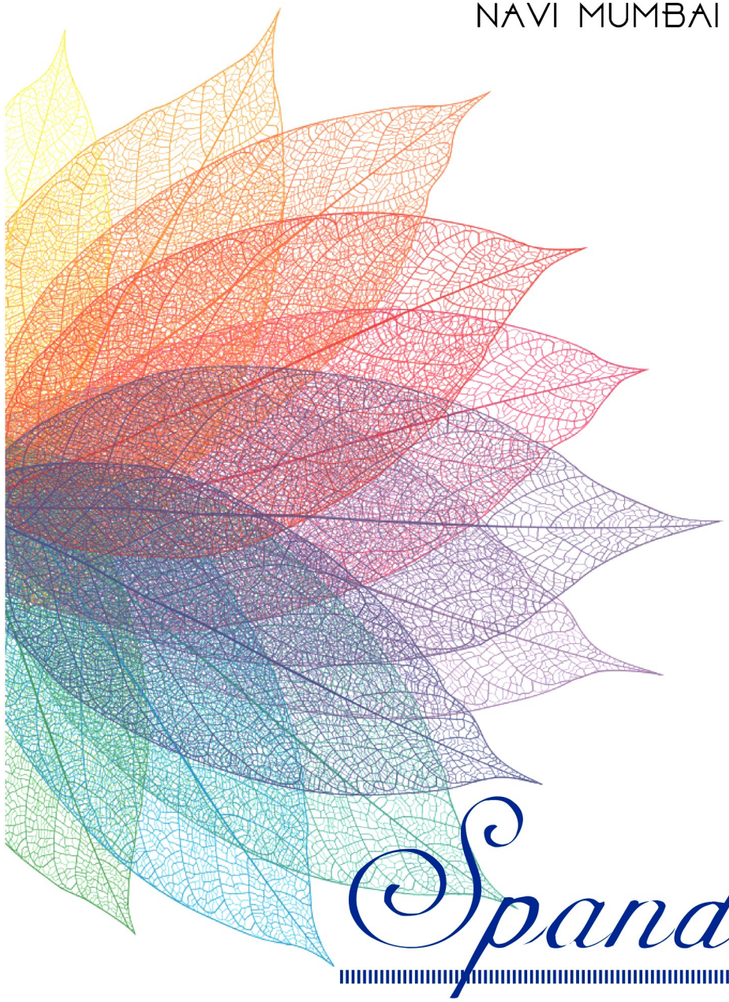
BHARATI VIDYAPEETHPOONA BHARATI VIDYAPEETH PUNE

1964-2014 envisioning BHARATI VIDYAPEETH
Founder Hon. Dr. Patangrao Kadam

BHARATI VIDYAPEETH'S COLLEGE OF PHARMACY

NAVI MUMBAI



Spandan 2017

The Pulse of Innovation

SPANDAN…
THE PULSE OF INNOVATION

BHARATI VIDYAPEETH'S COLLEGE OF PHARMACY

Sector no. 8, Belapur , Navi Mumbai – 400614
Tel: +912227571122/27572131; Fax : +912227574515

Affiliated to : University Of Mumbai
Approved by : All India Council for Technical Education, New Delhi
Recognized by : Pharmacy Council of India

VISION:

To emerge as a premier pharmacy college imparting education of high standards

MISSION:

To produce pharmacy graduates with high ethical standards, capable of providing quality services to industry, academia, research and mankind at large

To create a center of excellence for education and research in the field of pharmaceutical advances.

To provide long-standing learning opportunities in pharmaceutical sciences

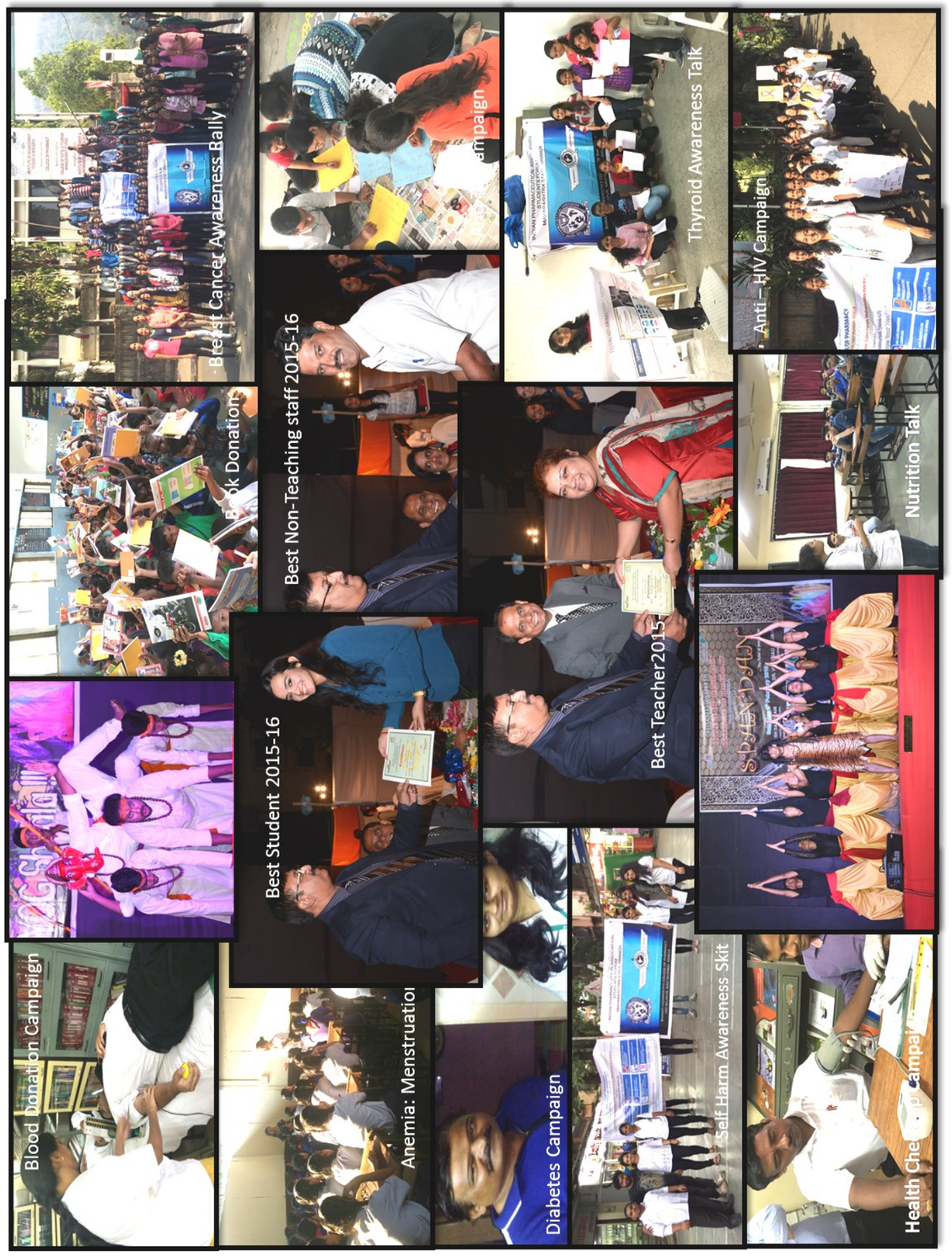
PROGRAM EDUCATIONAL OBJECTIVES (PEOs) :

Upon completion of the graduate course, graduates will be :

Technically and professionally well established in there careers.

Well equipped to serve the community by creating awareness about healthcare issues.

Well qualified to participate in resaearch and innovations.



MESSAGE

Hon'ble Dr. Patangrao Kadam
M.A., LL.B., Ph.D.
Founder : Bharati Vidyapeeth.
Chancellor: Bharati Vidyapeeth University, Pune.

I am pleased to note that our College of Pharmacy at Navi Mumbai is bringing out its annual number "SPANDAN". The Principal and his colleagues deserve compliments for sustaining the tradition of publication of its annual magazine continuously since its inception.

Bharati Vidyapeeth runs three Colleges of Pharmacy, one each in Pune, Mumbai and Sangli. All these three Colleges have established their academic reputation across the State. I am particularly proud of our College of Pharmacy at Mumbai for its splendid academic achievements during a short span. It is known as one of the best Pharmacy Colleges within the jurisdiction of Mumbai University. I am also aware that its students have given excellent performance at various University examinations by securing highest ranks. I am sure the College would maintain and strengthen further the academic tradition which it has established. SPANDAN provides opportunities to the students to express their literary and other potentials and also for showcasing the academic achievements of the College.

My best wishes to SPANDAN and to the College.

Dr. Patangrao Kadam

IDMA J B MODY BEST STUDENT AWARD WINNERS 2015-16

BHAVIN KHATRI

SHLOKA AIYER

Principal Dr. Vilasrao J. Kadam felicitating Dr C.S Ramaa on receiving the Indo Poland research grant for the Project titled " Development of novel thiazolidinediones (TZD's) with anti-leukemic potential" jointly approved by

Department of Science & Technology and Polish Ministry of Scientific Research.

MESSAGE

Prof. Dr.Shivajirao Kadam
Vice Chancellor: Bharati Vidyapeeth University, Pune.

It is gratifying to note that Bharati Vidyapeeth's College of Pharmacy, Navi Mumbai is bringing out the 13th edition of annual college magazine, "Spandan". I take pleasure to pen a few words to magazine 'SPANDAN'.

We cherish our motto of all round development of our students. The process of education involves acquisition of knowledge and skills, building up of strong character, to enhance employability of the students. "Spandan" is exclusively meant for churning out the latent literary potential of the students. It helps to portray creations, achievements and skills of our student's in academics as well as extracurricular activities, thereby sharpening their communication skill, contributing to their overall personality development. It is inclusive of the annual progress report of the college.

All the three Pharmacy colleges run by Bharati Vidyapeeth are known for their academic excellence. This Pharmacy College has created a niche of its own. The academic achievements of its students in terms of their high ranking in examinations and of the teachers in terms of their research are indeed very laudable.

I have gone through the earlier issues of this magazine and I have found them to be informative and full of creatively. I wish the present issue to be of the same or even better quality. I congratulate the Principal, faculty and the students for their sustained interest in publication of this magazine.

I wish them success.

(Prof. Dr.Shivajirao Kadam)
Vice Chancellor

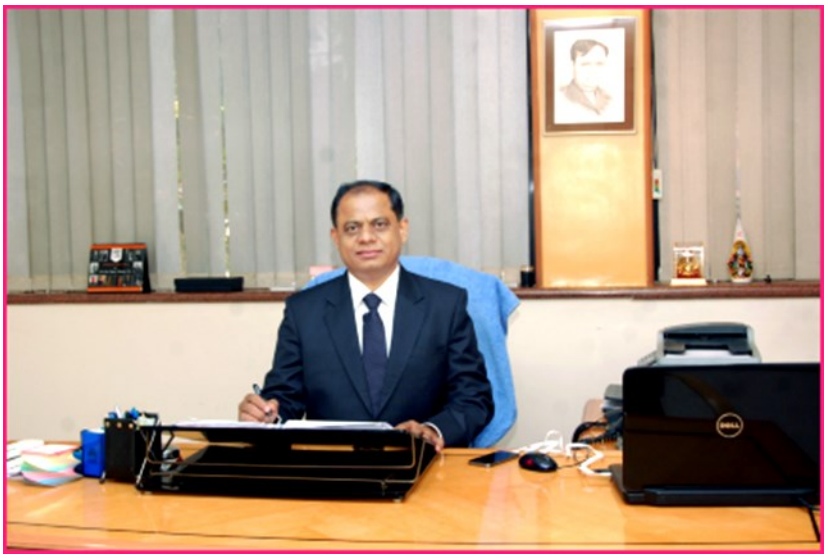
MESSAGE

Dr. Vishwajit Kadam
Secretary, Bharati Vidyapeeth, Pune

At the outset, I congratulate the Principal and his colleagues for the forthcoming issue of SPANDAN, the annual number of the College maintaining a long tradition of its publication. Our College of Pharmacy in Mumbai is one of the Colleges of Bharati Vidyapeeth of which I feel very proud mainly because of its academic and other achievements. Bharati Vidyapeeth runs three Colleges of Pharmacy with an objective of providing competent Pharmacists to man the Pharmacy profession in the country and I feel very proud to say here that a large number of the alumni of our Pharmacy Colleges have established their reputation as pharmacy professionals, clinical pharmacists, pharmacy teachers and pharmacy researchers. The field of Pharmacy offers a wide range of opportunities for research. I am happy to note that the track record of research achievements of this College is indeed laudable.

My best wishes for SPANDAN and the College.

Dr. Vishwajit Kadam
Secretary



Hon'ble Dr. Vilasrao Kadam

Principal, Bharati Vidyapeeth's College of Pharmacy, Navi Mumbai.

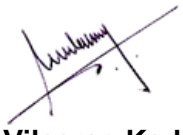
From Principal's Desk…..

On behalf of the entire Bharati Vidyapeeth's College Of Pharmacy fraternity, I am delighted to welcome you into the portals of this great institution dedicated to the cause of top-quality technical education with the motto of "Social transformation through dynamic education".

To channelize the creative aspect of the students, the college has come up with the magazine. This is not just a means for a college to communicate its thought but it also highlights the success and achievement of its pursuits. It gives an insight to ones thought and creativity through varied expressions. The college magazine exemplifies the voyage transverse and exhibits the literary skills of our students. Our students have been able to leave their imprint in the path they have walked till now and the college has carved a niche of its own in the educational hub.

Apart from academic activities, the co-curricular activities, sports, cultural and social- service activities, form important parts of the life of the students. The college is relentlessly striving to perceive and maintain academic excellence and at the same time encourages the students to participate in various co-curricular and extra-curricular activities. Through project-based learning, students get an opportunity to look at a problem from different perspectives and look for solutions; which prepares them to combat the demands of the different industries/entrepreneurships that eventually students will be required to perform in professional field.

In the global scenario, professional education in India plays a key role, since Indian professionals contribute considerably to the knowledge bank of the world. In this context, our professional training should be characterized by judicious blend of the values of our ancient wisdom and the rapidly changing concepts in technology and management. We are committed to empower youth of today with knowledge and leadership qualities that will enable them to not only stand on their own feet but be the world leaders in some field or the other.



Dr. Vilasrao Kadam

EDITORIAL COMMITTEE

SPORTS COMMITTEE

Rx WINNERS

STUDENTS COUNCIL

TEACHING STAFF

PH.D TEACHERS AND STUDENTS

NON TEACHING STAFF

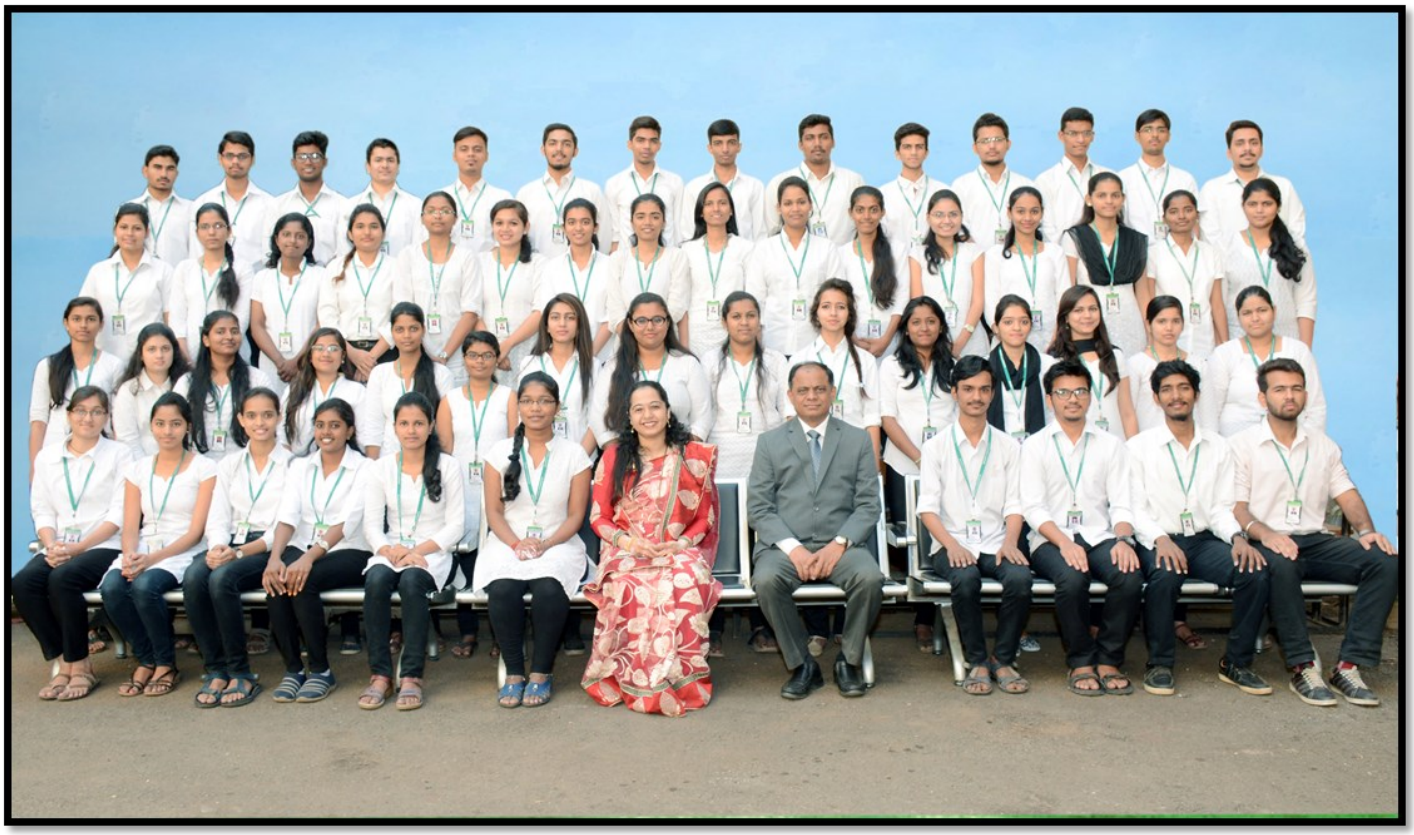
EXAM COMMITTEE

SECOND YEAR M.PHARM

FIRST YEAR M.PHARM

FINAL YEAR B.PHARM

THIRD YEAR B.PHARM



SECOND YEAR B.PHARM

FIRST YEAR B.PHARM

CULTURAL COMMITTEE

HEALTH CAMPAIGNS

IPA CELL

ALUMNI COMMITTEE

PLACEMENT COMMITTEE

RUSHI MEHTA
F.Y. B.PHARM

URVI SHETTY
S.Y. B.PHARM

VANSHIKA SAHANE
F.Y. B.PHARM

PALAK KARIA , S.Y. B.PHARM

SHUBHAM GHUGE , F.Y. B.PHARM


Rx
Voyage
BVCOP

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ARTICLES & POEMS

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SCRATCH YOUR HEAD

b. HEALTH ALERTS

c. LITERATURE

2. POEMS

DECLARATION

TITLE : **SPANDAN 2017**……*A Pulse of Innovation.*
Languages : English, Marathi and Hindi.

Period of Publication : Annual

Publisher : Dr. Vilasrao Kadam

Publisher's Address : B.V's College of Pharmacy,
Sector 8, CBD Belapur,
Navi Mumbai 400614

Nationality : Indian

Editor(s) : Dr. (Mrs.) V.M. Jadhav, Professor
Mrs. Manisha S. Karpe, Associate Professor
Mrs. Vaibhavi N. Garge, Assistant Professor
Ms. Sneha Mundada , Assistant Professor

Cover page Designed by : Mr. Prakhar Kulshrestha (S.Y. B.Pharm)

Circulation : For private circulation only.
Owner : B.V's College of Pharmacy, Navi Mumbai.

I, Principal Dr. Vilasrao Kadam, declare that the particulars given above are true to the best of my knowledge and belief.

Sd/-

Dr. Vilasrao Kadam

EDITORIAL TEAM MESSAGE

Dear Friends,

It's been 13 years since our first SPANDAN magazine was published. How it has grown! The SPANDAN magazine has been an exclusive part of Bharati Vidyapeeth's College Of Pharmacy culture ever since. Like every year we have incorporated an interesting segment in it for you, our dear magazine reader's. The interesting part begins just at very beginning of magazine, "THE COVER PAGE". This cover page, in short, is amalgamation of daedalian expedition of a pharmacist. In this edition of SPANDAN we have weaved in literature as well as scientific articles contributed by you who would enrich our knowledge and understanding. Not to forget those detailed sketches and paintings from your skilled hands which have left us spellbound! This issue wouldn't have become a success without the motivation of our teachers and talented minds like you. We apologise for excluding some of the articles due to space constraints. Hope this doesn't deter you from writing again next year.

We hope you all enjoy this alluring edition as much as we enjoyed bringing it out.

Happy Reading!!!

BHARATI VIDYAPEETH'S COLLEGE OF PHARMACY SECTOR – 8, C.B.D., NAVI MUMBAI – 400 614.

Progress Report

Duration – 1st July 2016 to 31st January 2017

I. Admission

i) B.Pharm: The following no. of students were admitted for the academic year 2016-17. F.Y.B.Pharm. students were admitted on the basis of MH-CET as per the rules laid down by the Directorate of Technical Education, Govt. of Maharashtra.

Class	No. of Students
F.Y.B.Pharm.	60
S.Y.B.Pharm.	67 (Including 17 no. of students directly admitted from D.Pharm.)
T.Y.B.Pharm.	63
Final Year B.Pharm.	58

ii) M.Pharm

The following no. of students were admitted for the academic year 2016-17, for M.Pharm. on the basis of GPAT / CET as per the rules laid down by the Directorate of Technical Education, Govt.of Maharashtra.

Branch	No. of Students
M.Pharm. in Pharmaceutics	03
M.Pharm. in Pharm.Chem	02
M.Pharm. in Pharmacology	04
M.Pharm. in Quality Assurance	06

II. Commencement of Classes

Regular classes for Sem.III, V and VII started from 29th July 2016. Regular Classes for Sem.I (First year B.Pharm.) and M.Pharm started from 10/08/2016.

III. University Results

The results of Sem.II, IV, VI and VIII examinations conducted by the University of Mumbai for year second half May 16 was declared in August 2016.

Class	No. of Students Appeared	No. of Students passed	% passing	Name of Student	%/ SGPA grade	Rank
Sem. VIII	53	42	79.24	Ms. Pade Leena Rajendra Anita	8.54	1
				Ms. Mandora Nayan Nishikant nita	7.98	2
				Mr. Yadav Varunkumar Radharama	7.86	3
Sem VI	54	44	81.48	Ms. Jadhav Sanika Suryakant	8.67	1
				Mr. Barua Harsh Deepak Asha	8.5	2
				Ms. Anjali Sreedharen Sarada	8.21	3
				Mr. Jirait Rehman Irfan Abida	8.21	3
Sem IV	69	54	78.26	Ms. Pokar Dhruvisha Jayesh Bhakti	8.73	1
				Ms. Shinde Komal Prabhakar Priya	8.42	2
				Ms. Haldankar Nidhi Nitin Neha	8.38	3
Sem II	58	43	74.13	Ms. Singh Pallavi Davinder Singh Poonam	8.17	1
				Mr. Karia Palak Pradeep Kalpana	8.50	2
				Batra Rashi Virendra Manisha	8.04	3

IV. Teaching Faculties –

Presently the college has 22 teaching faculties including Principal, 5 Professors and 7 Associate Professors. It is important to mention that among the teaching staff there are 10 doctorates and 5 have already registered for Ph.D. The following faculty joined in academic year 2016-17.

Sr. No.	Name of Faculty	Post
1	Mrs. Pooja U. Pherwani	Associate Professor in Pharmacology

For the following subjects, visiting faculties have been appointed

S.Y.B.Pharm. (Sem.-III) Computer Application, Mathematics

F.Y.B.Pharm. (Sem.-V) Environmental Sciences and Communication

V. Library Books-

Total no. 505 books costing Rs.3,56,759/- and 125 books costing Rs.2,61,467/- and e journals and journals of Rs.6,85,611/- were purchased for B.Pharm and M.Pharm respectively during this tenure.

VI. Seminars / Conferences / Publications / Presentations –

A. List of paper publication

1. INTERNATIONAL

Serial No.	Article
1.	Kadam , V. ;Patel,V.; Karpe ,M.; Kadam ,V. Design, Development and Evaluation of Celecoxib-Loaded Microsponge-Based Topical Gel Formulation. Applied Clinical Research, Clinical Trials & Regulatory Affairs. 3, 44-55,(2016). (ISSN NO:2213-476X).
2.	Karpe, M.; Surve, D.; Jadhav, K.; Kadam, V. Development and Evaluation of Novel Tabletted Microspheres for Controlled Release of Glimepiride.Current Drug Therapy 11(1),47 -57, (2016) (ISSN NO:1574 -8855).
3.	Jagdale, D., Bhairi, S. A Critical Review on Obsessive-Compulsive Disorder. International Journal of Universal Pharmacy and Bioscience, 5(4), 18-24 (2016). [ISSN: 2319-8141]
4.	Jagdale, D., Bhairi, S. Triple Negative Breast Cancer: An Overview. International Journal of Pharma and Bioscience, 7(3), 100-110 (2016). [ISSN: 0975-6299]
5.	Jagdale, D., Mondal, N. Antimicrobial Peptides: A Review on its Types, Mechanism of Action, Synthesis and Therapeutic Applications. International Journal of Pharmaceutical Research Scholars, 5(2), 72-81(2016). [ISSN: 2277-7873]
6.	Umesh Bhanushali, Saranya Rajendran, Keerthana Sarma, Pushkar Kulkarni, Kiranam Chatti, Suvro Chatterjee, C.S. Ramaa. “5-Benzylidene-2,4-thiazolidenedione derivatives: Design, synthesis and evaluation as inhibitors of angiogenesis targeting VEGR-2”. Bioorg. Chem. 2016 Aug;67:139-47.

7.	Umesh Bhanushali, Samidha Kalekar-Joshi, Renuka Kulkarni-Munshi, Swapna Yellanki, Raghavender Medishetty, Pushkar Kulkarni and Ramaa Subramanian Chelakara. Design, Synthesis and Evaluation of 5-pyridin-4-yl-2-thioxo-[1,3,4]oxadiazol-3-yl Derivatives as Anti-angiogenic Agents Targeting VEGFR-2. Anti-Cancer Agents in Medicinal Chemistry, 17(1): 67-74. (International/IF 2.72/Bentham
8.	Vij, M., Garse, H., Kumar, P., Dand, N. Current and future trends of cyclodextrin complexation; a superior technique for improving oral bioavailability of poorly soluble drugs. International Journal Of Pharmaceutical Research And Bio-Science. 5(3), 236 – 265 (2016) (ISSN: 2277-8713)
9.	Vineeta Khanvilkar *, Nishigandha Chalak, HPTLC Method Development and Validation for Standardisation of Ayurvedic Formulultion : Mahashankh Vati, 2016; Vol. 7(7): 3012-3020.
10	Garge,V., Waikul, K. Elastography : Techniques and Applications, World journal of pharmacy and pharmaceutical sciences, 5(3), (2016), [ISSN : 2278 -4357]
11	Thorat, R., Joshi, Y. Evaluation of The Herb-Drug Interaction In Chick Embryo For Anti-Inflammatory Activity, Indo American Journal of Pharmaceutical Research, volume 6, Issue 6, 5938 – 5943 (2016),[ISSN : 2231 – 6876]
12	Garge, V.*, Waikul, K. Nikam, S. Antibacterial Activity of Gardenia gummifera Linn. Extracts, International Journal for Pharmaceutical Research Scholars,Volume 5, Issue 2, 316-320 (2016), [ISSN: 2277 – 7873]
13	Surve,D.; Mohite,P.; Karpe,M.; Kadam,V. Molecularly Imprinted Polymers: Novel Discovery for Drug Delivery.Current drug delivery.13(5),632-645,(2016).(ISSN NO:1567-2018).
14	Joshi, H., Ramaa, CS. Simple and rapid HPLC method determination of CSR1 & CSR2, new heterocyclic thiazolidinedione derivatives, in rat plasma. International Journal of Pharmacy and Pharmaceutical Sciences. International journal of pharmacy and pharmaceutical science, 8(8), 273-276 (2016). [ISSN: 0975 - 1491]
15	Joshi, H., Marulkar, K., Gota, V., Ramaa, CS. Hydroxy Cinnamic Acid Derivatives as Partial PPARγ Agonists: In silico Studies, Synthesis and Biological Characterization Against Chronic Myeloid Leukemia Cell Line (K562). Anticancer agents in Medicinal Chemistry, 16, (2016). [ISSN: 1875-5992]
16	Karpe, M., Kadam, V., Kadam,V**.** HPTLC method development and validation of Olmesartan Medoxomil in bulk and marketed formulation Indo American journal of pharmaceutical Research. 6(3),4883-4890,(2016) (ISSN NO: 2231-6876).
17	Karpe ,M.;Kadam ,V.;Jadhav, K.; Kadam ,V. Design, Development and Characterization of Liquid Oral Sustained Release *in situ* Gel Formulation of Glimepiride. Applied Clinical Research, Clinical Trials & Regulatory Affairs. 3(2),117-126,(2016).(ISSN NO:2213- 476X).
18	Karpe, M., Jadhav, N .,Bagade,S., Kadam,V .Formulation and evaluation of topical microsponge based gel of Bifonazole. Indo American journal of pharmaceutical Research 6(04), 5307 – 5319,(2016) (ISSN NO: 2231-6876).
19	Kadam, V;S Bagde, S.; Karpe,M.; Kadam,V .A Comprehensive Overview on Biosimilars. Current Protein & Peptide Science.17(8),756-781, (2016).(ISSN NO : **1389-2037).**

20	Karpe,M.,Awasare,S.,Upadhye,T.,Pawar,Y.,Damle,A., Rajan,M., Jadhav,K., Kadam,V., In vitro dissolution and in vivo gamma scintigraphic evaluation of gastro retentive Metformin tablets. World Journal of Pharmaceutical Research. 5 (6)1317-1325,(2016).(ISSNNO:2277-7105).
21	Godiyal Shilpa , Nihalani Girish , Qureshi Rizwan , Jadhav Kisan , Kadam Vilasrao Development and validation of HPTLC method for estimation of Valsartan in bulk and marketed formulation .Indo American Journal of Pharmaceutical Research.2016:6(08),6478-84.
22	Qureshi Rizwan, Godiyal Shilpa, Jadhav Kisan , Kadam Vilasrao . Wonders of versatile spherulites" .Indo American Journal of Pharmaceutical Research.2016:6(12), 7140-44.
23	DS Duttagupta, VM Jadhav, VJ Kadam, Simultaneous Estimation of Glycyrrhizin and Catechin from Marketed Herbal Formulations by Hptlc. World Journal of Pharmacy and Pharmaceutical Sciences, 5(4), 1098-1110, ISSN 2278 – 4357 SJIF Impact Factor 6.041
24	Suchita V. Ghumre *, Varsha M. Jadhav and Vilasrao J. Kadam, "High Pressure Liquid Chromatographic Method Development and Validation For Estimation Of Acyclovir in Bulk and Marketed Formulation", International journal of Pharmaceutical sciences and research, vol. 7(5) May 2016, p 2194-2200. Impact Factor - 1.79
25	Dewal L. Kondalwar* , Suchita V. Ghumre, Varsha M.Jadhav, Vilasrao J.Kadam. "A Review- Challenges faced by an analyst for developing method for analysis and standardisation of drug",International journal of analytical research, vol. 5(1) Jan-Mar 2016, p 49-55. SJIF (Impact Factor) - 3.056
26	Harsh Barua, Nidhi Bhagat and Dr. (Mrs.) M. P. Toraskar "Study Of Binding Interactions Of Human Carbonic Anhydrase XII" in Int J Curr Pharm Res. Volume 9, Issue 1, Jan 2017, 118 -125. Research Article [ISSN 0975 – 7066]
27	Jadhav, V*., Dhande, S., Kadam, V. Cosmetics side effects. World Journal of Pharmacy and Pharmaceutical Sciences, 6(1), 327-343.
28	Khedkar, P*., Dhande, S., Kadam, V. Molecular cloning from DNA to drug discovery and development. World Journal of Pharmacy and Pharmaceutical Sciences, 6(1), 344-352.
29	DS Duttagupta, VM Jadhav, VJ Kadam, Simultaneous Estimation of Glycyrrhizin and Catechin from Marketed Herbal Formulations by Hptlc. World Journal of Pharmacy and Pharmaceutical Sciences, 5(4), 1098-1110, ISSN 2278 – 4357 SJIF Impact Factor 6.041
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2. NATIONAL

Serial No.	Article
1.	Parekh Khushbu and JadhavA.P.*(2016), Development and Validation of stability Indicating RP-HPLC Method for the Simultaneous Determination of Berberine and Curcumin in an Ayurvedic Formulation, Indian Drugs,53(08), 48-52.
2.	Mali S. D. and Jadhav A. P.* (2016), Extraction and Isolation of Embelin using Flash Chromatography, Indian Drugs, 53 (06), 80-81.
3.	Karthik Sankar and Dr. Aruna P. Jadhav* (2017), Nosodes and Sarcodes, Indian Journal Of Traditional Knowledge, Vol. 16(1), 158-163.
4.	Dhande S. R.*, Bhutkar S. P. and Mahadik J. V. (2017), Effect of Haritaki churna on cardioprotective action of Arjuna in isoproterenol induced myocardial infarction in rats. Indian drugs. 54 (01), 41-48.
5.	Patel Nafsin and Jadhav A. P.* (2016), Extraction and Isolation of Nuciferine from Lotus Leaves using Flash Chromatography, Indian Drugs, 54 (1), 55-57.
6.	Patel Nafsin and Jadhav A. P.* (2016), Development and Validation of HPLC Method for Quantitative Estimation of Nuciferine from Lotus Leaves, Indian Drugs, 53(12), 37-41.
7.	Dhamankar R. S. and Jadhav A. P.* (2016), Evaluation of Ayurvedic Formulation: Shaddharana Churna, Indian Journal of Natural Products and Resources, Vol. 7 (4), December 2016, 301-309.

Book chapter

1. Pednekar Priti, Godiyal Shilpa, **K.R. Jadhav**; V.J. Kadam "MesoporoSilica Nanoparticles: A Promising Multifunctional Drug Delivery System " accepted for publication in Nanostructures for Cancer Therapy (eds)Grumezescu, Alexandru Mihai,Ficai, Anton, Elsevier publication.
2. Dr.C.S. Ramaa was a Guest Editor for a special issue on "Drug Reprofiling: An Alternate Path to Drug Discovery". Current. Topics Med. Chem. 16 (19), 2016, 2067-2068. (International/IF 2.90/Bentham).

3. Workshop, seminar, conferences Attended

Name of Faculty	Workshop/ Seminar/ conference
Dr. (Mrs.) M. P. Toraskar, Dr. Aruna Jadhav, Ms. Shrutika Patil, Ms. Sneha Mundada, Abhay Shirode, Nilkamal Waghmare, Dhiraj Nikam	1.One day seminar on 'Empowering knowledge' arranged by Elsevier Connect Seminar (30th Nov. 2016, at Courtyard By Marriott, J. B. Nagar, Andheri (East), Mumbai – 400 059
Mrs.Vineeta V. Khanvilkar	2.Attended NCIP2017, 2nd National Conference of Institute of Pharmacy Emerging Trends in Drug Discovery, Development and Molecular Targets for Cancer Research, Nirma University, January 24-25, 2017 as a Session Speaker, Title: Clinically Relevant Herb-Drug Interactions in Oncology: Case Studies to Analysis

4. QIP attended

Name of faculty	QIP
Ms.Vineeta V. Khanvilkar, Abhay Shirode	1. One week staff development program ""Applications of advance analytical tools and technology in pharmasciences in SPPSPTM, SVKM's NMIMS Vile Parle, Mumbai in 26th-31st Aug 2016

B. List of paper Presentations

Serial No.	Présentations
1	Chauhan, R., Dand, N. Nanobiomaterials for bionic eye: Vision of the future at One day national seminar and poster competition on Nanotechnology: New perspective in drug delivery systems. - THIRD PRIZE.
2	Harsh Barua, Nidhi Bhagat and Dr. (Mrs.) M. P. Toraskar "Study Of Binding Interactions of Substitued Phenyl Sulfonyl Hydrazide Derivatices with Human Carbonic Anhydrase XII" in National level poster presentation and competition at Ideal college , Kalyan, Mumbai on 2nd September 2016.- THIRD PRIZE.
3	Tanvi Wani, Chetan Pawar and Dr. (Mrs.) M. P. Toraskar. Won First Prize in Chem-in-motion for "CHEMTASTIC 2016, at VES college of Pharmacy, Chembur(E), Mumbai on Saturday, 23rd July 2016.
4	Khedkar, P., Bhutkar S., Dhande, S. Study of pharmacokinetic interaction of arjuna with haritaki churna, poster presentation at 2-day National symposium on Current scenario of pharmacological experimentation and interpretation at prin. KMK College of Pharmacy, Mumbai September 2016.
5	Jadhav, V., Kaikini, A., Dhande, S. Evaluation of anti-hyperlipidemic activity of herb, poster presentation at 2-day National symposium on Current scenario of pharmacological experimentation and interpretation One day national seminar on Diabetes: Bench to Bedside, 27th January 2017.September 2016.

6	Aditya Naik, Rashi Batra, Shrutika Patil. ICMR sponsored national seminar on " Recent advances in cancer therapeutics and its molecular targets, Oncothermia: advances in treatment of malignant glioma. KGRDCP&RI, Karjat on 14th Jan 2017.
7	Sukanya S. Chavan, Deepthi V. Tatiraju, Varsha M. Jadhav, Vilasrao J. Kadam Formulation and Standardisation of Topical Herbal Gel for Painful Diabetic Neuropathy. One day national seminar on Diabetes: Bench to Bedside, Prin. KMK College of Pharmacy 27th January 2017.

VII. <u>Affiliation and Approvals</u> – (2016-17**)**

☑ **B. PHARM.**

Sr. No.	Name of the Body	Approval Up to	Remark
1.	All India Council for Technical Education, New Delhi	2016-17	Approval granted up to 2016-17
2.	Pharmacy Council of India, New Delhi	2018-2019	Approval granted up to 2018-19
3.	University of Mumbai	Permanent	Permanent affiliation granted

☑ **M. PHARM. (PHARMACEUTICS /Q.A. /PHARM. CHEM./PHARMACOLOGY)**

Sr. No.	Name of the Body	Approval Up to	Remark
1.	All India Council for Technical Education, New Delhi	2016-2017	Approval granted upto 2016-17
2.	University of Mumbai	Permanent	Permanent affiliation granted

☑ **PH. D. (PHARMACEUTICS /PHARM.CHEM./)**

Sr. No.	Name of the Body	Approval Up to	Remark
1.	University of Mumbai	2017-18	-

VIII. Teaching Day Celebration :-

Principal felicitated teachers on 5th Sept.2016, on the occasion of Teachers Day.

IX. Guest Lectures :-

The following distinguished persons delivered guest lecture at Bharati Vidyapeeth's College of Pharmacy during this period.

Sr. No	Name of the faculty	Organization & Position	Date of Lecture	Duration of lectures (hrs)	Topic covered	Target Audience
1	Dr. Hemant Deshpande	Managing Partner (Pollux)	8/7/16	1	Bridging gap between Industry and Academia" Enhancing Industry Readiness	T.Y and Final Year B. Pharm
2	Mr. Urmil Gala	Center Director GEEBEE Education	2/08/2016	1	Overseas Education	T. Y .B.Pharm
3	Ms. Chitra	Institute of Technology and Management (ITM) Navi Mumbai	3/9/16	2	Personality Devlopment	Final year B.Pharm
4	Mr. Sankalp Trivedi	Managing Director, Enhance Skills	3/9/16	1	Personal Skill development	Final Year. B.Pharm

5	Mr. Uday Tiwari	Director, Corporate Health Care Alliance	3/9/16	1	Carrer opportunities for Hospital Pharmacy	T.Y. B.Pharm
6	Ms. Rajashree Mokashi	Chief Operating Officer, Stemade Biotech Pvt.Ltd	2/12/16	1	Stem Cell Based Research	Faculty Of BVCOP
7	Dr. R. P. Gude	Retired Scientist and Visiting Professor, Actrec	2/12/16	1	Cell lined based studies and lab set up for studies.	Faculty Of BVCOP
8	Mr. Sanket Bhatia	Regional Manager, Endeavour	2/12/16	1	Preparation for study abroad GRE, TOFFEL	T.Y. B. Pharm
9	Dr. R. K. Maheshwari	Professor, SGSITS Indore	10/12/16	1	Enhancement of solubility of water insoluble drugs with solid solubilizers	Final Year. B. Pharm
10	Gayatri Shardul	Senior Officer, Cytel	22/12/2016	1	Career in SAS/PV	Final Year. B.Pharm
11	Mr.Sanket Bhatia	Regional Manager Endevour Careers	02/01/2017	2	Preparation of GRE Examinations	F.Y and S.Y B.pharm
12	MrRohan Gawande	Assistant professor ARMIET BIZ School	03/02/2017	1	MBA Health Care Administration	Final Year and T.Y. B.Pharm students

X. <u>Students Activities</u> –

Student council was formed for year 2016-17 consisting of following members,

Sr. No.	Post	Name of the Members
1.	Cultural Committee I/C	Dr. M. P. Toraskar
		Ms. S. J. Mundada

2.	Sports Committee I/C	Mr. Sandeep R. Nikam
		Mr. Nilkamal K. Waghmare
		Dr. Neha Dand
3.	General Secretary	Ms. Rupali Madapura
4.	Cultural Secretary	Ms. Parimalasree Chellappa
5.	Sports Secretary	Mr Rehman Jirait
6.	Associate Cultural Secretary	Ms. Apurva Dusane
7.	Associate Sports Secretary	Mr. Rohang Shukla
8.	Treasurer	Mr. Bhavya Shah
9.	Bv's Katta Head	Ms. Sapana Patil
10.	Final Year CR	Mr. Shaan Qureshi
11.	Third Year CR	Mr. Bhavya Shah
12.	Second Year CR	Ms. Pooja Jaiswal
13.	First Year CR	Mr. Sushant Mahajan
14	Final Year (CCR)	Ms. Nikita Mohite
		Ms. Gauri Ghag
	Third Year(CCR)	Ms. Shivani Modhave
		Ms. Nidhi Haldankar
	Second Year(CCR)	Ms. Palak Karia
		Ms. Rutuja Katkar
15	Final Year (CSR)	Ms. Manisha Dudhal Mr. Aniket Londhe
	Third Year (CSR)	Ms. Shamika Shirke Mr. Shubham Auti
	Second Year (CSR)	Ms. Shalaka Patankar Mr. Vighnesh Konar
	First Year (CSR)	Ms. Chaitali Garach Mr. Indrajeet Misal

a. Total 52 students appeared for General Knowledge Test conducted by Bharati Vidyapeeth's, Pune on 5th January 2017.

b. Rx Voyage 2017 festival organized by I.P.A., MSB was held on 5th – 14th January 2017. Lots of prizes were bagged by our College for different events such as cultural events, techfest and art contest.

Technical Paper/Poster Presentation 2016-2017

SR. NO	NAME OF STUDENTS	EVENT	TOPIC TITLE	ORGANIZED BY	DATE	AWARDS
1	Chetan Pawar and Tanvi Wani	Chemtastic	Chem –in-motion	VES College of Pharmacy, Chembur	23/07/2016	1st Place
2	❖ Gauri Ghag ❖ Durve Sanjana	National Level Poster Presentation	Poster Presentation	Ideal College of Pharmacy and Research, Kalyan	02/09/2016	1st Place
	❖ Nidhi Bhagat ❖ Harsh Barua					3rd Place
	The other participants for Poster Presentation at Ideal College of Pharmacy and Research, Kalyan on 02/09/2016 were Aniket Londhe, Rupali Madapura, Sanika Jadhav, Kirtika Chatri, Rajanigandha Chavan, Nikita Mohite, Shaan Qureshi, Komal Dalvi, Sonali Bhagat, Tanvi Rane, Santosh Samal, Rehman Jirait, Bhagyashree Sakpal, Revathy Varma					
3	Harsh Barua, Jignesh Panchal, Santosh Samal	Rx Tech fest Oral Paper Presentation	Novel solubilization techniques for analysis of solid dosage form	IPA Student forum,Bombay College of Pharmacy, Kalina, Santacruz	07/01/2017	1st Place
4	Tanvi Rane,Parimala sree Chellapa, Rupali Madapura	Rx Tech fest Oral Paper Presentation	Use of chromatographic techniques for determination of herbal drug interaction	IPA Student forum , Bombay College of Pharmacy, Kalina, Santacruz	07/01/2017	2nd Place

Event	Name of Participant	Rank
MEHENDI	**Third Year** 1. Nita More	2nd
REPEAT-O-MINUTE	**Final Year** 1. Parimalasree Chellappa	2nd
SUDOKU	**Second Year** 1. Palak Karia	2nd
PHARMACY'S GOT TALENT	**Third Year** 1. Karishma Singh	
PARODY	**First Year** 2. Saurabh Parkale 3. Amey Kajari 4. Bijal Vanjara	1st
	Second Year 5. Vignesh Konar **6.** Suraj Mane	
	Third Year 7. Rohang Shukla	
	Final Year 8. Jignesh Panchal 9. Harsh Barua	
AD MAD	**First Year** 1. Saurabh Parkale 2. Amey Kajari 3. Bijal Vanjara	1st
	Second Year 4. Akshay Nerkar	
	Third Year 5. Rohang Shukla 6. Apurva Dusane	
	Final Year 7. Jignesh Panchal 8. Santosh Samal 9. Rehman Jirait 10. Aniket Londe 11. Bhagyashree Sakpal	
	Second Year 1. Akshay Nerkar	
	Third Year 2. Hemant Ahire 3. Aniket Jhadav	
	Final Year 4. Jignesh Panchal 5. Tanvi Rane	

	6. Aniket Londe 7. Santosh Samal	
SCAVENGER HUNT	**Third Year** 1. Bhavya Shah	3rd
	Final Year 2. Sanjana Durve 3. Bhagyashree Sakpal 4. Chetan Pawar 5. Parimalasree Chellappa	
	Third Year 1. Beena Gaikwad 2. Jyoti Pawar 3. Shwetali Rane 4. Shubhechha Bansod	

Rx Sports winner 2017

Sr. No.	Game	Name of the student	Class	Place
1.	Rink Football	Rehman Jirait Amey Kajari Siddhesh Garg Indrajeet Misal Rohang Shukla Atharva Bhanushali	Final Y. B. Pharm F. Y. B. Pharm F. Y. B. Pharm F. Y. B. Pharm T. Y. B. Pharm S. Y. B. Pharm	3rd
2.	Pool Singles (Girls)	Revathy Verma	Final Y. B. Pharm	1st
3.	Pool Singles (Girls)	Tanvi Rane	Final Y. B. Pharm	2nd
4.	Pool Singles (Girls)	Nikita Mohite	Final Y. B. Pharm	3rd
5.	Pool Doubles (Girls)	Nikita Mohite and Gauri Ghag	Final Y. B. Pharm	1st
6.	Fifa	Rehman Jirait	Final Y. B. Pharm	2nd
7.	Chess	MrunaliniNarvekar	T. Y. B. Pharm	3rd
8.	Throwball	Tanvi Rane Parimalasree Chellappa Rupali Madapura Manisha Dudhal Amruta Nandgawle Nilam Dere Komal Jarag Kalyani Sharma Ritu Thombare Shruti Jagtap	Final Y. B. Pharm Final Y. B. Pharm Final Y. B. Pharm Final Y. B. Pharm T. Y. B. Pharm T. Y. B. Pharm S. Y. B. Pharm S. Y. B. Pharm F. Y. B. Pharm F. Y. B. Pharm	3rd

C. INTER COLLEGE COMPETITIONS

College secured 3rd place as "Best College" award among 27 Colleges in Rx Voyage 2017 festival organized by I.P.A., MSB. College also secured 3rd place in sports activities and in **HIV** Health Campaign.

XI. Equipment Purchase –

The equipment, chemical & glassware's and furniture worth Rs 452971/- have been ordered during this period.

XI. Research Grants –

A. Dr C.S Ramaa received the Indo Poland research grant for the Project titled " Development of novel thiazolidinediones (TZD's) with anti-leukemic potential" jointly approved by Department of Science & Technology and Polish Ministry of Scientific Research.

B. The following faculties received Research Grant from University of Mumbai for their research proposals.

Academic year	Name of the faculty member (project investigator)	Amount received Rs.
2016-17	Dr. M.P. Toraskar	30,000/-
	Mrs Vaibhavi N.Garge	25,000/-
	Mr. Nilkamal K.Waghmare	25,000/
	Mr. Abhay R.Shirode	25,000/

XII. College Activities:

i. College has been selected as "ARC centre" for online receipt of CAP admission form / option form for the admission to F.Y. degree course in Pharmacy for the year by Directorate of Technical Education.

ii. A Welcome Function for F.Y.B.Pharm students and F.Y.M Pharm was organized on 10/08/2016. All parents of students of F.Y. B.Pharm /M. Pharm attended the same

iii. The BVCOP Training and Placement Cell organized a one day seminar on "**Pharmacy Career Guidance: Pharma and Beyond...**" in view of creating awareness about the various job profiles among the Third Year B.Pharmacy and Final Year B. Pharmacy students, held on Saturday, 20th August 2016 Eminent speakers from Industry specialized in their respective job domain addressed the students.

iv. Lecture on **"Personality Development"** was conducted for Final Year B. Pharmacy students by ITM, Vashi on 3rd September, 2016.

v. College has organized A step towards healthier society: education Campaign on 7/10/2016 in association with IPA student forum at Krantiveer Vasudev Balvant Fadke Vidyalaya Sector 8b, CBD Belapur. Total 50 students from the college participated in the activity.

vi. College has organized **Anti HIV rally** of students on 1st December 2016 as a part of Aids day. Our students actively participated in the same.

vii. College has organized an **Anti TB rally** of students on 2nd December 2016. More than 100 people from different locations of CBD were counselled and surveyed by our trained student volunteers.

viii. **One Day Seminar on** "RESEARCH METHODOLOGY" *with a theme* **"Channelize Your Research- From Lab to Public Domain**" was *held on Saturday,*10th December 2016. M. Pharm research students and teaching faculty from our college as well as from different colleges of Mumbai University have participated in the seminar.

ix. The College Women Development Cell (CWDC) along with the final year girl students of BVCOP conducted an awareness campaign on **"Hygiene And Menstruation Issues"** for the adolescent girl students of Bharati Vidyapeeth's School for English as well as Marathi medium standards VI to VIII.

x. **"INSPIRE – 2016"** an initiative by BVCOP Entrepreneurship Development Cell was organized for third year B.Pharm, final year B.Pharm and M.Pharm students with of view of inspiring budding pharmacist for starting their own pharma manufacturing setup and making them aware about different technical and legal aspects about it. It was organized on Saturday, 17th December 2016.

xi. The College Organized A One Day Seminar under BVSEMICON ***"Flowcat***

Synthochem " "Envisioning The Future of Drug Discovery" on *Tuesday, 17th January 2017* . M. Pharm research students and teaching faculty from our college as well as from different colleges of Mumbai University have participated in the seminar.

xii. The College Women Development Cell (CWDC) organized an **"Anaemia Awareness Campaign"** in collabration with SHARP (NGO), New Delhi., on 1st Feb 2017, 197 volunteers were present.

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SOL-GEL CHEMISTRY

MS. PRANALIB. BHORE.
(STUDENT OF SECOND YEAR M. PHARMACY, Q. A. DEPARTMENT)
MRS VINEETAV. KHANVILKAR.
(ASSISTANT PROFESSOR IN

The versatility of sol-gel chemistry enables us to generate a wide range of silica and organosilica materials with controlled structure, composition, morphology and porosity. These materials hosting and recognition properties, as well as their wide-open structures containing many easily accessible active sites, make them particularly attractive for analytical purposes.

The extremely rich chemistry of sol-gel-derived silica-based porous solids has propelled this family of materials to a prominent place in various areas of research. This increased prominence is due to the versatility of the (usually) low-temperature sol-gel processing, which combines the control of composition and microstructure at the molecular level with the ability to shape material in bulk, powder, fiber, monolith, and thin-film forms. The popularity of these materials can be attributed, in part, to three significant factors:

(a) The ability to generate an almost infinite number of organic-inorganic hybrids that display both the mechanical stability of a rigid inorganic framework and the particular reactivity (e.g., selective recognition, optical properties, electrochemical activity) of the organic component;

(b) The fact that sol-gel-derived materials can be used to encapsulate biomolecules (e.g., enzymes, antibodies, or other proteins) in a functional state; and

(c) The discovery of the supramolecular template approach, which can generate ordered mesostructures over long length scales.

Sol-gel synthesis: an old process for novel materials

Sol-gel processing of silica is an intrinsically simple process. It usually involves hydrolysis of silicon alkoxide precursors [e.g., tetramethyoxysilane (TMOS) or tetraethoxysilane (TEOS)] and catalytic polycondensation to produce a macromolecular network of siloxane bonds. Less common aqueous silicates can also be used as precursors. Chemical reagents for the preparation of sol-gel materials normally include at least one precursor, a solvent to dissolve the precursor(s), a catalyst (acid, base, or ions), and water. Although gel formation from alkoxides has been performed for more than 150 years, with the first patent registered in the late 1930s, only in recent decades we have seen a revolution in the area of sol-gel-derived materials, with regard to

both our fundamental understanding of their molecular-scale properties and their applications to analytical chemistry. The structure of evolving silicates is a consequence of the successive polymerization, gelation, aging, drying, and heating steps.

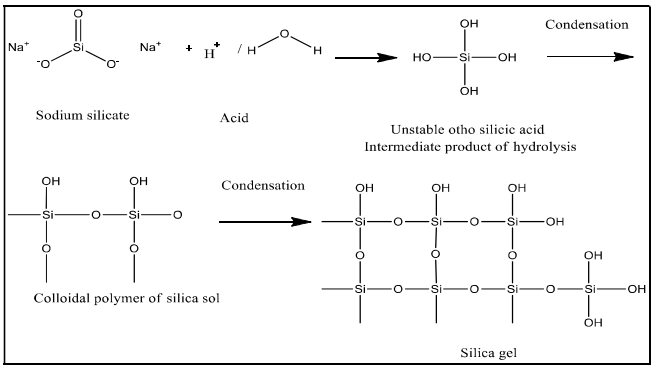

Figure 1, Reaction showing synthesis of silica gel by sol-gel process.

Accurate tuning of the experimental parameters affecting these steps allows control over the microstructure of the final materials, from wide-open aerogels and highly porous monoliths or particles to less porous xerogels and fully dried silica thin films. A significant breakthrough in porosity control has been achieved with the emergence of ordered mesoporous silicates prepared by the surfactant template route, giving rise to novel materials that possess large uniform pore sizes (1.5–10 nm), highly ordered nanochannels, large surface areas (>1000 m2g-1), and tunable liquid crystal–like structures. Even larger pores (>10 nm) have been introduced into the silicate matrix via colloidal crystal templating, whereby the silica framework condenses around ordered arrangements of latex spheres ranging in diameter from 50 to 1000 nm. In both cases, the templates are removed via calcination or chemical treatments, leaving an array of ordered pores. More recent advances in this field rely on the creation of materials with hierarchical porosity, which are of special interest for chromatographic separations and chemical sensing. Another attractive feature of the sol-gel process is that the materials can be shaped at room temperature, for example by casting bulk gels in precision molds; spinning fibers; or dip-coating, spin-coating, or electrode positing thin films, which may be useful in designing analytical sensing devices of various geometries and sizes. Sol-gel chemistry is also a versatile tool for the synthesis of organic-inorganic hybrid materials with advanced properties that are often difficult to achieve either from totally inorganic or from totally organic materials. Hybrids of class I (weak interaction between organic and inorganic constituents) are obtained by impregnation, doping, or physical entrapment of organic, bioorganic, or organometallic species within sol-gel matrices. Hybrids of class II (organic component strongly attached to the siloxane network via covalent bonds) are typically prepared via co-condensation of alkoxysilane and organosilane reagents. The latter approach benefits from a wide variety of commercially available organoalkoxysilanes, which enable the durable immobilization of the organo-functional groups; hybrids of class I, however, may suffer from leaching problems. An overlap between organic chemistry and the chemistry of ceramic materials has thus led to the development of numerous novel materials with controlled characteristics and tailor-made properties, including, for instance, polysiloxane-immobilized ligands, dye-containing solgels, mesoporous organic-inorganic hybrids, and silica gels encapsulating biomolecules. Among the most recent advances derived from the design flexibility of the sol-gel process in promoting host-guest interactions are molecularly imprinted xerogels, chiral sol-gel materials, and the successful immobilization of poorly stable membrane-bound proteins by sol-gel entrapment. The past decade has seen intense activity in the development of sol-gel materials and in their applications.

Conclusion:

The field of sol-gel chemistry has become an exciting area of research, with many opportunities in the fields of chemistry and material science. Today one can find numerous commercial products prepared using sol-gel processes including monolithic silica columns for chromatography [Merck(tm), Phenomenex(tm)], enzymes immobilized in sol-gels [Fluka(tm)], and mesoporous silica and organosilica nanoparticles [Claytec, Inc.(tm)]. Sol-gel chemistry provides a relatively simple, flexible means to prepare a host for chemically reactive groups or species, chromatographic supports for efficient separations of complex mixtures on the traditional scale and on the microscale, and porous materials that can selectively complex an analyte in solution for removal and/or remediation. This review has touched on a subset of what those in the broad field of sol-gel chemistry have accomplished.

TRANSFERSOMES: ASPECTS IN TRANSDERMAL DRUG DELIVERY SYSTEM

-RISHIKESH KSHIRSAGAR , S.Y.M.PHARM

INTRODUCTION

Transfersomes isa recent novel drug delivery system and which are special types of liposomes, consisting of phosphatidylcholine and an edge activator. This system also takes advantage of phospholipids vesicles as transdermal drug carrier. They are self-optimized aggregates, with ultra flexible membrane, which deliver the drug reproducibly either into or through the skin. The system delivers the drug with high efficiency depending on the choice of administration or application. This system has several order magnitude of elasticity and flexibility over liposomal drug delivery which makes it favourable for efficient skin penetration

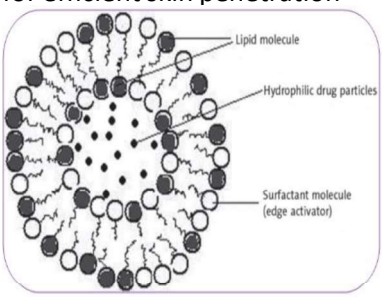

Fig 1. Schematic Diagram Of Transferosomes

FORMULATION CONSIDERATION:

Phospholipids are the chief constituents in the formation of transfersomes: 10–25% of surfactants offer flexibility, 3–10% of alcohol acts as a solvent while phosphate buffer saline (PBS) is used as a hydrating medium. Lipids are used as complexing agents & Edge Activator (EA). These EAs are responsible for the ultra-adaptive properties of transfersomes.

Class	Examples	Uses
Phospholipids	Soya phosphatidyl choline Dipalmitoyl phosphatidyl choline Distearoyl phoshatidyl choline	Vesicles forming component
Surfactant (Edge modifier)	Sodium cholate Sodium deoxycholate tween-80 Span-80	For Providing flexibility
Alcohol	Ethanol, Isopropyl alcohol	As a solvent

Table no 1 DIFFERENT EXCIPIENTS USED IN THE PREPARATION OF TRANSFEROSOMES

PREPARATION OF TRANSFEROSOMES

There are two different methods for preparation of transferosomes:-

1. Vortex sonication method : In the vortexing-sonication method, mixed lipids (i.e. phosphatidylcholine, EA and drug) are blended in a phosphate buffer and vortexed to attain a milky suspension. The suspension is sonicated, followed by extrusion through polycarbonate membranes.

2. Rotary evaporation sonication method : The rotary evaporation–sonication method involves dissolution of phosphatidyl choline and edge activator in a blend of chloroform and methanol (2:1, v/v), followed by the removal of organic solvent using rotary evaporation under reduced pressure .The film deposited is hydrated with a solution of drug solution while rotating the flask for one hour at room temperature. The vesicles produced are left to swell for two hours at room temperature, followed by 30 min of sonication in a bath sonicator so as to decrease their volume. Extrusion of vesicles then occurs through a sandwich of 450- and 220-nm polycarbonate membranes.

MECHANISM OF DRUG PENETRATION

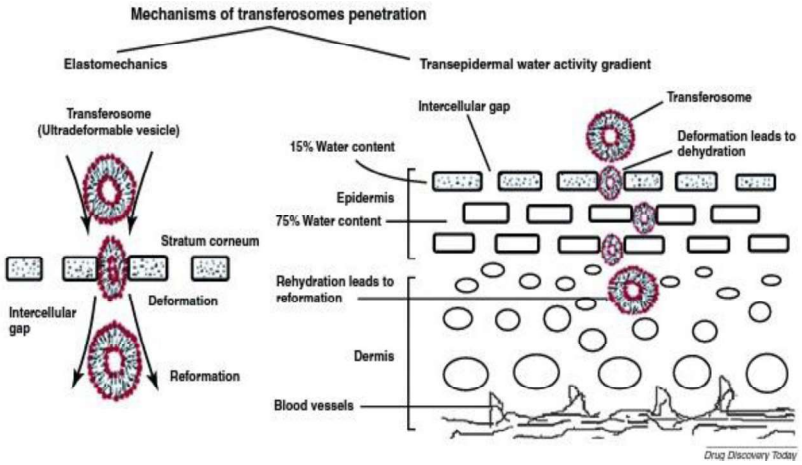

Fig 2 Schematic diagram of Penetration of transferosomes through skin.

CHARACTERIZATION OF TRANSFEROSOMES

Table no 2. Methods used for evaluation transferosomes

Parameter	Methods
Vesicle shape morphology & Degree of deformability	Transmission electron microscopy (TEM)
Entrapment efficiency	Mini-column centrifugation method
Vesicle size and size distribution	Dynamic light scattering methods
Skin permeation potential	Confocal laser scanning microscopy (CLSM)
Phospholipid surfactant interaction	Fluroscence microscopy

ADVANTAGES

- Formulation of transfersomes involves pharmaceutically acceptable additives, is easy to scale up and does not require an elaborate procedure.
- Transfersomes are biocompatible, biodegradable and are capable of protecting the encapsulated drug from metabolic degradation.
- They are also able to transport drug through very narrow pathways between most cells in the skin (five to ten times narrower than their own diameter) without significant loss.
- Transfersomes have been used as transporters for various therapeutic agents, including peptides proteins ,insulin, albumin , gap junction protein (GJP) , DNA , antigens , nutraceuticals , analgesics , anaesthetics , corticosteroids and sex hormones , and have been proven to augment significantly the amount of drug permeated through the skin.

CONCLUSION

Thus Transferosomes are ultra deformable, flexible vesicular system which can pass through the stratum corneum of intact mammalian skin. The concentration & choice of edge activator affect the vesicular size & entrapment efficiency of vesicle. Due to flexibility of vesicles it can deliver both small & large molecular weight of drug. Transferosome can deform & pass through narrow constriction (from 5 to 10 times less than their own diameter) without measurable loss. So, drug enter into the system have maximum bioavailability, similar to injectable formulation.

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PHOTODYNAMIC THERAPY: ASPECTS IN CANCER TREATMENT

-PRAMALI BHORE
F.Y. B.PHARMACY

Despite progress in basic research that has given us a better understanding of tumor biology and led to the design of new generations of targeted drugs, recent large clinical trials for cancer, with some notable exceptions, have been able to detect only small differences in treatment outcomes.

Photodynamic therapy (PDT) has the potential to meet many currently unmet medical needs. PDT is a treatment that uses a drug, called a photosensitizer and a particular type of light. When photosensitizers are exposed to a specific wavelength of light, they produce a form of oxygen that kills nearby cells.

Although still emerging, it is already a successful and clinically approved therapeutic modality used for the management of neoplastic and non-malignant diseases.

Components of PDT:

PDT consists of 3 essential components: photosensitizer (PS), light, and oxygen. None of these are individually toxic, but together they initiate a photochemical reaction that culminates in the generation of a highly reactive product termed singlet oxygen ($^1O_2$).

1. Photosensitizers: Most of the PSs used in cancer therapy are based on a tetrapyrrole structure.Table 1 displays the most promising PSs that have been used clinically for cancer PDT (whether approved or in trials).

2. Light Sources: The region between 600 and 1200 nm is often called the optical window of tissue. However, light up to only approximately 800 nm can generate $^1O_2$, because longer wavelengths have insufficient energy to initiate a photodynamic reaction. Both lasers and incandescent light sources have been used for PDT and show similar efficacy. Light-emitting diodes (LEDs) are alternative light sources with relatively narrow spectral bandwidths and high fluence rates.

Table: Clinically applied photosensitizers:

PHOTOSENSITIZER	STRUCTURE	WAVELENGTH, nm	APPROVED	TRIALS	CANCER TYPES
Porfimer sodium (Photofrin) (HPD)	Porphyrin	630	Worldwide		Lung, esophagus, bile duct, bladder, brain, ovarian
ALA	Porphyrin precursor	635	Worldwide		Skin, bladder, brain, esophagus
ALA esters	Porphyrin precursor	635	Europe		Skin, bladder
Temoporfin (Foscan) (mTHPC)	Chlorine	652	Europe	United States	Head and neck, lung, brain, skin, bile duct
Verteporfin	Chlorine	690	Worldwide (AMD)	United Kingdom	Ophthalmic, pancreatic, skin
HPPH	Chlorin	665		United States	Head and neck, esophagus, lung
SnEt2 (Purlytin)	Chlorin	660		United States	Skin, breast
Talaporfin (LS11, MACE, NPe6)	Chlorin	660		United States	Liver, colon, brain
Ce6-PVP (Fotolon). Ce6 derivatives (Radachlorin, Photodithazine)	Chlorin	660		Belarus. Russia	Nasopharyngeal. sarcoma. brain
Silicon phthalocyanine (Pc4)	Phthalocyanine	675		United States	Cutaneous T-cell lymphoma
Padoporfin (TOOKAD)	Bacteriochlorin	762		United States	Prostate
Motexafin lutetium (Lutex)	Texaphyrin	732		United States	Breast

Abbreviations: ALA, 5-aminolevulinic acid; AMD, age-related macular degeneration; Ce6-PVP, chlorin e6-polyvinypyrrolidone; HPD, hematoporphyrin derivative; HPPH, 2- (1-hexyloxyethyl)-2-devinyl pyropheophorbide-a; MACE, mono-(L)-aspartylchlorin-e6; mTHPC, m-tetrahydroxyphenylchlorin; nm indicates nanometers; SnEt2, tin ethyl etiopurpurin.

Mechanism of action:

Following the absorption of light (photons), the sensitizer is transformed from its ground state (singlet state) into a relatively long-lived electronically excited state (triplet state) via a short-lived excited singlet state. The excited triplet can undergo two kinds of reactions. First, it can react directly with a substrate, such as the cell membrane or a molecule, and transfer a hydrogen atom (electron) to form radicals. These radicals interact with oxygen to produce oxygenated products (type I reaction). Alternatively, the triplet can transfer its energy directly to oxygen, to form singlet oxygen — a highly reactive oxygen species (ROS) (type II reaction). Both type I and type II reactions occur simultaneously, and the ratio between these processes depends on the type of sensitizer used, the concentrations of substrate and oxygen, as well as the binding affinity of the sensitizer for the substrate. Cell death occurs mainly by three pathways: apoptosis, necrosis and autophagy.

Advantages and limitations of PDT:

The advantages of PDT compared with surgery, chemotherapy, or radiotherapy are reduced long-term morbidity and the fact that PDT does not compromise future treatment options for patients with residual or recurrent disease. Due to a lack of natural mechanisms of $^1O_2$ elimination and a unique mechanism of cytotoxicity, mutations that confer resistance to radiotherapy or chemotherapy do not compromise antitumor efficacy. Moreover, PDT can be repeated without compromising its efficacy. These are significant limiting factors for chemotherapeutics and radiotherapy. Despite of several advantages, this therapy can only be used for solid tumors**.**

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LEMON PEEL: THE BREAKTHROUGH IN CANCER

-SHUMAILA SIDDIQUI,
MRS.VINEETA V.KHANVILKAR

Cancer is the life threatening and dreadful disease characterized by the abnormal proliferation of cells that invade the adjacent tissues and cause the destruction of these tissues.Several ways of treating the cancer by conventional treatment which are surgery, chemotherapy, hormonal therapy, and radiation. Conventional treatment chemotherapy could cause adverse and toxic side effects on normal cells while curing cancer and therefore fails to control the disease. The alternative solution for the harmful effects of synthetic agents is the use of natural plants, which provide outstanding contribution to modern therapeutics.Citrus and citrus peels contain common flavonoids, such as hesperidin, naringin, neohesperidin, narirutin, eriocitrin, didymin and rutin among others.Medicinal uses of Citrus peel such us,

1. They are abundance of polyhydroxy flavonoids (pHFs) such as hesperidin, neohesperidine and naringin and also the source of polymethoxyflavones (PMF) with high concentration, which are mainly represented by Nobiletin, tangeretin etc.

2. Research in anticancer activity of citrus contains flavonoids has been majorily focused on in-vitro experiment on action mechanism of, such as anti proliferative effects, enzyme inhibition and cancer cell attenuation.

3. PMF has demonstrate the growth inhibition of human leukemic cell lines and tangeretin play important role in cancer cell proliferation and metasis stage by inhibition of cell adhesion and invasion. It inhibit the prolieration and migration of human cancer of breast, lung, liver, prostate etc.

SKIN CANCER:

IN-VIVO experiment with citrus polymethoxy flavanoid, nobiletin effectively inhibited the production of hydrogen peroxide (H_2O_2) which attribute to reduced O_2 generation because of the functional relationship between H_2O_2 formation and O_2 dismutase. Pretreatment with nobiletin remarkably reduce the weight of edema thickness of epidermis number of infiltered leukocyte indicating the efficacy of nobiletin in anti-inflammation and anti-carcinogenic.

COLON CANCER:

The formation of aberrant crypt focci (ACF) in early stage of progression is widely considered a histological biomarker for colon tumorogenesis. Furthermore increased number of incident and multiplicity of ACF are closely associated with colorectal cancer. Oral feeding of mixed citrus peel extract decreased the total number of aberrant crypt focci. The mild extract of citrus peels is an effective antitumor agent, which tends to down-regulation of the protein level of COX-2, ODC, MMP-C. The development of CRC (colorectal cancer) involves various genetic and molecular changes in cell, proliferation, apoptosis and metastatis. (COX-2 Enzyme promot tumorogenesis and decreased apoptosis).

PROSTATE CANCER:

Nobiletin significantly reduced the weights of prostate and testes and reduced the incidence and multiplicity of adenocarcinomas by 50% and 64%.Apperant inhibition of PC-3 tumor growth was observed event at lower dose of nobiletin. The prostate tumor was nearly eliminated in the group treated with the higher dose. The citrus peel extract is also effective against immune -deficient prostate cancer bearing PC-3 tumor, which is completely eliminated by the approach of extract.

LUNG CANCER:

Major citrus flavanoid, nobiletin has demonstrated as an anti-lung cancer activity in murin tumor model. The in-vivo anti-cancer mechanisam of nobiletin found prior to the in-vivo study include apoptosis .Nobiletin induced cell cycle arrest at G Phase.

Taken all together, a considerable number of well-established lines of evidence have confirmed that flavonoids in lemon peel exhibit a remarkable an anti-tumorigenetic property. Excellent permeability through membrane allows citrus flavonoids to possess great bioavailability which consequently attracts researchers to perform scientific studies for effectively disease prevention and treatment.

OPIORPHIN – NATURAL PAINKILLER FOUND IN HUMAN SPIT

-SUKANYA CHAVAN AND ARUNA GARUD (S.Y.M PHARM)

Right now, you are walking around with a mouth full of extremely powerful, untested pharmaceuticals. Your saliva contains opiorphin, a painkiller that's about six times more powerful than morphine!!

WHAT IS OPIORPHIN?

Opiorphin is an endogenous chemical compound first isolated from human saliva. It is a relatively simple molecule consisting of a five-amino acid polypeptide, Gln-Arg-Phe-Ser-Arg. Opiorphin pentapeptide originates from the N-terminal region of the protein PROL1 (proline-rich, lacrimal 1).

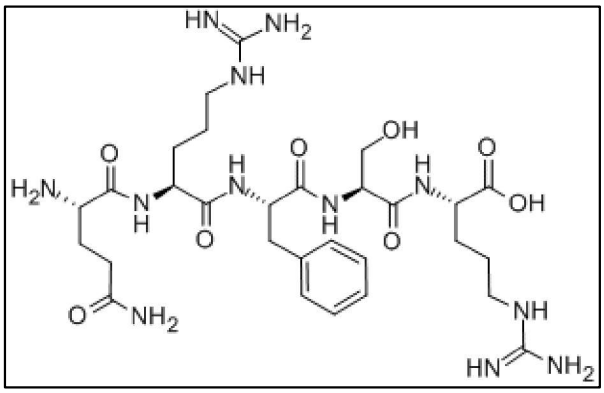


FIGURE: STRUCTURE OF OPIORPHIN

OPIORPHIN AS AN ANALGESIC

MOA:

Opiorphin seems to work by prolonging the body's own defences against pain. It does so by preventing the breakdown of chemicals called enkephalins, which in turn activate opiate receptors that block pain signals from reaching the brain. Enkephalins are nothing but natural pain-killing opioids in the spinal cord. Opiorphin protects enkephalin from degradation by inhibiting proteases: human neutral endopeptidase (hNEP), aminopeptidase-N (hAP-N). Such action extends the duration of enkephalin effect where the natural pain killers are released physiologically in response to specific potentially painful stimuli, in contrast with administration of narcotics, which floods the entire body and causes many undesirable adverse reactions, including addiction liability and constipation.

ISOLATION AND CHARACTERIZATION OF OPIORPHIN FROM HUMAN SALIVA:

The study was designed to search for the natural NEP inhibitor (opiorphin) in human salivary secretions. The protocol of clinical research established with the Centre of Biomedical Research of the Pasteur Institute. Human saliva was collected from 10 healthy male volunteers. The saliva was collected into previously chilled tubes containing aprotinin (1,000 kallikrein inhibitor units/ml), Pefabloc (0.4 mM), and HCl (0.1 M final concentration) and then stored at −80°C. Then, the three-step purification procedure (methanol acid extraction, CE-HPLC, and RP-HPLC) was used to isolate human salivary components. All of the extracts and chromatographic fractions were analyzed for their capacity to inhibit the hydrolysis of SP by human cell membranes containing NEP.

The saliva samples (45 ml altogether) were treated according to the following protocol.

1. Extraction of low-molecular-weight components in methanol acid at 4°C-

First, 4 volume of methanol containing 0.1% trifluoroacetic acid (TFA) solution were added to 1 volume of saliva. This step inactivates and precipitates high-molecular-weight proteins and allows the solubilization of the low-molecular-weight salivary constituents. The methanol mixture quickly was homogenized and then centrifuged at 4°C and 12,000 × g for 15 min. The methanol was removed from the supernatant after lyophilization.

2. CE-HPLC-

The methanol-extracted saliva was solubilized in solvent A (10 mM ammonium acetate, pH 4.3) and injected into a HEMA-IEC BIO-1000 carboxymethyl column (Alltech, AIT-France, Houilles, France). Components were eluted and isolated according to their cationic characteristics in a two-step linear gradient of 10–500 mM and 500–900 mM ammonium acetate (pH 4.7), successively at a 1 ml/min flow rate. Fractions of 2 ml were collected, and the solvent was removed after lyophilization.

3. RP-HPLC-

The active fractions of the previous CE-HPLC were solubilized in solvent A (0.1% TFA in H2O) and injected into a Synergi Max-RP column. After a 10-min equilibrium period under isocratic conditions (solvent A, 1 ml/min), sample components were eluted with a linear gradient of 1–99% solvent B (100% acetonitrile/0.1% TFA, by vol) at a 1 ml/min flow rate. Fractions of 1 ml were collected, and the solvent was removed after lyophilization.

The active fractions underwent a further purification procedure on a new Synergi Max-RP column through elution with a linear gradient of 1–99% solvent B (100% methanol/0.1% TFA). Column eluates were collected (microsorb tubes, Nunc; VWR, Fontenay-sous-Bois, France) at 1-min intervals and the fractions were analyzed after lyophilization for their inhibitory potency of the hNEP ectopeptidase activity.

Characterization using SELDI-TOF MS:

Protein Chip array technology and N-terminal sequence analyses were performed in the platform of analyses and protein microsequencing. After freeze-drying, the major active fractions of the last purification step were recovered in ultra-pure water (60–100 µl). A 2-5µl spot of sample was deposited on an Au or Np stick and SELDI-TOF MS analysis was performed after the addition of 0.8 µl of matrix (α-cyano-4-hydroxycinnamic acid saturated in 50% acetonitrile/0.5% TFA then diluted 10 or 50 times in the same solution). N-terminal sequence analysis was carried on the rest of the sample.

CASE STUDY:

To evaluate the effects of opiorphine on pain responses in-vivo, Rougeot C et al used two pain rat models, the tail-flick and the formalin tests. They assessed the potency and duration of the analgesic action of opiorphin with reference to morphine. The occurrence of adverse effects with emphasis on the side-effect profile at equi-analgesic doses was compared. They demonstrated that opiorphin elicits minimal adverse morphine-associated effects, at doses (1-2 mg/kg, i.v.) that produced a comparable analgesic potency in both spinally controlled thermal-induced acute and peripheral chemical-induced tonic nociception. The analgesic response induced by opiorphin in the formalin-induced pain model preferentially requires activation of endogenous µ-opioid pathways. However, in contrast to exogenous µ-opioid agonists such as morphine, opiorphin does not develop significant abuse liability or analgesic drug tolerance after subchronic treatment.

CONCLUSION:

Opiorphin, by inhibiting the destruction of endogenous enkephalins, which are released according to the painful stimulus, activates restricted opioid pathways specifically involved in pain control, thus contributing to a greater balance between analgesia and side-effects than found with morphine. Therefore, opiorphin could give rise to new analgesics endowed with potencies similar to morphine but with fewer adverse effects than opioid agonists. Its chemical optimization, to generate functional derivatives endowed with better bioavailability properties than the native peptide, could lead to a potent class of physiological type analgesics.

Hence, therapeutic application of opiorphin in humans would require modification of the molecule to avoid its rapid degradation in the intestine and its poor penetration of the blood–brain barrier.

Abbreviations-

•SP: Substrate P

•hNEP: human Neutral Endopeptidase

•hAP-N: human Aminopeptidase N

•CE-HPLC: Cation Exchange HPLC

•RP-HPLC: Reverse Phase HPLC

•SELDI-TOF MS: Surface-Enhanced Laser Desorption Ionisation- Time of Flight Mass Spectrometry.

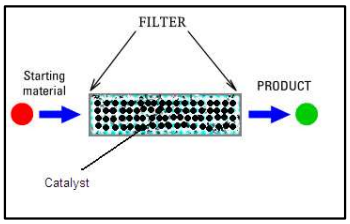
FLOW CHEMISTRY

-KAUSTUBH WAGLE
(F.Y.M.Pharm)

INTRODUCTION

Flow chemistry is the pumping of a continuous flow of dissolved reaction mixture through a reactor. The reactor can either be a fixed bed type reactor, where the reaction mixture is passed through a solid catalyst or reagent, or a tubular type reactor where the starting material, reagent, or catalyst are homogeneously dissolved in solution and pumped through a heated or cooled zone. The internal diameter of the reaction line is typically in the micron to low millimeter range. The key point to take away from this is that reactions are performed continuously, so only a small part of the reaction mixture undergoes a reaction at any one time. Performing chemistry this way leads to a number of advantages over standard batch processes.

- Improved Reaction Time
- Improved Temperature Control
- Multi-step Synthesis
- Improved Selectivity



In a fixed bed reactor the reaction mixture is pushed through the solid reagent or catalyst. The ratio of the catalyst/reagent compared to the reaction mixture is much higher. The reaction mixture travels through the channels created by the solid particles and interacts continuously as it passes down the length of the reactor. The reaction mixture can't help, but interact with the solid catalyst/reagent. This can lead to increased reaction rates of several orders of magnitude. If you compare this to a batch reaction, the solid catalyst is stoichiometrically low in comparison to the rest of the reaction mixture, so adsorption of all the material onto the catalyst surface will take longer.

The widest range of reactors covering the largest amount of chemical space, including:

- **H-Cube Pro™** and **Gas Module** for gas reagent chemistry from hydrogenation to oxidation.
- **The IceCube™** for low temperature and high energy reactions

H-CUBE PRO ™

A revolutionary bench-top standalone hydrogenation reactor, uniquely combining continuous-flow microchemistry with endogenous on-demand hydrogen generation and a disposable catalyst cartridge system. It allows fast and cost-efficient hydrogenation with superior yield when compared to conventional methods.Continuous hydrogenation reactions are performed in a flow system. The hydrogen gas necessary for the reaction is generated in-situ. Reactions take place on disposable proprietary CatCarts®, packed catalyst columns modeled after conventional HPLC systems, ensuring excellent lab integration and ease of use. Every aspect of the operation on the H-Cube® is controlled and monitored using a touch-screen panel. With no external storage of hydrogen necessary, the H-Cube® may be used safely in almost any laboratory environment, while its minimal "footprint" maximizes available bench space.

ADVANTAGES

Safer:

•No cylinders or other external hydrogen source necessary.

•No catalyst filtration.

Efficient:

•Analyze reaction results after 5 minutes. Pressure and temperature can then be changed to optimize product conversion to 100%

•Perform up to 50 different validation conditions in a day

Convenient:

•Compact size -can be used in a standard laboratory fume hood

ICECUBE ™ FLOW REACTOR

Safe exothermic reactions made easy.

The IceCube™ is a revolutionary continuous flow low temperature reactor specifically for high energy reactions to be performed in a highly controlled and safe manner. The system is made up of 3 modules. The Ozone Module, Pump Module, and Reactor Module. The modules can be configured or purchased separately to match the configuration expected.

OZONE MODULE

It gives you a safe and efficient way of generating ozone from oxygen. The ozone/oxygen amount is precisely controlled through the built-in mass flow controller. The system can also be used as a powerful and compact stand alone ozonizer.

Oxygen flow rate: 10-100 mL/min.
O_3/O_2 v/v%: 14% at 20 mL/min oxygen flow rate.

REACTOR MODULE

Reactor Module is a highly versatile reactor capable of controlling even extremely exothermic reactions safely and simply. Composed of two reactor plates with Peltier heating/cooling, and a reaction line made of Teflon for wide chemical compatibility. The system may be configured for 2, 3, or 4 reactants in 1 sequence. Difficult or dangerous reactions such as lithiation, azide generation or ozonolysis may now be performed and quenched immediately without the need for isolation of dangerous intermediates.

PUMP MODULE

Pump **Module** is made up of 2 rotary piston pumps, which have good chemical compatibility.The pumps are connected by two 3-way valves,which control the path of reactant or solvent through the reactor. Multiple pump modules can be purchased. Single pumps also. Flow rate: 0.2 – 4 mL/min

ADVANTAGES

Safer

- High energy reactions can now be performed in an extremely safe and controlled manner through excellent temperature control.
- Automatic blockage/leakage detection.
- High chemical resistance allowing the use of different reagent, even strong acids.

Simple

- Everything is software controlled. Just set few parameters, press "Start", and let the IceCube™ to do the rest.
- Chemistry application focused design.
- Only tap water needed for cooling.

Innovative

- Makes dangerous exothermic reactions safe to do.
- Generate libraries from previously forbidden chemistries with upcoming automation system.

High Control

- Built in safety feature, such as automatic stop features in case of alarm
- Continuous real time feedback from the control unit

Productivity

- Easy scale-up from mg to kilo scale

ACKNOWLEDGEMENT

I on behalf of entire Bharati Vidyapeeth's College of Pharmacy are greatly thankful to ThalesNano Inc. for coming up with a technology that greatly helps chemists. I specially Want to thank Mr.Richard Jones,Chief Commercial Officer Thalesnano Inc. for his warm knowledge filled session on Flowchemistry.

RETRIEVING SHORT-TERM MEMORIES

-SONAL MORE & SHRADDHA JOSHI
FIRST YEAR M.PHARM

Neurons can continue to capture a short-term memory without continuous firing, researchers show.

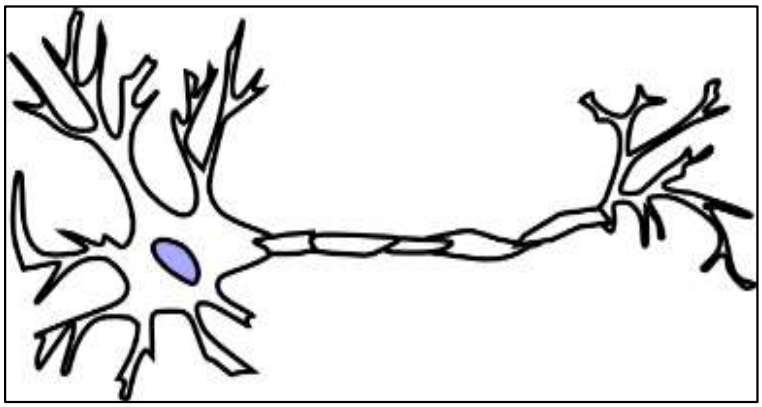
Neuroscientists have long tried to uncover the neuronal connectivity and patterns of activity that explain human cognitive behaviors. The prevalent theory of working memory—using information stored in short-term memory to complete a task—is that the brain's connections that code for the needed information must fire continuously. Researchers from the University of Wisconsin–Madison and their colleagues provide evidence for a different theory, in which information can be stored in working memory in an inactive neuronal state. The team's results suggested there are multiple ways our brains store short- and longer-term memories, depending on expectations of when that information is likely to be needed. A great deal of behavioral working memory research measures how much information can be briefly stored in working memory. This work suggests that there exists extra information in a 'hidden' or 'latent' state that may be missed by these measures. The prior work had already hinted that not all working memory information needs to be maintained by neuronal activity. In the new work, the University of Wisconsin–Madison team directly showed that the synapses corresponding to information maintained in short-term memory can be inactive and yet the memory can remain accessible and easily shift into one's focus of attention.

Using functional magnetic resonance imaging (fMRI), researchers measured and analyzed whole-brain activity of study participants performing a simple, sequential visual recognition task—of a word, face, or direction of motion—over a span of about 30 seconds. The participants were shown two different items and informed which item would be tested on first, although both were to be held in working memory. Only brain regions related to the prioritized item remained active while brain activity corresponding to the other item dropped to baseline, the researchers observed, suggesting no neuronal firing. "With our methods, the activity of the item subjects were told not to focus on drops all the way to baseline in the same way as information that is forgotten. If the participants were subsequently told to prepare for a test of the previously non-prioritized item, the activity pattern was reversed.

In a follow-up experiment, the researchers stimulated the participants' brains periodically—and unexpectedly—with a targeted pulse of transcranial magnetic stimulation, recording their electroencephalography (EEG). Such stimulation was enough to reactivate the focus on the non-prioritized item, but only when the participants had expected to need to recall information on the item later in a experiment. This item was in some prioritized state in the brain because it could be reactivated with the pulse. The pulse was thought to bring information back into momentary awareness. Yet if the participants were stimulated with the pulse but didn't expect the item to be relevant later, their brain regions associated with the item remained inactive, suggesting that these folks were able to actively prioritize these short-term memories.

The observed memory state likely falls between the short-term information within our active attention and the long-term memories that form over days and years, requiring protein synthesis, the researchers reported. The refocusing of attention in working

memory has been shown many times before, but here, the researchers observed involuntary reactivation of the 'hidden' working memory items with external neuro-stimulation, which is extremely novel.



According to the results of the present investigation might also impact how neuroscientists evaluate the human brain's capacity for juggling and storing information. The leading theory was working memory and attention is the limiting part of human cognition,These latest findings suggest that the brain prioritizes information, putting some of it out of mind but with an ability to readily retrieve it, he added.The availability of extra information in working memory above and beyond what may have inferred as behaviorally or neurophysiologically requires us to rethink how we interpret the capacity limits of working memory.

ACKNOWLEDGEMENT

We would like to extend our heart felt gratitude towards THE SCIENTIST,EXPLORING LIFE,INSPIRING INNOVATION journal for the precious information and our research guide Dr.(Mrs.) Varsha Jadhav for her valuable guidance.

NOVEL DRUG DELIVERY SYSTEMS

-PRANALI S. MANJREKAR.
(T.Y. B-Pharm)

A new era of science and technology has evolved in pharmaceutical research focussed at development of different novel drug delivery systems. The evolution of an existing drug from its traditional form to a novel delivery system may considerably improve its performance in aspects of efficacy, safety and patient compliance. So the method of administrating a drug can also have significant effect in its efficacy. In recent years the considerable advances in drug delivery systems have enabled more effective routes of administration. This review highlights the different novel drug delivery system, drug carriers and their potential to resolve the current challenges faced by biotechnology and pharmaceutical Industries.

The methodby which a drug is delivered can have a significant effect on its efficacy. Some drugs have an optimum concentration range within which maximum benefit is derived, and concentrations above or below this range can be toxic or produce no therapeutic benefit at all 1. On the other hand, the very slow progress in the efficacy of the treatment of severe diseases, has suggested a growing need for a multidisciplinary approach to the delivery of therapeutics to targets in tissues.

From this, new ideas on controlling the pharmacokinetics, pharmacodynamics, non-specific toxicity, immunogenicity, biorecognition, and efficacy of drugs were generated. These new strategies, often called drug delivery systems (DDS), which are based on interdisciplinary approaches that combine polymer science,

pharmaceutics, bioconjugate chemistry, and molecular biology. To minimize drug degradation and loss, to prevent harmful side-effects and to increase drug bioavailability and the fraction of the drug accumulated in the required zone, various drug delivery and drug targeting systems are currently under development 1. Controlled and Novel Drug Delivery which was only a dream or at best a possibility is now a reality. During the last decade and half pharmaceutical and other scientists have carried out extensive and intensive investigations in this field of drug research.

Various Drug Delivery Systems:

Carrier based Drug Delivery System:

A) Liposomes
B) Nanoparticles
C) Microspheres
D) Monoclonal antibodies
E) Niosomes
F) Resealed erythrocytes as drug carriers

Trasdermal Drug Delivery Systems:

A) Sonophoresis
- Mucoadhesive delivery systems
- Supramolecular delivery systems
- Variable release delivery systems

B) Osmotic pump
C) Microencapsulation

Targeting is the ability to direct the drug-loaded system to the site of interest. Two major mechanisms can be distinguished for addressing the desired sites for drug release:

These systems can be characterised as controlled drug release systems and targeted drug delivery systems. The therapeutic benefits of these new systems include:

- Increased efficacy of the drug
- Site specific delivery
- Decreased toxicity/side effects
- Increased convenience
- Viable treatments for previously incurable diseases
- Potential for prophylactic applications
- Better patient compliance.

Market Opportunities of Sustained Release Dosage Forms: The global market for advanced drug delivery systems amounted to $134.3 billion in 2008, and was projected to increase to $139 billion in 2009. The estimate for 2014 is $196.4 billion, for a compound annual growth rate (CAGR) of 7.2% in the 5-year period. The largest segment of the market is targeted drug delivery, which reached $50.9 billion in 2009 and is expected to increase to $80.2 billion in 2014, for a CAGR of 9.5%.Sustained-release products have the second-largest market share, with estimated sales of $36.1 billion in 2009 and $45.8 billion in 2014, for a CAGR of 4.9%. Benefits for short half-life drugs, sustained release can mean less frequent dosing and thus better compliance reduce variations in plasma/blood levels for more consistent result 53.

Over the past several years, great advances have been made on development of novel drug
delivery systems (NDDS) for plant actives and extracts. The variety of novel herbal
formulations like polymeric nanoparticles, nanocapsules, liposomes, phytosomes,
nanoemulsions, microsphere, transferosomes, and ethosomes has been reported using
bioactive and plant extracts. The novel formulations are reported to have remarkable
advantages over conventional formulations of plant actives and extracts which include enhancement of solubility, bioavailability, protection from toxicity, enhancement of
pharmacological activity, enhancement of stability, improved tissue macrophages
distribution, sustained delivery, and protection from development of novel herbal formulations
and summarizes physical and chemical degradation. The
present review highlights the current status of the
their method of preparation, type of active ingredients, size, entrapment efficiency, route of administration, biological activity and applications of novel formulations.

As discussed in this article there are numerous drug delivery technologies such as oral, pulmonary, Transdermal, colon, vaginal, etc to deliver the drugs in an efficient manner. Recently biotechnological companies

producing many more protein and peptide based drugs by sequencing the human genome. It is estimated in next 10 to 20 years more than half of the drugs are replaced by protein based drugs especially 80%of them are antibodies. The drugs like proteins, peptides, carbohydrates, oligo-nucleotides and nucleic acids in the form of DNA usually cannot be delivered through conventional routes because of their large molecular size, rapid degrading ability, and limited ability to cross cell membranes.For such drugs injections may be only route, which presents the industries a new challenge for developing new drug administration routes. Gene therapy is also one of the exciting sector in biotech companies going to be involved in drug delivery technologies. This therapy includes genetically engineered proteins. So far the industries have come in a long way and wish to continue the growth at impressive rate in drug delivery systems. Tomorrow's drugs definitely will be more challenging in terms of the development of delivery systems, and pharmaceutical scientists will have to be ready for a difficult task ahead.

SCIENTISTS DEVELOP CANCER THERAPY THAT REDUCES TOXIC CHEMOTHERAPY EFFECTS

SOURCE : MDLINX
-ADITYA NAIK

Earlier this year, CytImmune Sciences asked David Kingston, a University Distinguished Professor of Chemistry with the Virginia Tech College of Science, to create a paclitaxel derivative that binds to gold-based nanoparticles while in the blood stream, only releasing the drug once it's inside a cancerous tumor. Paclitaxel chemotherapy is widely used to treat breast, ovarian, lung, and colon cancer.

"Paclitaxel side effects occur because the drug is given intravenously and thus is distributed throughout the body, and not just to the tumor," said Kingston, who joined the Virginia Tech Department of Chemistry in 1971. "In addition, the solvent used to allow infusion has its own toxicity. Paclitaxel could be a much more effective drug if it could be targeted directly to the tumor. This would allow each dose to be given without causing significant side effects, and would thus increase the potential for cures."

In describing the benefits of the new approach, Kingston compared the traditional delivery of paclitaxel to using a shotgun with pellets. The blast of killing a tumor results in great collateral damage. Kingston and his team say their delivery method is like a finely tuned rifle, using CytImmune's gold-based nanoparticles as the delivery bullet.

The gold nanoparticles are coated with both paclitaxel and tumor necrosis factor – a cell-signaling protein commonly called TNF. Gold nanoparticles are known to cling around cancerous tumors. TNF thus binds to the tumor blood vessel cells, ultimately killing them and reducing the high pressure inside the tumor, which prevents paclitaxel from reaching the cancer cells to kill them.

Using this new approach, the slowly released paclitaxel that is bound to the gold nanoparticles can reach the targeted cancer cells to kill them.

The researchers found that in early lab tests in treating mouse melanoma, a 2.5 milligram dose of paclitaxel delivered on Kingston's gold nanoparticles vehicle was essentially as effective as a dose of 40 milligrams of paclitaxel by itself.

The delivery method is expected to soon move toward clinical trial, said Kingston.

In addition to Kingston, other members of his team included Jielu Zhao, a 2016 doctoral graduate in chemistry, now a chemist at Proctor and Gamble, and Shugeng Cao, a former post-doctorate researcher also in chemistry, now an associate professor at the University of Hawaii at Hilo, carried out the actual synthesis of the paclitaxel derivatives with the designed linkers to allow them to bond to the gold nanoparticles, with Kingston supervising.

“This approach has the potential to be a game-changer in nanoparticle-based drug delivery systems,” said Kingston, “since it combines the power of drug targeting by tumor necrosis factor, with the advantages of nanoparticle delivery, including the low toxicity of nanoparticle drugs to normal, healthy tissue.”

“By combining the tumor blood vessel destroying activity of TNF with the cancer killing effect of paclitaxel onto CytImmune’s tumor-targeted, ‘stealth’ gold nanoparticles, Dr. Kingston’s team and CytImmune’s team may have potentially created a new cancer drug that is far more effective and less toxic to the human body,” said Lawrence Tamarkin, chief executive officer at CytImmune

FROM POISON TO POTION

-AMRUTA A.N.
T.Y. B.PHARM

Whether you're talking about Spider-man's archenemy or the deadly poisons that animals and insects use to kill their prey, venom most often conjures up negative thoughts. Spider bites, snakebites, bee stings: All of these frighten us, and it's not only about the pain of getting bitten, but also the potentially harmful toxins. But as it turns out, some venoms may be actually being beneficial to human health. Venoms contain hundreds of different ingredients, some of which are not the harmful toxins we assume them to be. Venoms are extremely biologically active and these chemical concoctions provide a great natural resource for researchers to study different chemicals, some of which can be developed into drugs. From scorpions and spiders to snakes and bees, many other researchers are finding ways to bring out the positive in poison. Here's a look at five recent examples of venom as medicine.

1. *Deathstalker Scorpion Venom For Brain Cancer*

The deathstalker scorpion, native to North Africa and the Middle East, is highly dangerous because of its venom—a neurotoxin powerful enough to kill a child or elderly person, often by causing pulmonary edema. Recently, Miqui Zhang, a materials scientist at the University of Washington, and her research team showed that a certain compound found in the venom of the deathstalker scorpion could help in the treatment of brain cancer. In the study published in the monthly journal ACS Nano, Zhang showed off a way to use an ingredient of the venom called chlorotoxin (which, despite its name, is non-toxic) to help treat brain cancer. In gene therapy, doctors inject small bits of healthy DNA that are attached to nanoparticles, and these move toward the tumor site to repair or replace the cancer causing gene mutations.

2. *Bee Venom in Cancer Treatment*

In a similar study, Samuel A. Wickline, a biomedical engineer at Washington University School of Medicine, altered a protein found in the bee venom—which often causes inflammation after stings—called melittin. Like chlorotoxin, melittin can help deliver therapeutic drug compounds to damaged cells. Wickline linked the compound to the membrane of nanoparticles, which, without, disrupting a drug’s normal function, helped it more accurately hit its target. Scientists are primarily focused on using this as an anticancer therapy.

3. *Tarantula Venom for Muscular Dystrophy*

Frederick Sachs, a biophysist, studies the function of ion channels on the membrane of muscle cells to see what happens in the muscle tissue when you turn these channels on and off. He has been searching for a chemical that would inhibit these channels.

In their studies of the venom, which is too weak to harm a human, they came across a peptide that they called GsMtx-4.

Sure enough, the isolated peptide successfully turned the channels off, which Sachs figured could reduce the amount of stress in muscles. Excessive mechanical stress on muscles is common in muscular dystrophy, a disease that can cripple young children. But by injecting a synthetic version of the peptide into lab mice with dystrophy, Sachs found that muscle activity improves.

4. *Scorpion Venom for Studying Pancreatitis*

A compound called antarease, similar to the peptide found in tarantula venom, has proved a useful medical tool because of its effect on ion channels. East Carolina's Fletcher discovered the compound in the venom of the Brazilian yellow scorpion, which often causes pancreatitis—a severe inflammation of the pancreas-in sting victims.

Pancreatitis is more commonly cause by gallstones and alcohol abuse, and recent studies suggest it may be a precursor to pancreatic cancer.

Fletcher's research team found that antarease is likely cause; when they injected the purified compound into pancreatic tissue, it disrupted the pancreas control of its digestive enzymes, insulin, and other proteins, which can cause inflammation.

5. *Cobra Venom for Arthritis*

The Indian cobra is one of the most common venomous snakes in South East Asia, and is responsible for most of the 10,000 deaths by snakebite that occur in India each year. Despite that danger, India's traditional medicine system, ayurveda, has used these cobra venoms to treat various health conditions for thousands of years.

Earlier this year, physiologist Antony Gomes and his research team at the University of Calcutta in India published a paper in the journal *Toxicon* showing the role the venom might play in improving arthritis. In the study, male rats were induced with arthritis and were then injected with nonlethal doses of Indian monocellate cobra venom. The rats showed significant improvement in their arthritic symptoms.

NEW DRUGS LIST

-Dr. NEHA DAND

Sr. no	Brand Name	Active Ingredient	Approval Date	FDA-approved use on approval date
22	Spinraza	nusinersen	23-12-2016	To treat children and adults with spinal muscular atrophy (SMA)
21	Rubraca	rucaparib	19-12-2016	To treat women with a certain type of ovarian cancer
20	Eucrisa	crisaborole	14-12-2016	To treat mild to moderate eczema (atopic dermatitis) in patients two years of age and older
19	Zinplava	bezlotoxumab	21-10-2016	To reduce the recurrence of Clostridium difficile infection in patients aged 18 years or older
18	Lartruvo	olaratumab	19-10-2016	To treat adults with certain types of soft tissue sarcoma
17	Exondys 51	eteplirsen	19-09-2016	To treat patients with Duchenne muscular dystrophy
16	Adlyxin	lixisenatide	27-07-2016	To improve glycemic control (blood sugar levels)
15	Xiidra	lifitegrast ophthalmic solution	11-07-2016	To treat the signs and symptoms of dry eye disease
14	Epclusa	sofosbuvir and velpatasvir	28-06-2016	To treat all six major forms of hepatitis C virus
13	NETSPOT	gallium Ga 68 dotatate	06-01-2016	A diagnostic imaging agent to detect rare neuroendocrine tumors
12	Axumin	fluciclovine F 18	27-05-2016	A new diagnostic imaging agent to detect recurrent prostate cancer
11	Ocaliva	obeticholic acid	27-05-2016	To treat rare, chronic liver disease
10	Zinbryta	daclizumab	27-05-2016	To treat multiple sclerosis
9	Tecentriq	atezolizumab	18-05-2016	To treat urothelial carcinoma, the most

				common type of bladder cancer
8	Nuplazid	pimavanserin	29-04-2016	To treat hallucinations and delusions associated with psychosis experienced by some people with Parkinson's disease
7	Venclexta	venetoclax	11-04-2016	For chronic lymphocytic leukemia in patients with a specific chromosomal abnormality
6	Defitelio	defibrotide sodium	30-03-2016	To treat adults and children who develop hepatic veno-occlusive disease with additional kidney or lung abnormalities after they receive a stem cell transplant from blood or bone marrow called hematopoietic stem cell transplantation
5	Cinqair	reslizumab	23-03-2016	To treat severe asthma
4	Taltz	ixekizumab	22-03-2016	To treat adults with moderate-to-severe plaque psoriasis.
3	Anthim	obiltoxaximab	18-03-2016	To treat inhalational anthrax in combination with appropriate antibacterial drugs.
2	Briviact	brivaracetam	18-02-2016	To treat partial onset seizures in patients age 16 years and older with epilepsy.
1	Zepatier	elbasvir and grazoprevir	28-01-2016	To treat patients with chronic hepatitis C virus (HCV) genotypes 1 and 4 infections in adult patients.

CHEMOTAXONOMY

MS. PRATIKSHA MORE AND
DR. ARUNA JADHAV

Chemotaxonomy is defined as 'the classification of organisms based on the differences and similarities in their biochemistry', also known as chemosystematics, it is an attempt to classify & identify organisms (originally plants), according to demonstrable differences and similarities in their biochemical composition.
The science of chemotaxonomy or chemical taxonomy is used for the classification of plants on the basis of their chemical constituents. All the living organisms produce secondary metabolites that are derived from primary metabolites. The chemical structure of the secondary metabolites and their biosynthetic pathways is often specific and restricted to taxonomically related organisms and hence useful in classification. This method of classification is considered better in comparison to traditional method due to the ease of working methodology. According to De Candolle Plant taxonomy will be the most useful guide to man in his search for new industrial and medicinal plants; and chemical characteristics of plants will be most valuable to plant taxonomy in the future. In plants, the more popular families that have been studied through chemotaxonomy are Malvaceae, Ranunculaceae, Magnoliaceae, Polygonaceae, and Solanaceae. The findings of chemotaxonomic studies are helpful to taxonomist, phytochemists and pharmacologists to solve selected taxonomical problems.

Secondary metabolites are useful in chemotaxonomy, they are present in less amounts & are specific e.g. Berberine alkaloid in berberidaceae, Tropane alkaloids in solanaceae, Volatile oils in umbelliferae, Poisonous content in Menispermaceae, Protoanemonine in ranunculaceae and Rutin in Rutaceae family; hence they can serve as the basis for classification of crude drugs [3]. Secondary metabolites get influenced by factors like **Heredity**; this affects both qualitative and quantitative change in secondary metabolites, **Biogenetic pathways**; it was believed that specific alkaloid characteristics of a particular family are not synthesized by totally different family, **Convergence**; taxonomically unrelated plants when grown in different conditions develop similar changes, **Divergence**; Taxonomically related plants when grown in different conditions develop different morphological characters**, Primitive character**; Some groups of plants are considered to be more primitive than other (so certain characters are considered to be primitive) whereas either character are considered for the evaluation process of the same.

There is need of chemotaxonomic classification to understand biosynthesis of chemical constituents, to identify the percentage or composition of any given compound in a plant would give the progression of a plant, species and genus, variation in chemical constituents can be exactly described in terms of definite structural configuration.

Chemotaxonomic classification is advantageous because it is entirely independent of the classical biological methods, which is perhaps greatest virtue; it provides a meeting ground for taxonomists & chemists, facilitates a more precise understanding of biologic evolution & natural relationships. It is very useful at the genera & lower levels but is of very limited value at the higher taxonomic levels. Relying totally on the evidence obtained from a single source often leads to wrong conclusions and also non-availability of complete chemical information due to incomplete investigation limits the chemotaxonomic studies.

Nowadays chemotaxonomy is developing rapidly due to modern analytical techniques made the plant analysis simple and quick & requires low quantity of plant material. Reason to develop this classification is that activity & therapeutic use of drugs are based on chemical constituents, so chemical classification is preferred. With the advancement of analytical techniques, today so many groups of plants are there in which phytochemical data has contributed to extensive taxonomic improvements. The presence or absence of a particular phytochemical in a plant along with the knowledge of its biochemical synthetic pathways can be used to assign its taxonomic position.

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Flash Chromatograph for Phytoconstituent

Akshata Adhyapak,
Karthik Sankar AND
DR. ARUNA JADHAV

Chromatography is an analytical technique commonly used for separating a mixture of chemical substances into its individual components, so that the individual components can be thoroughly analyzed.

Chromatographic methods are classified as follows:

Based on technique:

Column Chromatography (HPLC, GC, Flash chromatography)

Planar Chromatography (Paper chromatography, TLC)

Based on affinity:

Adsorption chromatography (HPTLC, HPLC, GC, Flash chromatography)

Partition chromatography (GLC, Paper chromatography)

Based on non-affinity:

Gel permeation chromatography

Flash Chromatography

Introduction [1]

Flash chromatography is basically an air pressure driven hybrid of medium pressure and shorter column chromatography which has been optimized for particularly rapid separation. Flash chromatography is a simple, efficient, economical, robust and powerful tool. It is mainly used for isolation and purification of synthetic products and phytoconstituents. This technique used to separate mixtures of molecules into their individual constituents, frequently used in the drug discovery process.

Principle [1]

The principle is that the eluent, under gas pressure (normally nitrogen or compressed air) is rapidly pushed through a short glass column with larger inner diameter. The glass column is packed with an adsorbent of defined particle size. The most commonly used stationary phase is silica gel 40–63 μm, but other particle sizes can be also used for packing. Normally gel beds are about 15 cm high with working pressures of 1.5–2.0 bars.

Procedure [2]

Selecting a Solvent System:

The compound of interest should have a TLC R_f of 0.15 to 0.20 in the solvent system selected. Binary (two component) solvent systems with one solvent having a higher polarity than the other are usually best since they allow for easy adjustment of the average polarity of the eluent. The ratio of solvents determines the polarity of the solvent system, and hence the rates of elution of the compounds to be separated. Common binary solvent systems in order of increasing polarity are dichloromethane/hexane, ether/hexane, hexane/ethyl acetate, and dichloromethane/methanol.

Determining the Quantity of Silica Gel Required:

The amount of silica gel depends on the R_f difference of the compounds to be separated, and on the amount of sample. For *n* grams of sample, use 30 to 100 *n* grams of silica gel. For easier separations, ratios closer to 30:1 are effective, for difficult separations, more silica gel is often required. The density of powdered silica gel is about 0.75 g per ml.

Packing the Column:

Obtain a glass column and make sure that it has either a glass frit or a plug of cotton wool directly above the stopcock to prevent the silica gel from escaping from the column through the stopcock. Then pour in the silica gel using a funnel. Instead of glass column, cartridges or pasteur pipettes can also be used.

Solvating the Silica Gel Column:

Next, tap gently and evenly the sides of the column with a piece of rubber tubing to settle the silica gel. Pour a good amount of elution solvent onto the silica gel. Use pressurized gas to force the solvent through the silica. Continue to flush solvent through the silica gel until the entire silica plug becomes homogeneous in appearance.

Applying the Sample:

Allow the solvent which remains above the silica to drain down until it is flush with the surface of the silica. Dissolve the sample into the minimum volume of the elution solvent. Apply this to the top of the column, being careful not to disturb the top of the silica. Allow the sample to soak into the silica. Next, rinse the sides of the column with as few as possible milliliters of the elution solvent. After the rinsings have soaked into the silica gel, add a small amount of sand to protect the top surface of the silica when you add more solvent.

Eluting the Sample:

Add a good part of the elution solvent to the column. Apply pressure to force the solvent through the column. The pressure should be the minimum necessary to keep a steady stream coming out of the column. The solvent, at first, contains none of the compound and can be discarded. If the R_f of your compound is 0.33 or less, discard an amount of solvent equal to the volume of the dry silica used for the column. When all of the solvent is used, the sample should have finished eluting into the test tubes. To maximize the efficiency of chromatography, the fractions collected should be not more than about one tenth of the column volume. For example-If 25 g of silica gel is used, fractions of about 3 mL should be collected.

Locating the Sample:

Use TLC to determine which fraction contains the compound. As the fractions are isolated, perform TLC for each fraction. Combine the fractions that contain the sample together in a flask, then concentrate the sample on the rotavap (rotary evaporator).

Cleaning the Column:

Flush all the remaining solvent out of the column using pressurized gas. When all liquid solvent has been removed from the reservoir, remove the last remnants of solvent by applying vacuum (from aspirator) to the bottom of the column.

Advantages

- Fast and economic methods for the synthesis laboratory.
- Ideal for the separation of compounds up to gram quantities.
- No expensive equipment required.
- In an ideal way transfers results from TLC to CLC.
- Automated changes between normal phase and reversed phase chromatography.
- Flash chromatography can be an alternative to preparative HPLC as it saves time and solvent.
- Modern flash chromatography with disposable cartridges and advanced detection techniques is applicable to a wide range of compounds.

Applications

- It is used for Purification of Protected Peptide.
- It is used for Separation of closely related organic compounds (Isomers)
- It is used for High Speed Flash Fractionation of Natural Products.
- It is used to purify, collect and identify the various aromatic components in a semi-synthetic extract.
- In impurity isolation during drug purification.

Examples of phytoconstituents

Few phytoconstituents such as azadiractin from neem[3], glucosinolates from mustard[4], citrus limonoid glycosides from grapefruit[5], embelin from false black pepper[6], nuciferine from lotus[7] have been separated using flash chromatography.

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MULTI-VITAMINS TO BE CLASSIFIED AS DRUGS

VIBHA DESHPANDE
FINAL YEAR B.PHARM

The Drug Controller General of India has proposed to bring some popular vitamin supplement brands under the category of 'drugs', a move that could give rise to a tussle between pharma companies and the regulator as it will mean stringent restrictions on marketing of these products.

Among the 10 products that have been mentioned in the proposal are Sun Pharma's multi-vitamin capsule 'Revital', Pfizer's 'Ferradol' and AlkemPharma's 'A to Z'. These products are currently classified as 'food' and come under the Food Safety Act, which exempts them from stringent rules on pricing and marketing.

An eight-member committee looking into the matter was of the view that the ingredients of these multi-vitamins fall under the category of 'drugs'. It considered parameters like composition of the products, effect of each ingredient on the body, food safety and standard requirements as well as the indications claimed by the firms.

One critical recommendation the committee made was that if a multivitamin product claims that it treats, mitigates or prevents any disease or disorder then it should be classified as 'drug'.

In an email response to ET query on the matter, Sun Pharma said it is still reading the drug controller's recommendations. Pfizer and Alkem could not be reached for comment.

India's nutraceutical market is estimated to be close to $2 billion, with companies having a free hand in determining prices and marketing of such products.

If implemented, the drug controller's proposal could deal a big blow to many companies that are betting big on this segment, according to an industry executive did not wish to be named.

According to figures available from research firm All-India Organisation of Chemists and Druggists Association (AIOCD), the vitamins and minerals segment grew 13% in the last one year to touch .`8,329 crore.

"Vitamins are essential dietary supplementation, just like any other 'food' substance. It is strange that there was only one doctor present in the committee that made this recommendation," said RK Shanghvi, medical and nutraceuticals head of Indian Drugs Manufacturers Association (IDMA), a lobby group of Indian drug makers. "Also, it is sad that there was only one medical professional on the committee that made this recommendation, and that it is not enough to determine the fate of the country's health." Shanghvi also said that such proposals end up being ambiguous, as with the current recommendation, and that even some health drinks can be classified as drugs.

MALARIA VACCINE THAT CAN SHIELD MILLIONS

SANIKA JADHAV
FIINAL YEAR B.PHARM

A new jab against malaria could prevent millions of cases, scientists claim. Researchers say the vaccine, which has just completed the final stages of testing, could make a ‘substantial contribution’ to controlling the disease. Drug firm GlaxoSmithKline has applied for a licence from the European Medicines Agency (EMA) for the RTS, S vaccine. The news is significant because RTS,S is the first malaria vaccine to reach advanced trials. Tests were carried out on 15,500 toddlers and babies in sub-Saharan Africa.

Among those who had three doses of RTS,S and a booster shot, the number of clinical

cases of malaria – those confirmed by a doctor – was reduced by 36 per cent after four years.

But the protection waned over time, boosters worked less well than the initial dose and the vaccine was not as effective in younger children, a report in The Lancet journal says. Scientists have worked on the vaccine for more than 20 years – at a cost of more than £330million, but experts say there is a long way to go.

There is no licensed vaccine against malaria anywhere in the world and researchers say they are hopeful the results will be sufficient for RTS,S to gain a licence from the EMA. The World Health Organisation could then recommend its use by October this year.

In the trials, an average of 1,363 cases of clinical malaria were prevented over four years for every 1,000 children vaccinated, and 1,774 cases in those who also received a booster. Over three years, an average 558 cases were averted for every 1,000 infants vaccinated, and 983 cases in those also given a booster dose. Professor Brian Greenwood, the study's author and professor of clinical tropical medicine at the London School of Hygiene and Tropical Medicine, said: 'Despite the falling efficacy over time, there is still a clear benefit from RTS, S. 'Given that there were an estimated 198million malaria cases in 2013, this level of efficacy potentially translates into millions of cases of malaria in children being prevented. 'But he said he was 'disappointed' by the results of the clinical trials, adding: 'I hoped the vaccine would be more effective, but we were never going to end up with the success seen in measles vaccines, with 97 per cent efficacy.'

The disease is difficult to treat because the malaria parasite has a complicated life cycle and has learned how to evade the human immune system over hundreds of years.

The latest World Health Organisation figures show that of the 198million cases in 2013, 584,000 people died. Most victims are children in Africa, where one dies every minute.

Currently, the most effective prevention measure is the use of mosquito nets. The trial involved 15,459 infants aged six to 12 weeks and children aged five to 17 months from Burkina Faso, Gabon, Ghana, Kenya, Malawi, Mozambique and Tanzania.

SMART INSULIN TO REPLACE DAILY JABS FOR DIABETICS

MINAKSHI SONONE
FINAL YEAR B.PHARM

A new device with micro needles smaller than the width of a human hair can inject doses of insulin into the bloodstream whenever the blood sugar levels need to be adjusted. Painful insulin injections could become a thing of the past for the millions who suffer from diabetes, thanks to a new invention from researchers at the University of North Carolina and NC State, who have created the first "smart insulin patch" that can detect increases in blood sugar levels and secrete doses of insulin into the bloodstream whenever needed. The patch - a thin square no bigger than a penny - is covered with more than one hundred tiny needles, each about the size of an eyelash. These "microneedles" are packed with microscopic storage units for insulin and glucose-sensing enzymes that rapidly release their cargo when blood sugar levels get too high.

Diabetes affects more than 387 million people worldwide. Patients with type 1 and advanced type 2 diabetes try to keep their blood sugar levels under control with regular finger pricks and repeated insulin shots, a process that is painful and imprecise. Researchers have tried to remove the potential for human error by creating "closed-loop systems" that directly connect the devices that track blood sugar and administer insulin. However, these approaches involve mechanical sensors and pumps, with needle-tipped catheters that have to be stuck under the skin and replaced every few

days.

The first material was hyaluronic acid or HA, a natural substance that is an ingredient of many cosmetics. The second was 2-nitroimidazole or NI, an organic compound commonly used in diagnostics. The researchers connected the two to create a new molecule, with one end that was water-loving or hydrophilic and one that was water-fearing or hydrophobic. A mixture of these molecules self-assembled into a vesicle, much like the coalescing of oil droplets in water, with the hydrophobic ends pointing inward and the hydrophilic ends pointing outward. The result was millions of bubble-like structures, each 100 times smaller than the width of a human hair. Into each of these vesicles, the researchers inserted a core of solid insulin and enzymes specially designed to sense glucose.

In lab experiments, when blood sugar levels increased, the excess glucose crowded into the artificial vesicles. The enzymes then converted the glucose into gluconic acid, consuming oxygen all the while. The resulting lack of oxygen or "hypoxia" made the hydrophobic NI molecules turn hydrophilic, causing the vesicles to rapidly fall apart and send insulin into the blood.

Once they designed these "intelligent insulin nanoparticles," they had to figure out a way to administer them to patients with diabetes. Rather than rely on the large needles that had beleaguered previous approaches, they decided to incorporate these balls of sugar-sensing, insulin releasing material into an array of tiny needles. Gu created these "microneedles" using the same hyaluronic acid that was a chief ingredient of the nanoparticles, only in a more rigid form so the tiny needles were stiff enough to pierce the skin. They arranged more than one hundred of these microneedles on a thin silicon strip to create what looks like a tiny, painless version of a bed of nails. When this patch was placed onto the skin, the microneedles penetrated the surface, tapping into the blood flowing through the capillaries just below.

PCOS ON THE RISE AMONG TEENAGE GIRLS

SHREYA ADANGALE
(T.Y BPHARM)

Studies say PCOS affects five to 10 per cent women in the reproductive age (approximately 11 to 48-year-olds). Among the leading causes of female subfertility, it's a common endocrine problem in women.

Symptoms

Gynaecologist and infertility specialists say , "An ovulation results in irregular menstruation, amenorrhea, and ovulation-related infertility. Hormone imbalance generally causes acne and hirsutism (excessive hair growth). Insulin resistance, another side-effect of PCOS, is associated with obesity, Type 2 diabetes and high cholesterol levels. Its symptoms and severity vary greatly."

Lifestyle to be blamed

Unlike earlier days, there is a significant rise in the number of teenage girls suffering from PCOS. Nowadays there are many teenagers complaining about irregular menses, excessive hair growth, acne, male pattern baldness, decreased menses or excessive flow

Obesity is one of the main reasons why PCOS is on the rise. Most youngsters eat processed and junk food, which leads to quick weight gain. Add to that strenuous academic schedules and extracurricular activities, and they're left with no time to exercise."

Common treatment options

When PCOS is associated with obesity, weight loss is the most effective method of restoring ovulation and menstruation. Vitamin D deficiency may play a role in the development of PCOS, so that has to be treated as well. Some common pointers that I tell my patients include:

- Stop radical dieting. Diet should be for wellness, not starvation. Include more green leafy vegetables and lentils in your meals and avoid junk food.

- Control your blood sugar. Cut down on white bread, pasta, potatoes and oily foods. Replace them with high-fibre carbs and protein-rich foods.

- Exercise facilitates weight loss, acts as a mood elevator and regulates blood glucose levels."

Patients should provide a detailed history of their symptoms, so that an accurate diagnosis is possible. Medications include contraceptive pills with a combination of oestrogen and progesterone, which possess anti-androgenic properties,

Medication is crucial
While lifestyle changes are important, medication also plays a big role in treating PCOS. However, drugs are to be taken only in consultation with your doctor.

HOW SCIENCE SUPPORTS YOGA AS A CURE FOR DEPRESSION

SOURCE : TIMES OF INDIA
RUTUJA KATKAR
S.Y. B.PHARM

Antidepressants have had thousands, if not millions of dollars funding research on their benefits. At the same time, what may be the world's best depression treatment remains consistently under-tested and under-advertized, namely because there's no company that stands make enough money off of it to support its promotion.

Nonetheless, small studies have been conducted, and time and time again this miracle cure has proven not only its efficacy, but its lack of negative side effects—and plethora of positive side benefits—as well.

What is this miracle drug? It's not a drug at all: its exercise.

Studies revealed that after just four weeks, patients of major depression who exercised daily instead of taking medication experienced 95-100% of the improvement prescription drugs produced in their non-exercising counterparts.

Furthermore, a 10 month follow-up showed that the exercise-only group maintained the highest remission and stay-well rate.

So what is it about exercise that can so drastically improve our mood? Researchers suspect it comes down to the way our brains are wired. Like most species, we evolved as active organisms. Scientists suggest that our brains are simply not designed to handle life without physical activity.

In support of this argument, research reveals that exercise not only helps with depression, but also anxiety and even substance-dependence.
Scientists have noted that in addition to balancing serotonin and endorphin levels, exercise produces natural chemical compounds that support brain cell growth and maintenance

Neuroscience researchers have also found that exercise can switch on genes to increase galanin, a neurochemical that tones down the brain/body stress response. In other words, exercise can help the stressed as well as the depressed.

But order to get the most benefit from exercise, whether we're suffering from depression, stress, anxiety, or all of the above, we can't rely on cardio alone.

While aerobic activity plays a key role in physical and psychological health, stretching, strength training, and developing our body's core muscles are all vital components to maintaining optimum well-being.

One study revealed that even stretching for 15-20 minutes alone could decrease depression by nearly 30%. Combining stretching with other types of physical activity offers even greater benefits.

By integrating stretching, strengthening, and balancing exercises, yoga for depression offers one of the best methods for elevating one's mood.

Studies have illustrated yoga's ability to combat depression through balancing brain chemistry and stress hormone levels. Through a regular yoga routine, we can pull ourselves out of the pit of depression and rise once more to enjoy vitality and inspiration in our day-to-day lives.

Hence yoga should be made an integral part of our day to day

hectic lives, it is boon to us humans.

DEPRESSION AND DIABETES: TOO MUCH IN COMMON

SHREYA ADANGALE
(T.Y B.PHARM)

A common metaphor used to understand diabetes is that the "diabetic patient lacks sweetness in her life". While this is by no means meant to represent any individual patient's experience with diabetes, some people do find an element of truth to this statement.

And when you consider that depression often coexists with diabetes, this statement gets even closer to home.

The medical community recognizes the relationship between elevated blood sugar levels and conditions such as heart and kidney disease; we now also recognize that elevated blood sugar and depression are also closely linked. Depressed patients are less likely to engage in effective self-care practices such as exercise and cooking nutritious meals from whole foods (foods that have one ingredient on their list/foods that come directly from planet earth: think fruits, vegetables, nuts, seeds, beans, fish, meat), which only exacerbates their increasing blood sugar levels.

Our bodies do not like our blood sugar levels to be too high (or too low, for that matter). As blood sugar levels rise, the pancreas pumps out more insulin to siphon the sugar out of our bloodstream and into the cells of our bodies for use as energy, or to be stored for later as triglycerides, or fat-storage molecules. The problem is that if we constantly have high levels of insulin in our bloodstream, the cells in our body become "resistant" to insulin. Think of insulin as a stereo, playing a message to the cells that glucose is outside, can they please open their doors and let in glucose in? The cells get that message and open up their doors. If, however, there is lots of glucose and therefore lots of insulin, the message played by insulin gets louder and louder. In an effort to "plug their ears" from insulin's now-very loud message, the cells open fewer doors, so less glucose can get into the cells, and more insulin must then be produced. This is a state of insulin resistance, which is a precursor to diabetes, and occurs in the early stages of type II diabetes.

Among several other effects, insulin resistance and blood sugar dysregulation have marked disruptive effects on sleep, and can contribute to the development of sleep apnea. Sleep is one of the most fundamental activities required for optimum mental health, so sleep disturbance feeds the negative spiral into worsening health for patients suffering from depression and diabetes.

By addressing lifestyle factors including **diet** (primarily, removing refined carbohydrates from the diet and adding in protective antioxidants and polyphenols from fruits and vegetables, as well as appropriate amounts of protein), **exercise** levels (implementing realistic movement goals appropriate for each patient), and **sleep** (making sure you're getting restful, rejuvenating sleep), we at the Mind-Body Center aim to help you feel better mentally, emotionally, and physically. ***We've also noticed that weight loss, an alert mind, regular and sustainable energy levels, and clear skin happen to be pleasant side effects!***

Omega-3 fatty acids from fish oil, may aid healing after heart attack

Giving heart attack patients a high dose of omega-3 fatty acids from fish oil, daily for six months after a heart attack improved the function of the heart and reduced scarring in the undamaged muscle, according to new research in the American Heart Association's journal Circulation.

The heart's shape and function can be altered after a heart attack, a condition known as post-heart attack remodeling and it is linked with poor patient outcomes and could lead to heart failure. Therapies that can improve healing of the heart or prevent adverse remodeling, remain scarce.

A previous study found that omega-3 fatty acids from fish oil were associated with improved survival for heart attack patients, but the role of omega-3 fatty acids in improving the structure and tissue of the heart in patients receiving current guideline-based therapy after a heart attack was unknown.

In the new OMEGA-REMODEL randomized clinical trial, researchers found compared to those taking a placebo, patients taking a dose of 4 grams of omega-3 fatty acids daily for six months:

experienced a 5.8 percent reduction in left ventricular end-systolic volume index: a clinical marker that can predict patient outcome after a heart attack; and had a 5.6 percent reduction in a measurement of scarred connective tissue (fibrosis) formation in the non-damaged heart muscle.

"Heart failure is still a major problem after a heart attack despite all the therapy we have and the advances in interventional care," said Raymond Y. Kwong, M.D., M.P.H., senior author of the study and director of Cardiac Magnetic Resonance Imaging, Brigham and Women's Hospital and an associate professor of medicine at Harvard Medical School in Boston, Massachusetts. "Our findings show that omega-3 fatty acids are a safe and effective treatment in improving cardiac remodeling, so it may be promising in reducing the incidence of heart failure or death, which are still major healthcare burdens to patients who suffer a heart attack."

Researchers said these results suggests that omega-3 fatty acids allow the heart to contract better, and also reduces the fibrosis in the region that is not damaged.

The researchers also observed a reduction in biomarkers for inflammation, suggesting that omega-3 fatty acids have some anti-inflammatory properties.

The study involved 360 heart attack survivors, half were given a high dose omega-3 fatty acids and half placebo, beginning within a month of the heart attack. Because the study participants were given high doses of omega-3s in addition to their other medications, patients were under a physician's care and observed for any potential adverse outcomes by study authors throughout the study.

The treatment was found to be safe and effective. Both groups received treatment based on guidelines issued by the American College of Cardiology Foundation and the American Heart Association. Blood tests were used to confirm that patients in the omega-3 fatty acids group were taking the treatment.

CALCIUM SUPPLEMENTS POSE DEMENTIA RISK IN SOME WOMEN

SOURCE: TIMES OF INDIA

RUTUJA KATKAR

An observational study revealed that older women with cerebrovascular disease were at increased risk of dementia if they took calcium supplements

Older patients with osteoporosis are often given calcium supplements to support bone density, but evidence suggests that these products might harm vascular health, which can increase dementia risk.

Researchers analysed data from a previous population study involving 700 women aged 70–92 years who did not initially have dementia.

Brain scans were performed in 2000–2001 and again in 2005–2006. The later scans revealed that more women taking calcium supplements (n=98) developed dementia compared with those who didn’t (14.3% vs 7.5%,*P*=0.046), and in particular stroke-related dementia (8.2% vs 2.4%, *P*=0.006).

Further analysis revealed that the increase in risk was primarily restricted to women with cerebrovascular disease.

The researchers conclude in *Neurology* (online, 17 August 2016)[1] that calcium supplements may increase the risk of dementia in older women with cerebrovascular disease, but more research is needed.

NEW WEARABLE DEVICE CAN HELP TREAT DIABETES

Source: the internet
ADITYA NAIK

Scientists from Japan have developed a wearable medical device that can help diabetic elderly or overweight people to lose fat and treat type 2 diabetes.
The device developed by Kumamoto University affects visceral fat loss and improves blood glucose (sugar) by helping overweight or elderly people exercise, which is effective for the treatment of diabetes.
Type 2 diabetes is a disease of systemic organ failure due to chronic hyperglycemia and inflammation from the accumulation of excess visceral fat.
Metabolic disorders such as hyperglycemia attenuate stress resistance in the human body and exacerbate insulin resistance.
The heat shock response (HSR) is activated as a response to stress in the human body, but its function decreased in those with type 2 diabetes.
A research team from the university has found that by restoring the function of HSP72 — the main protein of HSR — improved glucoserelated abnormalities.
The researchers developed a belt-type medical device that uses a special type of rubber.
"This device is very easy to use since it simply attaches to the abdomen and it has a lowimpact on the patient. "One can expect the effects to be similar to exercise therapy," Tatsuya Kondo, who led the research, said in a statement.
The team then performed a clinical trial of MES + HS on 40 obese men suffering from type 2 diabetes.
Results showed a decrease fasting glucose levels, a loss of visceral fat, improve insulin resistance and a significant improvement in glycatedhemoglobin (HbA1c) values.

"Even in patients who have difficulty exercising, such as those who are overweight, elderly, or have some form of disability, this device can be expected to provide acceptable treatment in addition to conventional diabetic medical care," Tatsuya added.

NEW POLICY FOR DRUG DISPOSAL

-SOURCE: TIMES OF INDIA
RUTUJA KATKAR
S.Y. B.PHARM

June 20, 2016: With the vast selection of drugs available for almost every ailment in the country, there has been a tremendous success in controlling health conditions with drugs. However, these drugs have an expiration, and the unused stock which have reached their expiration have to be disposed.

This is not only important to make space for the new batch of incoming drugs, but also to ensure that an expired or a degraded product doesn't fall into the wrong hands or gets misused. Apart from the disposal of the active drug itself, the packaging material, product inserts, and other supporting paraphernalia have to be discarded too.

The Karnataka Government has taken up the matter of drug disposal on priority, and is devising a policy on its effective and systematic disposal. This will include not only the drugs that have reached their expiration date, but also those which are substandard, or do not meet

the safety and/or stability requirements. The Karnataka State Pollution Control Board (KSPCB) has tied up with Satva Health Solutions to develop innovative methods to cater to discarded medication. Currently, in the cities of Bengaluru and Mangalore, an estimated drug stock amounting to INR 10 crore needs to be dealt with, with an approximate processing cost of INR 1 crore to clear this pile up. Upon the successful completion of the pilot scale study which the KSPCB has outsourced, this initiative will be scaled up. With inputs from citizens, such as collection of a 0.5% drug cess tax, a steady inflow of funds will be ensured in order to continue this project with any hiccups.

Satva Health solutions has prior experience in disposal of drugs and biomedical wastes, and after multiple trial runs with pharmacies across the state, have embarked on this project for the scientific disposal of drug and hazardous wastes.

SUN PHARMA TO DEVELOP ANTI-DENGUE DRUG

SOURCE : TIMES OF INDIA
RUTUJA KATKAR
S.Y. B.PHARM

June 03, 2016: Dengue fever is a tropical disease caused by the bite of the mosquito Aedesaegypti carrying the dengue virus. The initial symptoms include high fever, headache, joint pain and a skin rash which is very typical of dengue. With prompt diagnosis and treatment, recovery is instant in almost within a week. However, negligence to correct the symptoms could lead to life threatening conditions such as hemorrhagic fever, which brings about a cascade of events including bleeding, a drop in platelet count, and a leaking of blood plasma accompanied by a severe drop in blood pressure.

At present, 5 different types of the dengue virus are known, of which one gives a lifelong immunity to that particular strain.

Sun Pharma has collaborated with Ranbaxy, and the Delhi based ICGEB (International center for Genetic Engineering and Biotechnology) in order to develop a cure for dengue. The focus is presently on the isolation of active compounds of the herb Cissampelospariera, which has also been used in the Ayurvedic system of medicine. The alcoholic extract of this plant has shown to be effective in combatting the dengue virus. Sun Pharma plans to introduce the drug in 17 countries and will pay sales royalties to ICGEB. The research team at Sun Pharma has completed the in vitro and in vivo studies on the active principles of the extract and will soon file it as an NCE with the regulatory authorities.

This drug would be of great benefit in the tropical countries, especially India, which has a high incidence of dengue, and dengue related complications. The annual financial burden, inclusive of costs of therapy are close to US $ 1 billion in India alone.

ALCOHOL & HEARING

- SYDNEY.EDU.AU › FACULTY OF SCIENCE
ADITYA NAIK

It's hard to pinpoint exactly. But at every party, there comes a stage when the mood picks up. People have drunk enough alcohol to reach the point where they loosen their inhibitions, and start relaxing and dancing. The observable link to the effect of the alcohol is that the noise level goes up with the mood.

Why does the party get louder when people drink more alcohol? What is alcohol doing to your brain, and what are the flow-on effects?

Alcohol, known as ethyl alcohol, or C_2H_5OH, has

wondrous properties. It can remove oil stains from the garage floor, and store body parts or axolotls beautifully for centuries.

In humans, drinking small quantities of this versatile liquid can improve mood and self-confidence, and get the conversation flowing. But in bigger doses, the effects are less wondrous. Alcohol then interferes with your fine muscle control and your higher mental functioning, which messes with your decision making.

But getting back to party mode, why are you getting that sudden increase in noise?

We're still not entirely sure, but it seems to involve a feedback loop - let me explain. Once you have a few drinks, your sense of hearing is impaired. So when you speak, you mistakenly think that you are talking more softly than usual. To compensate, you (without even thinking about it) automatically start talking louder.

We should also factor in social competition and loss of inhibition. As people try to get their 'words of wisdom' across, there is a bit of 'shouting-down-the-competition'. This is called the Lombard Effect (after Étienne Lombard, a French otolaryngologist, who discovered it in 1909).

Interestingly, alcohol effects on hearing are different for men and for women. Women go deafer than men.

In typical studies, men and women (in a double blind situation) drank juice, either with, or without, alcohol. Then, once the people drinking alcohol hit around 0.03% blood alcohol concentration (BAC), their hearing was tested at six different audio frequencies running from low to high (250 Hz, 500 Hz, 1,000 Hz, 2,000 Hz, 4,000 Hz and finally 8,000 Hz). On average, the men would lose two to nine decibels (dB) of hearing, while women would lose more - five to twelve decibels. A lot of the hearing is lost around the 500-1,000 Hz range - which are the frequencies where a lot of speech happens, and where vowels are discriminated.

Unfortunately, in most of the studies, the sample sizes are rather small. From this limited data, the trend seems to be that women, fat people, unhealthy people, older people, and those with a history of heavier drinking lose more of their hearing in each drinking event. Luckily, within a week of the drinking event, the hearing tends to return to pre-alcohol drinking levels. Overall, most of the temporary hearing loss was down at the lower frequencies.

However, the hearing loss was different for long-term drinkers. They tended to have permanent hearing loss, and more often, at the higher frequencies.

We're not sure why.

We know that sound information is carried from your eardrum to the central processing centres inside your brain.

How does alcohol make you slightly deaf? Where in the hearing chain does alcohol make you slightly deaf? We have some tantalising hints from the relatively few studies done, but the simple answer is that we don't know.

This hearing loss might be from the alcohol having a direct toxic effect on the cochlea, or a subtle influence on neurotransmission, or a direct anaesthetic effect or osmotic effect on nerves or hair cells in the cochlea - or changes in impedance of the moving bones of the inner ear, or something else. We don't really know how.

The alcohol might be acting on your eardrum, or the muscles that can pull on the eardrum to quieten down the outside world, or the cochlea, or the cochlear nerve that carries the information into your brain, or it could be acting on the area in your brain that processes this information.

Regardless of the exact pathway by which it happens, the result once you've had a few drinks is that you 'hear' yourself as if you are talking too quietly, and to compensate, you start talking loudly.

There are many causes of hearing loss in our modern industrial world. Social drinking in the evening for most people usually happens in a noisy bar. This adds to the noise-induced hearing loss the party-goers get exposed to in everyday life.

We worry about getting blind drunk. But maybe another concern for the inebriated, is getting deaf drunk.

10 NATURAL DEPRESSION TREATMENTS

SOURCE: THE INTERNET

ADITYA NAIK

Being depressed can make you feel helpless. You're not. Along with therapy and sometimes medication, there's a lot you can do on your own to fight back. Changing your behavior -- your physical activity, lifestyle, and even your way of thinking -- are all natural depression treatments.

These tips can help you feel better -- starting right now.

1. Get in a routine. If you're depressed, you need a routine, says Ian Cook, MD. He's a psychiatrist and director of the Depression Research and Clinic Program at UCLA.

Depression can strip away the structure from your life. One day melts into the next. Setting a gentle daily schedule can help you get back on track.

2.Set goals. When you're depressed, you may feel like you can't accomplish anything. That makes you feel worse about yourself. To push back, set daily goals for yourself.

"Start very small," Cook says. "Make your goal something that you can succeed at, like doing the dishes every other day."

As you start to feel better, you can add more challenging daily goals.

3. Exercise. It temporarily boosts feel-good chemicals called endorphins. It may also have long-term benefits for people with depression. Regular exercise seems to encourage the brain to rewire itself in positive ways, Cook says.

How much exercise do you need? You don't need to run marathons to get a benefit. Just walking a few times a week can help.

4. Eat healthy. There is no magic diet that fixes depression. It's a good idea to watch what you eat, though. If depression tends to make you overeat, getting in control of your eating will help you feel better.

Although nothing is definitive, Cook says there's evidence that foods with omega-3 fatty acids (such as salmon and tuna) and folic acid (such as spinach and avocado) could help ease depression.

5. Get enough sleep. Depression can make it hard to get enough shut-eye, and too little sleep can make depression worse.

What can you do? Start by making some changes to your lifestyle. Go to bed and get up at the same time every day. Try not to nap. Take all the distractions out of your bedroom -- no computer and no TV. In time, you may find your sleep improves.

A GOOD NIGHT'S SLEEP

SOURCE: THE INTERNET

ADITYA NAIK

Here are five secrets backed by science to sleep peacefully.

Everyone dreams of getting that perfect night's sleep, but it's not as difficult as you might think. A good night's sleep doesn't just make you feel well-rested and alert. In fact, your sleep quality has a huge influence on your physical and mental health and well-being.

So, the next time you find yourself counting sheep for hours on end, try one of these strategies and see if it helps.

1 EXERCISE REGULARLY

When you're exhausted, exercising seems like one of the most impossible tasks in the world. However, most studies agree that exercising regularly is one of the best ways to help your body prepare for sleep. After all, if your body hasn't burned any physical energy it may not feel that it needs to sleep.

2 LIMIT THE BLUE LIGHT FROM SCREENS

Study shows that the blue light coming from screens can seriously interrupt your sleep patterns. Your late night TV-watching or social media checks may be having a significant impact on your sleep quality. The light suppresses your body's production of melatonin, a hormone that helps to regulate your sleep cycle.

3 STICK TO A BEDTIME

One of the most important sleep strategies is to make sure you get enough of it. Make sure that you are going to bed early enough that you can regularly get about eight hours of sleep each night. Researchers recommend that you also fall asleep and wake up at the same time every day. This strategy helps to regulate your body's circadian rhythm and cue your sleeping patterns.

4 MAKE A BEFORE-BED ROUTINE

Take some time to craft your own going to bed rituals. Anything calming should do the trick — your routine could include reading a few pages of a book, journaling, using scented hand lotion, or doing some meditation. These activities help to decrease the stress hormone cortisol, allowing your body to feel calm and safe enough to fall asleep.If you remain anxious or worried, try writing down everything you are worrying about on a pad of paper by your bed. You can also add a sentence explaining how you will begin to fix the problem tomorrow. This can help to release the worry from your mind, and allow you to react.

5 LIMIT YOUR CAFFEINE INTAKE

If you are truly struggling with falling asleep, your daily caffeine habits may be to blame. After all, caffeine is a drug — a stimulant that keeps your body from recognising signs of exhaustion. It can take five to six hours for your body to process half of the caffeine you consume. For this reason, it's safest to stop drinking any caffeine.

SMOKING IS THE MOST PREVENTABLE CAUSE OF DEATH

ARJUN SENAPATI
S.Y. B.PHARM

This means that many of those who lose their lives because of smoking-related illnesses could probably live much longer if they didn't smoke. Smoking can damage some of the most important organs in your body, including the lungs, heart and brain. The poisonous chemicals in cigarettes can cause emphysema (a lung disease) and bronchitis (inflammation of air passages to the lungs), heart disease, heart attacks, stroke (an interruption of the blood flow to the brain) and cancer.

Here are some other effects that smoking can have on your health:

- Hearing and vision loss
- Arthritis
- Chronic coughing, more phlegm (mucus) in your mouth and asthma
- Decrease in athletic performance. Think about it: you can't run as fast or jump as high if you can't breathe properly!
- Cancer of the mouth, gum disease, tooth decay, and yellow staining of the teeth
- Peptic ulcers, pancreatic cancer, bladder cancer, kidney and liver damage
- Heartburn
- Diarrhea
- Decreased circulation in the fingers and toes
- Yellowing of fingernails and toenails
- Bad breath
- Wrinkles

Another problem is that smoking is usually not a one-shot deal. It can take only weeks or days for new smokers to become addicted. Why? Because cigarettes contain a drug called Nicotine, the ingredient that causes the

addiction. The more you smoke, the more you want to continue to smoke. Your body becomes physically dependent on the drug and begins to crave it. This is what makes it so difficult to quit smoking once you've started.

Here are some other interesting (and shocking) facts about smoking:

- Approximately 1500 kids are killed each year by fires in the home that were caused by cigarettes. The tobacco industry has the science to make a self-extinguishing cigarette, but they don't use it! Why?
- Cigarette butts are among the biggest causes of pollution on beaches.

Secondhand Smoke

Even if you don't smoke, just being around people who are smoking can cause health problems. "Secondhand smoke" (also called "sidestream smoke") from someone else's cigarette can be just as dangerous as smoking itself.

Here are some facts about second hand smoke:

- It kills about 3,000 non-smokers each year from lung cancer.
- It causes up to 300,000 lung infections (like pneumonia and bronchitis) in babies and young children each year.
- It causes babies to be at risk for SIDS (Sudden Infant Death Syndrome).
- In a crowded restaurant, smoking can produce six times the pollution of a busy highway.
- Pets suffer too! It can cause leukemia (a type of cancer) in cats and enlarged hearts in dogs.
- It causes 30 times as many lung cancer deaths as all the different kinds of pollution combined.
- It causes wheezing, coughing, colds, earaches and asthma attacks.
- It fills the air with many of the same poisons found in the air around toxic waste dumps.
- It ruins the smell and taste of food.
- It causes reddening, itching, and watering of the eyes.

Smokeless Tobacco

Finally, you may have heard about smokeless tobacco, a sticky substance that you chew, kind of like gum, with a tobacco flavor. This product is also known as "chewing tobacco," "spit tobacco," and "snuff." Many people think that smokeless tobacco isn't harmful to your health the way cigarettes are. Not true! Chewing this stuff can cause bleeding gums, sores in the mouth that never heal, and cancer of the mouth. In addition, it may cause bad breath, hiccups, dizziness, nausea and yellow staining of the teeth. Sounds gross, huh? Like cigarettes, smokeless tobacco contains Nicotine, which makes it addictive.

MAKING SKIN LEAKY MAY IMPROVE DRUG DELIVERY.

-MEDICINALNEWSTODAY.NET

-ADITYA NAIK

Researchers from Japan may have made great strides in the advancement of drug delivery, by finding a way to make the skin "thinner," making it easier for drugs to pass through and enter the bloodstream.

Researchers reveal how they used microplasma to thin the skin, allowing drug compounds to pass through to the bloodstream.

Our skin provides us with an impermeable barrier to the environment. This is good, because it means that our skin is waterproof, which protects us from dehydration. Skin also acts as a natural barrier to

pathogens, such as bacteria and viruses.

In order to administer drugs, the skin needs to be bypassed. This is most commonly done by injection, which disrupts the skin barrier, leaving us vulnerable to infection. It is also often painful.

Another method of delivering drugs is orally, but enzymatic digestion of drugs and potential toxicity are risk factors. In order to deliver a drug through the skin without damaging the skin barrier function, the skin has to be made "leaky."

The outer layer of the skin is made up of dead cells, which are glued together by specialized lipids and proteins. These cells form a multi-layered structure called the stratum corneum.

Very few drugs can cross the stratum corneum by passive diffusion. To make skin leaky, the structures between the cells in the stratum corneum have to be disrupted, without damaging the cells or leaving it vulnerable to infection. Drugs can then enter the body through the skin - transdermal delivery - and enter the bloodstream or the immune system.

New methods to achieve this are therefore of great interest to scientists and pharmaceutical companies who want to develop drugs for transdermal delivery.

Using microplasma to thin the skin

Scientists in Japan have been working on a different method to disrupt the impermeable stratum corneum using treatment with atmospheric microplasma.

Plasma is the fourth state of matter, the others being solid, liquid, and gas. Plasma can be produced by partial ionization of a gas.

Plasma is commonly used for the sterilization and treatment of surfaces in industrial applications. When atmospheric air is used for this process, the resultant plasma is called atmospheric plasma. When plasma is generated in a very small space, covering only micrometer distances, it is termed microplasma.

Researchers from Shizuoka University in Japan compared the effect of plasma treatment using conductive and non-conductive materials on the stratum corneum.

The team presented their findings at the 63rd Annual Symposium and Exhibition of the American Vacuum Society (AVS), held in Nashville, TN.

For this study, they used the skin from mini pigs, as pig skin most closely resembles that of humans.

Microplasma treatment led to leaky skin, with no damage

Treatment using a conductive material resulted in significant damage to the skin by the plasma jet, with small holes and burnt areas. But treatment on a non-conductive material using atmospheric microplasma showed no damaging effect on the skin.

Importantly, the microplasma treatment resulted in increased permeability, which was measured using a specialized type of spectroscopy and a dye test.

The skin is normally impermeable to dyes, but microplasma treatment resulted in leaky skin, allowing the dye to penetrate the stratum corneum. This indicates that drugs could also permeate the stratum corneum after microplasma treatment and be absorbed by the skin.

A combination of Attenuated Total Reflectance (ATR) and Fourier Transformed Infrared (FTIR) spectroscopy (ATR-FTIR) was used to test the structure of the skin after microplasma treatment.

This technique indicated that there was a change to the chemical structure of the skin, but that it was not damaged.

The data presented indicate that microplasma treatment

could be used to improve transdermal delivery of drugs.

The authors did however note in their recent publication in the journal Biofabrication that "the microplasma irradiation to living bodies (including humans) and the effect of the applied voltage waveform need to be confirmed in future clinical studies."

This work shows that innovative solutions are needed to address the problem of transdermal delivery of drugs.

WHERE HAVE MY HAIR GONE?

TIMES OF INDIA
ADITYA NAIK

It's official. Men are inching towards baldness as early as in their 20s, and that's a leap from our fathers' generation that hoped to walk into their 40s with a full crop of hair.

Losing hair is far from being a modern concern, but premature balding, say trichologists is turning out to be more of a trend than rarity. And the way we live our lives has more to do with it than genes or plain bad luck.

Swedish hair specialist Dr Fred Zuli and Italian scientist Dr Falvio Ferrari, who were in Mumbai for a discussion on hair growth technology, put it down to four major hair fall reasons: stress, vices, pollution and poor nutrition.

While it's normal to lose between 50 and 100 strands of hair a day, serious hair loss — medically termed alopecia — is a sign that something is wrong with our body, says trichologist Dr Apoorva Shah. "As a reaction to an incident of extreme mental or physical stress, the body typically sheds hair after a gap of three months. For instance, if you are down with food poisoning, the mal-absorption of nutrients during this period can lead to hair loss in the next few months. So, it's important to jog your memory to pinpoint the cause."

Dr Ferrari squarely puts the blame on stress. "While genetics plays a key role in balding, a stressful lifestyle can play havoc. Simple lifestyle changes such as, getting seven hours of sleep, having a glass of water every hour (strands are made up of minerals, which only water can replenish) and eating protein-rich foods at regular intervals can bring about an 80 per cent change."

"Nutrition is vital for hair growth. No other part of the human body grows at the rate of half an inch per month, except bone marrow, so you must feed it," says Dr Shah

Eat well, see it grow

The relationship between food and hair is simple. Hair is made up of a protein called keratin. So, it's essential that you include sufficient protein in your diet. A low-protein diet forces your body to save the available protein for other purposes, like rebuilding cells, thus depriving hair of it. Dr Shah says spinach, almonds, walnuts, paneer, tofu and milk are hair-happy foods. Green tea is effective because it blocks out Dihydrotestosterone (DHT), the hormone that causes hair loss.

Rapunzels are dead .Men are not alone. Women are also losing more hair than they did in the past, because a stressful lifestyle is a major reason for hair fall. Stress is driving their bodies to produce more androgens (male hormones), thereby upping the secretion of the hair loss-causing chemical DHT, says Ferrari. With women, excessive styling and colouring is also to blame. "Heat and chemicals weaken the hair, leading to easy breakage," adds Dr Zuli. Dr Shah says the indiscriminate use of oral contraceptives that can cause hormonal imbalance in the long run should be checked.

To moisturise the scalp, he advises oiling it with coconut or almond oil three nights a week, and washing it off the next morning. Trimming split

ends every eight weeks helps, too.

Smoking away your mane

Here's one more reason for hair fall and to quit smoking. The carbon monoxide that you inhale, prevents the blood from transporting oxygen and key nutrients to hair follicles. Nicotine narrows the blood vessels, further stalling fresh hair growth.

While moderate drinkers can hold on to their hair, regular guzzlers are at risk. Alcohol is known to suck the body of its iron supply, impeding absorption of zinc. Booze also causes dehydration, stopping the body from absorbing vital nutrients. Since hair is almost one-fourth water, excessive alcohol will invariably leave it brittle.

How stress plays spoilsport

Stress is one of the major hair fall reasons. A hair follicle needs energy to grow. Coenzyme Q10, found in whole grains, fish and meat, boosts the scalp's ability to produce energy, especially in a cell's mitochondria or energy factory. Stress causes oxidation, harming Coenzyme Q10 among other anti-oxidants, thereby being one of the major contributors to the list of reasons for hair fall.

Feed hair with the following to cut down hair fall :

Vitamins B3, B5, B9, and E (found in orange, spinach, chicken, fish, broccoli and soya beans)

Zinc (wheat, dairy, oats and egg yolk)

Magnesium (milk, tuna, banana, cashews)

Iron (fish, leafy greens, fortified cereals, and beans)

Massage your hair with hot oil

Heat some oil (preferably coconut oil or almond oil) and slowly massage your scalp using your fingertips. It increases flow of the blood to the hair follicles, enhance the strength of the roots of your hair and condition your scalp.

WHY GETTING FRESH AIR IS SO GOOD FOR YOU

SOURCE: THE INTERNET
ADITYA NAIK

While we grew up frolicking through fields, swinging at the park and cruising along on our bikes, as adults, many of us spend most of our time indoors. But all of those hours spent outside were actually good for more than using up our unlimited, childhood energy. As it turns out, science shows that some fresh air really will do you good.

Just like you learned in elementary school, trees use photosynthesis to turn carbon dioxide into the oxygen we need to breathe. In just one year, the presence of trees saved 850 lives and prevented 670,000 cases of acute respiratory symptoms, according to new research published in the journal Environmental Pollution. Trees remove pollution from the air, making it healthier for us to take into our lungs. According to the research, the fresh air created by trees is especially beneficial to those living in urban areas, where the air is more heavily polluted.

Air pollution can create some major health problems. Highly polluted air has been shown to cause a burning effect in eyes, noses and throats. Polluted air also makes it harder for those with asthma to breathe. Some toxic chemicals that can live in the air -- like benzene and vinyl chloride -- are highly toxic. They can even cause cancer, birth defects, long term injury to the lungs, as well as brain and nerve damage. Breathing fresh air that plants produce lowers the chances of coming into contact with these scary pollutants.

It can boost your immune system.

It may be time to step outside if you find yourself cooped up with tons of other people at your office, or even in your

own home. Such close quarters exposes you to all sorts of germs. Plus, even a simple walk outside can raise your immune system. "Exercise leads to an increase in natural killer cells, neutrophils and monocytes, which ultimately increases immune function," Ather Ali, ND, MPH, assistant director of Complementary/Alternative Medicine Research at the Yale-Griffin Prevention Research Center tells Health.com.

Science shows that you really should stop and smell the roses, as the smell of them promotes relaxation. Other flowers, like lavender and jasmine can also lower anxiety and up your mood. Research shows that the scent of pine trees decreases stress and increases relaxation. Even walking through a park or your own backyard can help you feel calmer and happier when you catch a whiff of freshly cut grass. And while rain may put a damper on your outdoor plans, we love nothing more than the scent of a downpour, according to Smithsonian magazine. The smell reminds us of the color green and may be linked with the growth of both the plants and animals that we need to eat, which could explain why it smells so good to us.

Fresh oxygen energizes.

Back away from the energy drink. Research shows that spending time in fresh air, surrounded by nature, increases energy in 90 percent of people. "Nature is fuel for the soul, " Richard Ryan, researcher and professor of psychology at the University of Rochester, tells the University of Rochester. "Often when we feel depleted we reach for a cup of coffee, but research suggests a better way to get energized is to connect with nature."

HOW TO IDENTIFY BOGUS MEDICINES

-NEHA YADAV
FINAL YEAR B.PHARM

- If the packing of the medicine changes.
- If the colour of the medicine changes.
- If the consistency of ointment changes.
- If the flavour and odour of liquid preparations changes.
- If the medicines are available at a very low price than the normal price.
- If the seller refuses to give the bill for the medicine purchased.
- If the label of routinely used medicines like Iodex, ointments is changed.
- If the seller does not give Disposal syringe although mentioned on the label of injection
- If the expected result is not obtained from the drug.

10 'Unsolved' Mysteries Of The World That You Probably Didn't Know Were Already Solved

-Shreya adangale
(T.Y. B.PHARM)

Everyone loves a good mystery! More than that, everyone loves to obsess over a mystery that hasn't been solved. What can be more fun than nose-diving into a hurried conclusion, looping around a bunch of far-fetched theories before eventually saying "Aliens"? There are some mysteries that make a perfect cut to that list.

But sadly, they have been solved. It is almost as if someone licked the cream out of a bourbon biscuit and left the bland, uninteresting crust behind. It is often heartbreaking to buy a simple logical explanation behind mysteries that managed to baffle geniuses for the longest time.

Here are some you might have thought were still not solved:

1. The Bermuda Triangle

Mystery: Also known as the Devil's Triangle, it is a loosely defined region in the North Atlantic Ocean, where many aircrafts and ships are said to have disappeared under mysterious circumstances, never to be seen again.

Solved: According to research, the average number of crafts disappearing here is the same as in any other well-traveled part of the ocean. What that implies is, take any other part of the ocean that has seen its fair share of traffic, and you'd end up with similar number of 'disappearances'. This story has survived on unnecessary hype. There have been no major disappearances since 1999.

2. The Bloop

Mystery: It is a mysterious ultra-low-frequency and an incredibly loud sound originating in the South Pacific that was heard by two stations which are separated by 5000 kilometres. People started to think it might be produced by an enormous animal that has never been seen before.

Solved: The NOAA Vents Program attributed the sound to that of a large icequake. Numerous icequakes share similar spectrograms with Bloop, as well as the amplitude necessary to spot them despite ranges exceeding 5000 km.

3. Egyptian Pyramids

Mystery: The world has been baffled for years about just how slave workers transported the massive blocks across the Valley of the Kings in around 2000 BC to build the majestic pyramids. It has often been called a work of the aliens.

Solved: Dutch researchers have figured that the Egyptians placed heavy objects on a sledge, pulled by hundreds of workers, and simply poured water on the sand in front of it, which made it easier for the sledges to glide over the sand.

It really did take us thousands and thousands of years to crack something this simple! Or, do you think it took us more years to believe it could have been this simple?

4. Ica Stones

Mystery: They are a collection of andesitic stones from the Inca Empire found in Ica Province that bear a variety of diagrams. Some of them supposedly have depictions of dinosaurs, and advanced technology. Wonder how people could predict it all, back in that age!

Solved: Javier Cabrera Darquea collected and popularized the stones, obtaining many of them from a farmer named BasilioUschuya, who after claiming it to be real ancient artifacts, confessed that he produced a patina by baking the stone in cow dung to give it an authentic look, and, created the carvings using a knife.

5. The Iron Pillar, Delhi

Mystery: A major tourist attraction, it has successfully avoided rust for around 1600 years despite being in open air. Most people naturally leave the explaining to ancient supernatural elements.

Solved: Scientific analysis proves that the pillar is coated with iron containing phosphorous that prevents it from corrosion.

6. Side notes in Homer's Odyssey

Mystery: The notes in the margin of this edition baffled people for a very long time. Was it a clue to something more important or was there a message hidden in it?

Solved: Turns out the marginalia was nothing but scribbled translation of the book in an archaic French shorthand.

7. The crew of Mary Celeste

Mystery: The entire crew of Mary Celeste disappeared like poof! It was as if the whole ship just vanished in

thin air without any explanation, leaving everyone confused and worried!

Solved: She was found later. It looks like the crew abandoned the ship when the alcohol on the board combusted. The crew, however, was never seen again. Scientists determined that a vapour based explosion would not damage anything, but it would still be a petrifying experience.

8. Loch Ness monster

Mystery: Nessie, the Loch Ness Monster, was the most well-known lake monster in the history of lake monsters. Some people believed it to be a living dinosaur or even a sea serpent that swam into the lake before it became landlocked. But Nessie became a reality for a lot of people and shot to stardom after a photograph of the monster showing his head and neck was published.

Solved: The image, taken by a surgeon from London, was later admitted as a hoax.

9. People who believe in ghosts

Mystery: All of us have met at least one person would go to any extent to make us believe that he/she has seen a ghost (at least once). Most of us got carried away by their stories, restlessly fearing something similar might happen to us.

Solved: They probably have active left temporoparietal junctions. Scientists have found that a small electric shock in that part of the brain cause people to see someone else in the room. Keep that in mind the next time you meet someone instead of letting it make your blood run cold.

10. Mystery spots

Mystery: They are said to be sites where the magnetic field behaves erratically and makes objects fall.

Solved: They are rotated and are at an inclination of 20 degrees. It interferes with your sense of judgment so you can't tell where the horizon is.

SAW AN OLD MAN TODAY...

-PRAKHAR KULSHRESTHA,
S.Y. B.PHARM

Saw an old man today.

The wrinkles on his face showcased,

The lifetime of wisdom and misery he possessed.

He had to use a stick to walk because,

At this stage, even his knees could talk.

It was evident that he was having a hard time, and,

It's reason was there, just in time.

It was his grandchild, not even eleven at that time.

The look on his face reflected how much he despised,

To walk at a pace so slow, that an entire rainforest could grow,

by the time they were near block 9.

It struck me just at that time,

For the child, the old man wasn't even worth a dime.

But there was another side of it, yet to be explored,

Some great stuff, yet to be exposed.

It was after a while when the child tripped on a mine.

The old man ran, sped up his pace,

One should've definitely looked the expression on his face.

He was scared to death with the tiniest scratch on his grandchild.

He quickly cleaned the little wound and made sure everything was fine.

The child could not realise the care he got at that time,

Perhaps too juvenile he was or had something else up in his mind.

Maybe he won't understand it now, but he will one day in his lifetime.

The old man might not live till then, but his essence will glorify his spirit at all times….

ON FIELD, ON FIRE...!

-VIGNESH KONAR
S.Y.B.PHARM

When I am on the field.

I have a fire.

Win or lose, doesn't matter,

Playing is my only desire.

I am okay as a keep,

Good as a lead,

Really want to see me rolling?

Then place me midfield!

It's not always about hitting goals,

The Game's all about passing.

Dribble, pass, pass, shoot,

And you surely are going to win.

Few minutes of play every day,

Is what it really takes.

Fearless I feel,

Stress and tension it eradicates.

If poems are my drug,

Then football is my passion.

AMOUNT OF ANGST

-DHWANI SHAH
F.Y. B.PHARM

You bury in fire,
I'll drive you in fury.
You see everyone in dyslexia,
While I see through psychological enemy.
Maybe we are bound to hell,
Where mercy is delusional to me.
Killing the circumstances,
I'm growing into a catastrophe.
A fictional infatuation of a fairytale's wonderland,
Dropped hatred of millennium in the sky,
You can feel blood stealing voids.
From where you start,
There is nowhere to hide while ends are infinite.
Crawling behind bushes of anguish and tyranny,
All you get is a bite of serenity.
With just a step ahead,
You behind thousands of miles,
Bones will twist to make bow,
Shooting arrows that'll never reach their goals.
Then you'd turn around,
Find yourself in a lost scape.
Don't worry, take my hands,
They'll keel you safe.

INSIGHT

-PRAJAKTA GODSE
F.Y. B.PHARM

Resting on a spongy White pillow,
A room perfectly scented
A night lamp beside and flowers on either
And the moon out there, perfectly crescent

Silence prevails in and out
After suppressing thoughts and pitied faces
Eyes turn heavy; soon light
Starting at the ceiling, darkness follows

"Good morning", Said the girl in white
I opened my eyes, the star was up
The flowers replaced, the curtains changed
The silence vanished and the thoughts popping again

Everything new and bright, but yet dull
Because, I am still the same, staring…
A rigid passive body, a lifeless burden
On this bed since time unnoted

Each day with a hope for a change
in ME, my present my condition and the faces
Calm, Patient and tolerant is all I should be
Until a golden day arrives and Comforts me

MOTHER

-SHUBHAM GHUGE
F.Y B.PHARM

You are the one who cares for me,
You are the eyes that helps me see.
You are the one who knows me best,
When its time to have fun and time to rest.
You are the one who has helped me to dream,
You hear my heart and you hear my scream.
Afraid of life but looking for love,
I'm blessed for god sent you from above.
You are my friend my heart and my soul,
You are the greatest friend i know.
You are the words inside my song,
You are my love, my life, my mom.

THE LAST PAGE OF OUR NOTEBOOKS...

YASH V PANCHAL
F.Y B PHARMACY

A place where we check
Whether our pen is working or not
A place where we calculate the percentage out of the marks we got

The last page of our notebook...

A place where we play the game
of flames with our secret crush's name
Then strike it off so that no one sees
and not giving a chance for our best friend to tease

The last page of our notebook...

A place where we chat
with our friend when the class is going on
Unable to listen
the boring lecture going on since morn

The last page of our notebook...

A place where we note important questions for the upcoming exam
A place where we scribble random things or even try drawing the funny face of Ma'am

The last page of our notebook...

A place where we write
Beautiful lines of our favorite song
A place where we and our friends play
tic-tac-toe with marks of right and wrong

The last pages of our notebooks...
aren't just pages, They are much more...
They are precious diaries...
where we unknowingly treasure our teenage memories...

मैत्री

डेरे निलम दत्तात्रय
Third Year B. Pharm

पहाट सोनेरी किरणांची
नवीन आशेची, नवीन विचारांची
एका स्वतंत्र्य आयुष्याची
जन्म आडतो अशा मैत्री वाचून
गरज ही प्रत्येक जिवनाची
मित्र हा असतो असा एक झरा
असतो ज्याच्याकडे मनातील वसा
त्यावाचून खिडकीतून परततो गंध न घेता वारा
प्रत्येक घटनेचा इतिहास तो
पाऊल टाका दाही दिशा
खाचखळग्यावरूनी लोटांगण घाली
निस्वार्थ मैत्री हीच त्याची शिधा
व्यक्त करण्या आपल्या भावना
नसे गरज शब्दाची
अबोल डोळ्यातूनही वाचे
गरज आपल्या आयुष्याची

आठवण

डेरे निलम दत्तात्रय
Third Year B. Pharm

आठवणींच्या जगात थोड फिरून याव म्हटल
हरवलेले क्षण परत जगुन याव म्हटल
दुसऱ्या वर्गात गणितात मिळालेले शंभर पैकी शंभर
आणि तो वार्षिक परीक्षेत आलेला पहिला नंबर
ऑफीसमधून आल्यावर बाबांच्या गाडीवर
मारलेली चक्कर
काय सांगु यार ते दिवस होतेच एक नंबर
शनिवारच्या सकाळच्या शाळेला हमखास मारलेली बुट्टी
जणु काही होती आमच्यासाठी गव्हरमेंट सुट्टी
शेजाऱ्यांच्या झाडावरून पेरू चोरताना वाटलेली भिती
आणि मित्राला कडकडून मारलेली मिठी ।।
घरादारात केलेला वही पुस्तकांचा पसारा
कागदाचे विमान-होडी बनविण्याचा आनंद निराळा
बाबांच्या नजरेतला तो विलक्षण दरारा
आणि आईच्या कुशीतला शांत निवारा
लाल-लाल शाईने माखलेली विज्ञानाची वही
आणि पहिल्यांदाच मारलेली बाबांची
खोटी खोटी सही
दिवाळीच्या सुट्टामध्ये बनवलेला मातीचा किल्ला
कधी गेले हे सोनेरी क्षण कधी कळलच नाही
काळाच्या गतीच हे कोड आजवर
कोणाला उलगडलच नाही
सरल ते बालपण आणि उरल हे शहाणपण
खरच होतीच ती दुनियान्यारी
उरली फक्त आठवणींची शिदोरी

आपले आभाळ !

आकाश कृष्णा आदलिंगे
Final Year B. Pharm

आपले आभाळ मोजावे आपणच
घेऊ नयेत उसनी कुणाची प्रयस्थ निरीक्षणे .....
सांदीफटीतून जर विशिष्ट ओळख नसलेले काही
हाताला लागले तर त् आपले आभाळच असते !

आपले आभाळ जोखावे आपणच
कुण्या दुसऱ्याने त्यात उड्डाणे भरण्याअगोदर .....
हात वर केल्यावर जे हाताला लागत नाही
ते ही असू शकते आपले आभाळच !

आपले आभाळ निरखावे आपणच
कुण्या दुसऱ्याने त्यातला सुर्यास्त चितारण्यापूर्वी
आपल्या आभाळात आपल्याही नकळत
खूपदा होत असतात सुर्योदय, उल्कापात, ग्रहणे !

चुकली दिशा तरीही !

मुळ कवी – विं. दा. करंदिकर

Article given by –
Akash Krishna Aadlinge
Final Year B. Pharm

चुकली दिशा तरीही हुकले न श्रेय सारे ;
वेड्या मुसाफिराला सामील सर्व तारे.

मी चालतो अखंड चालायचे म्हणून;
धुंदीत या गतीच्या सारेच प्रंथ प्यारे.

डरतात वादळांना जे दास त्या ध्रुवाचे ;
हे शीड तोडले की अनुकूल सर्व सारे.

चुकली दिशा तरीही आकाश एक आहे ;
हे जाणतो तयाला वाटेल तेथे न्यारे.

आशा तशी निराशा हे श्रेय सावधांचे ;

बेसावधास कैसे डसणार निखारे.

नात्याचा गोडवा

प्रतिक्षा जोशी

गरज म्हणुन नात कधी जोडू नका
सोय म्हणून सहज असं तोडू नका
रक्ताचं नात नाही म्हणून,
कवडी मोल ठरवू नका ।।

भावनांच मोल जामा,
मोठेपणात हरवु नका
आयुष्याच्या प्रत्येक वळणात
नवं नात जुळत असत
जन्मभर पुरेल इतक भरून प्रेम मिळत असत
तुम्ही फक्त ओंजळ पुढे करून पहा

कमीपणा मानु नका,
व्यवहारातल देण घेण फक्त मध्ये आणु नका .....
मिळेल तितक घेत रहा जमेल तितक देत रहा

समाधानात तडजोड असते
फक्त समजुन घ्या
नात म्हणजे ओझ नाही,
मनापासून समजुन घ्या

शब्दांना भावरूप देते, तेच खरे पत्र
नात्यांना जोडून ठेवते तेच खरे गोत्र
नजरे पल्याड पाहु शकतात
तेच खरे नेत्र
दुर असुनही दुरावत नाहीत
तेच खरे मित्र .....

का कळेना ???

डेरे निलम दत्तात्रय

Third Year B. Pharm

का कळेना कोणत्या क्षणी
हरवते मन कसे
उमलती कशा धुंद भावना
अल्लद वाटे कसे,
बंध जुळती हे प्रीतीचे गोड नाते
हे जन्मांतरीचे
एक मी एक तू शब्द मी गीत तू
आकाश तू आभास तू साऱ्यात तू
ध्यास मी श्वास तू स्पर्श मी मोहोर तू
स्पप्नात तू सत्यात तू सत्यात तू
घडले कसे कधी कळले जे न कधी
हळुवार ते यावे कसे ओठावरी
दे न तू साथ दे हातात हात दे
नजरेतन नजरेतुन होकार हे

SCRATCH YOUR HEAD

DOSE IT:

W	S	O	L	U	T	I	O	N	R	V	G	S	U	Z
H	U	O	B	W	S	N	O	I	S	L	U	M	E	I
D	S	R	J	G	A	M	J	A	O	P	P	D	H	B
T	P	B	X	Q	Z	J	M	H	P	T	R	K	P	N
S	E	S	E	G	N	E	Z	O	L	O	I	A	B	O
D	N	P	H	A	N	T	S	H	P	Y	S	X	B	U
O	S	A	W	E	B	I	Q	S	K	T	U	W	N	G
U	I	I	H	T	T	M	F	G	I	M	W	G	W	L
C	O	N	N	O	I	T	A	L	F	F	U	S	N	I
H	N	T	R	F	X	E	L	I	X	I	R	S	F	N
E	A	Y	F	Z	E	E	D	R	A	U	G	H	T	I
N	X	U	D	J	N	E	L	U	S	P	A	C	U	M
T	N	E	M	T	N	I	O	J	C	P	I	L	L	E
S	A	K	T	C	K	L	O	T	I	O	N	S	T	N
C	J	C	N	O	I	D	O	L	L	O	C	F	U	T

CAPSULE
COLLODION
PILL
PASTILLE
LOZENGES
SUPPOSITORY
DROPS
SNUFF
INSUFFLATION
OINTMENT
EMULSION
SUSPENSION
SOLUTION
PAINT
DOUCHE
ENEMA
DRAUGHT
ELIXIRS
LINIMENT
LOTIONS

RIDDLE ME THIS:

1. Two fathers and their two sons go fishing together. They each catch one fish to take home with them. They do not lose any fish, and yet when they arrive at home they only have three fish. How can this be?

2. A seven letter word containing thousands of letters.

Find words using only these letters:

Words with three and more than three only:

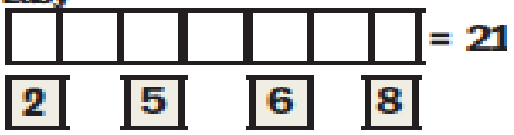
A, M, E, B, I ,T.

10: Average.
20 : Good.
25+ : Excellent.

MATHS IT

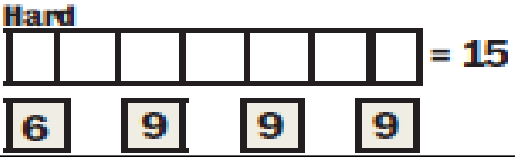
Use the operators " +, - , * , /" and the given number only once.

Easy



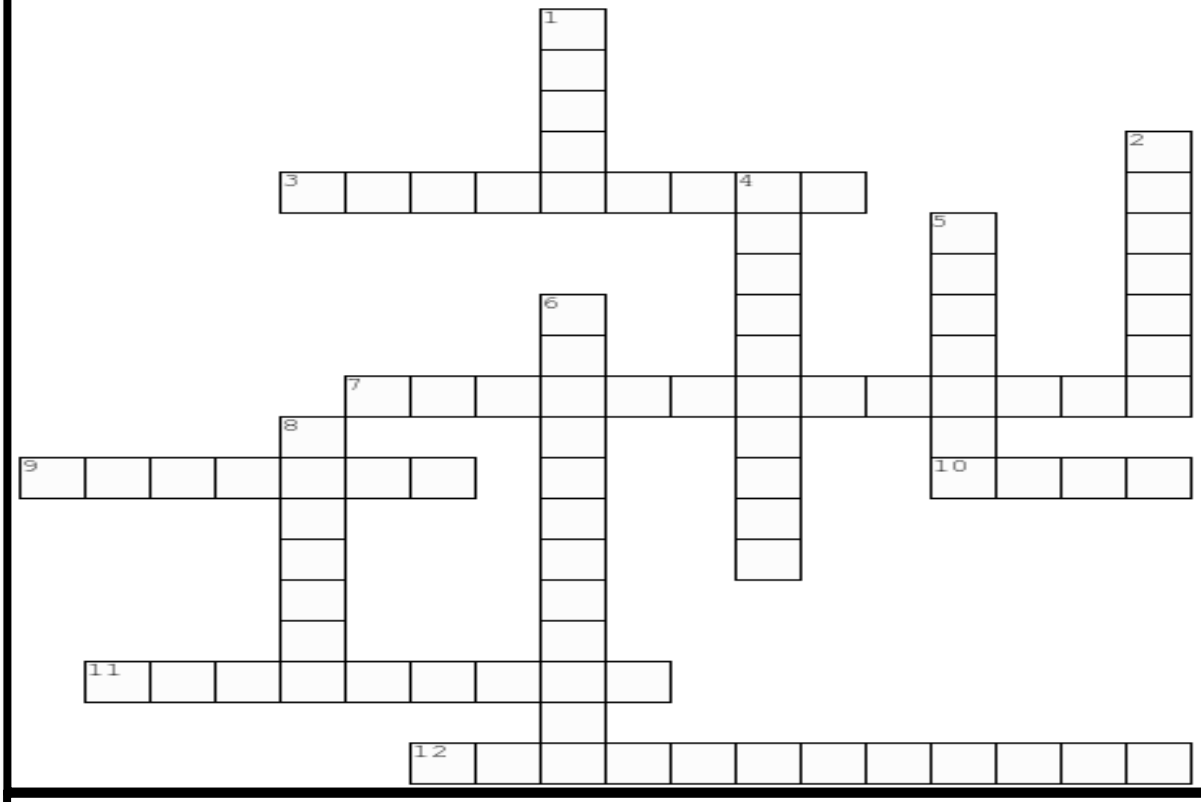
Medium

Hard



BEING PHARMACIST

Complete the crossword below



Across

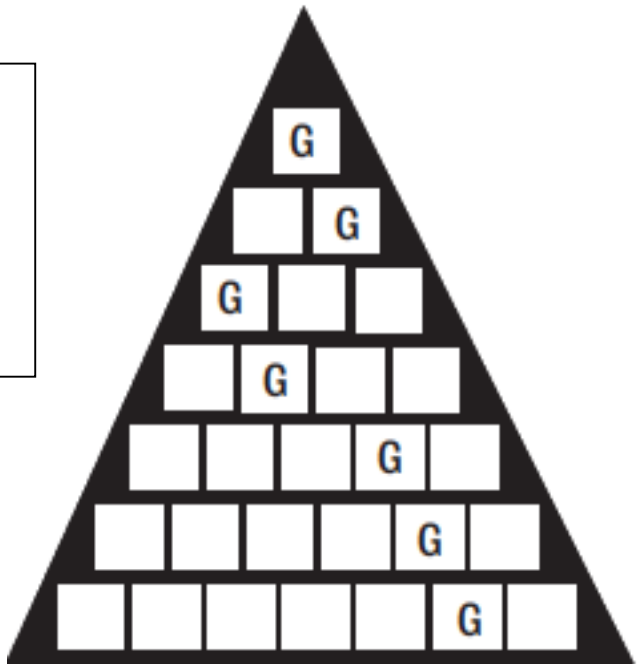
3. BREAK IT AND YOU'RE IN TROUBLE
7. BIBLE FOR PHARMACISTS
9. WHO LET THE HAIR OUT
10. AN ADSORBING AGENT
11. TEMPERATURE NEVER EXCEEDS 100*C
12. OFTEN FOUND IN LATIN

Down

1. YOU'LL BE THE EDUCATED DEALER OF THAT
2. THE MAN OF STEEL WITH A FLAT HEAD
4. SHARING IS CLEANING
5. SMOCK WORN BY PROFESSIONALS IN THE MEDICAL FIELD
6. MIX CRUSH MIX...
8. NOT ONLY CLEANS YOUR NAILS

LET'S BUILD IT:

1. GRAM, ABBR.
2. SILVER FOR THE CHEMIST
3. WANDER ABOUT
4. ELFERLY
5. SHERRIG'S STAR eg.
6. A SMALL HIPSANIC SHOP
7. SLAVERY



Answers

MATHS IT:

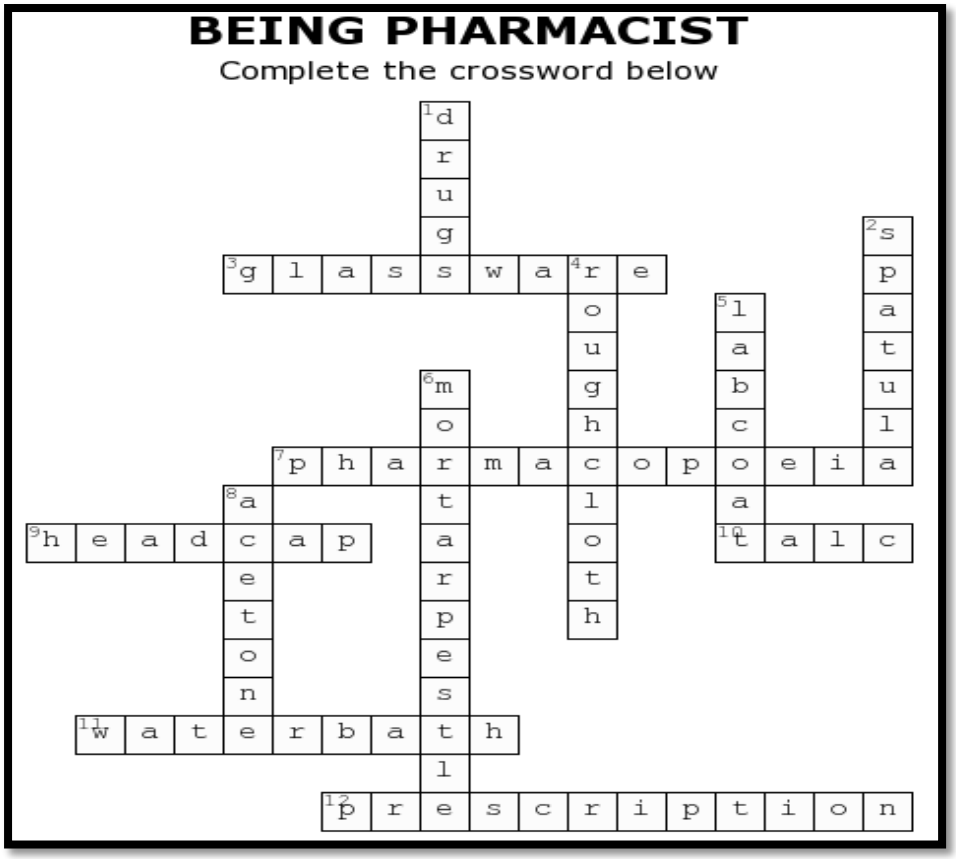
Easy
2+8+5+6=21
Medium
6x2+1-9=4
Hard
6+9+9-9=15

BUILD IT:

G, Ag, Gad, Aged, Badge, Bodega, Bondage.

BEING PHARMACIST

Complete the crossword below



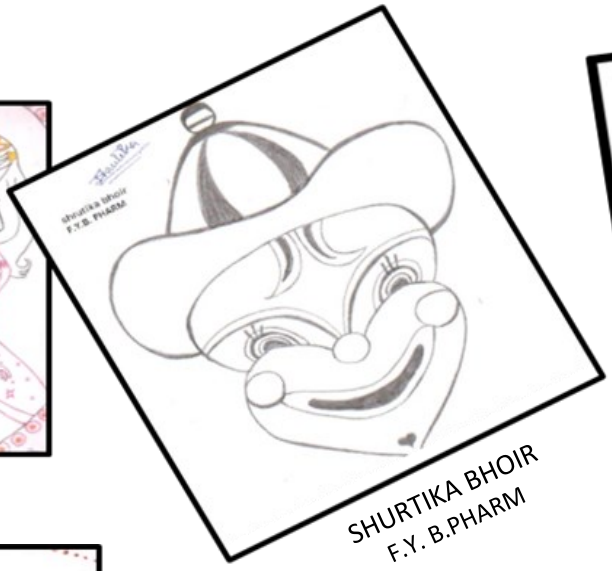
RIDDLE ME:

1. There are only three people, Grandfather, Father and Son.
2. Mailbox

Find words using only these letters:

bet	met	abet	beta	mabe	tame
bit	tab	bait	bima	mate	team
eat	tam	beam	bite	meat	time
eta	tea	beat	emit	mite	ambit
mat	tie	bema	item		

SHURTIKA BHOIR
F.Y. B.PHARM

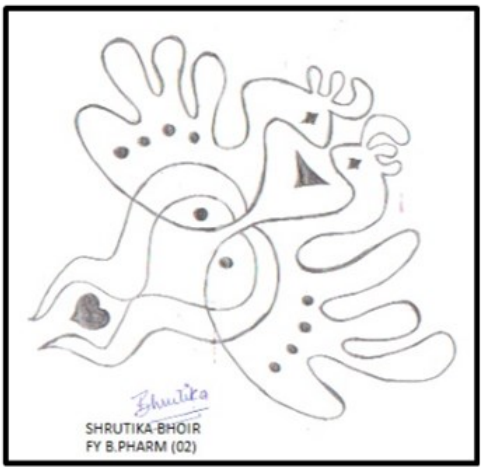


SHURTIKA BHOIR
F.Y. B.PHARM

PAYAL BAFNA
F.Y.BPHARM

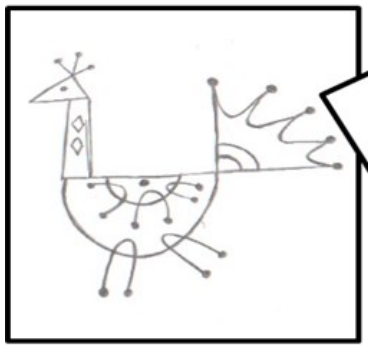
SANJANA PANDIT
F.Y. B.PHARM

SHURTIKA BHOIR
F.Y. B.PHARM

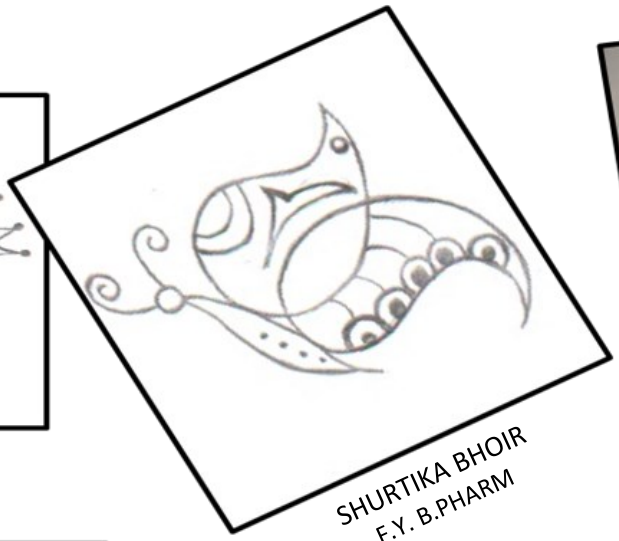


SHURTIKA BHOIR
F.Y. B.PHARM

PAYAL BAFNA
F.Y. B.PHARM



SHURTIKA BHOIR
F.Y. B.PHARM



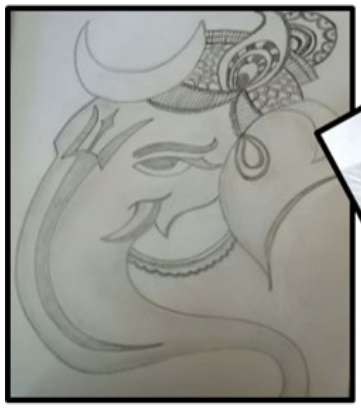
SHURTIKA BHOIR
F.Y. B.PHARM

BHAGYASHREE SAKPAL
FINAL YEAR B.PHARM

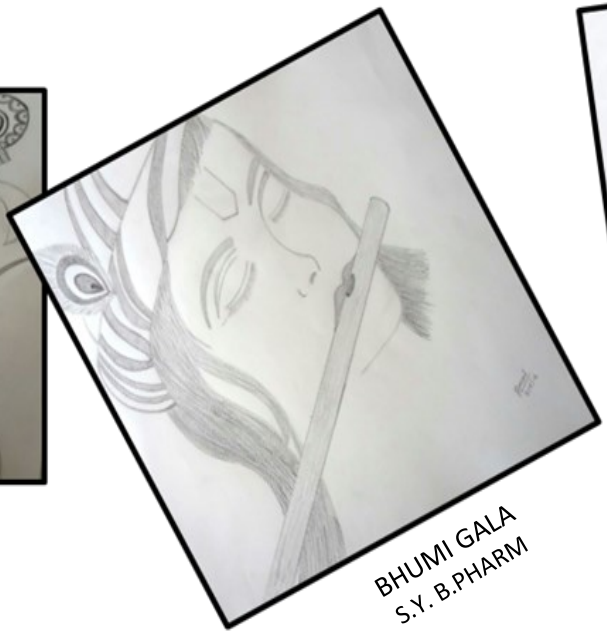
RITU CHOUDHARY
F.Y. B.PHARM

BHAGYASHREE SAKPAL
FINAL YEAR B.PHARM

BHAGYASHREE SAKPAL
FINAL YEAR B.PHARM



BHUMI GALA
S.Y. B.PHARM



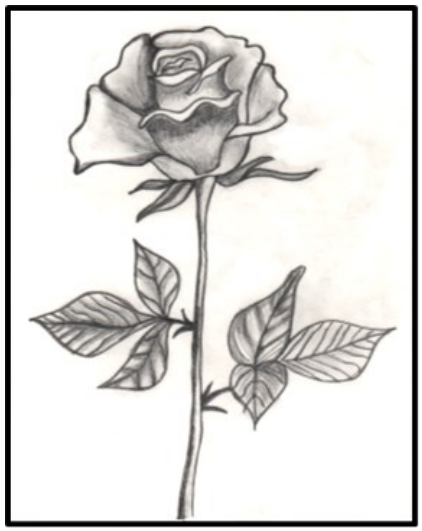
BHUMI GALA
S.Y. B.PHARM

KALYANI SHARMA
S.Y. B.PHARM

BHAGYASHREE SAKPAL
FINAL YEAR B.PHARM

PALAK KARIA
SECOND Y. B.PHARM

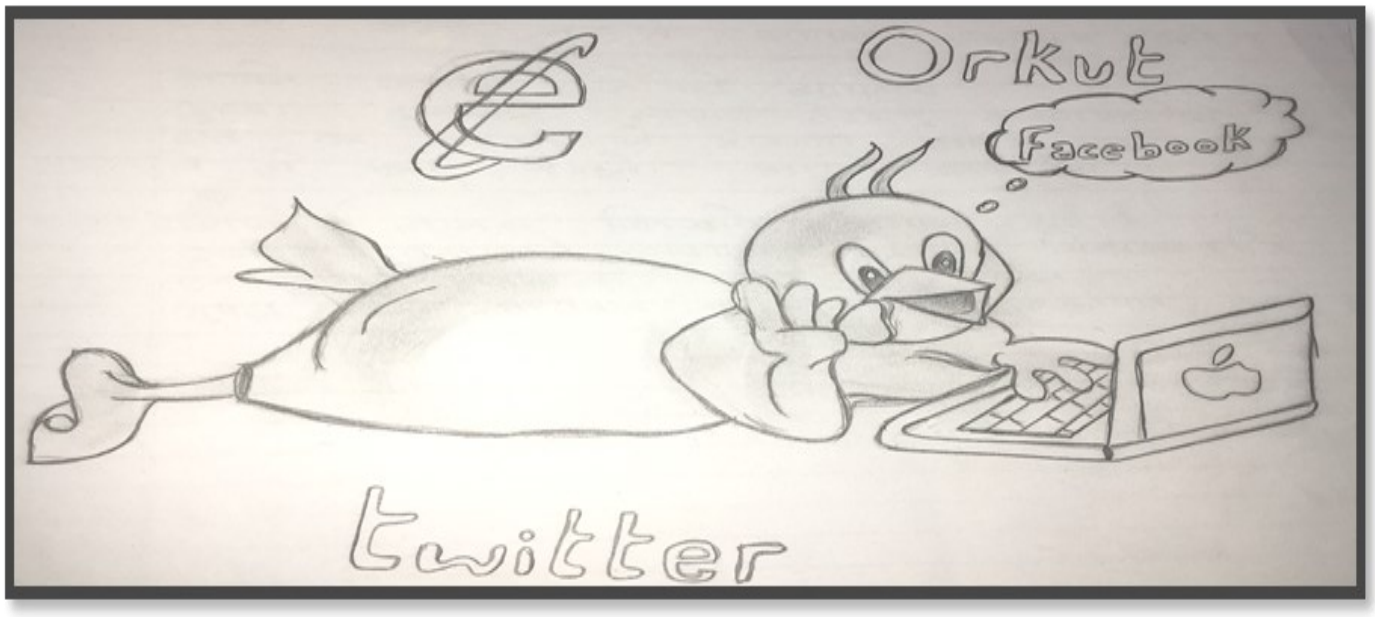
PALAK KARIA
SECOND Y. B.PHARM



PALAK KARIA
SECOND Y. B.PHARM

PALAK KARIA
SECOND Y. B.PHARM

BHAGYASHREE SAKPAL
FINAL YEAR B.PHARM



BHAGYASHREE SAKPAL
FINAL YEAR B.PHARM