The Mission

"The mission is to impart Quality Pharmacy Education and integrate it with training in the pursuit of excellence to the 'would be' Pharmacy Professionals. to serve the need of Health Care System, Pharmaceutical industries and Research Development in India and abroad. while holding the health, safety and well being of our community above other consideration and also upholding the laws and standards governing the profession."

Vision

- To be at the Forefront of Pharmacy Education and Research by Adopting and Creating
- Scientific Approach
- Career Centric Orientation
- Optimistic Attitude
- Pragmatic Outlook through Knowledge Creation, its Application and Dissemination.

Values

- Our students, Faculty and Staff
- Teaching and Learning Process
- Interdisciplinary research

Short Term Goals

- To Improve the academic track record
- To Raise the standard of placement
- To Provide good infrastructure facilities
- To Enhance the quality of teaching-learning methodology
- To Inculcate/cultivate the spirit of research

Long Term Goals

- Bioavailability Study Center
- Production of essential drugs
- Facility for Nanotechnology
- Technology Transfer
- Analytical Services Center
- Green Chemistry & Drug Design Laboratory
- Pilot Mfg. Plant
### Quality Policy

- Quest for Knowledge & Skill
- Unending Efforts to build System
- Attitude for Contribution on all fronts
- Leadership by Motivation
- Intuition for Research and Innovation
- Team work for Performance
- Yearning for Excellence and Perfection

---

**Sinhgad Technical Education Society’s**

**Sinhgad College of Pharmacy, Pune-41.**

**GOVERNING COUNCIL**

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<th>Name</th>
<th>Designation</th>
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<td>Prof. M. N. Navale</td>
<td>Founder President, STE Society</td>
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<td>Chairman</td>
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<td>2.</td>
<td>Dr. (Mrs.) Sunanda M. Navale</td>
<td>Founder Secretary, STE Society</td>
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<td>3.</td>
<td>Mr. Rohit M. Navale</td>
<td>Vice - President (HR) STE Society</td>
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<td>4.</td>
<td>Ms. Rachana M. Navale</td>
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<td>Shri. G. K. Shahani</td>
<td>Director (Project), STE Society</td>
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<td>Dr. M. G. Bhat</td>
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<td>Mr. M. K. Avachat</td>
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<td>Professor Emeritus, BV’s Poona College of Pharmacy, Pune. Educationalist</td>
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Editorial Committee

Technical and Non technical section:
Mrs. S. N. Shrotriya
Ms. V. M. Shende
Mrs. K. P. Khadtare

Chronicle:
Ms. K. S. Bodas

Photo gallery:
Ms. K. S. Bodas
Mrs. K. P. Khadtare

Magazine Designed By:
Ms. V. M. Shende (e-editor)
Anuj Kale

Cover Page Design:
Shirish Gawas
Pooja Gaonkar

Student Editorial Team:
Anuj Kale (M. Pharm)
Aniruddha Girme (T. Y. B. Pharm)
Shirish Gawas (T. Y. B. Pharm)

Special Assistance & Advisor
Mrs. S. K. Patwardhan
DECLARATION

[FORM 1 (VIDE RULE-31)]

Title : Spandan: The Vital Beat
Language : English, Marathi, Hindi
Period of Publication : Annual
Publisher : Dr. K. N. Gujar
Publisher’s Address : Sinhgad Technical Education Society’s
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Address : Sinhgad Technical Education Society’s
SINHGAD COLLEGE OF PHARMACY
Vadgaon (Bk.), Pune- 411 041.
Editor : Mrs. S. N. Shrotriya
e-Editor : Ms. V. M. Shende
Address : Sinhgad Technical Education Society’s
SINHGAD COLLEGE OF PHARMACY
Vadgaon (Bk.), Pune- 411 041.

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

Sd/-
Dr. K. N. Gujar
Principal

(For Private Circulation Only)

The editorial board of SPANDAN of Sinhgad College of Pharmacy as an institute accepts no responsibility for opinions expressed and statements made by individual authors.
Sinhgad Technical education Society (STES) has become an educational icon and Sinhgad College of Pharmacy (SCOP) is imparting high quality education in pharmaceutical field. I am glad to see that SCOP is striving hard not only to achieve academic excellence but also to tune overall skills of the students. I would like to take this opportunity to congratulate the team of SCOP for getting accredited by National board of accreditation (NBA).

A college magazine is the reflection of the creativity of the students, involved in multifarious activities. It speaks about their imagination, talent through the canvas of Spandan, the college magazine.

Progress of any institute relies greatly on progress of its students which is related with enhancement of their knowledge and the overall growth. Literary work is the best way to express the hidden talent of youth.

It gives me immense pleasure to write a few words for the 10th issue of “Spandan – the Vital Beat.” This magazine has become the identity of the college which reflects the versatile and highly proactive image of the institute.

I appreciate the efforts of the members of Editorial Board & faculty involved in bringing out “Spandan –The Vital Beat” within stipulated time.
Happiness engulfs me when I turn the pages of "Spandan - the Vital Beat", the literary magazine of Sinhgad College of Pharmacy, published annually. Each edition of "Spandan - The Vital Beat" with literary fragrance which reaches far and wide. It covers all the aspects right from technical articles to literary articles and is reflection of college activities. In this way we promote students to put across their innovative ideas in the college magazine.

Sinhgad College of Pharmacy (SCOP) is very active and vibrant segment of Sinhgad Technical education Society (STES). The quality education and research is priority of college and all the members are trying to groom their students with latest subject knowledge and technology.

I feel gratified to see that we are doing our best in carrying on the mission of grooming our students as such professionals who are not only competent enough to combat the challenges in their life but also become good human beings with moral excellence and social sensitivity.

I congratulate the efforts of the members of the Editorial Board that they have brought out this issue of the magazine in such a beautiful form that reminds me the story of a diver who dives deep into the sea and comes out with pearls. It is because of their selfless and untiring efforts that we see the magazine enriched with variety of articles.

Dr. (Mrs.) Sunanda Navale
We at Sinhgad Technical Education Society endeavor to inspire and empower our students to be life long learners, critical thinkers and productive members of an ever-changing global society.

It is a matter of great pride and satisfaction for Sinhgad College of Pharmacy, Vadgaon to bring out the tenth issue (first issue of e magazine) of the annual College Magazine 'Spandan- The Vital Beat'. The wide-spectrum of articles in different sections gives us a sense of pride that our students and teachers possess creative potential and original thinking in ample measures.

The College has made tremendous progress in all areas like academic, co-curricular, extracurricular and overall development of staff and students. Also I would like to congratulate all faculty members for achieving great success in Sinhgad Karandak 2013.

I am hopeful that this small piece of literary work shall not only develop the taste for reading among students but also develop a sense belonging to the institution as well.

Mr. Rohit Navale
I am happy to know that Sinhgad College of Pharmacy, Vadgaon is bringing out the tenth issue (first issue of e-magazine) of the annual College Magazine “Spandan- The Vital Beat”.

All colleges under Sinhgad Institutes are the product of a vision, of a dream of Excellence in Education. Our primary commitment is to find the true potential of our students and equip them for the future, by providing them with the necessary skills, knowledge, and values. Sinhgad College of Pharmacy, Vadgaon is one of the most integrated multidisciplinary institutions which provides platform for the staff and students to showcase their academic and extracurricular talents.

A magazine is like a mirror which reflects the clear picture of all sorts of activities undertaken by the institution and also helps enhance the writing skills of the students and the teaching faculty.

I send my good wishes to Dr. K. N. Gujar, Principal and Spandan editorial Team who are responsible for creating such a wonderful piece of literary art.
It is a matter of great pride and satisfaction for Sinhgad College of Pharmacy to bring out the tenth issue of the annual College Magazine Spandan. The wide-spectrum of articles in different sections gives us a sense of pride that students and teachers possess creative potential and original thinking in ample measures. Each article is entertaining, interesting and absorbing. I applaud the contributors for their stimulated thoughts and varied hues in articles contributed by them.

Commendable job has also been done by the Editorial Board in planning for and producing the magazine. My congratulations to the team who took the responsibility for the arduous task most effectively.

I am sure that the College Magazine will provide a platform to the students to sharpen their writing talent and will strengthen the academic activities of the College.

Wishing you all the best in your ventures, efforts and careers.

Dr. A. V. Deshpande
It is a matter of great privilege and immense pleasure for me to be a part of the tenth edition of college magazine "Spandan – the Vital Beat ".

Today, the role of a college is not only to pursue academic excellence but also to motivate and empower its students to be life long learners, critical thinkers, and productive members of an ever-changing global society. A college must try to provide its students with an atmosphere for multifaceted development, where students are encouraged to channelize their potential in the pursuit of excellence. The talents, skills, and abilities of each student need to be identified, nurtured, and encouraged so that he/she is able to reach greater heights. Students need to be provided with a platform to think, express, and exhibit their skills.

The college magazine is the platform where the students can unmask their masked talents. One most striking facet of the "Spandan – the Vital Beat" would be a reflection and showcasing the diversity of minds, thoughts, creativity, arts, skills etc., of the young souls of the college. It is said that a leader is born with the birth of every child. The only need is to provide an enabling environment, careful nurturing, and a spring board for meaningful blossoming, honing and effective use of unbound talents. The "Spandan – the Vital Beat" intends to fill this void for young minds to unleash their unparalleled innovative ideas.

I wish to put on records the incessant assistance and cooperation from editorial team of college magazine in publishing of first issue of “e- Spandan”. I am especially thankful to the editorial team who has burnt their midnight oil for timely production of this maiden edition.

The ability of students of editorial committee to take any given task as challenge to accomplish it with vigor and enthusiasm helps to make every issue more and more informative and entertaining as well. I am hopeful that ‘e- Spandan will be enjoyed by all.

Dr. K. N. Gujar
Principal
Sinhgad College of Pharmacy, Vadgaon (Bk.), Pune
From Editors’ desk…….

Welcome to the tenth issue of College Magazine ‘e-Spandan 2012-13.’ We are glad to proclaim that this is the first issue of ‘e-Spandan’. A College magazine is a repository of the heart and soul of the college. It reflects the life and times of the college at various periods in its history and is something that students cherish and treasure in their later years. This first issue is based on two different themes. The theme for technical section is ‘World of Micronutrients and Nutraceuticals’ and nontechnical section is based on save a Girl Child: Stop Female Foeticide.

We would like to thank our laudable Principal, Dr. K. N. Gujar for initiating this idea of e-magazine. We are also obliged to the novel and effective inspirations of Dr. Gujar in making our magazine poles apart from others.

The collection of articles, photographs and technical information was the hectic task. We are grateful to Mrs. A. N. Ranade, Mrs. Mulgund, Mrs. Jamkar for their contribution and would like to salute team spirit revealed by Spandan editorial committee towards completion of this tough task.

We would also like to acknowledge the efforts taken by Mr. Anuj Kale, Archit Peshave, Shirish Gawas and Pooja Gaonkar for creation of wonderful cover page and the overall design of e magazine. We also appreciate the ability of students to take any given task as challenge to accomplish it with vigour and enthusiasm helps to make every issue more and more informative and entertaining as well.

We are thankful to Mrs. S. K. Patwardhan for her timely suggestions, appropriate guidance and support throughout this activity.

We are grateful to Mr. Malhari Sagar for his valuable contribution in typing Devnagri section.

To conclude, we hope you will enjoy the reading,

Thank You!

Mrs. Shilpa Shrotriya
Ms. Kaumudee Bodas
Ms. Varsha Shende
Ms. Kirti Khadtare

Editorial Team, SCOP
Dear reader(s),

It really gives me a pleasure and an embiggened sense of editorial responsibility as an incoming student editor for the tenth issue of *Spandan* which also happens to be the first issue of *E-Spandan*. As the first order of conduct, I would like to express my sincere appreciation especially to Dr. K. N. Gujar and rest of the editorial committee for their efforts and dedication in transforming the tenth issue of Spandan into a widely accessible version of *E-Spandan* which will be available on the society’s website for students and general public.

The technical and non-technical topics that this committee has chosen in the wake of female foeticide and increasing general sense of nutrition science in India seem to perfectly blend in the current issues faced by healthcare fraternity and current social setting.

After the typical formalities of appreciations above, I shall tell ya’ll that the editorial team is open to receive supporting, opposing, critical and virtually all sorts of responses from the readers which could be published in the next issue. Critics can start crucifying the contributing authors right away. We also intend to expand the scope of the magazine from a limited number of existing, probably stereotypically boring sections to editorial, cartoons, and perhaps even an exposé to spice the read up!

Due to unknown and unforeseen circumstances, we’re not printing the magazine this year, possibly due to paper crunch. Not to be confused with currency crunch. But we’re looking forward to spread the contents across masses across internet.

Hopefully, *E-Spandan* makes waves through the web.

Insanely yours,

**Anuj Kale**
Chief Editor,
Student Editorial Team
A Glance at Our Achievements
in 2012-2013

SCOP IS AMONGST THE TOP 5 PREFERRED COLLEGES IN MAHARASHTRA.

Accreditation & affiliation

- Accredited by NBA for 3 years for B.Pharm. course w.e.f. 4/1/13
- Permanently affiliated for B. Pharm course by University of Pune

Students' achievements

- Mr. Parth Shah received 1st prize for best poster at satellite symposium on Neurobiology of Cognition at Bangalore
- Mr. Rohit Shah, Mr. Parth Shah & Ms. Charul Avchat won 1st Prize at VIGOR 2012 in quiz competition at Allana College of Pharmacy, Pune.
- PG team of SCOP won 2nd prize in YICC at ICT, Mumbai.
- Ms. Priya Wadgaokar won 1st Prize in Elocution competition at Satara College of Pharmacy, Satara.
- Participated in various competitions at 51st National Pharmacy Week (NPW), 2012 organized by IPA, Pune Branch from 12th Dec to 18th Dec 2012. Students also grabbed awards in 5 different competitions at NPW 2012.
- 11 posters presented at 64th Indian Pharmaceutical Congress at Chennai on 7th - 9th Dec. 2012
- Participated at Avishkar Zonal level on 10th December 2012 and University level on 27th Dec. 2012.
- Participated in poster competition at Bhor on 26th Dec 2012.
- Conducted JEE exam on 7th April 2013.
Mr. Nihar Patil won 2nd prize in *All India Kho-Kho Competition at Jalandhar, Punjab* on 20th Dec 2012.

Ishaan Talwarkar won 1st prize for State level Badminton Championship at Latur.

SCOP team won first prize in *Group Dance Grand Finale* and Mr. Samrat Gaikwad / Ms. Noopur Naik won intercampus *Duet Singing in Sinhgad Karandak 2013*.

SCOP Group dance team also won 1st prize in *Symbiosis*, 1st Prize in “Nrityangana Sime Fest Comm-2013” and Third Prize in “Tune in Fundamental 13” held at Symbiosis institutes.

Dr. N. S. Ranpise/ Mrs. A. N. Ranade received National Level Troikaa Award for “Innovative Thesis” for research project on “Design & development of Bilayer floating tablet of Amoxicillin & Alovera gel powder”

Mrs. S. V. Mulgund received award at Avishkar-2012 (zonal level) for her research project on “LC And LC-MS/MS Studies For Separation, Identification And Characterization of Degradation Impurities Of Finofibrate”.

Sinhgad college of Pharmacy organized

- University of Pune Sponsored Seminar
  - **International :01** (on 22nd to 24th March 2013)
  - **National: 01** (on 20th to 21st March 2013)
  - **State: 01** (on 19th March 2013)

Self Sponsored Workshop & Seminars: **01**

Entrepreneurship development program on 25th August 2012

Workshop on selection process on production interview skills on 23rd Feb 2013.
Dr. M. S. Gambhire recently awarded his PhD by Jaipur National University

- 09 Faculty are Pursuing PhD
- Total 39 Papers are presented by the Faculty at various National/International conferences

**Grants 2012-13**

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**Publications**

- Research papers published by the faculty in various National & International journals: 66
- Till date books published by Faculty: 7
- Patents filed by faculty: 4

**University of Pune Activities**

- Participated in Yuvajagar Abhiyan at Sangvi, Pune on 12th Dec 2012.
- Conducted Jagar Janivecha on “Safety of Woman & gender equality” on 9th Jan 2013.
- Conducted National Service Scheme (NSS) Camp from 28th Jan to 3rd Feb 2013 at Kolewadi, Pune.
- Running Full Fledge K. B. P. Earn and Learn Scheme, coordinated by Mrs. M. A. Nagras.
Micronutrients are vitamins and minerals that are needed in small amounts for optimal health. There are 28 essential vitamins and minerals that play key roles in the body. Many, such as vitamins C and E, act as antioxidants. Although vitamin deficiency diseases, such as scurvy and pellagra, are no longer common in developed countries, less obvious deficiencies may be common. Recent studies show that many people take in less than the recommended dietary allowance (RDA) for many micronutrients, such as zinc, folic acid, vitamin D, vitamin B₆, and vitamin B₁₂. Insufficient micronutrient intake has short-term and long-term health consequences. For example, the immune system is weakened by poor intakes of nearly every essential vitamin and mineral, and a lack of nutrients that are required for DNA function may increase the risk for certain cancers.

Micronutrients: Common Vitamin and Mineral Deficiency States

- **Vitamin B₁₂.** Vitamin B₁₂ deficiency affects 10 to 15 percent of individuals over age 60, mainly due to poor absorption from the intestinal tract.
- **Vitamin C.** Deficiency of vitamin C, which results in a disease called scurvy, occurs in significant number elderly and hospitalized patients and in individuals who avoid fruits and vegetables. In smokers, the risk for vitamin C deficiency is much greater than in nonsmokers.
- **Vitamin D.** Vitamin D deficiency can result in rickets, a disease of deformed bones that can affect infants and children. The natural source of vitamin D is sun exposure. However, considerable evidence suggests that people who live in northern cities or who rarely go outdoors (e.g., elderly persons) do not meet vitamin D requirements. Vitamin D is present in few foods, which many people do not eat for reasons of preference or health (e.g., oily fish and egg yolk). As a result, the American Academy of Pediatrics recommends 400 IU of vitamin D supplements for infants, children, and adolescents who ingest less than 500 mL per day of vitamin D–fortified formula or milk. Multiple vitamin formulas typically contain some vitamin D. An additional supplement may be needed for individuals with low serum vitamin D levels and individuals with higher requirements, such as those over 70 years.
- **Iron.** Deficiency of this mineral is most common in women of child-bearing age and during pregnancy. Anemia caused by iron deficiency is the most common vitamin or mineral deficiency in the world.
- **Calcium.** The exact amount of calcium needed is uncertain. While some authorities recommend up to 1500 mg per day, some evidence suggest that lower intakes may be adequate. Further, there is some evidence that excessively high calcium intakes may increase the risk for prostate cancer and kidney stones under certain circumstances.
Micronutrients: Antioxidants and Phytochemicals
Certain vitamins (vitamins C and E), minerals (e.g., zinc, magnesium, and selenium), and carotenoids are essential antioxidants in the body. Evidence suggests that a healthful overall diet is required—namely, a diet that is both low in factors that promote disease and high in antioxidant nutrients.

In addition, increasing evidences indicate that nutrients called phytochemicals are responsible for the majority of antioxidant effects. In general, populations eating greater amounts of phytochemical–containing foods (e.g., fruits, vegetables, and whole grains) have a significantly lower risk of certain diseases, such as heart disease, cancer, diabetes, hypertension, and arthritis.

Micronutrients: At–Risk Populations
Certain groups are more likely to have micronutrient deficiencies and may require dietary changes or supplementation.

- **Alcohol abuse.** Low blood levels of vitamin B, vitamin C, vitamin E, carotenoids, and selenium have been found in alcohol–dependent patients. Folic acid intake may be especially important for alcohol consumers. For example, individuals who consume alcohol appear to be at twice the risk for breast cancer when folic acid intakes are below recommendations, compared with those with higher intakes.

- **A Western dietary pattern.** Individuals who eat a typical Western diet generally have reduced intakes of several micronutrients, compared with individuals who primarily eat plant–based diets. In a European study of more than 65,000 men and women, individuals avoiding meat and other animal products had much higher intakes of fiber, folic acid, and vitamins C and E, compared with meat–eaters. Other surveys have showed that vegetarians generally have higher intake of vitamins C and E, potassium, and dietary fiber, compared with meat–eaters. Further, pregnant vegetarian women had significantly lower risk for folic acid deficiency than women who ate meat.

- **Smokers.** Smokers often have poorer diets in general than nonsmoking individuals, and generally consume fewer fruits and vegetables and more saturated fat. Also, smokers have significantly lower blood levels of carotenoids and vitamin C.

- **Inappropriately restricted diets.** Nutritional deficiency can result from overly strict dietary restrictions, particularly those that eliminate the most nutrient–rich foods (e.g., vegetables, fruits, and whole grains). Individuals who consume low–carbohydrate, high–meat diets may have vitamin C intakes that are nearly 50 percent lower than those of persons eating more plant–based diets.

- **Elderly persons,** particularly those in hospitals or long–term–care facilities, and vegetarians are at risk for deficiency of vitamins D and B₁₂. Poor intakes in these and other groups have led to the suggestion that all adults take a multiple vitamin daily.

- **Medications** may interact with nutrients to cause deficiencies. Folic acid deficiency may occur due to treatment with many seizure medications (e.g., phenytoin, carbamazepine, phenobarbital, and valproic acid).
  - Vitamin B₁₂ absorption decreases as a result of long–term acid reflux therapy (e.g., proton pump inhibitors) and treatment with the diabetes drug metformin.
  - Low potassium commonly occurs due to diuretics, amphotericin B, corticosteroids, and insulin. Excessively high potassium can occur due to use of heparin and certain diuretics (e.g., spironolactone).
  - Thiamine deficiency may occur due to diuretic use.
  - Magnesium deficiency frequently results from diuretics, amphotericin B, certain antibiotics, and cyclosporine.
## Vitamin Information

<table>
<thead>
<tr>
<th>Vitamin</th>
<th>Functions/Roles in Metabolism</th>
<th>Recommended Dietary Allowance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Vitamin A</td>
<td>Bone growth, reproduction, immune function, eyesight</td>
<td>Adults: Age 19+:</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Males: 900 µg</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Females: 700 µg</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Infants/children:</td>
</tr>
<tr>
<td></td>
<td></td>
<td>0–6 months: *400 µg</td>
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<tr>
<td></td>
<td></td>
<td>7–12 months:*500 µg</td>
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<tr>
<td></td>
<td></td>
<td>1–3 years: 300 µg</td>
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<td></td>
<td></td>
<td>4–8 years: 400 µg</td>
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<tr>
<td></td>
<td></td>
<td>9–13 years: 600 µg</td>
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<tr>
<td></td>
<td></td>
<td>14–18 years (boys): 900 µg</td>
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<tr>
<td></td>
<td></td>
<td>14–18 years (girls): 700 µg</td>
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<tr>
<td></td>
<td></td>
<td>Pregnancy:</td>
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<tr>
<td></td>
<td></td>
<td>Age &lt; 18 years: 750 µg</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Age 19+: 770 µg</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Lactation: Age &lt; 18 years 1,200 µg</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Age 19+: 1,300 µg</td>
</tr>
<tr>
<td>Vitamin D</td>
<td>Maintenance of normal blood levels of calcium and phosphorus; bone mineralization; cell growth, immune function</td>
<td>Adults:*</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Ages 19–70: 15 µg/800 IU</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Ages 70+: 20 µg/800 IU</td>
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<tr>
<td></td>
<td></td>
<td>Infants/children:*</td>
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<tr>
<td></td>
<td></td>
<td>10–12 months: 10 µg/400 IU</td>
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<tr>
<td></td>
<td></td>
<td>1–18 years: 15 µg/800 IU</td>
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<tr>
<td></td>
<td></td>
<td>Pregnancy/lactation:*</td>
</tr>
<tr>
<td></td>
<td></td>
<td>15 µg/800 IU</td>
</tr>
<tr>
<td>Vitamin E</td>
<td>Antioxidant (protects cells against free radicals) plays role in immune function and DNA repair; blood clotting</td>
<td>Adults:</td>
</tr>
<tr>
<td></td>
<td></td>
<td>19+ years: 15 mg</td>
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<tr>
<td></td>
<td></td>
<td>Infants/children:</td>
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<tr>
<td></td>
<td></td>
<td>0–6 months:* 4 mg</td>
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<tr>
<td></td>
<td></td>
<td>7–12 months:* 5 mg</td>
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<td></td>
<td></td>
<td>1–3 years: 7 mg</td>
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<td></td>
<td></td>
<td>4–8 years: 7 mg</td>
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<td></td>
<td></td>
<td>9–13 years: 11 mg</td>
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<td></td>
<td></td>
<td>14–18 years: 15 mg</td>
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<tr>
<td></td>
<td></td>
<td>Pregnancy: 15 mg</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Lactation: 19 mg</td>
</tr>
<tr>
<td>Vitamin K</td>
<td>Blood coagulation, bone growth</td>
<td>Adults: 19+ years:*</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Males: 120 µg</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Females: 90 µg</td>
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<tr>
<td></td>
<td></td>
<td>Infants/children:*</td>
</tr>
<tr>
<td></td>
<td></td>
<td>0–6 months: 2 µg</td>
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<tr>
<td></td>
<td></td>
<td>7–12 months: 2.5 µg</td>
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<td></td>
<td></td>
<td>1–3 years: 30 µg</td>
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<td></td>
<td></td>
<td>4–8 years: 55 µg</td>
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<tr>
<td></td>
<td></td>
<td>9–13 years: 60 µg</td>
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<tr>
<td></td>
<td></td>
<td>14–18 years (boys): 120 µg</td>
</tr>
<tr>
<td></td>
<td></td>
<td>14–18 years (girls): 75 µg</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Pregnancy/lactation:*</td>
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<tr>
<td></td>
<td></td>
<td>Age &lt; 18 years: 75 µg</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Age 19+: 90 µg</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Vitamin</th>
<th>Functions/Roles in Metabolism</th>
<th>Recommended Dietary Allowance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Vitamin C</td>
<td>Antioxidant; synthesis of connective tissue components (e.g., collagen, elastin, fibronectin, proteoglycans)</td>
<td>Adults (&gt; 19 years):&lt;br&gt; Males: 90 mg&lt;br&gt; Females: 75 mg&lt;br&gt; Infants/children:&lt;br&gt; 0–6 months: *40 mg&lt;br&gt; 7–12 months: *50 mg&lt;br&gt; 1–3 years: 16 mg&lt;br&gt; 4–8 years: 25 mg&lt;br&gt; 9–13 years: 45 mg&lt;br&gt; 14–18 years (boys): 75 mg&lt;br&gt; 14–18 years (girls): 65 mg&lt;br&gt; Pregnancy:&lt;br&gt; Age &lt; 18: 80 mg&lt;br&gt; Age 19–50: 85 mg&lt;br&gt; Lactation:&lt;br&gt; Age &lt; 18: 115 mg&lt;br&gt; Age 19+: 120 mg</td>
</tr>
<tr>
<td>Thiamine (B₁)</td>
<td>Metabolism of carbohydrates and branched-chain amino acids</td>
<td>Adults (&gt; 19 years):&lt;br&gt; Males: 1.2 mg&lt;br&gt; Females: 1.1 mg&lt;br&gt; Infants/children:&lt;br&gt; 0–6 months: *0.2 mg&lt;br&gt; 7–12 months: *0.3 mg&lt;br&gt; 1–3 years: 0.5 mg&lt;br&gt; 4–8 years: 0.8 mg&lt;br&gt; 9–13 years: 0.9 mg&lt;br&gt; 14–18 years (boys): 1.2 mg&lt;br&gt; 14–18 years (girls): 1.1 mg&lt;br&gt; Pregnancy/Lactation: 1.4 mg</td>
</tr>
<tr>
<td>Riboflavin (B₂)</td>
<td>Coenzyme in numerous reactions</td>
<td>Adults (ages 19+):&lt;br&gt; Males: 1.3 mg&lt;br&gt; Females: 1.1 mg&lt;br&gt; Infants/children:&lt;br&gt; 0–6 months: *0.3 mg&lt;br&gt; 7–12 months: *0.4 mg&lt;br&gt; 1–3 years: 0.5 mg&lt;br&gt; 4–8 years: 0.6 mg&lt;br&gt; 9–13 years (boys): 0.9 mg&lt;br&gt; 14–18 years (boys): 1.3 mg&lt;br&gt; 9–13 years (girls): 0.9 mg&lt;br&gt; 14–18 years (girls): 1.0 mg&lt;br&gt; Pregnancy: 1.4 mg&lt;br&gt; Lactation: 1.6 mg</td>
</tr>
<tr>
<td>Niacin (B₃)</td>
<td>Coenzyme in numerous reactions</td>
<td>Males &gt; 14 years: 16 mg&lt;br&gt; Females &gt; 14 years: 14 mg&lt;br&gt; Infants/children:&lt;br&gt; 0–6 months: *2.0 mg&lt;br&gt; 7–12 months: *4.0 mg&lt;br&gt; 1–3 years: 6.0 mg&lt;br&gt; 4–8 years: 8.0 mg&lt;br&gt; 9–13 years (boys): 12.0 mg&lt;br&gt; Pregnancy: 18 mg&lt;br&gt; Lactation: 17 mg</td>
</tr>
<tr>
<td>Vitamin</td>
<td>Functions/Roles in Metabolism</td>
<td>Recommended Dietary Allowance</td>
</tr>
<tr>
<td>---------------</td>
<td>-------------------------------------------------------------------</td>
<td>-------------------------------</td>
</tr>
<tr>
<td>Pyridoxine (B₆)</td>
<td>Coenzyme in the metabolism of amino acids and carbohydrates</td>
<td>Adults:</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Ages 19–50: 1.3 mg</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Age 51+ (males): 1.7 mg</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Age 51+ (females): 1.5 mg</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Infants/children:</td>
</tr>
<tr>
<td></td>
<td></td>
<td>0–6 months:* 0.1 mg</td>
</tr>
<tr>
<td></td>
<td></td>
<td>7–12 months: * 0.3 mg</td>
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<tr>
<td></td>
<td></td>
<td>1–3 years: 0.5 mg</td>
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<tr>
<td></td>
<td></td>
<td>4–8 years: 0.6 mg</td>
</tr>
<tr>
<td></td>
<td></td>
<td>9–13 years (boys/girls): 1.0 mg</td>
</tr>
<tr>
<td></td>
<td></td>
<td>14–18 years (boys): 1.3 mg</td>
</tr>
<tr>
<td></td>
<td></td>
<td>14–18 years (girls): 1.2 mg</td>
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<tr>
<td></td>
<td></td>
<td>Pregnancy: 1.9 mg</td>
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<tr>
<td></td>
<td></td>
<td>Lactation: 2.0 mg</td>
</tr>
<tr>
<td>Folic acid</td>
<td>Essential for DNA synthesis</td>
<td>Adults (ages 19+): 400 µg</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Infants/children:</td>
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<tr>
<td></td>
<td></td>
<td>0–6 months:* 65 µg</td>
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<tr>
<td></td>
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<td>7–12 months:* 80 µg</td>
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<tr>
<td></td>
<td></td>
<td>1–3 years: 150 µg</td>
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<td></td>
<td></td>
<td>4–8 years: 200 µg</td>
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<td></td>
<td></td>
<td>9–13 years: 300 µg</td>
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<tr>
<td></td>
<td></td>
<td>14–18 years: 400 µg</td>
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<tr>
<td></td>
<td></td>
<td>Pregnancy: 600 µg</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Lactation: 500 µg</td>
</tr>
<tr>
<td>Vitamin (B₁₂)</td>
<td>Essential for normal blood cell formation and brain and nerve function</td>
<td>Adults (ages 19+): 2.4 µg</td>
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<tr>
<td></td>
<td></td>
<td>Infants/children:</td>
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<tr>
<td></td>
<td></td>
<td>0–6 months:* 0.4 µg</td>
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<tr>
<td></td>
<td></td>
<td>7–12 months:* 0.5 µg</td>
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<tr>
<td></td>
<td></td>
<td>1–3 years: 0.9 µg</td>
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<tr>
<td></td>
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<td>4–8 years: 1.2 µg</td>
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<td></td>
<td></td>
<td>9–13 years: 1.8 µg</td>
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<td></td>
<td></td>
<td>4–18 years: 2.4 µg</td>
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<tr>
<td></td>
<td></td>
<td>Pregnancy: 2.6 µg</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Lactation: 2.8 µg</td>
</tr>
</tbody>
</table>

* IOM did not set an RDA for vitamins in this age group. Instead, an Adequate Intake (AI) is used. According to the Institute of Medicine, “The AI is a recommended average daily nutrient intake level, based on experimentally derived intake levels or approximations of observed mean nutrient intake by a group (or groups) of apparently healthy people that are assumed to be adequate. An AI is established when there is insufficient scientific evidence to determine an Estimated Average Requirement (EAR).”
Nutraceuticals and Cancer

Ms. Kaumudee S. Bodas
Assistant Professor (Pharmacognosy)

About 2000 years ago, Hippocrates emphasized “Let food be your medicine and medicine be your food”. Currently there is an increased global interest as “nutraceuticals” play a major role in treatment of various disorders and overall health improvement. The term “Nutraceutical” was coined by Dr Stephen DeFelice, Chairman of the Foundation for Innovation in Medicine in 1989. According to this “nutraceutical” is any substance that may be considered a food or part of a food and provides medical or health benefits, encompassing, prevention and treatment of diseases.

There is a confusion regarding the terminologies like “nutraceuticals”, “functional foods”, “dietary supplements,” “designer foods”, “medical foods”, “pharmafoods”, “phytochemicals” etc. There is a thin dividing line in their interchangeable usage. “Pharmaceuticals” may be considered as drugs used mainly to treat diseases, while “nutraceuticals” are those that are intended to prevent diseases. Both pharmaceuticals and nutrients can cure diseases but only pharmaceuticals require governmental sanction.

Nutraceuticals are sometimes called as functional food when these are used in diet without knowing the medicinal properties. It provides the body with the required amount of vitamins, fats, proteins, carbohydrates necessary for healthy survival. A dietary supplement is a product that is intended to supplement the diet that contains one or more active ingredients. Medical foods are a specific category of therapeutic agents that are intended for the nutritional management of a specific disease.

Nutraceuticals in Cancer Treatment:

According to the World Cancer Report the cancer rates there would be 15 million new cases in the year 2020 i.e. a rise in 50%. A healthy lifestyle and diet can help in preventing cancer.

The diagnosis of cancer, its treatment, and surviving cancer present a challenge to the cancer patient. Current treatment for cancer including chemotherapy, radiotherapy, and biologically based therapies each contribute unintended side effects compromising the maintenance of health and nutritional well-being. Some of the complications are nausea, vomiting, changes in taste and smell, pain and fatigue, and changes in bowel habits. All or some of these symptoms can result in weight loss, deregulated satiety, and food aversions that can lead to loss of weight, muscle mass, and low energy.

In a recent survey of medicines for cancer across 13 countries, it was estimated that 30% of cancer patients employ some type of complementary and alternative medicine practice (CAM). Among 95% of patients using CAM, almost half were taking dietary supplements or nutraceuticals. Nutraceuticals have proven very promising in detoxifying and inhibiting anti-inflammatory and anticell growth signaling potential anticancer properties. Nutraceuticals may act independently or in combination as anticancer agents.

The additive and synergistic effects of nutraceuticals may be responsible for their potent antioxidant and anticancer activities.
Certain natural compounds also have the potential to interfere with the late-stage cancer, and perhaps alter the course of metastatic spread of cancer. Some nutraceuticals with prominent anticancer properties are shown in figure below;

- **Cruciferous vegetables** are a group of vegetables named by their cross-shaped flowers and include broccoli, Brussel sprouts, watercress, cabbage, cauliflower, kohlrabi, and turnips. They contain an abundant amount of isothiocyanates attributing their anticancer properties.

- **Curcumin** has been shown to inhibit the induction of cancers of the skin, stomach, duodenum, and colon in models of chemical carcinogenesis in mice and rats. Tea is rich in polyphenolic constituents, which have strong anti-inflammatory, antioxidant, anticarcinogenic, as well as antimitagenic properties. Tea polyphenols are also reported to inhibit proliferation and increase apoptosis in PCa cells in vitro. Combination of Epigallocatechin Gallate (EGCG) and Genistein, derived from green tea and soy products, with Quercetin, present in abundance in fruits and vegetables, exert synergy in controlling the proliferation and expression of androgen receptor and tumor suppressor P53 gene expression. Apples contain hydroxycinnamic acids, dihydrochalcones, flavan-3-ols/procyanidins, anthocyanins, and flavonols.

- **Quercetin 3- glycosides (Q3G)**, chlorogenic acid, catechin, and epicatechin. It prevents cancer by the inhibition of MCF-7 human BC cells proliferation.

- The juice and peel of pomegranates possess marked antioxidant capacity with high content of polyphenols, in particular, ellagitannins, condensed tannins, and anthocyanins, and both have been shown to have chemopreventive, chemotherapeutic, and anti-inflammatory efficacy.

- **DAS**, an organosulfur component of garlic (Allium sativum; Alliaceae) has been demonstrated to exert a potential chemo preventive activity against human cancers, such as that of the colon and lung.

The active pungent compound red chilies, capsaicin, retards the proliferation of cancer cells, suppresses the inflammatory response, and may mediate apoptosis through influence on the GSKβ3 component of the beta-catenin pathway, corrupted in many human cancers in vitro. Also oral capsaicin can inhibit the
proliferation of human pancreatic cancer grown as xenografts in nude mice. Capsaicin acts as a pain reliever in one of the major side effects of chemotherapy or radiotherapy.

Eugenol is found in oil of cloves, basil, cinnamon, and other aromatic spices. Tumor growth suppressive effects of eugenol were noted in studies of human cancer cell lines and in the MNNG-rat model of gastric cancer.

Gingerol, the active compounds in ginger has pronounced anti-inflammatory activity and has been found to have the ability to inhibit invasion, motility, and adhesion in human breast cancer cell lines, human hepatocarcinoma cells, and other cell lines. Also it offset one of the major side effects of cytotoxic chemotherapy, nausea and vomiting.

As per study, Diosgenin, a steroidal saponin found in fenugreek seeds suppressed the proliferation of human myelogenous leukemia cells, colon cancer cell lines, and breast cancer cell lines.

Resveratrol found in grapes acts as a potential inhibitor of late-stage cancer. Resveratrol treatment significantly inhibits MMPs involved in invasion and metastasis of glioblastoma (a type of brain tumor) cells.

Piperine showed direct effect on the development of breast stem cells, inhibiting mammosphere formation.

Role of Nutraceuticals in cancer prevention

Several approaches have been reported to investigate the role of nutraceuticals on reduced cell damage in the normal cells of the body. The possible mechanisms of cancer prevention are delayed apoptosis, DNA interaction and reduced necrosis, cell proliferation, signaling and maintaining metabolic integrity in the cancer tissue. The biomarker of cancer such as metalloproteinase, vitamin D hydroxylase, interleukins, omega-3 fatty acids, induced neutropenia, DNA adducts, DNA methylases, polymorphism, superoxide dismutase have been discovered as potent indicators of nutraceuticals chemo preventive mechanism. Cell mediate immunity is active and strong in youth and deteriorates with age. The major cytokines including interleukines, TNF alpha and NFAB loose their synergy response and affect cell mediated immunity to synthesize enough IgG, IgM, IgD antibody molecules. Humoral immunity also gets affected by less helper and suppressor lymphocytes. The possible metabolic points likely changed by nutraceuticals in apoptosis cascade and immunity loss are shown in Fig. below:

In other recent reports the investigators showed a positive response of different nutraceutical supplements and foods in cancer prevention of different organs in the body as shown in Table below.

<table>
<thead>
<tr>
<th>Cancer</th>
<th>Nutraceuticals</th>
</tr>
</thead>
<tbody>
<tr>
<td>Brain cancer</td>
<td>soy Isoflavonoids</td>
</tr>
<tr>
<td>Breast cancer</td>
<td>lycopene, phytoestrogen</td>
</tr>
<tr>
<td>Common cancer</td>
<td>cruciferous vegetables</td>
</tr>
<tr>
<td>Colon cancer</td>
<td>nuts, fibers</td>
</tr>
<tr>
<td>Gastric cancer</td>
<td>herbs</td>
</tr>
<tr>
<td>Intestinal cancer</td>
<td>sphingolipids</td>
</tr>
<tr>
<td>Liver cancer</td>
<td>silibinin, citrus flavonoids</td>
</tr>
<tr>
<td>Lung cancer</td>
<td>vitamins A and E</td>
</tr>
<tr>
<td>Ovary cancer</td>
<td>Vitamin A, D, antioxidants</td>
</tr>
<tr>
<td>Pancreatic cancer</td>
<td>Vitamins and isoflavonnes</td>
</tr>
<tr>
<td>Prostate cancer</td>
<td>lycopene, phytoestrogen</td>
</tr>
</tbody>
</table>

Nutraceuticals are growing in number & investigations suggest high hopes in cancer prevention. In last 5 years enormous change is demonstrated in the perception of nutraceuticals as cancer preventive and therapeutic supplements in cancers of different organs. Although, Nutraceuticals field offers a good opportunity for research but still several hurdles have to be crossed in research for beneficiary effects in human health.
Alzheimer's disease (AD) is the neurodegenerative disorder that affects the brain leading to dementia. It usually occurs late in life.

Cause behind the Alzheimer's disease
Researchers found senile plaques and components of the plaques such as amyloid beta peptide (Abeta), which is a proteolytic fragment of the amyloid precursor protein, and neurofibrillary tangles in the brain lesions as the basic diagnosis of the AD. Plaques found in the brain are found to be the cause of the damage to the cholinergic neurons found in the basal forebrain of the AD patients.

Drugs of choice for Alzheimer's disease:
Among the drugs of choice for AD are donepezil HCl and tacrine, which are cholinesterase inhibitors, ivastigmine and galantamine, which are inhibitors of the breakdown of acetylcholine and memantine HCl, which is the glutamate regulator. Even the drugs of choice come with the side effects such as dizziness, headache, nausea, vomiting and insomnia.

Nutraceuticals for Alzheimer's disease:
Recently researchers have found that many types of spices, fruits, medicinal plants and vegetables could have potential anti-oxidant activity and could help against AD.

1) Curcumin, yellow curry spice, has anti-oxidant and anti-inflammatory properties and could help against neurotoxic and genotoxic agents. Technically speaking, it inhibits NF-κB leading to prevention of Abeta-induced cell death in a human neuroblastoma cell line that has been considered as the therapeutic strategy for Alzheimer's disease. It also inhibits fibril and oligomer formation, inhibit Egr-1, Abeta-induced cell death, and activation of transcription factors that is further strengthening the role of curcumin in AD treatment.

2) Piperine, an active alkaloid in *Piper nigrum*, has also shown efficacy against AD. Researchers found that the compound improved the memory impairment much in the rat model. It also improved neurodegeneration in the hippocampus.

3) Aged garlic extract (AGE) has also showed antiamyloidogenic properties. Technically speaking, AGE suppressed the development of reactive oxygen species (ROS) that are found to be involved in the apoptotic mechanism of Abeta-mediated neurotoxicity.

4) Sage
5) *Angelica sinensis*
6) *Angelica gigas*
7) Morin
8) Ginger
9) Cinnamon (All of these compounds from 4 to 9 are found to protect the neuronal cells from Abeta-induced neurotoxicity)
10) Ursolic acid
11) Linalool (Compounds 10 & 11 act through the inhibition of acetylcholinesterase)
Parkinson’s disease (PD) is a nervous disorder represented by the symptoms of trembling hands, lifeless face, monotone voice, and a slow, shuffling walk. It is generally caused by the degeneration of dopamine-producing brain cells, and is the commonest form of Parkinsonism. Dopamine is a chemical used to send messages from the brain to the muscle to start voluntary movements.

Technically speaking, the occurrence of intracellular inclusions called Lewy bodies composed of aggregates of the presynaptic soluble protein called alpha-synuclein showed the symptoms of PD.

Treatment strategies for PD

Simple but still imperfectly attainable strategy for the treatment is the replacement or mimicking of the dopamine in the brain.

One of the best treatments, in this case, is the administration of levodopa (L-dopa), which is a precursor of dopamine.

**Natural treatments for the Parkinson’s disease**

Natural treatments for the PD include:

1) **Curcumin**: Researchers found that curcumin decreases synuclein toxicity and the generation of reactive oxygen species (ROS), which are found to be involved in the programmed cell death. It also increases neuronal survival in the substantia nigra that is present in the midbrain and have a function in movement.

2) **Zingerone**: It is an extract obtained from the ginger root. Researchers found that zingerone inhibits the dopamine reduction in mouse model.

3) **Eugenol**: It is obtained from the cloves.

4) **Morin**

5) **Anethole**

6) **Thymoquinone**

7) **Carnosol**

8) **Kaempferol**

**Reference:**

Greek Physician Hippocrates, Known as father of Medicine (said several centuries ago)

*"Let Food be Your Medicine"

The Philosophy behind is: “Focus on Prevention”
The term “Nutraceutical” was coined from “Nutrition” & “Pharmaceutical” in 1989 by Stephen DeFelice, MD, Founder and Chairman of the Foundation for Innovation in Medicine (FIM). Other words used in the context: Dietary supplementation, Functional, Multi-functional Foods, etc. Nutraceutical can be defined as “A food or part of food or nutrient, which provides health benefits, including the prevention and treatment of a disease.”

Broadly can be defined as:
- Nutrients: Substances which have established nutritional functions e.g. Vitamins, Minerals, Amino Acids, Fatty acids, etc.
- Herbas/Phytochemicals: Herbs or Botanical products
- Dietary Supplements: Probiotics, Prebiotics, Antioxidents, Enzymes, etc.

**NUTRIENTS**
- Most common Nutrients used/ supplemented as Nutraceutical are:
  - Minerals and Vitamins
  - or in combination or
  - in combination with other antioxidants

**Health Benefits of different common nutrients**

**VITAMINS**

**Fat Soluble Vitamins**
- Vitamin A: Acts as antioxidant, essential for growth and development, maintains healthy vision, skin and mucous membranes, may aid in the prevention and treatment of certain cancers and in the treatment of certain skin disorders.
- Vitamin D: Essential for formation of bones and teeth, helps the body to absorb and use calcium
- Vitamin E: Antioxidant, helps to form blood cells, boosts immune system
- Vitamin K: Essential for blood clotting

**Water Soluble Vitamins**
- Vitamin C: Antioxidant, necessary for healthy bones, gums, teeth and skin. Helps in wound healing, prevent from common cold
- Vitamin B 1: Helps in carbohydrate metabolism, essential for neurological function.
- Vitamin B 2: Energy metabolism, maintain healthy eye, skin and nerve function.
- Vitamin B 3: Energy metabolism, brain function
- Vitamin B 6: Helps to produce essential proteins, convert proteins to energy
- Vitamin B 12: Help in producing genetic material, formation of RBC, maintenance of
CNS, synthesis of amino acids, involved in metabolism of protein, fat and carbohydrate.

- Folic acid: Helps in RBC formation, formation of genetic material of cell, very much essential during pregnancy
- Pantothenic acid: Aids in synthesis of cholesterol, steroids, and fatty acids, crucial for intraneuronal synthesis of acetylcholine.

**Vitamins like Compounds**

- L-Carnitine: Helps in oxidation of fatty acids, role in oxidative phosphorylation.
- Choline: Lipotropic agent, used to treat fatty liver and disturbed fat metabolism.
- Inositol: For amino acid transport and movement of Potassium and sodium.
- Taurine: Helps in retinal photoreceptor activity, bile acid conjugation, WBC antioxidant activity, CNS neuromodulation, platelet aggregation, cardiac contractibility, sperm motility, insulin activity.

**MINERALS:**

- Calcium: essential for bone and teeth, maintaining bone strength, nerve, muscle and glandular function, blood clotting.
- Iron: energy production, Hb, oxygen transport,
- Magnesium: for healthy nerve and muscle function, bone formation.
- Phosphorous: energy production, phosphorylation process, bone and teeth, for genetic material.
- Cobalt: component of Vit. B 12 and B 12 coenzymes.
- Copper: Hb and collagen production, function of heart, energy production, absorption of Iron.
- Iodine: proper function of Thyroid gland,
- Chromium: with insulin it helps in conversion of carbohydrate and fat into energy, treatment of diabetes.
- Selenium: Antioxidant, functioning of heart muscle, part of GPX enzyme.
- Zinc: Essential for cell reproduction, for development in Neonates, wound healing, production of sperm and testosterone hormone.

**HERBALS:**

- Aloe vera: Anti-inflammatory, emollient, wound healing.
- Evening Primrose oil: Dietary supplement of linoleic acid, treatment of atopic eczema.
- Garlic: Antibacterial, antifungal, antithrombotic, anti-inflammatory.
- Ginger: carminative, antiemetic, treatment of dizziness.
- Ginseng: Adaptogen
- Green tea: Antioxidant, reduces risk of CVD, enhances humoral and cell mediated Immunity.
- Vegetables, fruits, whole grain, herbs, nuts and various seeds contain an abundance of phenolic compounds, terpenoids, sulphur compounds, pigments etc. that has been associated with protection / treatment of certain disease conditions.

**PHYTOCHEMICALS:**

Phytochemicals could provide health benefits as:

1. Substrate for biochemical reactions
2. Cofactors of enzymatic reactions
3. Inhibitors of enzymatic reactions
4. Absorbents that bind to & eliminate undesirable constituent in the intestine
5. Scavengers of reactive or toxic chemicals
6. Enhance the absorption and / or stability of essential nutrients
7. Selective growth factor for beneficial bacteria
8. Fermentation substrate for beneficial bacteria
9. Selective inhibitors of deleterious intestinal bacteria
Method to enhance active components in food

- Manipulating the diet to get maximum level of active components
- Combination of food ingredients rich in nutraceuticals
- Fortifying food with active ingredients
- By fermentation of food products
- Changing food habits to natural type of diet

CONCLUSION

- Nutraceuticals are present in most of the food ingredients with varying concentration
- Concentration, time and duration of supply of nutraceuticals influence human health
- Manipulating the foods, the concentration of active ingredients can be increased

Diet rich in nutraceuticals along with regular exercise, stress reduction and maintenance of healthy body weight will maximize health and reduce disease risk.

<table>
<thead>
<tr>
<th>Phytochemicals</th>
<th>Source</th>
<th>Role</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tocotrienols &amp; tocopherols</td>
<td>Grains</td>
<td>Suppressed the growth of diverse tumors cell lines via initiation of apoptosis and concomitant arrest of cells in the G1 phase of the cell cycle</td>
</tr>
<tr>
<td>Carotenoids</td>
<td>Fruits &amp; vegetables</td>
<td>Antioxidants, protects against uterine, prostate, colorectal, lung and digestive tract cancers, and protection to other antioxidants.</td>
</tr>
<tr>
<td>Limonoids</td>
<td>Citrus fruits</td>
<td>Inhibiting phase I enzymes &amp; inducing phase II detoxification enzymes in liver, provide protection to lung tissue.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Brand name</th>
<th>Components</th>
<th>Function</th>
</tr>
</thead>
<tbody>
<tr>
<td>Betatene</td>
<td>Carotenoids</td>
<td>Immune function</td>
</tr>
<tr>
<td>Xangold</td>
<td>Lutein esters</td>
<td>Eye health</td>
</tr>
<tr>
<td>Lipoec</td>
<td>α-lipoic acid</td>
<td>Potent antioxidant</td>
</tr>
<tr>
<td>General</td>
<td>Phytosterol</td>
<td>CHD reduction</td>
</tr>
<tr>
<td>Premium probiotics</td>
<td>Probiotics</td>
<td>Intestinal disorder</td>
</tr>
<tr>
<td>Soylife</td>
<td>Soyabean phytoestrogen</td>
<td>Bone health</td>
</tr>
<tr>
<td>Fenulife</td>
<td>Fenugreek galactomann</td>
<td>Control blood sugar</td>
</tr>
<tr>
<td>Teamax</td>
<td>Green tea extract</td>
<td>Potent antioxidant</td>
</tr>
<tr>
<td>Marinol</td>
<td>Ô3 FA, DHA, EPA</td>
<td>Heart health protection</td>
</tr>
<tr>
<td>Clarinol</td>
<td>CLA</td>
<td>Weight loss ingredient</td>
</tr>
<tr>
<td>Cholestaide</td>
<td>Saponin</td>
<td>Reduce cholesterol</td>
</tr>
</tbody>
</table>

TABLE NO. 1. VARIOUS PHYTOCHEMICALS

Table No. 2. NUTRACEUTICALS AVAILABLE IN MARKET
<table>
<thead>
<tr>
<th>Class / components</th>
<th>Source</th>
<th>Potential benefit</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Fatty acids</td>
<td>Milk &amp; Meat</td>
<td>Improve body composition, reduce cancers</td>
</tr>
<tr>
<td>CLA</td>
<td>Fish oil, berseem &amp; maize fodder, mustard, linseed, rapeseed</td>
<td>Reduce CVD &amp; improve mental, visual function</td>
</tr>
<tr>
<td>n-3 FA (DHA, EPA)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. Polyphenols</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Anthocyanidine</td>
<td>Fruits</td>
<td>Neutralises free radicals, reduce risk of cancer</td>
</tr>
<tr>
<td>Catechins</td>
<td>Tea, babul pods, mustard cake, rape seed, salseed</td>
<td></td>
</tr>
<tr>
<td>Flavonoids</td>
<td>Citrus</td>
<td></td>
</tr>
<tr>
<td>Flavones</td>
<td>Fruits, vegetables, soya bean</td>
<td></td>
</tr>
<tr>
<td>Proanthocyanidine</td>
<td>Cocoa, chocolate, tea, rape seed</td>
<td>Reduce CVD</td>
</tr>
<tr>
<td>3. Saponins</td>
<td>Soybeans, GNC, lucerne, chick pea</td>
<td>Lower cholesterol, anti cancer</td>
</tr>
<tr>
<td>4. Probiotics / Prebiotics / Synbiotics</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Lactobacillus</td>
<td>Dahi, yogurt</td>
<td>Improve GI health</td>
</tr>
<tr>
<td>Fructo - oligosaccharides</td>
<td>Whole grains, onions, combination of Pro &amp; Prebiotics</td>
<td></td>
</tr>
<tr>
<td>5. Phytoestrogen</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Daidzein, Zenistein</td>
<td>Soybean, flax, lentil seed, maize, berseem, lucerne, subabul fodder</td>
<td>Reduce menopause symptoms, 1 bone health</td>
</tr>
<tr>
<td>Lignans</td>
<td>Flax, rye, vegetables</td>
<td>Reduce cancer and heart diseases</td>
</tr>
<tr>
<td>6. Carotenoids</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Daidzein, Zenistein</td>
<td>Soybean, flax, lentil seed, maize, berseem, lucerne, subabul fodder</td>
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<tr>
<td>Lignans</td>
<td>Flax, rye, vegetables</td>
<td>Reduce cancer and heart diseases</td>
</tr>
<tr>
<td>β-carotene</td>
<td>Berseem, lucerne, oat &amp; maize fodder, Carrots, vegetables, fruits</td>
<td>Neutralises free radicals</td>
</tr>
<tr>
<td>Luteine</td>
<td>Vegetables</td>
<td>Healthy vision</td>
</tr>
<tr>
<td>Zeo-xanthine</td>
<td>Eggs, citrus, corn</td>
<td></td>
</tr>
<tr>
<td>Lycopene</td>
<td>Tomatoes</td>
<td>Reduce prostate cancer</td>
</tr>
<tr>
<td>7. Dietary fiber</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Insoluble fiber</td>
<td>Wheat bran</td>
<td>Reduce breast, colon cancer</td>
</tr>
<tr>
<td>β-glucan</td>
<td>Oats</td>
<td>Reduce CVD</td>
</tr>
<tr>
<td>Whole grain</td>
<td>Cereal grains</td>
<td></td>
</tr>
</tbody>
</table>
"Nutraceutical" the term which was coined from "nutrition" and "pharmaceutical" in 1989 by Stephen DeFelice, MD, founder and chairman of the Foundation for Innovation in Medicine (FIM), Cranford, NJ. When food is being cooked or prepared using "scientific intelligence" with or without knowledge of how or why it is being used, the food is called "functional food." Thus, functional food provides the body with the required amount of vitamins, fats, proteins, carbohydrates, etc, needed for its healthy survival. When functional food aids in the prevention and/or treatment of disease(s) and/or disorder(s), it is called a nutraceutical. Examples of nutraceuticals include fortified dairy products (e.g. milk) and citrus fruits (e.g., orange juice) Nutraceuticals must not only supplement the diet but should also aid in the prevention and/or treatment of disease and/or disorder. Nutraceuticals are represented for use as a conventional food or as the sole item of meal or diet. The use of nutraceuticals, as an attempt to accomplish desirable therapeutic outcomes with reduced side effects, as compared with other therapeutic agents has met with great monetary success.

DEFINITIONS OF A NUTRACEUTICAL

1. Nutraceutical is "Food, or parts of food, that provide medical or health benefits, including the prevention and treatment of disease." by Dr. Stephen DeFelice (Foundation for Innovation in Medicine).

2. Nutraceutical is a term of convenience, not a scientific term, says Cal Bewicke, marketing director, Acta Pharmacal, Sunnyvale, CA. "It was coined by people to define a nutritious food product. Lately it has come to mean a product which combines traditional food."

What Are the Benefits of Nutraceuticals in Medicine?

- Higher Confidence in Product Quality and Effectiveness
- Improved Market for Nutraceutical Products
- Increased Public Awareness
- Increased Healthcare Industry Awareness
- Establishment of a Self-Governing agendagredients and active components.

CONCEPT OF NUTRACEUTICALS

In the pharmaceutical development process, it is a requirement to have clinical test results from animal tests and studies, for verification of the effects. On the other hand, in the case of nutrition, there was no verification method for foods in preventing diseases in the past. In recent years however, as food composition has been scientifically proven to cause life style-related diseases, and has become a social issue. The concept
of Nutraceuticals has started to be acknowledged as one of the measures for preventing such diseases.

**NUTRACEUTICAL CATEGORIES**

**Dietary Supplements Including Botanicals:**
- Vitamins, minerals, co-enzyme Q, carnitine
- Ginseng, Gingko Biloba, Saint John's Wort, Saw Palmetto

**Functional Foods:**
- Oats, bran, psyllium and lignin's for heart disease and colon cancer
- Prebiotics - Oligofructose for control of intestinal flora
- Omega-3 milk in prevention of heart disease
- Canola oil with lowered triglycerides for cholesterol reduction
- Sterols (Benecol) in reduction of cholesterol adsorption.

**Medicinal Foods:**
- Transgenic cows and lactoferrin for immune enhancement.
- Transgenic plants for oral vaccination against infectious diseases.
- Health bars with added medications

**CLASSIFICATION**

Nutraceuticals or functional food can be classified on the basis of their natural sources, pharmacological conditions or as per chemical constitution of the products.

**Nutraceutical are broadly categorized as follows.**

Substances with established nutritional function such as
- Vitamins, minerals, amino acid and fatty acids nutrients.
- Herbal and botanical products
- Foods for viability, functional food, medical food health food, organic food
- Sport and energy product
- Natural medicinal products with specific health benefit

The classification of nutraceuticals based upon its therapeutic implications for the treatment or prevention of specific condition may produce a big list. Some of the important conditions in which the nutraceuticals are specially directed for its treatment, preventions or support.

**INORGANIC MINERALS SUPPLEMENTS**

Large number of elements control variety of physiological and biochemical functions of human diet may develop variety of health related problems and diseases.

**Calcium:** calcium is an important element in the treatment of bone loss and prevention. Calcium deficiency is found in 25% of women, even though much higher percentage has osteopenia or osteoporosis. Pre-puberty is the best time to begin supplementing the diet with calcium rich minerals along with exercise regimen. Sufficient intake of calcium and vitamin D post menopausal can significantly reduce the risk for fracture.

**Magnesium:** Magnesium is an essential element involved in well over 300 enzymatic processes and critical in proper use and maintenance of calcium. Many individuals with calcium deficiency are actually magnesium deficient which prevent proper use of calcium.

**Boron:** Boron is reported to be helpful in supporting the calcium and estrogen levels in postmenopausal women.

**Copper:** Copper is an essential element needed by all tissues in the body. Copper and zinc must be in proper proportion. Copper is best absorbed when bound to an amino acid.

**Zinc:** Zinc is one of the most important trace mineral zinc support the body’s overall antioxidant system by scavenging free radicals. It also performs many other vital functions.
Phosphorous: Phosphorous is important in maintaining bone structure and modulating plasma and bone formation.

What Caused the Rapid Emergence of Nutraceuticals?
Consumers dissatisfied with drug costs and conventional healthcare are turning to unproven and untested natural products for treatment and prevention.
- Chronic diseases with poor therapeutic alternatives
- Hurried impersonal exchanges with providers stressed by managed care
- Desire for personalized medicines
- Large population trying to stave off the effects of aging
- New focus on preventive medicine
- Public perception that "natural is good"

More than 40% of Americans use alternative medical therapies, nutraceuticals (herbals/botanicals) account for a significant proportion.

Nutraceuticals, the Alternative Crop for Wellness and Prevention
Fund an initiative at the National Nutraceutical Center that brings together industry, academia, and government to jointly apply cost-effective scientific approaches in agricultural and manufactural efforts to make nutraceuticals a highly profitable crop. Center will disseminate the results to the general public and to healthcare, agriculture, and manufacturing industries and will focus on:
- Basic and clinical research to determine key plant components, effectiveness, dosage levels, and interactions with other nutraceuticals and pharmaceuticals.
- Basic agricultural and plant biotechnology studies to determine how to grow nutraceuticals, maximize key ingredients, and develop a cash crop potential.
- Quality assurance and standards development at all levels of supply/manufacturing.

Today’s Problem:-
- U.S. healthcare costs are the highest in the world, while morbidity and mortality measures are not correspondingly the highest.
- Consumers dissatisfied with drug costs and conventional healthcare are turning to unproven and untested natural products, nutraceuticals, for treatment and prevention.
- Supply of "certified" products is limited and demand exceeds supply.
- Most raw materials are imported and lack government/industry control on product quality and contamination.

The nutraceutical industry in the US is about $86 billion. This figure is slightly higher in Europe and, in Japan, represents approximately a quarter of their $6 billion total annual food sales - 47% of the Japanese population.

Status of Nutraceuticals in Various parts of World
In Japan the expected effects of taking functional ingredients, such as anti oxidation, bone formation/absorption, glucose incorporation, influence to immune system, influence to carcinogenic rate of a patient with cirrhosis, liver enzyme induction, learning and biophylaxis factor, were chosen for assessment and verification.

In Europe, a focus is placed on a faultless approach, from research to industrialization, of Nutraceuticals, mainly promoted in Food Valley. On the contrary, the United States is focusing on the approaches for prevention of diseases and life-style related diseases based on the study of Nutraceuticals. Some venture companies are now working a service to provide Nutraceuticals for those who easily contract diseases, through individual genetic information analysis.
**Neutraceuticals**

Sana Malhotra  
S. Y. B. Pharm.

"Neutraceuticals", a term combining the words “nutrition” and “pharmaceutical”, is a food or food product that provides health and medical benefits, including the prevention and treatment of disease. They are available in the form of isolated nutrients, dietary supplements and specific diets to genetically engineered foods, herbal products and processed foods such as cereals, soups and beverages, and provide all the essential substances that should be present in a healthy diet for a human, including energy and nutrient supplements to body, which are required for maintaining optimal health.

Nutraceuticals are widely used in the food and pharmaceutical industries. Some Nutraceuticals are useful in maintaining healthy prostate function, remedy for restlessness and insomnia. Nutraceuticals, such as glucosamine and chondroitin sulfate, offer possible chondro-protective effects against joint injury.

- **Spirulina - Spray Dried Powder**
  Spirulina is a microscopic blue-green alga in the shape of a spiral coil, living both in sea and fresh water. Spirulina is arguably nature’s most powerful green food for human and animal. It is produced primarily from two species of cyanobacteria: *Arthrosira platensis* and *Arthrosira maxima*. Spirulina is rich source of Protein, Carotenoids, Gamma Linolenic Acid, Vitamin B12; trace minerals such as Iron, Magnesium, Calcium and Selenium. Sulpholipids, the antioxidant enzyme Superoxide dismutase (SOD) and some pigments like Phycocyanin, Beta-carotene, Zeaxanthin and Chlorophyll. It is mostly used in dietary supplement.

- **Natural Mixed Carotenoids**
  Natural Mixed Carotenoids found in *Dunaliella salina* are among nature’s best antioxidants, containing a variety of carotenoids including Beta-carotene, Alpha-carotene and Xanthophylls like Zeaxanthin, Cryptoxanthin and Lutein hence the name “Natural Mixed Carotenoids”. These have a high ratio of cis to trans isomers. They are highly stable and easily absorbed by the human body due to their high bioavailability.

- **Natural Astaxanthin**
  Astaxanthin is a red colored carotenoid pigment that is naturally found in microalgae, yeast, salmon, trout, krill, shrimp, crayfish, crustaceans and the feathers of some birds, but naturally it is produced from microalgae *Haematococcus pluvialis*. The primary use for human in form of food supplement. It prevents the initiation of cancer cells in the tongue, oral cavity, large bowel, bladder, uterus and breast. Protects the eyes and skin from UV.
Natural Purified Lutein esters
Natural lutein esters contain lutein esters, small amounts of Zeaxanthin esters and cryptoxanthin esters which are extracted from marigold flowers, Tagetes erecta. Lutein and Zeaxanthin are the only carotenoids found in both the macula and lens of the human eye. It is used in dietary supplement, pharmaceuticals, as functional foods and as an antioxidant.

Natural Zeaxanthin
Zeaxanthin is one of the two primary xanthophyll carotenoids contained within the retina of the eye. Within the central macula, zeaxanthin is the dominant component, whereas in the peripheral retina, lutein predominates. These are used as a food additives and food dyes.

Natural Lycopene
Lycopene is a carotenoid that gives the characteristic bright red color to tomatoes, guavas, watermelon and pink grape fruit. Lycopene helps in reducing risk of prostate and cervical cancers, and it supports cardiovascular health. Lycopene is a proven antioxidant which neutralizes free radicals that may damage the body's cells. It is also used as food colouring agent.

Phycocyanin Powder
Phycocyanin is a blue colored pigment that belongs to the class of Phycobiliproteins found in Blue-Green algae. Phycocyanin, produced by Aphanizomenon flos-aquae and Spirulina. It is used in the food and beverage industry as a natural colouring agent and is also found in sweets and ice cream. Phycocyanin has major role as a fluorescent marker and an antioxidant in various industries.

Green Tea Extracts
Green tea extracts are herbal derivatives from green tea leaves, Camellia sinensis containing antioxidant ingredients – mainly green tea catechins (GTC). Green tea has been associated with a number of health benefits such as, in weight reduction, in lowering cholesterol, an aid in digestion, and protection against certain diseases like cancer.
Nutraceutical is a combination of the words "nutrition" and pharmaceutical, is a food or food product that reportedly provides health and medical benefits, including the prevention and treatment of disease. Health Canada defines the term as "a product isolated or purified from foods that is generally sold in medicinal forms not usually associated with food. A nutraceutical is demonstrated to have a physiological benefit or provide protection against chronic disease.

REGULATORY ISSUES:

The current regulatory environment is said to discourage innovation and marketing for nutraceuticals/functional foods. Under the Food and Drugs Act, only a specified range of claims may be made for foods; otherwise, they are classed as drugs. The food regulations currently permit:

- positioning the food as part of healthy eating
- claiming that a nutrient or nutritive substance (as listed in the Regulations) is generally recognized as an aid or factor in maintaining the functions of the body, or necessary for the maintenance of good health and normal growth and development (also known as "biological role claims" and nutrient function claims).

Under the current regulatory framework nutraceuticals/functional foods appear to have an awkward fit. Although some may appear to consumers as ordinary foods, they are known to produce physiological effects. Others appear to be in a "drug-like" form however, some manufacturers are reluctant to consider them as such. There are several reasons why food producers generally want to avoid their products being treated as drugs.

One is the public perception that foods are consumed for "wellness" whereas drugs are necessary to fight "illness". Moreover, drugs must meet numerous constraints, including stringent regulations governing Good Manufacturing Practices, testing procedures and post-market surveillance. The end result is that few manufacturers have even applied for Drug Identification Number (DIN).

Because of the dichotomy between foods and drugs, manufacturers of nutraceuticals/functional foods are faced with two choices: They can either market their product with no health claims, or they can follow the more stringent regulatory requirements necessary for drugs.

The first option restricts the manufacturer's freedom to market the goods with health claims, and limits dissemination of information to consumers. The second option can delay a product's entry onto the market, limit its advertising and potentially add to its cost.
CANADA

There are no regulations dealing specifically with nutraceuticals or functional foods. All foods and drugs fall under the provisions of the Food and Drugs Act and Regulations.

Under the Act, the "food" definition includes: "any article manufactured, sold or represented for use as food or drink by man, chewing gum, and any ingredient that may be mixed with food for any purpose whatever."

A "drug" includes: "any substance or mixture of substances manufactured, sold or represented for use in

a. the diagnosis, treatment, mitigation or prevention of a disease, disorder, abnormal physical state, or the symptoms thereof, in man or animal,

b. restoring, correcting or modifying organic functions in man or animal or,

c. disinfection in premises in which food is manufactured, prepared or kept;"

Drug and food products must comply with all the quality and safety requirements of the Food and Drug Regulations. In addition to quality and safety requirements, drugs may be approved for sale if they meet the regulatory requirements for efficacy. Products sold which have been authorized for sale carry a Drug Identification Number (DIN) or General Public (GP) number on the label. Once a drug is on the market, a manufacturer must follow specific guidelines for submitting reports on any adverse reaction to the product.

UNITED STATES

In the United States, health claims may be made for foods and dietary supplements in accordance with the 1990 Nutrition Labelling and Education Act (NLEA) and the 1994 Dietary Supplements Health and Education Act (DSHEA), an amendment to the Food, Drug and Cosmetic Act.

The NLEA clarified and strengthened the authority of the Food and Drug Administration (FDA) to require nutrition labelling on foods and to establish the circumstances under which claims may be made about nutrients in foods.

In 1994, the Dietary Supplements Health and Education Act (DSHEA) allowed for the use of structure and function claims, which describe the role of a nutrient or dietary ingredient, intended to affect the structure or function in humans.

Under this legislation, structure and function claims for dietary supplements require post-market notification, with manufacturers obliged to substantiate their claims. The following disclaimer on the label is also required: "This statement has not been evaluated by the Food and Drug Administration. This product is not intended to diagnose, treat, cure, or prevent disease."

To market a dietary supplement containing an ingredient not sold prior to 1994, a producer must notify the FDA 75 days before putting the product on store shelves. The notification must include information supporting the safety of the ingredient. If the FDA feels a product may be harmful, it bears the onus of proving the danger.

The FDA has recently published proposed rules flowing from recommendations of the Commission on Dietary Supplement Labels.

JAPAN

Under the Japanese Nutrition Improvement Law, there are five categories of "Foods for Special Dietary Uses," including "Foods for Specified Health Use" or "FOSHU". Certain foods are considered by the Japanese to have beneficial ingredients. For example, dietary fibre, sugar alcohols, oligosaccharides, proteins, polyphenols, lacto- or bifido-bacilli, chitosan and sodium alginate are considered to help maintain good health. The FOSHU law regulates the marketing and labelling of products containing these ingredients.

Unlike American "dietary supplements", such products must be in a food form that can be integrated into the
diet. After regulatory review, these foods carry a label indicating the specified health benefit. For instance, some of these products claim to play a role in dental care, control cholesterol, blood sugar or blood pressure, promote healthy intestines, or promote the absorption of minerals. The approval of the Ministry of Health and Welfare must also be displayed on the label of FOSHU food products.

AUSTRALIA & NEW ZEALAND FOOD AUTHORITY (ANZFA)
In Australia and New Zealand health claims for foods are generally prohibited unless specifically prescribed by the Food Standards Code. Since August 1997, ANZFA has been assessing a proposal to permit certain properly substantiated health claims to be made for qualifying foods. Meantime, a regulatory initiative is being introduced to permit a pilot health claim on specified foods. The scientifically substantiated claim would link peri-conceptional maternal intakes of the B-group vitamin folate with a reduction in the incidence of neural tube defects (such as spina bifida) in babies. An evaluation of the impact of this pilot claim would then help ANZFA conclude its deliberations on the broader health claims issue. Final recommendations by ANZFA are expected in 1999.

EUROPEAN UNION (EU)
Member states of the European Union are governed by one directive for products with specific therapeutic claims. Products with non-therapeutic claims are regulated independently by member states. Currently each member of the European Union has its own set of legislation and regulations governing what are popularly known as “health foods.” (The term “functional foods” is used mostly by industry.) In general, however, health claims are not permitted on labels for foods or functional foods, although nutritional claims are permitted if they are indicated through proper labelling. Enforcement, however, tends to vary among member states, leading to uncertainty and risk for manufacturers attempting to sell their products across borders.

In an effort to modernize the rules governing these and related matters, a discussion document entitled General Principles of Food Law in the European Union was circulated for review by member states and stakeholders in July 1997. The aim of the paper was to measure the extent to which existing legislation meets the needs and expectations of consumers, producers, manufacturers and traders; to consider measures to reinforce official control and inspection systems governing a safe and wholesome food supply; and to launch a public debate on European Union food legislation.
Obesity and insulin resistance are the critical stages in development and progression of diabetes type-2. The reason associated with it is chronic low grade inflammation resulting from oxidative stress and imbalance in innate immune system. Hence, reduction in inflammation by transition of oxidative stress and innate immune response via antioxidant micronutrients could lead to improved insulin sensitivity and delayed onset of disease. Many micronutrients show anti-inflammatory or immuno-modulatory functions. They may act by preventing excessive expression of inflammatory signalling proteins.

Some of these are; Vitamin D - In type-2 diabetes, the role of vitamin D was suggested from the presence of vitamin D receptors (VDR) in pancreatic insulin producing cells. In these cells, the biologically active metabolite of vitamin D (1,25-dihydroxy vitamin D) enhances insulin production and secretion via its action on VDR. Alternative explanation of role of vitamin D can be given on the basis of its potent immuno-modulatory function. In this respect, supplementation with vitamin or its active form improved insulin can improve insulin sensitivity by preventing excess synthesis of inflammatory mediator protein (cytokine). Thus, vitamin D, either alone or in combination with calcium can prevent or control diabetes type-2.

In addition, some trace elements play role in prevention of diabetes type-2. Selenium being one of them can prevent precipitation of the disease. It can enhance insulin sensitivity by mediating insulin like actions. Moreover, selenium dependent enzymes are known to have antioxidant properties which can protect membranes and tissues from oxidative stress.

Magnesium, one of the trace elements also plays a role in insulin action and sensitivity. Adequate amount of magnesium may be useful in improving resistance and hence, prevention of the disease. Oral magnesium supplement may improve insulin sensitivity even in non-diabetic with normal levels of magnesium. This points the need for an early optimisation of magnesium intake to prevent the type-2 diabetes before its onset.

Considering current and future epidemiology of diabetes, harnessing alternative medicine, including micronutrients, seems a novel approach to manage the silent assassin.
With the completion of the Human Genome Project, the stage has been set for the integration of genetic science and technology into health care. Integration of genetics into nutrition science and food science is in its infancy. This emerging field of nutritional genomics holds the promise of improving therapeutic outcomes for existing disease and for preventing disease.

Nutritional genomics can be divided into two disciplines: nutrigenomics and nutrigenetics. Nutrigenomics studies the effect of nutrients on health through altering genome, proteome, metabolome and the resulting changes in physiology whereas, nutrigenetics studies how individual differences in genes influence the body's response to diet and nutrition. In a nutshell, nutritional genomics focuses on the bioactive substances found in regular food and how those substances affect the balance between health and disease via the interaction with the individual's genome. The convergence of the two disciplines is needed to fully realize the promise of nutritional genomics.

Following are five tenets of nutritional genomics to serve as a conceptual basis for understanding the focus and promise of this emerging field:

1. Substances contained in the food (micro- and macro-nutrients) can directly or indirectly affect the human genome through changes in its structure and gene expression.

2. Under certain circumstances and in some individuals the diet can be an important risk factor for the development of the number of diseases.

3. Some genes regulated by active substances in the diet probably play a crucial role in the onset, incidence, progression and severity of the disease.

4. The degree to which diet influences the balance between health and disease may depend on individual's genetic makeup.

5. Nutritional intervention is based on the knowledge of individual's nutritional status and needs as well as genotype (individualized nutrition) and can be used for prevention, mitigation or healing the chronic diseases.

An example of the application of the nutrigenomic approach was a study that simultaneously identified a mechanism for the regulation of sterol uptake in the intestine and the basis for sitosterolemia (a genetic disorder characterized by hyperabsorption of dietary sterols leading to hypercholesterolemia with a high risk of developing atherosclerosis). The study led to the discovery of a gene, two proteins produced by which were responsible for the regulated reverse transport of animal and plant dietary sterols out of the apical surface of intestinal cells. This explained why dietary sterols, which are structurally similar to cholesterol, are not absorbed in normal individuals. By scanning sitosterolemic individuals for this gene, it was found that all of them had a mutation in this gene responsible for their uncontrolled hyperabsorption of dietary sterols.
A number of genetic variations have been shown to increase the susceptibility to diet-related diseases. These include variants that have been associated with Type 2 diabetes mellitus, obesity, cardiovascular diseases, some autoimmune diseases and cancers. Nutrigenetics aims to study these susceptible genes and provide dietary interventions for individuals at risk of such diseases. For example, Nutrients can contribute to the development of cancers especially colon, gastric and breast cancer. Several gene variants have been identified as susceptibility genes. One example is the N-Acetyltransferase (NAT) gene. NAT is a phase II metabolism enzyme that exists in two forms: NAT1 and NAT2. During cooking of muscle meat at high temperature, some amino acids may react with creatine to give heterocyclic aromatic amines (HAA). HAA can be activated through acetylation to reactive metabolites which bind DNA and cause cancers. Only NAT2 fast acetylators can perform this acetylation. Studies have shown that the NAT2 fast acetylator genotype had a higher risk of developing colon cancer in people who consumed relatively large quantities of red meat.

The recent advances in nutritional genomics studies are owed to the completion of human genome project and the new biomics technologies that provide means for the simultaneous determination of the expression of many thousands of genes at the mRNA (transcriptomics), metabolites (metabolomics) and protein (proteomics) levels. Genomic and transcriptomic studies are mostly conducted by DNA microarray technologies. Proteomics and metabolomics have no standardized procedures yet, but usually, proteome analysis is done by two-dimensional gel electrophoresis and Liquid chromatography-mass spectrometry, while metabolome analysis is conducted through gas chromatography-mass spectrometry, liquid chromatography-mass spectrometry and liquid chromatography-nuclear magnetic resonance. Usually, these technologies are applied in a “differential display” mode.

The integration of genomics into nutritional sciences has illuminated the complexity of genomic responses to nutritional exposures while offering opportunities to redefine the current concept of preventive medicine. It is highly likely that during the next decade the nutritional supplement and functional food industries will experience robust growth in response to advances in nutritional genomics research and its applications. But, nutrigenomics is just in the very beginning of its existence. Only large and systematic studies will determine how important nutrigenomics will be in the future clinical practice. The final goal of nutrigenomics is to find an optimum dietary regimen for a given individual respecting not only the quantitative and qualitative nutritional needs and health status, but also the genetic predispositions in order to prevent the onset of many western-type diseases, or to help to cure them more effectively.
Protein in fibre can replace expensive ways to store drugs. For thousands of years silk has been considered ultimate fabric for luxury clothing. But the coveted cloth material might soon make its way into the most unlikely of places, pharmaceutical industry. Scientists from Tufts University in the US have found that silk protein can act as potent preserving agent for vaccines and drugs.

Vaccines are preserved either by using preservative like thiomersal or through cold chains. While thiomersal is mercury based and can be harmful, cold chains are expensive and cumbersome. Failure to maintain optimum temperature between 2°C and 8°C result in denaturation of drugs. The method is particularly unreliable for developing countries like India that have poor power, infrastructure. Over the past few years, many deaths have been reported in compromised vaccines that were not kept at optimum temperature.

The team of scientists has found that silk protein; fibroin can keep vaccines and antibiotics intact at temperature of up to 60°C for over six months. The protein molecule is like a sheet with numerous tiny pockets. These pockets trap the drug molecules and act like nanoscale bubbles wrap to protect them. This unique structure makes it strong, moisture resistant, stable at extreme temperature and biocompatible. These properties make the protein useful for stabilising antibiotics, vaccine and other drugs.

The scientist preserved measles, mumps and rubella vaccines (MMR) and antibiotics like penicillin and tetracycline in silk protein. These were then compared with the manufactures supplied vaccine formulation at 4°C, 25°C, 37°C and 45°C. They found that vaccines and antibiotics preserved in silk protein have better stability compare to the standard ones at high temperature.

Scientists say that protein can be successfully used to prepare products like films and micro-needles to store and administer vaccines and antibiotics. India with its ample silk supplies can capitalise on this discovery, “technologies like these can protect drug from external shocks such as heat and light. They can revolutionise drug storage by bringing down cost and improving coverage of national vaccination programmes.”
Nutraceutical, a portmanteau of the words “nutrition” and “pharmaceutical”, is a food or food product that reportedly provides health and medical benefits, including the prevention and treatment of disease. Such products may range from isolated nutrients, dietary supplements and specific diets to genetically engineered foods, herbal products, and processed foods such as cereals, soups, and beverages. The term nutraceutical was originally defined by Dr. Stephen L. DeFelice. These chemical components are derived from plant, food, and microbial sources, and provide medicinal benefits valuable to long-term health. Examples of these nutraceutical chemicals include probiotics, antioxidants, and phytochemicals.

In addition, many botanical and herbal extracts such as ginseng, garlic oil, etc. have been developed as nutraceuticals. Nutraceuticals are often used in nutrient premixes or nutrient systems in the food and pharmaceutical industries.

- Antioxidants: resveratrol from red grape products; flavonoids inside citrus, tea, wine, and dark chocolate foods; anthocyanins found in berries, Vitamin C
- Reducing hypercholesterolemia: soluble dietary fiber products, such as psyllium seed husk
- Cancer prevention: broccoli (sulforaphane), fiddleheads (Matteuccia Struthiopteus)
- Improved arterial health: soy or clover (isoflavonoids)
- Lowered risk of cardiovascular disease: alpha-linolenic acid from flax or chia seeds, Omega 3 fatty acids in fish oil.

LYCOPENE

Lycopene (from the New Latin word lycopersicum, referring to the tomato species) is a bright red carotene & carotenoid pigment and phytochemical found in tomatoes and other red fruits and vegetables, such as red carrots, red bell peppers, Watermelons and papayas (but not strawberries or cherries).

Although lycopene is chemically a carotene, it has no vitamin A activity. Lycopene belongs to class carotenoids. These are the orange, red, yellow pigments synthesized in plants. Their function in plants is to absorb light in photosynthesis, protecting plants against photosensitization. The five principle carotenoids found in human plasma, as the result of ingesting plants, including alpha and beta carotene, beta cryptoxanthin, lutein and Lycopene. Over 600 carotenoids have been identified till date. Like all carotenoids, lycopene is a polyunsaturated hydrocarbon (an unsubstituted alkene). Structurally, it is a tetraterpene assembled from eight isoprene units, composed entirely of carbon and hydrogen, and is insoluble in water. Lycopene's eleven conjugated double bonds give it its deep red color and are responsible for its antioxidant activity. Due to its strong color and non-toxicity, lycopene is a useful food coloring. It is not an essential nutrient for humans, but is commonly found in the diet, mainly from dishes prepared from tomatoes.

When absorbed from the stomach, lycopene is transported in the blood by various lipoproteins and accumulates in the liver, adrenal glands, and testes. Because preliminary research has shown an inverse correlation between consumption of tomatoes and cancer risk, lycopene has been considered a potential...
agent for prevention of some types of cancers, particularly prostate cancer.

**Structure and physical properties**

Ball-and-stick model of all-trans lycopene

Lycopene is a symmetrical tetraterpene assembled from 8 isoprene units. It is a member of the carotenoid family of compounds, and because it consists entirely of carbon and hydrogen, is also a carotene. Plants and photosynthetic bacteria naturally produce all-trans lycopene, but a total of 72 geometric isomers of the molecule are sterically possible. When exposed to light or heat, lycopene can undergo isomerization to any of a number of these cis-isomers, which have a bent rather than linear shape. Different isomers were shown to have different stabilities due to their molecular energy.

**HISTORY**

Lycopene was largely ignored for decades due to its lack of activity of provitamin A, which was thought to be a distinguishing character of carotenoids. In a 1995 Harvard study conducted with 47,894 men, researchers found that eating 10 or more servings a week of tomato products was associated with a reduced risk of prostate cancer by as much as 30%. Lycopene is a pigment that gives vegetables and fruits like tomatoes, pink grapefruit and watermelon their characteristic red color. It also appears to have strong antioxidant properties. Several studies indicate that consumption of Lycopene is associated with a lowered risk of prostate cancer and cardiovascular disease.

**LOCATION**

Lycopene is not produced in the human body. It is obtained by consumption of foods rich in Lycopene like tomatoes. Pink grapefruit and watermelon provide Lycopene in small amounts. Lycopene is better absorbed by the body when it is consumed in processed tomato products rather than fresh tomatoes. In a study it was found that Lycopene absorption from tomato paste was 2.5 times more than fresh tomatoes.

**BIOLOGICAL ACTIVITY**

Carotenoids are protective against chronic diseases which are thought to be caused by damage from free radicals. Free radicals are molecules with unpaired electrons in their outer atomic orbital, causing the molecule to be extremely reactive. Carotenoids prevent oxidative damage in biological systems, such as cell membrane and other structures, DNA molecules, lipids and proteins. Environmental sources include environmental toxins, air pollutants such as nitrogen dioxide, Sunlight, ionizing radiations, certain drugs and cigarette smoke. It is found to be protective in the following types of cancers: Esophageal, gastric, pancreatic, bladder and Prostate. It also shows protective activity in case of sun burn. Lycopene has shown protective effect against cardiovascular diseases. Oxidative damage is believed to be the underlying mechanism in etiology of CVDs. More recently the multifaceted role of oxidative modified LDL has been proposed as being instrumental in atherogenesis. Carotenoids along with vitamin E may function to protect LDL against oxidation. Once vitamin E is depleted, carotenoids become the secondary barriers for oxidation of LDL. It is also believed that Lycopene may reduce the risk of developing atherosclerosis and may reduce high cholesterol.

**SIDE EFFECTS AND ALLERGIES**

People allergic to tomatoes and their products should avoid consuming Lycopene supplements. No side effects have been reported from eating lycopene tomato based products or lycopene food nutrition supplements. Currently Lycopene supplements are available as oral dosage forms. A lot of research is being done to study the other effects of lycopene.
Nutraceutical, a combination of the words "nutrition" and "pharmaceutical", is a food or food product that reportedly provides health and medical benefits, including the prevention and treatment of disease. A nutraceutical is demonstrated to have a physiological benefit or provide protection against chronic disease.

The quality of life in terms of income, spending and lifestyle has improved with economic development. However, it has also thrown up a major challenge in the form of 'lifestyle diseases'. The first victim of this lifestyle change has been food habits. Consumption of junk food has increased manifold, which has led to a number of diseases related to nutritional deficiencies. Nutraceuticals can play an important role in controlling them. Such products may range from isolated nutrients, dietary supplements and specific diets to genetically engineered designer foods and herbal products. There is a slight difference between the functional foods and nutraceuticals. When food is being cooked or prepared using "scientific intelligence" with or without knowledge of how or why it is being used, the food is called "functional food". Thus, functional food provides the body with the required amount of vitamins, fats, proteins, carbohydrates, etc. needed for its healthy survival. When functional food aids in the prevention and/or treatment of disease(s) and/or disorder(s) other than anemia, it is called a nutraceutical. Examples of nutraceuticals include fortified dairy products (e.g. milk) and citrus fruits (e.g. orange juice).

Benefits
- May increase the health value of our diet.
- May help us live longer.
- May help us to avoid particular medical conditions.
- May have a psychological benefit from doing something for oneself.
- May be perceived to be more "natural" than traditional medicine and less likely to produce unpleasant side-effects.
- May present food for populations with special needs (e.g. nutrient-dense foods for the elderly)

Bridging the gap between food and medicine
Nutraceuticals are foods or food ingredients that provide medical or health benefits. This emerging class of products blurs the line between food and drugs. They do not easily fall into the legal categories of food or drug and often inhabit a grey area between the two.

AREA COVERED BY NUTRACEUTICAL PRODUCTS
All therapeutic areas such as anti-arthritis, pain killers, cold and cough, sleeping disorders, digestion and prevention of certain cancers, osteoporosis, blood pressure, cholesterol, depression and diabetes have been covered by nutraceuticals.

THE FUTURE OF NUTRACEUTICALS
Increasing awareness levels about fitness and health, spurred by media coverage are prompting the majority of people to lead healthier lifestyles, exercise more, and eat healthy. The expanding nutraceutical market indicates that end users are seeking minimally processed food with extra nutritional benefits and
organoleptic value. This development, in turn, is propelling expansion in the nutraceutical markets globally. The emerging nutraceuticals industry seems destined to occupy the landscape in the new millennium. Its tremendous growth has implications for the food, pharmaceutical, healthcare, and agricultural industries. Many scientists believe that enzymes represent another exciting frontier in nutraceuticals.

"Enzymes have been underemployed... they're going to be a hot area in the future." Fermentation technology using microbes to create new food products also represents potential. Global trends to healthy products cannot be reversed. Companies taking the lead by investing strategically in science, product development, marketing and consumer education will not go unrewarded.

Thus we can say that nutraceutical industry is growing at a rate far exceeding expansion in the food and pharmaceutical industries. In tomorrow's market, the most successful nutraceutical players are likely to be those companies in which functional product are just a part of a broad line of goods satisfying both conventional and health value point. Future demand of nutraceutical depends on consumer perception of the relationship between diet and disease.
Food and drugs from nature play quite a significant role in public healthcare system throughout the world. Human inquisitiveness and search for specific constituents of plants, animals, minerals and microbial origin which are beneficial to our overall health have cost coining of terminologies such as functional food or nutraceuticals. Nutraceuticals have evolved from the recognition of the link between food and health. Nutraceuticals are foodstuffs which provide health benefits in addition to their basic nutritional value. These may include fortified foods as well as dietary supplements that can be sold in capsules, tablets or powders. The term ‘Nutraceutical’ was coined by Dr. Stephen L De Felice, Founder and Chairman of the Foundation for Innovation in Medicine, New Jersey, USA. The idea behind the use of nutraceuticals is that certain organic extracts can have positive benefits on both the mind and body. From cancer to vertigo, claims of nutraceuticals’ effectiveness in combating or altogether curing a long list of ailments are abundant.

The Indians, Egyptians, Chinese and Sumerians are just a few civilizations that have provided evidence suggesting that foods can be effectively used as medicine to treat and prevent disease. Ayurveda, the 5,000 year old ancient Indian health science, have mentioned benefits of food for therapeutical purpose. Documents hint that the medicinal benefits of food have been explored for thousands of years. Hippocrates, considered by some to be the father of Western medicine, said that people should "Let food be thy medicine." Nutraceuticals are products derived from food sources that provide extra health benefits, in addition to the basic nutritional value found in foods. Products typically claim to prevent chronic diseases, improve health, delay the aging process and increase life expectancy.

There is minimal regulation over which products are allowed to display the nutraceutical term on their labels. Because of this, the term is often used to market products with varying uses and effectiveness. The definition of nutraceuticals and related products often depend on the source. Members of the medical community desire that the nutraceutical term be more clearly established in order to distinguish between the wide varieties of products out there. There are multiple different types of products that may fall under the category of nutraceuticals.

**Dietary supplements**

A dietary supplement is a product that contains nutrients derived from food products that are concentrated in liquid or capsule form. The Dietary Supplement Health and Education Act (DSHEA) of 1994 defined generally what constitutes a dietary supplement. A dietary supplement is a product taken by mouth that contains a "dietary ingredient" intended to supplement the diet. The "dietary ingredients" in these products may include: vitamins, minerals, herbs or other botanicals, amino acids, and substances such as enzymes, organ tissues, glandulars, and metabolites. Dietary supplements can also
be extracts or concentrates and may be found in many forms such as tablets, capsules, softgels, gelcaps, liquids, or powders.

Dietary supplements do not have to be approved by the U.S. Food and Drug Administration (FDA) before marketing. Although supplements claim to provide health benefits, products usually include a label that says: “These statements have not been evaluated by the Food and Drug Administration. This product is not intended to diagnose, treat, cure, or prevent any disease.”

**Medical foods**
Medical foods aren’t available as an over-the-counter product to consumers. The FDA considers medical foods to be “Formulated to be consumed or administered internally under the supervision of a physician, and which is intended for the specific dietary management of a disease or condition for which distinctive nutritional requirements, on the basis of recognized scientific principles, are established by medical evaluation.” Nutraceuticals and supplements do not meet these requirements and are not classified as Medical Foods.

Medical foods can be ingested through the mouth or through tube feeding. Medical foods are always designed to meet certain nutritional requirements for people diagnosed with specific illnesses. Medical foods are regulated by the FDA and will be prescribed/monitored by medical supervision.

**Pharmaceuticals**
Pharmaceuticals are a melding of the words farm and pharmaceuticals. It refers to medically valuable compounds produced from modified agricultural crops or animals (usually through biotechnology).

The nutraceuticals industry is still in its formative period and at present there is no universal agreement or legal definitions of the terms and designations used by this industry sector. Nutraceuticals are food supplements and have nutritional value. The present junk foods will not provide any nutritional value; rather it adversely affects the body. Hence it is concluded that nutraceuticals can be recommended as a regular part of the diet.

**Functional foods**
Functional foods are designed to allow consumers to eat enriched foods close to their natural state, rather than by taking dietary supplements manufactured in liquid or capsule form. Functional foods have been either enriched or fortified, a process called nutrification. This practice restores the nutrient content in a food back to similar levels from before the food was processed. Sometimes, additional complementary nutrients are added, such as vitamin D to milk.

Health Canada defines functional foods as “ordinary food that has components or ingredients added to give it a specific medical or physiological benefit, other than a purely nutritional effect.” In Japan, all functional foods must meet three established requirements: foods should be (1) present in their naturally-occurring form, rather than a capsule, tablet, or powder; (2) consumed in the diet as often as daily; and (3) should regulate a biological process in hopes of preventing or controlling disease.

**References:**
### Examples of Functional Food Components

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<th>Functional components</th>
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<th>Potential benefits</th>
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<tr>
<td>Lutein</td>
<td>Green vegetables</td>
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<td>Lycopene</td>
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<td><strong>Dietary Fibre</strong></td>
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<td>Insoluble Fibre</td>
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<tr>
<td>Beta-Glucan</td>
<td>Oats, barley</td>
<td>Reduce risk of cardiovascular disease. Protect against heart disease and some cancers; lower LDL and total cholesterol</td>
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<tr>
<td>Soluble Fibre</td>
<td>Psyllium</td>
<td>Reduce risk of cardiovascular disease. Protect against heart disease and some cancers; lower LDL and total cholesterol</td>
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<td><strong>Fatty Acids</strong></td>
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<td>Long chain omega-3</td>
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<td>Flavones</td>
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<td>Stanol ester</td>
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<td><strong>Prebiotics/Probiotics</strong></td>
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<tr>
<td>Fructo-oligosaccharides (FOS)</td>
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<td>Improve quality of intestinal microflora; gastrointestinal health</td>
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<td>Genistein</td>
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Technology Transfer is defined as “The process of taking an invention from its inception in a laboratory to product development phase and then to a commercial scale”.

Technology Transfer is an integral part of New Drug Discovery and development of new medicinal products. Thus if Technology Transfer process to production site is carried out at an affordable cost, the cost of product development would not raise during pilot scale up. For successful Technology Transfer of a product, the Departments responsible in a pharmaceutical industry are Research & Development; Production; Engineering; Quality Control and Quality Assurance. Technology transfer is both integral and critical to the drug discovery and development process for new medicinal product. This process is important to elucidate necessary information for technology transfer from R&D (Research & Development) to PDL (process development laboratory) and for development of existing products to the production for commercialization.

REASONS FOR TECHNOLOGY TRANSFER

- Lack of manufacturing capacity: The developer of technology may only have manufacturing equipment which is suitable for small scale operation, and must collaborate with another organization to do large scale manufacturing.
- Lack of distribution and marketing channels: The developer of technology may have fully developed the technology and even have obtained regulatory approvals and product registrations, but it may not have the marketing and distribution channels.
- When developer has no commercial capability If the developer of technology in a research institute does not have commercial capability, it has to collaborate with other organization to bring a pharmaceutical product to the market.
- Lack of resources to launch product commercially The original inventor of technology may only have the resources to conduct early-stage research such as animal studies and toxicology study, but doesn’t have the resources to take technology through its clinical and regulatory phases.
- Application in different field: With a view to create another source of income the developer may transfer the technology to another person for use in another field of application that is different from the field the technology is already applied.

IMPORTANCE OF TECHNOLOGY TRANSFER IN PHARMACEUTICAL INDUSTRY

- To elucidate necessary information to transfer technology from R&D to actual manufacturing by sorting out various information obtained during R&D.
To elucidate necessary information to transfer technology of existing products between various manufacturing places.

To elucidate necessary information to transfer technology of existing products between various manufacturing places and to exemplify specific procedures and points of concern for smooth technology transfer.

The ultimate goal for successful technology transfer is to have documented evidence that the manufacturing process for drug substance and drug products are robust and effective in producing the drug and drug products complying with the registered specifications and good manufacturing practice requirement.

Demonstration of necessary information to tech transfer from research and development to actual manufacturing.

For smooth manufacturing of commercialized product.

Improvement of the research pertinence and its promotion in foreign countries.

Promotes interdisciplinary projects to be developed in the region of interest.

Contribution with the creation and consolidation of research groups and centers for technology development involving the training of young research students.

**STEPS IN TECHNOLOGY TRANSFER**

The various steps involved in technology transfer are given below:

1) Development of Technology by R & D

   - Design of procedure and selection of excipients by R & D: Selection of materials and design of procedures is developed by R & D on the basis of innovator product characteristics. For this different tests and compatibility studies are done.

   - Identification of specification and quality by R & D: Generally it should be considered by R & D that quality of product should meet the specifications of an innovator product.

   - Validation studies: Production is implemented after validation studies that can verify that process is able to stabilize the product based on transferred manufacturing formula. While the manufacturing department accepting technology is responsible for validation, the research and development department transferring technology should take responsibility for validation such as performance qualification, cleaning validation, and process validation which are unique to subject drugs.

   - Scale up for production: Scale up involves the transfer of technology during the small scale development of the product and processes. It is

For this different stability studies are carried out for innovator product and for product which is to be manufactured.

2) Technology transfer from R & D to production

R & D provides technology transfer dossier (TTD) document to product development laboratory, which contains all information of formulation and drug product as given below:

   - Master formula card (MFC) includes product name along with its strength, generic name, MFC number, page number, effective date, shelf life and market.

   - Master packaging card gives information about packaging type, material used for packaging, stability profile of packaging and shelf life of packaging.

   - Master formula describes formulation order and manufacturing instructions. Formulation order and Manufacturing Instructions gives idea of process order, environment conditions required and manufacturing instructions for dosage form development.

   - Specifications and standard test procedure (STPs) helps to know active ingredients and excipients profile, in-process parameters and specifications, product release specification and finished product details.

3) Optimization and production

   - Validation studies: Production is implemented after validation studies that can verify that process is able to stabilize the product based on transferred manufacturing formula. While the manufacturing department accepting technology is responsible for validation, the research and development department transferring technology should take responsibility for validation such as performance qualification, cleaning validation, and process validation which are unique to subject drugs.

   - Scale up for production: Scale up involves the transfer of technology during the small scale development of the product and processes. It is
essential to consider the production environment and system during development of process. Different operations e.g. dispensing, sifting, blending, compaction/ dry granulation/ wet granulation, compression, coating are used in the formulation of solid dosage form. From blending to film coating, each process is easy for pharmaceutical professionals to be absorbed in the particular part of the manufacturing process for which they are directly responsible. Operators concentrate on keeping their segment of the production process running smoothly. But the whole manufacturing line can be improved, even before production begins, if technology transfer is implemented thoughtfully. Effective technology transfer helps to provide process efficiency and control and maintain product quality.

4) Technology Transfer Documentation

Technology transfer documentation is generally interpreted as document indicating contents of technology transfer for transferring and transferred parties. Each step from R & D to production should be documented, task assignments and responsibilities should be clarified and acceptance criteria for completion of technology transfer concerning individual technology to be transferred. It is duty of quality assurance department to check and approve the documentation for all processes of technology transfer.

- Development report: The ultimate goal for successful technology transfer is to have documented evidences. The R & D report is a file of technical development, and the research and development department is in charge of its documentation. This report is an important file to indicate rationale for the quality design of drug substances and drug specifications and test methods. The development report before the approval inspection, although the development report is not prerequisite for the application for approval, it can be used at the preapproval an inspection as valid document for quality design of new drug. In addition, this report can be used as raw data in case of post-marketing technology transfer. The development report contains data of pharmaceutical development of new drug substances and drug products at stages from early development phase to final application of approval, information of raw materials and components, rational for dosage form & formula designs and design of manufacturing methods, change in histories of important processes and control parameters, stability profile, specifications and test methods of drug substances, intermediates, drug products, raw materials, and components, which also includes validity of specification range of important tests such as contents impurities and dissolution, rational for selection of test methods, reagents and, columns, and traceability of raw data of those information.

- Technology transfer plan: The technology transfer plan is to describe items and contents of technology to be transferred and detailed procedures of individual transfer and transfer schedule, and to establish judgment criteria for the completion of the transfer. The transferring party should prepare the plan before the implementation of the transfer and reach an agreement on its contents with the transferred party.

- Report: Report completion of technology transfer is to be made once data are taken accordingly to the technology plan and are evaluated to confirm that the predetermined judgment criteria are met. Both transferring and transferred parties can document the technology transfer report; however, they should reach an agreement on its contents.

- Exhibit: After taking scale up batches of the product, manufacturing of exhibit batches take place. In case of exhibit, batch sizes are increased along with equipments and their processes involved. They are done for filing purposes in different regulatory agencies.
CONCLUSION

Technology transfer can be considered successful if a receiving unit can routinely reproduce the transferred product, process or method against a predefined set of specifications as agreed with a sending unit or a development unit. A dedicated technology transfer organization should set up to facilitate and execute the process. Technology Transfer provides an opportunity to reduce cost on drug discovery and development thus major pharmaceutical companies look for technology transfer opportunity as it reduces risk, cost and rate of failure. Progressive pharmaceutical companies should pay more attention to streamlining and optimizing their technology transfer process to ensure the rapid and successful introduction of new medicinal products to market.

REFERENCES

**Are we producing qualified PhDs!**

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Associate Professor,  
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PhD is not just a research project work to be completed with successful result and writing it up. It is a training period during which young scientists get an opportunity to learn the right way to do research and take science to next level. One cannot always control the various and erratic factors that will contribute to eventual success, but can ensure that one has acquired knowledge and skills that will always be an asset, regardless of your future career path. During the years of carrying out PhD work one should seize every opportunity to learn about every topic, both scientific and non-scientific, that either interests personally or is important for professional life or life in general.

Most countries are convinced that higher education and scientific research are key to economic growth and prosperity. Because of this the government is promoting higher education and more people are earning PhDs in science, technology and engineering. Even at university levels this is being further promoted by making it mandatory to become a Professor or Associate Professor. But this has taken a different shape and the quality of the PhD is being diluted leading to more number of doctorates as mushrooming overnight.

A statistical data says that in 2004, India produced around 5,900 science, technology and engineering PhDs, a figure that has now grown to some 8,900 a year. The government is making major investments in research and higher education including a one third increase in the higher education budget and is trying to attract investment from foreign universities. The system is driven by the supply of research funding, not by the demand of the job market. One way in which governments can bring about change is to better match educational supply with occupational demand. Governments should then open the doors to more PhDs only when they are most needed. Such analyses are already under way, and should be encouraged. But nowadays in the field of pharmacy a graduate goes for a post graduate study as there are not many opportunities to grow with just a graduate degree. The post graduate pursues PhD because he doesn’t get a job, temporally postponing the problem. To get a secure jobs in industry which require not only a PhD degree but how much the individual has trained himself during the course of PhD project work. Even after a PhD, there are few academic opportunities in India, and so better paid industry jobs are the major draw. There is a shortage of qualified PhDs which can stand up to the industries expectations. So the universities have to make appropriate postmortem. For many young people intent on postgraduate education, the goal is frequently to go to the United States or Europe because the system in India, the platform for doing long term research is not well supported. Unlimited growth could dilute the quality of PhDs by pulling less able individuals into the system. Exceptionally bright science PhD holders are becoming disillusioned by the ruthless and often fruitless fight for a permanent academic position.
The Pharmaceutical industry in India is the world’s third-largest in terms of volume and stands 14th in terms of value. In terms of the global market, India currently holds a modest 1-2% share, but it has been growing at approximately 14% per year during the last four years [1]. India gained its foothold on the global scene with its innovatively engineered generic drugs and active pharmaceutical ingredients (API), and it is now seeking to become a major player in outsourced clinical research as well as contract manufacturing and research. India also has a vast pool of trained pharmaceutical scientists, doctors and researchers, which opens up avenues for joint collaborative research for new drug discoveries along with joint intellectual property rights.

**INDIAN PHARMACEUTICAL INDUSTRY:**

**Growth**

The Indian Pharma industry has been able to claim a share in the global market by leveraging its strengths and enhancing its regulatory and technical maturity. Formulations manufactured in India constitute 20 per cent of the global generics market by value, and the overall share of Indian manufactured formulations is as high as 46 per cent in the generics segment in the emerging markets [2].

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**Chart 1:** Indian pharmaceutical market by 2020 (US $ billion)

**Investment in the Indian pharmaceutical industry**

The drugs and pharmaceuticals sector attracted foreign direct investments (FDI) worth US$ 5.03 billion between April 2000 and November 2011, according to the latest data published by Department of Industrial Policy and Promotion (DIPP) [3].

**Chart 2:** FDI inflow in the Drugs and Pharmaceutical industry (US $ mn)
FACTORS INFLUENCING GROWTH OF THE INDUSTRY

INCREASING SHARE OF PHARMA INDUSTRIES HEALTH CARE PROFESSION

- **2009**: Sanofi-Aventis launched Saath 7 program for diabetic patient[4]
- **2010**: Johnson & Johnson (J&J) launched a mobile health initiative for expectant mothers[5]
- **2011**: Pfizer collaborated with FMCG major ITC to enhance its product sales[6]

MAJOR CONTRIBUTION OF HERBAL AND MARINE SOURCES

INDIAN PHARMACEUTICAL INDUSTRY: SWOT ANALYSIS

- **Strengths**: Low cost of innovation, manufacturing and operations,
  Low cost of skilled manpower.
- **Weaknesses**: Stringent pricing regulations, presence of more unorganised players versus the organised ones.
- **Opportunities**: Opening of the health insurance sector and increase in per capita income.

**Threats**: Other low-cost countries such as China and Israel affecting outsourcing demand for Indian pharmaceutical products

Entry of foreign players

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“Stop female foeticide”
रण्या कुश्ती का उपहार,
इसे भी जीने का आधिकार!
STOP FEMALE FETICIDE

Art by
Rishi Kumar Joshi
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Female feticide is the selective abortion/elimination of the girl child in the womb itself, done deliberately by the mother, after the detection of the child’s gender through medical means. This is usually done under familial pressure from the husband or the in-laws or even the woman’s parents. Unplanned pregnancy is generally the reason behind abortion. However, female feticide is a far more heinous sin than the age old practice of killing an unwanted child, even before it’s born. Why do so many families selectively abort baby daughters? In a word: economics. Aborting female foetuses is both practical and socially acceptable in India. Female feticide is driven by many factors, but primarily by the prospect of having to pay a dowry to the future bridegroom of a daughter. While sons offer security to their families in old age and can perform the rites for the souls of deceased parents and ancestors, daughters are perceived as a social and economic burden.

Preference for the Male Child: Elimination/ removal of girls from the family tree even before they are born clearly indicate the vehement desire for a boy child. In the countries where female feticide has become unbridled, the core factor is the need to continue the family line through the male born into it. Sons are seen as the main source of income. Even though women today can easily rub shoulders with men, almost in every field they set their mind to, the common misconception still remains that it is the male who will help run the house, and look after his parents.

Deteriorated Status of Women: I’m not a rabid feminist who would shout herself hoarse about the domination of men in any society. Sure, males are the stronger sex when it comes to the pecking order in a country, but that does not entail a curbing of rights for women. Rather than whining about the denied opportunities, women should stand up and try to grasp the chances they want for themselves.

Foul Medical Ethics: The opening conversation to this hub satisfactorily covers this point. With the legalization of abortion in India, illegal sex determination and termination of pregnancies has become an everyday reality. The professionals in the medical field are only too glad to help parents realize their dream of a healthy baby boy. Female feticide is openly discussed amongst many in the healing fraternity and even pin boards outside certain clinics read, ‘Pay Rs.500 ($ 10) today to save the expense of Rs. 500 000 ($ 10 000) in the future’. The initial meagre sum is the cost of a pregnancy termination, while the bigger amount specified in comparison, is the expense that the family will be burdened with in the form of dowry for the girl.

Industrial Growth: Industrialization of the health sector has further strengthened the selective sex abortion quarter. With the advent of CVS, amniocentesis and Ultrasound, sex determination of the foetus has become much easier than it was earlier. This goes on to show how the manufacturers of high-tech equipments and gadgets, used to run these tests, benefit from the woes of future parents and their unborn child. Many hospitals are known to sign long
term contracts with the firms involved in the production of these types of medical machinery. Often, a healthy percentage of the profit is shared with the hospital and both parties enjoy the fruits of rewarding a death sentence.

**Skewed Sex Ratio:** In India, the number of girls per 1000 boys is declining with each passing decade. From 962 and 945 girls for every 1000 boys in the years 1981 and 1991 respectively, the sex ratio had plummeted to an all time low of 927 girls for 1000 boys in 2001. If that statistic is a matter of concern, the current figures are toeing the danger line with only 914 girls for 1000 boys in 2011. In the case of China, the sex ratio is an alarming 118 boys for 100 girls; that means 848 girls for 1000 boys. This is just an example of two nations trapped in the vicious circle. There are many others struggling with a skewed sex ratio.

Is an imbalance in the number of females a truly worrying matter?

Yes, indeed. Sex ratio is merely a microscopic view of the number of both genders. However, when calculated for the entire population, this clearly indicates the widespread disparity. This disparity may prove critical for the country's development in political, economic and emotional spheres. The sex ratios of some countries are listed below:

- Vietnam: 892/1000
- South Korea (sex ratio at birth): 934/1000
- USA: 962/1000
- Canada: 943/1000
- UK: 952/1000
- Sri Lanka: 961/1000

**Female/Women Trafficking:** The steep decline in the number of girls makes them scarce for the teeming number of males eligible for marriage. As a solution to this issue, illegal trafficking of women has become commonplace in many regions. This is a graver matter than the ideology of mail order brides. Women, often young girls who've just crossed the threshold of puberty, are compelled to marry for a price fixed by the groom-to-be. They are usually bought in from neighbouring areas, where the number of girls might not be as miniscule as the host region.

Child marriages become a rage and child pregnancies, a devastating consequence. The moment when a land participates in the trade off of its women population, it is a sure path laid ahead with pitfalls.

**Increase in Rape and Assault:** Once women become an endangered species, it is only a matter of time before the instances of rape, assault and violence become widespread. In the backdrop of fewer available females, the surviving ones will be faced with the reality of handling a society driven by a testosterone high. The legal system may offer protection, but as is the situation today, many cases might not even surface for fear of isolation and humiliation on the girl's part.

**Population Decline:** With no mothers or wombs to bear any child (male or female), there would be fewer births, leading to a decline in the country’s population. Though a control in the demographic statistics is currently the goal of many nations like China and India, a total wipe out of one sex is not the way to achieve this target. Science would then have to look up solutions to do away with the swarming number of men, should such a worst case scenario happen.

**Prevention and Cure**

Do the facts enlisted above truly spell disaster for the future of women? Not really. The issues of female infanticide, female feticide and selective sex abortion have gained global attention. Many international and national law making bodies have come forward to stop this cruel practice. Of the numerous steps taken to curb the matter, the prominent ones are:

- Cancellation/permanent termination of the doctor's license who partakes in fulfilling a client's demand to do away with her girl child.
- Heavy penalty imposed on companies like GE, which specialize in marketing medical equipments used for illegal sex determination and abortion in unlicensed clinics and hospitals.
- High fines and judicial action against ‘parents’ who knowingly try to kill their unborn baby.
Widespread campaigns and seminars for young adults and potential parents to enlighten them about the ill effects of female feticide. Ignorance is one of the major causes for the increase in the selective sex abortion cases. Spreading awareness can go a long way in saving our future sisters, mothers, girlfriends and wives.

A cohesive and concerted effort by everyone can prove to be the requisite baby step in the right direction. We may not support the notion of women rising above men, or them becoming the dominant sex, or conquering the world. However, the basic humane consideration to let an innocent child live and see the world she was conceived to grow in is not too much to ask. Let's not be murderers of our own flesh and blood.

The blessed curse
That dark day was a blessing
The blessing which was cursed...
Silent wounds were inflicted
That could never be nursed...
I curse the machine till date
That told them you were my girl
They didn’t want your rosy cheeks
And honey golden curls
It was painless laser
And In a minute you were dead.
I was numb and my ears burnt
“We will have a son now”
your living father said

Balram Rohra
Final Year B. Pharm
India is a vast country. A country which has left behind a number of stigmas and prejudices to move ahead as one nation. A nation with a cultural diversity, one can always find harmonious existence in a number of cities and towns of India. But, in a number of states, villages, cities and towns, another existence found is that of gender bias. Gender bias at the time when a child is born, leading to female foeticide and female infanticide. This problem is not usually found in a number of families belonging to the urban literate class. The problem pertains to the families having a rural or a traditional background (by traditional I mean those who believed in this act).

Now after 6 decades of Independence India, or rather Indians are not being able to give up their thoughts. We often see a number of incidents in the news related to this issue. Recently, a girl child, barely a few months old, was found in a garbage box. There have been incidents of the foetus lying in farms, floating in rivers, wrapped up in jute bags and left to die. A number of reasons lead to this heinous crime. To quote some, want of a male child to carrying the name of the family forward, lighting the funeral pyre to hoping for a bread earner are a few. The most prevalent these days is the fear of the demand for dowry. This has often been noticed that killing an unborn or just born girl child is better than paying a huge sum as dowry at a later stage. This mentality is specifically found in the rural areas and also in a few metropolitan cities. The states of Bangalore, Punjab, Delhi, Himachal, and Rajasthan are among others having a high rate of female foeticide cases. Sex determination is ever increasing in India even though there are strict laws against it. In 1994, the Government of India passed the Pre-conception and Pre-natal Diagnostic Techniques (Prohibition of Sex Selection) Act with the aim of preventing female foeticide. The implementation of this Act was slow. It was later amended and replaced in 2002 by the Prenatal Diagnostic Techniques (Regulation and Prevention of Misuse) Act without ever having been properly implemented. The Act has a central and state level Supervisory Board, an Appropriate Authority, and supporting Advisory Committee. The function of the Supervisory Board is to oversee, monitor, and make amendments to the provisions of the Act. Appropriate Authority provides registration, and conducts the administrative work involved in inspection, investigation, and the penalizing of defaulters. The Advisory Committee provides expert and technical support to the Appropriate Authority. Contravening the provisions of the Act can lead to a fine of Rs 10,000 and up to three years imprisonment for a first offence, with greater fines and longer terms of imprisonment for repeat offenders. The Appropriate Authority informs the central or state medical council to take action against medical professionals, leading to suspension or the striking off of practitioners found guilty of contravening the provisions of the Act.

Before conducting any prenatal diagnostic procedure, the medical practitioner must obtain a written consent from the pregnant woman in a local language that she understands. Prenatal tests may be performed in various specified circumstances, including risk of chromosomal abnormalities in the case of women over 35, and genetic diseases evident in the family history of the couple.
It has been six long decades since India gained independence but many Indians are still trapped in age-old traditional beliefs. Here, ‘old beliefs’ imply the mind set of people who still find themselves in the trap of girl-boy inequality. The ‘liberal’ Indian society has failed to transform the other orthodox India. No doubt India is advancing at a fast pace in the field of science and technology, and also in aping of the western culture, but if we look at the grass root level, the picture is not so rosy; it is rather a dark, especially when it comes to how we treat the fairer sex.

The status of females in India aptly symbolizes India’s status of being a developing nation – miles away from becoming a developed state. Of course, India deserves to be in this list because here, in this 21st century, the girl child continues to be murdered before she is born. Female foeticide is still prevalent in the Indian society; in fact, it has been a practice for hundreds of years. Narrow-minded people do not mind murdering their unborn daughters for the fear of giving huge amounts of dowry at the time of her marriage. Such people, whenever they discover they are going to have a girl child (through illegal sex selection tests), get the foetus aborted. Else they would continue to reproduce till they get a male heir. When price rise is already taking a toll on the standard of living, is it necessary to go in for more than two children irrespective of their gender?

Many families put pressure on women to give birth to boy so that he can take family’s name forward, light the funeral pyre and be the bread earner of the family. But these days, are girls less competent than boys? Just look at the results of Board exams or any other competitive exams, girls mostly outshine boys. Women empowerment has led to inundation of females excelling in the corporate world, engineering and medical professions.

Sadly, there have been numerous incidents of the foetus being found lying in farms, floating in rivers, wrapped up in jute bags etc. India's major social problem is the intentional killing of the girl child. The struggle for a girl child starts the day her existence is known in her mother's womb. The fear and struggle to survive swallow most of the girl’s life even if she is ‘allowed’ to live in this cruel world.

In India, the girl child is considered a burden as huge amounts of money, gold and other items need to be given in the form of dowry when she gets married. Dowry is not the only reason for poor couple to abort their girl child. The ages old traditions, customs and beliefs of the Indian society are largely responsible for creating a negative mind set among the couples. More shocking is the fact that the sinful crime of female foeticide is not only common in rural areas where social discrimination against women, lack of proper education etc. can be considered as reasons behind carrying out such acts, but also the ultra modern, so-called ‘educated’ people living in urban areas and metropolitan cities who are a step ahead in killing the girl child in the womb.

The truth behind this crime has been brought into light several times by the print and electronic media. But, it has failed to melt the hearts and minds of those who remain unaffected by the consequences of the grave sin they are committing.

The matter was discussed in length and breadth in the inaugural episode of the show ‘Satyamave Jayate’ anchored by Bollywood actor Aamir Khan. The show has once again ignited the spirited discussion on the female foeticide in the country. That episode had mothers from different parts of rural and urban India talking about the
pressure and the problems they faced for delivering a girl child. Although the show is doing really well and has already garnered positive reviews from the audiences, we will have to wait and see whether the impact will remain even after the programme stops beaming into our drawing rooms every Sunday. The emotional connect which the show has successfully created should be strong enough to stop the killing of the girl child before being born. If we look at the figures of sex ratio in India, according to the 2011 Census, the number of girls stands at 940 which is a marginal increase from 933 in 2001. Not surprisingly, Haryana has the lowest sex ratio among the states while Kerala remains at the top with the highest sex ratio. In the national capital Delhi, the statistics stand at 821 girls against 1000 boys in 2001 compared to 866 in 2011. According to the statistics, nearly 10 million female foetuses have been aborted in the country over the past two decades. Of the 12 million girls born in India, one million do not see their first birthdays. As a result, human trafficking has become common in various states of India where teenage girls are being sold for cheap money by poor families. The girls are treated as sex objects and more than half of such cases go unreported.

The United Nations’ World Population Fund indicated that India has one of the highest sex imbalances in the world. Not surprisingly, demographers warn that there will be a shortage of brides in the next 20 years because of the adverse juvenile sex ratio, combined with an overall decline in fertility. With the advent of technology, ultrasound techniques gained widespread use in India during the 1990s. It resulted in the foetal sex determination and sex selective abortion by medical professionals. Recently, incidences of female foeticide were reported from Beed district in Maharashtra where women used to come to a doctor’s clinic to get their female child aborted for Rs 2000. Just think for a moment about the doctor’s connivance in this illegal act. Doctors, whose aim is to save the lives of people, happily kill the foetus for a meagre two thousand bucks! And more heart wrenching is the fact that the aborted foetuses were very often fed to dogs.

The above mentioned case is not the only one of such heart wrenching heinous crimes. There are thousands of such clinics where illegal activities are carried out on a daily basis and in some cases, in connivance with politicians and police men.

The life transition from a female foetus to a school going girl to a caring woman is never an easy task for the fairer sex. She has to face challenges at every step of her life. Daily, there is news related to rape, sexual harassment, molestation, verbal abuse, torture, exploitation. She has to fight against gender indiscrimination, inequality, and hundreds of social norms are tagged with her the day she puts her steps outside her home.

In such a grim scenario, it’s really difficult to digest the harsh reality of the differences between a boy and a girl. India has a deeply rooted patriarchal attitude to which even the doctors and the women, who in spite of being the victims, unthinkingly subscribe. There is an urgent need of undoing the historical and traditional wrongs of a gendered society; only then the hope of abolition of female infanticide and boy preference can positively adjust the figures in favour of the girl child in future. The skewed sex ratio has to find a balance in order to maintain the progress of the country. NGOs working:-

**Snehalaya** ([www.snehalaya.org](http://www.snehalaya.org)) is based in Ahmednagar, Maharashtra. It was started in 1989 by a group of young volunteers led by Dr Girish Kulkarni, who were appalled by the violence then being committed upon women and children. They wanted to do something constructive that would help the situation.

**The Jalandhar based NGO Unique Home** for Girls has been doing significant work in providing shelter to abandoned girl children. Unique Home for Girls, started by the Bhai Ghanayya Ji Charitable Trust, established on May 17, 1993. The trust looks after unwanted, unclaimed or orphan female children, and aims to educate and raise these childrens as healthy individuals.

Let's make the world a better place to live saying no to female foeticide and welcoming the girl child whom we consider Lakshmi in Indian mythology with proud and dignity.
The world of a girl child is full of love, warmth and concern. She is the procreator and the mother of tomorrow. She is the one who shapes the destiny of civilisation and imparts values and virtues to the future. Unfortunately, this beautiful world is gloomy and filled with despair. The colour of innocence is ironically transforming into one of suppression. This beautiful creation of god has become the gravest concern today. Her world is filled with apathy and she is left alone on a barren land searching for a warm touch, a mother's love and a father's lullaby.

Traditions and rituals are outlining the survival of the girl child in India. Even though the country has made remarkable growth in various fields, it is tragically representing the lowest sex ratio. Patriarchal norms, low statuses of women and male child idolism are the primary reasons which cause bias against female children in India. The shocking decline of female to male ratio has jeopardised the future of India. A recent census report indicates a highly skewed ratio of 927 females born for 1000 males which fell from 976 to 1000 (2001 Census).

In various parts of the country like Rajasthan, the ratio has declined even further down to 800 females to 1000 males. Not only female foeticide and infanticide, but a series of discrepancies like lack of nutrition, early marriage and absence of basic necessities are also associated to the gravest concern for mankind.

Moreover, lack of girl education holds the female child to a low standard of living and results in inability to exploit her skills and knowledge. Educating a girl is like educating an entire family.
"Thou Shalt Not Kill" stipulates one of Moses' Ten Commandments. Some of the world's greatest religions believe that those are the words of God. From this viewpoint, killing is simply not acceptable under any circumstances. As a matter of fact, there is no religion that advocates killing. Indubitably, female foeticide does not even become debatable. It should be condemned at all cost. None of us have the right to take life. Female foeticide is the brutal act of aborting a foetus because it is female. It has been six long decades since India gained independence but many Indians are still trapped in age-old traditional beliefs. Here, 'old beliefs' imply the mindset of people who still find themselves in the trap of girl-boy inequality.

The 'liberal' Indian society has failed to transform the other orthodox India. No doubt India is advancing at a fast pace in the field of science and technology, and also in aping of the western culture, but if we look at the grass root level, the picture is not so rosy; it is rather a dark, especially when it comes to how we treat the fairer sex.

We will all agree that the trigger for female foeticide remains the "dowry" in India. And parochial minds do not event find it inconvenient murdering their own daughters for the fear of giving dowry at the time of their marriage. Such people, whenever they discover that they will be having a girl child, through illegal means of sex selection of course, get the foetus aborted. But those people tend to forget that the foetus itself is a form of life and that they are robbing it of its right to live as per the International Human Rights.
to give birth to a child and worse happens when she conceives a girl child. 
Ironically, this all happens in a country where people believe that girls are the incarnation of the goddess "Lakshmi". 
True, many families are out of bounds in joy when a girl child is born in their family. They think she will bring luck, harmony, happiness and peace in their family. They even touch her feet to seek her blessings. 
Equality between both sexes is a pre-requisite for the healthy development of a nation. 
Women should be able to say no to discrimination in any form and they should be able to claim their rights under any circumstances. 

In such a grim scenario, it's really difficult to digest the harsh reality of the differences between a boy and a girl. India has a deeply rooted patriarchal attitude to which even the doctors and the women, who in spite of being the victims, unthinkingly subscribe. 
There is a pressing need of undoing the historical and traditional wrongs of a gendered society; it is only then that the hope of abolition of female infanticide and boy preference can positively adjust the figures in favour of the girl child in future. The skewed sex ratio has to find a balance in order to maintain the progress of the country.

Art By,
Kinjal Mistry,
T. Y. B. Pharm
Female foeticide is the act of aborting a fetus because it is female. This is a major social problem in India and has cultural connections with the dowry system that is ingrained in Indian culture, despite the fact that it has been prohibited by law since 1961. See Dowry law in India. In India a strong preference for sons over daughters exists, unlike in Western cultures. People realise smaller family sizes with relatively greater number of sons by abuse of medical technologies. Pregnancies are planned by resorting to 'differential contraception'—contraception is used based on the number of surviving sons irrespective of family size. Following conception, foetal sex is determined by prenatal diagnostic techniques after which female foetuses are aborted. Foetal sex determination and sex-selective abortion by medical professionals has grown into a Rs. 1,000 crore industry (US$244 million). Social discrimination against women and a preference for sons have been promoted. Since 1991, 80% of districts in India have recorded an increasingly masculine sex ratio with the state of Punjab having the most masculine sex ratio. According to the decennial Indian census, the sex ratio in the 0-6 age group in India went from 104.0 males per 100 females in 1981, to 105.8 in 1991, to 107.8 in 2001, to 109.4 in 2011. The ratio is significantly higher in certain states such as Punjab and Haryana (126.1 and 122.0, as of 2001).

It is estimated that more than 10 million female fetuses have been illegally aborted in India. Researchers for the Lancet journal based in Canada and India stated that 500,000 girls were being lost annually through sex-selective abortions.

Prenatal sex determination was banned in India in 1994, under the Pre-conception and Prenatal Diagnostic Techniques (Prohibition of Sex Selection) Act. The act aims to prevent sex-selective abortion, which, according to the Indian Ministry of Health and Family Welfare, "has its roots in India's long history of strong patriarchal influence in all spheres of life."

It is most prominent in Gujarat and the North Indian states, which according to census data have an alarmingly low ratio of female children. Certain castes regularly practiced female infanticide and later female foeticide. The castes with a much lower proportion of female children to male children included lewa patidars and the raijputs in Gujarat; Jats, Rajputs, Khutris and Moyal Brahmins in undivided Punjab, Rajputs and Gujars in the Uttar Pradesh.

British officials became aware of the problem in 1789 in North India. Census data showed a low of 659 females to 1000 males in 1891. This process began in the early 1990s when ultrasound techniques gained widespread use in India. There was a tendency for families to continuously produce children until a male child was born. This was primarily due to the large sexist culture that exists in India against women. This is reflected by literacy rates among women as well as economic participation, which are both particularly low in states where female foeticide is prominent and an unequal population ratio exists alongside. The government initially supported
the practice to control population growth. The Preconception and Prenatal Diagnostic Techniques (PCPNDT) Act was passed in 1994, making sex-selective abortion illegal. It was then modified in 2003 holding medical professionals legally responsible. However, the PCPNDT Act has been poorly enforced by authorities.

Social effects
Female feticide has led to an increase in human trafficking. In 2011, 15,000 Indian women were bought and sold as brides in areas where feticide has led to a lack of women.

Government response
Government response to the problem has been known to not have stopped female foeticide from occurring. Although several acts have been passed to combat the situations, many of them are not enforced strongly enough. This and the existence of several loopholes in the system means the practice of sex-selective abortion continues. An example of one of these loopholes would be on the pretext of checking for genetic disorders in the foetus, who can stop a doctor from examining the sex of the unborn child and informing the parents in secret.

In 2001, the Supreme Court in India gave orders to five multi-national companies Philips, Symonds, Toshiba, Larsen and Toubro and Wipro GE to give them the names and addresses of all the clinics and persons in India to whom they have sold ultrasound machines in the last five years to enable the state government to find out if these machines were registered. Unfortunately, not much happened after this directive, although the companies were reported to have supplied all the information that was required. The Statesman, a leading newspaper reported on February 3, 2002 that not a single illegal ultrasound machine has been impounded in Delhi.

Banning pre-conception sex-determination tests calls for new legislation. But the fact is that even the present PNDT Act is full of loopholes and cannot be effectively implemented. Law certainly empowers the government to act but the fundamental question is whether the government or Supreme Court can alone usher in social transformation in Indian society.

India’s prime minister acknowledges gendercide as a national shame; however, the police and judiciaries do not implement the law because they believe in the same thing. Authorities often let the unlawful parents and doctors off with light punishment. Often, when the mothers disobey the husband’s family decision to abort the female fetus and report it to the authorities, the suits are ignored or given a light sentence: The mother is targeted for bearing girls and disobeying the family’s decision to abort the child. She may even lose her job, be expose to constant death threats, and be left with unresolved cases. In addition, others who give birth to girls are prone to violence. Even if she is able to give birth to the baby girls, the family is likely to not report the births and even murder them.

Fighting back
Increasing awareness of the problem has led to multiple campaigns by celebrities and journalists to combat sex-selective abortions. Aamir Khan devoted the first episode “Daughters Are Precious” of his show Satyamev Jayate to raise awareness of this widespread practice, focusing primarily on Western Rajasthan, which is known to be one of the areas where this practice is common. Its sex ratio dropped to 883 girls per 1,000 boys in 2011 from 901 girls to 1000 boys in 2001. Rapid response was shown by local government in Rajasthan after the airing of this show, showing the affect of media and nationwide awareness on the issue. A vow was made by officials to set up fast-track courts to punish those who practice sex-based abortion. They cancelled the licences of six sonography centres and issued notices to over 20 others.

This has been done on the smaller scale. Cultural intervention has been addressed through theatre. A play such as 'Pacha Mannu', which is about female infanticide/feoticide, has been produced by a women's theatre group in Tamil Nadu. This play was showing
mostly in communities that practice female infanticide/foeticide and has led to a redefinition of a methodology of consciousness raising, opening up varied ways of understanding and subverting cultural expressions.

In a recent landmark judgment the Bombay High Court upheld an amendment to the PCPNDT Act banning sex-selection treatment. The Court pronounced that "pre-natal sex determination would be as good as female foeticide. Pre-conception sex determination violated a woman's right to live and was against the Constitution."

The Beti Bachao, or Save girls campaign, has been underway in many Indian communities since the early 2000s. The campaign uses the media to raise awareness of the gender disparities creating, and resulting from, sex-selective abortion. Beti Bachao activities include rallies, posters, short videos and television commercials, some of which are sponsored by state and local governments and other organizations. Many celebrities in India have publicly supported the Beti Bachao campaign.
India is a land of diversity, a religious country of people from all religions; caste and creed live in as one entire family. Being a land of diversity people in Indian are still united by their unity in their thinking. This has emerged to be one of the most powerful and considerate topic in the upcoming of our nation as a superpower. But as each and every coin has two sides this united thinking colocations have proved to hampering our progress in the near future. India had some of the most heroic deeds of various female warriors and freedom fighters who have engraved their name in golden in the long lasting history India. But on the other side our nation had the most unacceptable practices of sati, widow marriages, and “dasisystems” this had led to an irregular sex ratio which proved to be a great danger to the society. But the main issue occurred when after so many centuries also India did not leave this unity of thoughts.

Even today there is this fearing problem of this sex ratio wherein there are many so called “NAVARDEVS” waiting for their “NAVRIS”. After the deteriorating economic conditions in Indian, this problem of deteriorating number of girl child has emerged as the major issue of concern. Even today any Indian family expects that there should be male child to carry on their name in the future, but then they forget that if they deny this cute little baby girl then they are widening this gap between the boys and girls.

“A daughter is a miracle that never ceases to be miraculous..... full of beauty and forever beautiful....... loving and caring and truly amazing” - Deanna Beiscer.

To describe this scenic story even today as in the famous Hindi movie says,”100 mile door jab Kisiki shadi hoti hai to aaj bhi budhi amni kehti hai ki mera pota kab ayega”. This discrimination has really created some major problems to the so called modernized society, not only that it has an effect on the sex ratio but it has given rise to some major cynical problems against women. Science has proved to be a boon or curse or is still a debatable topic but apart it has proved fatal to this tendering female species. In the so called modernized society there are several implications done on the mother that whether she will give birth to a baby girl or a son, if found that there is a female species coming to life it is then killed even before it has tried to live. This has proved to be a major issue of concern for all of us, there are still some medical agencies which provide in this information to the society and endanger the lives of thousands of female species. There are certain incidents wherein the mother itself was killed for she was going to give birth to a baby girl child. So not only did the baby child die but again to say a female specie on earth had ended. In villages there is a trend that only the son is capable of handling the entire family and so this type of critical issues do com in existence more in these places.

This is the problem that the baby child is murdered before its death, but there are several incidents also that recently born baby girl child was succumbed to death. If the mother gives birth to a baby girl then that newly born child is wiped off from this chart of earth and then the mother is pacified by saying that the child had died in the womb only. Several “adivasi” parts of country also showed reckless happenings the newly born female specie were not even murdered they were
just thrown in the dustbin where in the found this welcoming by this so called modernized world.

One more issue that has been troubling modern India is the “Dowry”. Dowry big evil in some northern states of India. Father of the girl has to give lot of cash and gold to the bridegroom. This may be given either during the wedding or after the marriage ceremony. In case the father of the bride fails to spare the said valuables on account of his poor economic health, the bride (the daughter) is severely tortured or she may even be torched to death. Today, the said problem is quite widespread in the northern states of Bihar, Uttar Pradesh and Rajasthan. To avoid these sorts of problems the people have become smart enough (as they call themselves) by giving birth to male child and by doing do this the relatively spread in the society that they have their fixed deposit in terms of this boy and they will encash it at the time of his weeding by ransacking the family of the girl child. This is the premarriage problem; the issue is worst in the post marriage section the girl is beaten up till death even if it is revealed that she is going to give birth to a baby child. There are certain cases revealing the fact that people have killed their own daughters for the reason as she was not able to give birth to a male child. Another major issue with the poor girl child is that if they are fortunate enough to come into existence into this earth then they are treated as if they are a burden to this society and their birth has proved to be a real curse to family. This girl are then not allowed to study and restricted to only home choruses, they are treated as a commodity and are lended off to someone after a particular age. There have been cases registered wherein the circumstances were really worse than we could think, girls are been married at an early stage and then she is pressurized to give birth to a baby boy child only, and if she is not able to do this, then she is murdered, tortured and by such atrocities there are cases that women have themselves ended their life.

One more issue concerning this irregular sex ratio is really proving to be very venomous nowadays “RAPE”, this is the result of the same irregular sex ratio. People have gone to the lower most level of satisfying their hunger by committing such sinful crimes. This is not because of mental instability of the people but because of the improper sex ratio here in our country. Everyone feels that he wants to get married to the most beautiful women in this world, everyone wants to have the most dazzling girlfriend in this world, and every bhaiya wants a loving and caring didi to take care of him. Then why are we not supporting this cause for saving the girl child.

Previously they used to say that girls were the presence of goddess “Laxmi” in the house, then why has the scenario changed, the people nowadays don’t wants this Laxmi?

So even now it’s not late we should try on our part that we will try our best to save a girl child, not only by writing such essays but also “DIL SE…”will try to put in all efforts to support the noble cause of

"SAVE GIRL CHILD."
MOTHER
DAUGHTER
WIFE
Then why not
GIRL!

Art by,
Sayyami Chippa
F. Y. B. Pharm
Portrayal of a contemporary Indian woman—modern yet very simple, courageous yet timid, bold yet very scared, very ambitious, driven by the winds of passion and desire to spin her dreams into a reality.

Let us turn back the pages of history to the time of our freedom struggle. 15th August, 1947 the day India was freed from the clutches of the British. During this time span women were looked down upon as inferiors by the people. When they had no identity of their own and they were deprived of their right to education, they had to depend on their husbands. When ears rolled by there were many acts passed which uplifted the conditions of women. To name a few are abolishment of sati, the right to education, the Sharda Act prohibiting child marriage. But these didn’t see much success in the emancipation of women.

The various religious practices in India as well as the personal laws based on them consigned women inferior to men. The Purdah system was reigning over during the early freedom struggle. Women didn’t get their space. However in 1917 things changed—women were active participants in the struggle for independence. Sarojini Naidu then became the president of Indian national congress. More than any other factor participation in the national movement contributed the awakening of Indian women and their emancipation. Many women Leagues arose, All India women’s Conference in 1927 boosted their self-confidence. The constitution today gives equal rights to women for work and employment and equal wages for equal work for men & women. But yet today our old religious beliefs and conservative nature has been the greatest obstacle in the path of emancipation.

Today women are striding at the same pace as men yet not treated equal to their male counterparts. We have many eminent personalities like the space shuttle Kalpana Chawla, Indira Gandhi, Mary Kom and the list goes on. They have proved their mettle in so many fields. Today 40% of the employees in IT sector are women. Laws are being framed for women emancipation but not implemented properly. The Purdah system is yet practiced in our country. In 90% of the countries across the globe women emancipation is there but in India it is a different story. According to Right to education increase in literacy rate in year 2011 - 2012 in boys is 11.8% and in women it is 6.9%. Women in many parts are not having their Right to speech and expression. The Right to freedom and safety is a matter of deep concern today. Jawaharlal Nehru had said “You can tell the condition of the nation by looking at the status of the women.” India is ranked as the 4th most dangerous country in the world. The recent gangrape in Delhi is one that proves this. Why don’t people have the same respect and dignity for women?

The threat to our lives is rising day by day. Do we really need to arm ourselves with chilli powders and guns? There will be a time when we will require guns more than what a soldier needs. This is just one case which has come into picture I am sure there must be many more such cases which are unrevealed. Now after the outrageous protests the women are getting some feeling of emancipation that they are finally being able to voice their thoughts the every day anger and violations that they face. To curb all these atrocities neither laws nor restrictions on women need to grow instead the mindsets of people need to change. I hope to see a better vision of our country where women will be treated equally. “Hope this day dawns soon”. 

“THE EMANCIPATION OF WOMEN”

Ms Neha Katti
S.Y. B.Pharm

Sinhgad College of Pharmacy, Pune-41.
India has examples of women who have risen from the ashes like phoenix and done the country proud. India can be poised and shining only if the girls are given an opportunity to prove their talents. The Ministry for Welfare of Woman and Child in India says, ‘don’t kill your girl child. We will look after her.’ It is an embarrassment for all of us if we fail to protect the rights of the girl child. Unless India gives women a chance to survive, it would fail as the world’s largest democracy.

In education they have been toppers consistently against boys. A girl is like a flower to be nurtured. She is a goddess to be revered. She is mother earth that sustains the very breath of reverent. How can man even think of killing her in the womb? India is growing dynamically in every field. Today, the boom in economy, innovative technologies and improved infrastructure has become nation’s pride. The country has witnessed advancements in all fields but bias against a girl child is still prevailing in the country.

This social evil is deep rooted in Indian ethos and the most shocking fact is that the innovative and hard high end technologies are brutally killing the Indian girl child. Innovative techniques, like biopsy, ultrasound, scan tests and amniocentesis, devised to detect genetic abnormalities, are highly misused by number of families to detect gender of the unborn child. These clinical tests are highly contributing to the rise in genocide of the unborn girl child. In today’s day and age most couples prefer the process known as a planned pregnancy, because of various factors; prime amongst them being the financial well being to support the birth and nurturing of a child. In such cases, the first prenatal visit actually happens prior to actual pregnancy, to see whether one is ready to go off the contraception pills and conceive a baby. However, in maximum conceptions, one is unaware of the pregnancy until actual realization dawns after one skips the first menstrual cycle. Normally doctors except ladies to pay their first visit anywhere between the sixth and twelfth week after conception. Amniocentesis started in India in 1974 to detect fetal abnormalities. These tests were used to detect gender. Later the test was stopped by the Indian Council of Medical Research but it was too late. The benefits of these tests were leaked out and people started using it as an instrument for killing an innocent and unborn girl child. Many of the traditional women organizations also took up cudgels to stop this illegal practice but all failed and with the passage of time these tests became a major contributor to bias against a girl child.

Female feticide and infanticide is not the only issues with a girl child in India. At every stage of life she is discriminated and neglected for basic nutrition, education and living standard. When she was in the womb, she was forced to miss the moment when she was supposed to enter the world. At the time of birth her relatives pulled her back and wrung her neck. After killing her she was thrown into a trash can. During childhood, her brother was loaded with new shoes, dresses and books to learn while she was gifted a broom, a wiper and lots of tears. In her teenage, she missed tasty delicious food to eat and got only the crumbs. During her college days, she was forced to get married, a stage where illiteracy, lack of education...
resulted in high fertility rate, aggravating the condition of females in the country. Again if this female gives birth to a girl child, the journey begins once again. She missed all roses of life and was finally fitted to a graveyard. That's where she got peace of mind.

The nation of mothers still follows a culture where people idolizes son and mourns daughters. UN figures out that about 750,000 girls are aborted every year in India. Abortion rates are increasing in almost 80% of the India states. If the practice continues, then no longer a day will come when Mother India will have no mothers, potentially, no life.

It's high time we all pull up our socks to help save the girl child as time is really running out for the girl child in India.

The disastrous consequences of what is happening today will vanish out daughters from the country. Therefore to prevent a horrible future the need of the hour is to realize our responsibilities and give a halt to this evil crime of killing the girl child in the womb itself. A determined drive can initiate a spark to light the lamp and show the world that we indeed are the land of the great goddesses and mothers. A small step today will definitely lead to a giant leap tomorrow. We all are proud citizens of India. The need of hour is to realize our responsibilities and give a halt to this evil crime.

What can we do to curb the brutal and undesirable practice of mass killing girls? A determined drive can initiate a spark to light the lamp and show the world that we all are part of the great Mother India.
It has been six long decades since India gained independence but many Indians are still trapped in age-old traditional beliefs. Here, ‘old beliefs’ imply the mindset of people who still find themselves in the trap of girl-boy inequality. The ‘liberal’ Indian society has failed to transform the other orthodox India. No doubt India is advancing at a fast pace in the field of science and technology, and also in aping of the western culture, but if we look at the grass root level, the picture is not so rosy; it is rather a dark, especially when it comes to how we treat the fairer sex.

The status of females in India aptly symbolizes India’s status of being a developing nation – miles away from becoming a developed state. Of course, India deserves to be in this list because here, in this 21st century, the girl child continues to be murdered before she is born. Female foeticide is still prevalent in the Indian society; in fact, it has been a practice for hundreds of years.

Narrow-minded people do not mind murdering their unborn daughters for the fear of giving huge amounts of dowry at the time of her marriage. Such people, whenever they discover they are going to have a girl child (through illegal sex selection tests), get the foetus aborted. Else they would continue to reproduce till they get a male heir. When price rise is already taking a toll on the standard of living, is it necessary to go in for more than two children irrespective of their gender?

Many families put pressure on women to give birth to boy so that he can take family’s name forward, light the funeral pyre and be the bread earner of the family. But these days, are girls less competent than boys? Just look at the results of Board exams or any other competitive exams, girls mostly outshine boys. Women empowerment has led to inundation of females excelling in the corporate world, engineering and medical professions.

Sadly, there have been numerous incidents of the foetus being found lying in farms, floating in rivers, wrapped up in jute bags etc. India’s major social problem is the intentional killing of the girl child. The struggle for a girl child starts the day her existence is known in her mother’s womb. The fear and struggle to survive swallow most of the girl’s life even if she is ‘allowed’ to live in this cruel world.

In India, the girl child is considered a burden as huge amounts of money, gold and other items need to be given in the form of dowry when she gets married. Dowry is not the only reason for poor couple to abort their girl child. The ages old traditions, customs and beliefs of the Indian society are largely responsible for creating a negative mindset among the couples. More shocking is the fact that the sinful crime of female foeticide is not only common in rural areas where social discrimination against women, lack of proper education etc. can be considered as reasons behind carrying out such acts, but also the ultra modern, so-called ‘educated’ people living in urban areas and metropolitan cities who are a step ahead in killing the girl child in the womb.

The truth behind this crime has been brought into light several times by the print and electronic media. But, it has failed to melt the hearts and minds of...
those who remain unaffected by the consequences of the grave sin they are committing.

The matter was discussed in length and breadth in the inaugural episode of the show ‘Satyamave Jayate’ anchored by Bollywood actor Aamir Khan. The show has once again ignited the spirited discussion on the female foeticide in the country. That episode had mothers from different parts of rural and urban India talking about the pressure and the problems they faced for delivering a girl child. Although the show is doing really well and has already garnered positive reviews from the audiences, we will have to wait and see whether the impact will remain even after the programme stops beaming into our drawing rooms every Sunday. The emotional connect which the show has successfully created should be strong enough to stop the killing of the girl child before being born.

If we look at the figures of sex ratio in India, according to the 2011 Census, the number of girls stands at 940 which is a marginal increase from 933 in 2001. Not surprisingly, Haryana has the lowest sex ratio among the states while Kerala remains at the top with the highest sex ratio. In the national capital Delhi, the statistics stand at 821 girls against 1000 boys in 2001 compared to 866 in 2011.

According to the statistics, nearly 10 million female foetuses have been aborted in the country over the past two decades. Of the 12 million girls born in India, one million do not see their first birthdays.

As a result, human trafficking has become common in various states of India where teenage girls are being sold for cheap money by poor families. The girls are treated as sex objects and more than half of such cases go unreported.

The United Nations’ World Population Fund indicated that India has one of the highest sex imbalances in the world. Not surprisingly, demographers warn that there will be a shortage of brides in the next 20 years because of the adverse juvenile sex ratio, combined with an overall decline in fertility.

With the advent of technology, ultrasound techniques gained widespread use in India during the 1990s. It resulted in the foetal sex determination and sex selective abortion by medical professionals. Recently, incidences of female foeticide were reported from Beed district in Maharashtra where women used to come to a doctor’s clinic to get their female child aborted for Rs 2000. Just think for a moment about the doctor’s connivance in this illegal act. Doctors, whose aim is to save the lives of people, happily kill the foetus for a meagre two thousand bucks! And more heart wrenching is the fact that the aborted foetuses were very often fed to dogs.

The above mentioned case is not the only one of such heart wrenching heinous crimes. There are thousands of such clinics where illegal activities are carried out on a daily basis and in some cases, in connivance with politicians and police men.

The life transition from a female foetus to a school going girl to a caring woman is never an easy task for the fairer sex. She has to face challenges at every step of her life. Daily, there is news related to rape, sexual harassment, molestation, verbal abuse, torture, exploitation. She has to fight against gender indiscrimination, inequality, and hundreds of social norms are tagged with her the day she puts her steps outside her home.

In most of the cases, women abort their female child involuntarily when they succumb to family pressures. The in-laws’ illogical demand/desire for a boy preference makes the life of women hell. Sometimes, she is left by her husband if she is unable to give birth to a child and worse happens when she conceives a girl child. Ironically, it all happens in a country where the girl is seen as an incarnation of Goddess ‘Laxmi’. True, many families are out of bounds in joy when a girl child is born in their family. They think she will bring luck, harmony, happiness and peace in their family. They even touch her feet to seek her blessings.
Many childless couples even adopt a girl child irrespective of the worries of her future (mainly marriage).

In such a grim scenario, it’s really difficult to digest the harsh reality of the differences between a boy and a girl. India has a deeply rooted patriarchal attitude to which even the doctors and the women, who in spite of being the victims, unthinkingly subscribe. There is an urgent need of undoing the historical and traditional wrongs of a gendered society; only then the hope of abolition of female infanticide and boy preference can positively adjust the figures in favour of the girl child in future. The skewed sex ratio has to find a balance in order to maintain the progress of the country.

The question that remains for us is, when an entire social and economic machine like the Indian culture wages war on girls, is change possible and if so, where does change start?
PLEASE DON'T KILL ME
I WANT TO LIVE!

Art by
Ashwini Ambavkar
Final Y. B.Pharm
I feel these are some criteria as requisites for the students which would help them in their careers. If we work hard to achieve some of these attributes in our personality & life, we may become successful.

**DESCRIPTION/GENERAL APPEARANCE:** Let people describe you by your humble character and clean reputation and not by your fancy material possessions.

**PURITY, IDENTITY AND SAFETY:**
- Create & maintain unique identity based on your good principles, thoughts and actions.
- Maintain purity of your intensions & don’t allow the entry of impurities such as hostility, jealousy or complacency.
- Guard the safety of your morale and by no means create any harm to the nature and the society.

**PARTICLE SIZE:** Reduce the particle size of your inhibitions, incompetence or arrogance so that you will have greater areas of life open to you exploring many good opportunities.

**DENSITY:** Maintain appropriate ratios of mass of your expectations to the volume of your sincere & dedicated efforts both under normal (bulk) situations as well as in the tough (tapped) ones. This would ensure great self satisfaction & greater self esteem leading to consolidation of your positive personality.

**SOLUBILITY:** Enhance your soft skills for better absorption into the professional circle. Remain adaptable & strike balance between your personal & professional obligations (like an appropriate HLB of surfactant). Also, don’t polarize yourself with any misconceptions.

Together it should reduce the chances of confrontations (you may read as surface tension) of your roles as professional and family person.

**pH:** Avoid extremes of any behavioural traits
- Do not be too acidic or too caustic, vulnerable & timid
- Maintain integrity (high unionized fraction) for greater permeability into the zone of the ultimate self satisfaction

**PARTITION CO-EFFICIENT:** Maintain dignity of your diverse roles in both personal and professional life as you transform from an undergraduate to an ardent professional.
- Do not hesitate to partition back into the students’ stream to gain new perceptions & value additions in your life.

**MELTING/BOILING POINT:**
- Do not give into corruption and malpractices succumbing to any form of pressure.
- Let your melting point (read as vulnerability) be as high as possible.
- At the same time try maintaining a low boiling point i.e. do not lose your temper or patience over trivial issues and avoid becoming a permanent azeotrope.
- I assure you that together all these attributes would offer you a high quality life and career. Hence, please do not overlook them.

Finally, I wish to state that the formula for success may differ for different individuals but all of you should learn to enjoy every little success. Also, remember that success may be one of the and not the only objective of human life. Aim high and achieve higher and you will be among a few hits that make a blockbuster entity.
**OUT I LIVE YET I DIE...**

Sanika Ranbhor  
Final Year B. Pharm

They seem to wet me more,  
greasy surrounding though.  
It is not an easy breathing,  
With all surrounded foes,  
Holding knives out to pluck me out.  
Let me remain in this blood.  
Here I can hear the beats,  
and the music of my own...  
If I get out from this hideout,  
You might burn my cry.  
Let me stay for a few more days,  
If I am out, will you keep me safe?  
If I am in, she dies.  
Let me remain in this conch.  
Here I can cry day long,  
And make her smile...  
They surely wet me more,  
greasy surrounding though.  
Let me touch the cable of trust  
And never rip it apart.  
Was I ‘Him’? Would you wait?  
To try to never let me cry?  
Cry that would give me breath,  
Cry that would make me alive.  
They surely wet me more,  
greasy surrounding though.  
Outside I sleep in my own blood pool,  
Inside I have my mother’s.  
Be thankful to the creator though.  
You never had a chance to be mother.  
Here I can hear the beats,  
And the music of my own,  
Here at least I live for few months  
"Out I live yet I die!"

**LOVE - An Experiment**

Rahul Kale  
F.Y.B.Pharm

**Aim:** To determine the value of love in terms of science.

**Apparatus:** college, bus stop, park, restaurant, mandar, theatre etc

**Theory:**
1. Definition - love is a cigarette which starts in smoke and ends in ash
2. Reaction  
   a. Laila - majnu  
   b. Cat - Heera  
   c. Kareena - Romio

**Procedure:** When the ray of attraction from one eye of a body (boy) travels to the eye of another body (girl) then heart gently pushes that result in to smile.

**Important note:** The procedure may be reversed.

**a. Properties of love**

i. Physical property - a man in love tries to be neat, clean and tidy as well as tries to look smart

ii. Chemical property - love is a sweet poison

**b. Precaution:** it is harmful beyond the limit.

**Result:** It was found that love is a matter of realizing and not expressing. It causes ignition to the heart
ONLY FOR YOU...

Lavina Patil
S. Y. D. Pharm

My attendance in the class is only for you,
My regular visits to the library are only for you,
My contacts with teachers are only for you,
My nights spent without sleep are only for you,
My whole future only depends on you,
Oh my dear ‘Examination’ my devotion is only for you...

A FRIE...
Friendship is a tender of feelings,
With care and share its growing
and growing,
We get many friends in life's inning,
But only few can understand
silent feelings,
So never let them go apart.....
Because they are the only one’s
Without words means a lot,
means a lot.....

Real facts........
1. The statue of liberty index is eight feet long.
2. Rain has never been recorded in some parts of Atacama Desert in Chile.
3. A 75 year old person must have slept about 23 years.
4. Mosquitoes are more attracted to the color blue than any other color.
5. Koalas and humans are the only animals that have finger prints.

Lavina Patil
S.Y. D.Pharm

Kya suhana wo pal tha..
Beet gaya jo mera kal tha..
Padhake mera pehla din tha..
Mere hath me mom ka hath tha..
Mom ke hath me mera bag tha..
Bag me slate aur kalam tha..
Aur pero me sandal tha..
Padhke pharmacy business apna tha..
Ye papa ka sapna tha..
Dosto magar sirf sochne se kya hota tha..
Kyonki har std mai ek locha tha..
Thomas, newton ki tarah class me bhi present tha..
Aur rancho ki tarah question mai bhi pucha krata tha...
Margar fark sirf itna tha..
Me answer kabhi na sunta tha..
School k dino miltii roz data, par sikh na us se kuch milti thi..
Kyon ki apne age me kisiki bhi na sunta tha..
School k bad college me jana tha..
Admission k waqt pharmacy me sinhgad ka JAMANA tha..
Summer, barish ya fir ho winter, har din college jana tha..
Kyon ki kare to kya, akhir zalim lecture practical ka jamana tha..
Beet gaye din, mahine or saal, beet chala ye m.pharm apna..
kya hasin wo pal tha..

BEET GAYA JO MERA KAL THA................
“सर्व करारात महणून कारावाच नसत, विचित्रपद्धत बितात महणून कारावाच नसत, पुसावत वाचक महणून कारावाच नसत, तर कुंतक ऐका महणून कारावाच नसत, करण प्रेम करण सोप नसत”...
“शाका, वैश्विन्य असाच पडतां, एकमेकं बितात ती मन्य प्रेमाच पडतां, अभ्यासाचा पुस्तकाचं मग वाचक चूज दिसत, जागेचक्षु मग प्रेमचं स्वाभाव पडत, ज्या वयाच शिकाराच्यावर असत त्यावेळी महतवाचं पडत, कौरंबवीर सत्याकाश तर आयुष्याची वाचक वेळ स्वाभाविक, सहजजिक मग, आई—वेळीला विचारात पाणी पडत, करण प्रेम करण सोप नसत”...
“होटेल, सिनेमागृहात नेहमी जाऊ लागत, पैशाच बजेट नेहमी बनताव लागत, शेनकडे नेहमी तसेच देखाव लागत, मग जागेचक्षु मग शरण विद्याक लागत, दोण्याता ताप होकर दोक दुकानावर लागत, आणि किंवा होकर दुख जासा भोजाव लागत, ऐवढ सर्व करण सोप नसत, करण प्रेम करण सोप नसत”...
प्रेम करण लोकांचा युक्ती वाईट असत, “लग्नाच्या हे करण राइट नसत, प्रेममुळे किलर्क वेवा कुठी हासिल घडत असत, तर किंवा हॉस्पिटलमधून ऑस्ट्रिग खाव लागत, लाचार होजन किंवा किंवा जणाव लागत, अती ताणमुळे अर्ध्याची उभ राहत, करण प्रेम करण सोप नसत”!!!
“आई”

उद्वर्ध कथोटे
प्रथम वर्ष, पुस्तकांकी.
(फार्मस्यूटिक्स)

आई हा शब्द ख्रस्त खूप लहान आहे.
अमृतापेक्षा मात्र नक्कीच महान आहे.

आई असते ब्राह्मासरकी साळली.
लेक-रासाती आमुनध्वन दुःख ब्रेह्मणाची माकली.

आई महणजे प्रेम, जिवात, आपलकी,
या विश्वात तेवढीव एक शिलंक राहिलेली माणुसकी……

आई महणजे इदय,
जे परतल्या प्रयोकासरकी सारख चढपटल असत……

आजकाळ मात्र आईला उमलय्याांची
तोडल जगत आहे……

एक मात्र मात्रलीला जीवन जगण्याची
मारल जात आहे……

खरब काही विवसांतर आई, ताई
हे शब्दच इदयात्या सुदर शब्दवेशातुन
निघुत जातील की काय……

महुणून महणजे मिळाने त्या विबाहीला,
जीवन जगण्या अश्वदर्श मार्फत नव, मार्फत नव……
Out dated झालय आयुष्य,
स्वस्थी Download होत नाही…
sवेदनां ‘Virus’ लागणार,
दुःख send करता वेत नाही…
जुने भावसाठे तुडून गेलेले,
delete झालेल्या file सारखे…
अन घर आता शात असते,
Range नसलेल्या Mobile सारखे…
Hang झालेल्या PC सारखी,
मातीची सिथारी वाईट….
जाती माती जोडणारी,
कुठेच नाही website.
एकवित्तीया सत्तातील पिंडी मलिनीच ‘Cute’
Contact वाहत गेले संवाद झाले Mute.

Computer वा Chip सारखा,
माणूस मनाने खुजा झालय…
अन Mother नावाचा Board,
त्याच्या आयुष्यातून वजा झालय…

Floppy Disk Drive मध्ये आता संकटानांचे जगान नाही…
अन फाटली मन साधणारा Internet वर धागा नाही…
विज्ञानाच्या गुलाबिर्सीत केवी होती चूक,
सवत्साच्या नावाच्यासोबत आता लगते
Facebook…

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कोणी गेलं महणून…

नरेश घुपले
प्रथम वर्ष वी. फार्मसी

खेणी गेलं महणून आणणा,
आयुष्य शांबून देवावयच नसतं,

जपघायचो असतो प्रत्येक क्षण,
जगघार शासाना लांबून देवावयच नसतं

आईटमीच्या बाटावस्तन आपल्या,
स्वार्धपरंतु पोहोचावच असतं,

अभावापरंतु पोहचता वेत नसतं कधी,
त्याच खासी खेळावच असतं,

कसाही असल आयुष्य आपल
आयुष्य शांबून देवावयच नसतं,

दिवस तुंबा नसेल, रात्री तुंबी असेल,
त्या रात्रीला नवं स्वत्त मागावच असेल,

तुंबाच वेळेच्या शासानोक्रे,
शोध जगण मागावच असेल,

कोणी गेलं महणून आणणा,
आयुष्य शांबून देवावयच नसतं…

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"आई मला लवकर लवकर मोडू गाळ खायचय "

रमकांत नरळ्यां
प्रथम वर्ष पू. फार्मसी
(फार्मसीस्कूल)

आई मला लवकर लवकर मोडू गाळ खायचय,
मस्त फैकी बंग घेऊन आफऱ्यता जायचय,
नसतो कुंडला होमर्क ना असतो कुंडला जास,
आफऱ्यतामध्ये आन्यायर नसतो कुंडला क्लास,
घरी पेकऱ आरामात टी.सी. पहाट राहवचय,
मस्त फैकी बंग घेऊन आफऱ्यता जायचय...

सगळे अन्तऱ्याचे फ्रेस्ट आफऱ्यि चुणीच नसतात,
चोकलेट देण्याची कारणाने बाह्य बोळ म्हणतात,
चाँग चांग बोळ कडून रोज चोकलेट खायचय,
मस्त फैकी बंग घेऊन आफऱ्यता जायचय...

बॉन्युटसबर खसून कसलं काम करतात?
कॉमऱ्युटसबर तर नुसेलेच गें मासतात,
रोज रोज गें खेळून टोप्स कोर्सर कायचय,
मस्त फैकी बंग घेऊन आफऱ्यता जायचय...

आफऱ्यतांची जाकन मध्ये भपरू मासा करतात,
तरीं दर नसत तरी आफऱ्यता जातात,
आफऱ्यता जाकन मला घण खेळायचय,
मस्त फैकी बंग घेऊन आफऱ्यता जायचय...

आफऱ्यता रीसेस मध्ये हॉटेलसमेट जातात,
हॉटेल मध्ये जाकन मस्त चमचमीत खातात,
बगर, पिया, क्राइंस आफऱ्यि आईस्फूट खायचय,
मस्त फैकी बंग घेऊन आफऱ्यता जायचय...

मेहिनाचा रोबदी हाघणा केवळ खासे निकातात।
देव याणि एकदा पैशाच हे काय करतात?
मस्त तर मेहिनाचा फक्त एका खेळण म्हणायचय,
मस्त फैकी बंग घेऊन आफऱ्यता जायचय...

आई मला लवकर लवकर मोडू गाळ खायचय.....
आत्महत्या का?

संकात नहीं
प्रथम वर्ष एम. फार्मसी (फार्मांसीटिक्स)

तात्पुरता समस्यावर्ती,
कायमचे उपयोग करून नका,
आत्महत्या करून असे,
भिन्नासारखे मत नका,

यश अपवश वेत राहील,
अशी कच खाक नका,
शुल्क शुल्क गोष्टीसारखी,
प्राणाच मौत देखू नका,

आत्महत्या करून कुणाला,
समत्वाच उल्ले मिशलेले नाही,
तुम्ही तर सिद्धांतीच,
अजुन जीवनही काढलेल नाही.

मानसी गाढी
द्वितीय वर्ष, डी. फार्मसी

जीवन

जीवन हे एक दान आहे,
भिखारे तसे सिखावियाचे,
हे असच ते तसच का?
अस नाही विचाराचे,

जीवन हे गणित आहे,
हातीह धमुक दोषावर्तूक,
बेरीज–बजाबकी चुकली तरी,
उत्तर आपणच शोधावर्तूक,

जीवन हे आपल्याच आहे,
ते प्रयत्नाने पेलावरर्तूक,
सुखाने दुःखाच मात्र करून,
अतिम शिक्षार गाढीवरर्तूक,

जीवन हे एक उदाहरण आहे,
खूप कच्चाने कुत्रावरर्तूक,
आशोची फुल्स कोमेरजीती तरी,
मनाने–ताजे–तवाने रहावरर्तूक,

जीवन हे एक प्रत आहे,
पुण्य अर्जेणे जगावरर्तूक,
अनेक अडा गाडी आह्या तरी,
कथांच नाही सोडावरर्तूक...

मध्येहू मध्ये नाही सोडावरर्त.
Hostel Life...

बाहरी विषयक ताज्जुबात शिक्षणाला प्रणय भिडला,
अन्य शिक्षणात एकदम प्रगत सुधार ख्यात,
बहुतायत होस्टलमध्ये राहण्याचे,
स्वतंत्रता त्याच काही मदतील नाही होईल,
होस्टलमध्ये देतात गडवला समाबेस स्वतंत्र,
आता देखील पाहीले 8 चाल अलग होस्टलान,
पर्यायेचे ४ निवडीत विसर्य भिडला,
जीवनात तिथींच्या धूमच सुधार ख्यात,
सम्भवत: ताजमहली हामी जमकर,
जीवनातील खून तिथे त्याच काळ सुलगते,
कोळेज्यांनी एक चाक नाव Hostel Life,
सुंदर विषय विषयकाची आयतनाच्या Highlight,
Senior शी राहत होतो मिळण मिळण,
त्याच मालिका हटत फिसावर विशजी गेली पडली,
सर्व काही सुरक्षीत असताना जेवणाची मात्र उपासमार,
Strong, healthy असंले तरी,
पाक-या पाण्याला Born-vita किंवा क्रय देणार,
नाही हजर्त तरी warden शी ३६ वाच अकक्षा लागला, तरीही Friendship day, Birthday या २२ व्या मुहूर्त नाही ठकला,
परिशोधा जवळ आतीची अभाव कर, अवसर कर,
इतर देशी होत्याच की मग अपवास घटकामर अन दिवा रात्राची,
कणोणाची आई—बाहेर अनमोल बोल आज्ञातवता,
भाज—बहुं कोठरी भाजाच्या नाही र्स्वू मोक्षाचा आसती बांटता,
असं लक्ष्य—सावधानीत दिसत सर्वत्र नागात,
बसल्या जीवनाच्या याचवतू हे ती सहभागी असतात,
खरं... घर नसलेल्या तरी Hostel भोला असंतया...
उन—सावधानीत खेळ खराबतां, जीवन जगण्याची शिक्षकण देत, अही...
पुणे काह, मुंबई काह आणि नाशिक काह...
सावधान! same असतया...
अशी ही शासन व्यवस्था !!!

रामकासंत नरें
प्रथम वर्ष एम्स. फार्मसी
(फार्मस्युडीक्स)

“दररोज शिस्तीचा भाग महणून तृतीय काळाचे वा�谛व्याचे बकशाने त्याच्या
बाबाशी विचाराले”,
“बाबा, शासनव्यवस्था म्हणजे काय हो?”?
“त्याच असे आहे – बाबा विचार करीत म्हणाले”,
हे व्याग्य, मी घरात पैसे कमावून आणतो,
म्हणजे मी “मांबेल्दार”,
तुजी आई हा पैसा कुठे-कसा खर्च कराची हा उजवे म्हणजे ती
“सरकार”
आपल्या घरातील मोलकरीण काम करते महणून ती झाली
“कानगार”.
“तु “सामान्य नागरीक” आणि तुझ लहान भाक महणजेच “भावी
विपद”,” समजल?
“बऱ्या विचार करीत झाली गेला…
“तुजी त्याचा लहान भाक रविवाराचा आपात्याचा त्याचा जाग आली,
अंधकार जोलें केल्यामुळे त्यांना राह्यात.”
“बऱ्या आईला उदासीला गेला, ती गाव ग्राम्यसळी अस्तित्वाते
ती मोलकरीणा उदासीला गेला, तर विचार खोलीत बकशाचे बाबा
झोपलेले होते.”
“सरकाची बाबानी बकशाला विचाराला, “काय बंडोपंत कदती का
लोकसाही”?
बऱ्या मॅनंला, “कठल बाबा !
“जेकब मांबेल्दार, कामगारांच मोषण करीत असतत, तेव्हा
सरकार गाड झोपेते असत,
देशाची भावी पिची मुल्यांत गायलीसाठी जठत असतो,
आणि ती सर्व आस जवळ सामान्य नागरीकाला सहन करता
लागला!”

नम्न

बिरला बाबासाहब
द्वितीय वर्ष, डी. फार्मसी

जन्माला आला आहे, योड जगून बघ,
जीवनाला खूप दु-ख आहे ! योड सोळून बघ,
सिमुनिभर दुःखाने कोसतो, तको,
दु-खाचा झोगर परवून बघ,
यशाची चव चाहून बघ,
अध्ययन रेहून निर्देशन बघ !
घर बाध्ये सोप असत,
शोधी महतत करून बघ,
जगण कतीण, गरण सोप असत,
दोशीत्तात्ला चेतना सोळून बघ !
जीवन—मरण एक कोड असत,
जाता जाता एपेंड कोड सोळून बघ.

विनोद
एक हस्ती ‘आधार काड’ व्या संगत थांबलेला
असती,
आधाराक मागे बकतो आली माणे उघाचा
अस्तित्वाचा मुळीला जोळतली…
ए खडून नकोस नां गं पलीज…!

तुझ्या कलल्यानी
द्वितीय वर्ष, एम्स. फार्मसी
रस्मी जोयदेखे
प्रथम वर्ष, बी. फार्मैंसी

सिंगड विद्यापीठ अद्री तरी स्वागत होत नाही, कथा आहे मगुण आनंद होत नाही.

परक्याचे घन मगुण विता उदास होई, वशाचा दिवा नाही मगुण आई उदास होई.

शिक्षन यमुनेची सिर्फळता, गंगेची धार होते, कमतर मगुण घराणा आढ़ाव होते.

लगावत्या बाज़ारात सतत उमे सावधन लागते, सतत वरचस विश्वारूंला लान करता व ताई?

पसं म्हणजे जाते सी दिवसली मगुण, तरी हुंडा मागणी होते वर पक्काखड़ूं.

लग उडव धाटारे, येणे सारात सस्त, पैकीसारी मारी चळली लागते सतत.

एक दिवस जीवनात ती खूप कठिनते, जीवन सप्तविच्छासाठी मृत्यूला कवळडावते.

अशी ही व्यक्त आहे भारत देशातील कन्हेची, तरीही बदलत नाही विश्वारूंला समाजाची.

शहाणी तालाणी भोडे,
चूकर रिस्कट
हितीय वर्ष, बी. फार्मैंसी

चांगल्या शाणेच्या पोरान्या टाकावयी धडव राहतो,

Donation सारी उपर आणण्यो,
तेवढ पडली तर हाताळावया पकतो !

“मिजाज खरब तो बाप असतो !

कोलेज मधीने सोबत जातो, होटेल सोधतो,
स्थः फाटका विनियोण घालून,
आपल्या Jeans Pant पँचून देतो.

“मिजाज खरब तो बाप असतो !

स्थः: झाड्या मोबाइल वापरून,
आपल्या Stylist Mobile पँचून देतो !
आपल्या Prepaid वितै स्थः: भरती,
आपला आयाज धाक्यासाठी तरतो !

“मिजाज खरब तो बाप असतो !

Love Marriage करावला कोणी निघाळ तर खूप चिंततो !

“साश्चत नीट पाहिलं का ?” मगुण औरंगड़ो,

“बाबा तुम्हाला काही समजा का ? असे अंकलिवर खूप रक्तो !”

“मिजाज खरब तो बाप असतो !

मूलगी सातसी जातता, धायमोक्लुण रक्ततो,
माझ्या मिल्हला नीट लेना !
असं हात जोडून सागतो !

“मिजाज खरब तो बाप असतो !

खरब सवे कठिता आईत असतात,
एक विहिलवर कमी असतात,
मगुण का या व्यावसायिक विसर्जन करण,
“बाबा खरब दुधी ‘Great’ आहात !”
(16 दिसंबर 2012 रोजी दिल्लीत घड़ीलेल्या वलाकार घटनेसंस्करण...) 

16 दिसंबर 2012 हा दिवस, स्वास्थ्य शोधात तपास्ता होता, क्षण, तास यांचे दिवस, हंबरका कोणून रुकत होता. असे वेदनांनी, तो दिवस जगती होता, नेह्या दिवसाच्या बाजूला, क्रमण समर भवन होता. 

खुपस बाईट वायरल रे, 
निरोज जगाचा घेतला, 
करक माझा दोव्यावर, 
मी नेत माझे जगतां. 
मी बलाकार अनु दूळ दिले, 
तु माझ्याची शाळा रे, 
मी दिले साक्त, 
तु माझ्याची द्राक्षा रे. 

निथायां, निथारस, दानीकीसाठी, 
तु खडा झारा रे, 
माझ्यामुळे एक हवळ, 
त्याना तु सहाय रे. 
भक्तभक्तांच्या जजुणासाठी, 
तु विष बनून रे, 
फुलपासरांच्या पखासाठी, 
गडबाच बांध रे. 
मी दिल भक्त कप, 
तेव्हांतु पुण्य रे, 
माझी माझ्यांच्या अंतम इशा मागतो, 
ऐवळ भावांच्या संदेश दे (तत्त्वानां). 
धे भारती उंच तु, 
लापण दोक गगनाला, 
असांचे जरी सुर्य, तारे, 
असांचे तेज तुळक्ष्य सारे. 

प्रत्येक तुळकुळा ध्याचा, 
आहे सार्व भोजनम, 
21 व्या शतकातील प्रगतीपती, 
आहेस तुळ शान !!
“शिक्षण”

राहुल कवसकर
हिंदी वर्ष, पूर्व, कार्मिकी

आजकलच शिक्षण महणजे तुमत पैशाचं महण, कसं सागवात आता कोण करते वाच रखण, आजचा विद्याची महणजे परीक्षाची केवळ, महगूनने परीक्षाच्या काळातच अभ्यास करतो निवाल, आजकाळ अभ्यासाशी घोषपदवी, महगूनच आज झाली शिक्षणाशी गळ्याची, पालक महणतात आला. याही तुम्हाला नसव, नाहीतर खोखर गौडण नी तुझी कबर, खरंतर कॉलेज महणजे झाला बंदर, परतु आता तेघे दिसतो खूप अधार, शेयर दी मला इतकच नपालासांचे वाटल… बाबाशों… कार्हीतरी शिक्षणाशी, धड़ड़णयांना शोधीकर मदत करणाराशी, आपल्या देखभाल कल्याणाशी, समाजांचे भूमिके करणाराशी, स्वतः खूप खूप मोठे होणाराशी.

“Education is the most powerful weapon we can use to change the world.”

- Nelson Mandela

चारोबी

कमी–कमी निराकरकेचे वादाचे, आपल्यासारखी बीटे गेले, तर कमी नवीन याद योग्य आहे, काळम खरी बीटे होतो...

शतीता भोकरकर, आनंद भागवत, हिंदी वर्ष, वी. कार्मिकी
Garajte huye badal kabhi baraste nahi hai,
khile huye Phool kabhi murjhe nahi hai

Yaha moujud kai shero mai se sumsher hai hum,
Jo kabhi kisi se darte nahi hai....
Gehri dosti ka haath badhate hai hum,
Varna dushman bhi kisi se karte nahi hai....

Himalay par chadhne ka jazba rakhte hai hum,
U chothi moti chattane chadhte nahi hai....
Maut ke pegam ko saath lekar chalte hai hum,
Lekin itni aasan maut marte nahi hai....

Bole huye lafzo se mukharte nahi hai hum,
Aur jo mukhar jaye vo hum nahi hai....
Yun to roz roz hum mandir masjid jaya nahi karte,
Aur jane par mannate manga nahi karte....
Kyonki itni asani se khuda ko batane mai maza hi kya,
Jab tak khud khuda na puche bata PIYUSH teri raza kya hai....

Kahte hai log dhundhne par to khud khuda bhi mil jaye,
Lekin hum yun khuda ko dhundhte nahi hai....
Kyonki khud khuda hamse kabhi juda nahi hai.....
आयुष्य

अक्षित अनिव कीय वर्ष, बी. फार्मैसी

जन्माला आलोच आहोत तर आनदात जगाव, जगाव कीण आणि मरण सोप असते, वेदना सोडुन बघाव, आयुष्यात दुःख आहे तर, खाकें तुलक कराव, धोय समोर ठेवाव, व्यायाम वाट वधावी, अपयश येतच असते, पण माधार नाही व्यावाची, जीवनाचा कस्तो रघुवाचात, ल्यासाही कट करत बघाव, जीवन मरण एक प्रकारचे कोरें, आयुष्यात सोडवून बघाव.

खरा आनंद

अक्षित अनिव कीय वर्ष, बी. फार्मैसी

एकती भित्र नाही असा माघुस कुठेच नसेल, एकती भित्र नाही असा माघुस कुठेच नसेल, शोखापुरूष की होणं, प्रत्येकाने मैती केली असेल, शरीर रक्त नसेल तरी चालेल पण, आयुष्यात मैती हा हवीच, किंतु ती जुनी जाळी तरी, ती नेहमी वाचते नवीच, मैती स्वागत तयार आहे, मैती स्वागत विशेषत आहे, हवी एक गायपुरूष तर मैती खरा स्वास आहे, मैतीविच या नारायणवट स्वागतयश सर्व खुप आहे, खरे नारायण नसेल तरी, मैतीला एक रूप आहे, मैतीचा कधी गंध नसतो, मैतीचा कधी छंद असतो, मैती सर्वप्रथम कसेची, त्यात खरा आनंद असतो.
आस... 

मन हे वेळे

थिमणी पिरल्यु गन हे वेळे,

धिसता कोणी घटनात डेके,

एकदा पिल्लु घरटनात बसले,

कोणीतरी येताना धिसते,

पिल्लु शाहरले, बालरले,

पाहूनया ती माज्यी, बाबरी,

सरकाळी कंब प्रकाशासव हसरी अठा,

पिल्लु आता घरटनात नकोते,

होते स्वप्नात... झाडाखाळी बसले होते,

हात हवाता,

चाँदण्याचा संग पडे,

उमरत होती कुले,

स्वप्नातून जाणे झाले...।

आठवण

सुमागी न. कोस्कर

तृतीय वर्ष, बी. फार्मसी.

वयाच्या अतरा वर्ष मी आईच्या प्रेमात, वडीलाच्या धाकात, भावाच्या नजरेत आणि ताईच्या भाडणात घातलली,

अन अथानक ध्यानात रस्तूनाच्या जगात प्रवाश एकदीच्या प्रवाश सुरू केला,

पण या कागळ सकाळी सकाळी तुमचा ग्लास आणणारी, जेवणाच्या वेळी माणजीसाठी विवेकाने, तर कधी भूतून झोपलाच्या अलगात मोजे कागळारी आई नेहमीच ठोरे पाणजते.

तिथी कणोकणी येणारी हो आठवण, विद्यार्थी महत्त्वते तरी विद्यार्थी येत नाही.

विद्याः वेदात जातात पण, मन मात्र कुठून रमत नाही,

पाकस धो–भी झाला, तरी आठवणीच आभाज कधी मोकद होत नाही.

पाणी खाकोला वाहत रहात, पण आजोवा मात्र तिकत नाही.

वारा घणाण्या सुटला तरी, स्पर्श हा पूर्ण कधी होत नाही.

गारवा गोंवणाता जरी असला, तरी माछ्य्यी जु भात सापडतच नाही.

या सगळा आठवणीचा गं आई, नवनामुन आसवाना असंतू वाचा कुटलत.

पण पुरुषाभ्यास, साहित्याभ्यास तुझा हात मात्र इथवर पोहवत नाही... तुझा आथार मात्र इथवर पोहवत नाही...
अंधाने दोके
(द्वितीय वर्ष, प्रू. फार्मसी. (फार्मसिकोलोजी)  

अंग्रेजी गीत (For Pharmacists)

एक दिवस आला आमाला,
दुसरा दिवसी परीला गेला,
जो बाहा जो रे जो...

पहिल्या दिवसी आणला स्वाभिमा,
एक दिवस आला कामाला,
दुसरा दिवसी परीला गेला,
जो बाहा जो रे जो...

चौथ्या दिवसी आणला बोंच्याला,
तुडून पडला सकाळा क्लास,
शेवटी त्याला कोले ख्याला
जो बाहा जो रे जो...

पाचव्या दिवसी पाचव्या रंग,
मासक आणला कंघ्याला संग,
लेख्यात ते खुलले अंग,
जो बाहा जो रे जो...

सातव्या दिवसी आणला काटी,
उजुका राहिल याची,
नाही हो खाती,
जो बाहा जो रे जो...

सातव्या दिवसी सातव्या बाली,
सगळ्यां सामान मोटीला गेल,
शेवटी मलाही गोट काटला,
सगळ्यां सामान मोटी परत आणली,
जो बाहा जो रे जो...

अरेच्या हे तर स्वान होतां!
PHARMACY KI KAWAALI

प्रामाण्य वर्ष, एम. फार्मसी. फार्माकोलोजी

कभी तो दिल के सूर्य तव किये होते,
मनस्स क्षों की सहिष्णु मे हम गये होते,
ये तो अच्छा है की सिफारिश मे आ गये यतना,
B. Pharm दुनिया हम लोग मर गए होते
हम आज भी गूढ़ रहे है,
अगर सिंह जाय पव दो पत के लिए,
जो कहाते है B. Pharm करो,
वहाँ scope बहता है काल के लिए.

Pharmaceutics
Examiner को इतना होश कहा,
Student की हरितक को समझे,
Dispensary की बाजी छोड़ो Industry का जमाना है,
ये Mortar-Pestle लेके आवश्य हमे क्या पाना है,
जहा Lab के बाहर तो देख मॉस्ट बड़ा सुरुआत है,
मार Sir बोल रहे है बचने हमे emulsion बनाना है,
Examiner को इतना होश कहा,
Student की हरितक को समझे,
कितनी मदद करते है,
Syrup की एक बोतल के लिए,
हम आज भी…

Pharmacology
Cology की है नीव खड़ी चूहो की अमर विलियंगनी पर,
Needle, syringe और आरें सर्टी requirement लेके आते है,
एक unknown sample के लिए गुरा standard panel बनाना है,
अरे रिक Rat को ही क्यों हमे भी sacrifice कर दो ए जालीगाम,
ये सब जब से छुटकर हमे नये दुर चाले जाना है,
Cology की है नीव खड़ी चूही की अमर विलियंगनी पर,
हर रोज एक बूढ़ा मस्ता है छोटे से practical के लिए,
हम आज भी…

Medicinal Chemistry
Medichem में रहता risk बढ़ा,
Product अगर जल जाए तो,
Product मिलता है नम और पसीना खाद्य,
कठी sodium को basin मे केंद्रीत हो, क्या blast करने का इतरता है,
अरे product की घड़ी भाई product सीधा सकता है,
जहा double quantity मे synthesis करना, पता है न आये क्या किया की बढ़ा है,

Medichem मे रहता risk बढ़ा, product अगर जल जाए तो,
दूषण भी दोस्त बन जाते है,
Zip bag और एक label के लिए, हम आज भी…

Pharmacognosy
Cognosy मे B.S.खीटो,
T.S.की photo साथ रखा,
Ether को direct heat करते हों, क्या पूरा beaker जलाओगे,
और ये slide मे cover slip रखकर जतना वरना C- grade ही पाएगे,
जहा microscope का खबर रखना कही eyepeice गुम ना हो जाए,
और ये slide की अभावकर जतना दूरदूर सह जाओगे!
Cognosy मे B.S.खीटो,
T.S.की photo साथ रखा,
बना कैटिस लिख पाएगे,
Short note पूरा जतना के लिए, हम आज भी…

हम आज तो घर ये छोड़ चले,
लेकिन जो कभी आ जाए तो,
दोस्तो तो लगा हमे याद है,
जब पहली बार हम college मे आए थे,
अब मैं कहीं कहीं खाद्यों के सूपर साज़ाए थे,
जो friendship मे से love होना,
और love से फिर ज्यादा friendship,
रिश्ते मे भी न जाने फैशन के रूप दिखाए थे,
दोस्त : हां, हां बन रहे है,
ये First Year मे आए बने मे घोर कुटुंब,
नजरे बुटा पुराण हरमन लेके भीतर,
Second Year मे जब आए कुछ set हो गये थे,
Teacher’s की बाद सुकफ परदेस हो गये थे,
Third Year मे कर सुधाई इसमा वन सुनुद्धर,
Result आया बेहतर तब नाम गया उत्तर,
फिरे को छोड़ न अव लड़काइ हो गया है,
फिरे से जब पतर को पार हो गया है,
लेकिन ये जब तुम नज़र हो रहे है,
अरे अपने ही लोगो से हम अब दूर हो रहे है,
कोई हम गोबर दर्पण है तो हम गुड़ चार पार देते है,
पैसे से हम हो जाए उसे भी अपना लेते है,
हमे B. Pharm होना है बेकार नही,
ए जालीगाम तु फिऩ्डिनगों को मारता है,
हम नूतनिकों जीती देते है,
हम आज तो घर ये छोड़ चले,
लेकिन जो कभी आ जाए तो,
कठीनी जगह रखना यादे थे,
College मे एक घाट लो के लिए,
हम आज भी…
ये तो अच्छा है की हम सिफारिश मे आ गए
बसता……. B. Pharm दुनिया हम मर गए होते.
Exam ka Scene:
Tujhse kya puchna teri ankho ki juban padh lete hai hum....
Viva me question se pehle answer de dete hai hum....
Wahã....Wahaaaa....
Jese tese hui exam puri kisiko sahi na jaye facebook se duri....
Beet gai umar u padhke kya karna hai ab aage badhke....
Bina job ke halat buri anpadh ho gaye hum pe bhari....
Padhake kari sabne maharath haasil, Ab nahi chahata koi aage padhana.... M.pharm student ka sifr ek sapna, ab jese-tese pharma pura ho jaye apna....
10th - 12th tum bachke rahna, Degree graduation ka na tension rakhna....
Aana, khana, upa raja; yahi Pharma ka niyam purana....
Sachin jaise cricket master,
Tilak har kam me speedy blaster.
Vijay, Mihir sub me all rounder,
Pradeep ki hai boiling faster.
Pallavi ne chalaya aisa chakkar,
Bin khaile dedi subko takkar.
Mishra ke paas biceps hai jyada,
jignesh ka bhag usme se aadha.
Manish, Dilip ko to nahi koi tension,
Uska goal hai alcohol hi bechna
Srushi hai forensic officer,
Vishal ne join kiya sarkari daftar.
Mayur to hai bada detective,
Komal ne banayi tablet effective.

Foram, Rashmi ka to abroad target,
Priyanka jati via swargate.
Rishi ban gaya achha painter,
Vikram ne khola bunk center.
Mona kar sakti hai rat sacrifice,
Fir bhi Varsha ma’m says I am not satisfied...
Rajshree ki dressing simple simple,
Khade ki hasi me dimple dimple.
Samrat ka to career politics,
Ferheen ka hai future “Ceutics”.
Aarti to hai ladkiwali,
Mansi nikli nakhrewali.
Balaji dikhane me chota bachha,
Practical hand hai uska accha.
Kaustubh ka gangnum style niral,
Sayali ka hai bolbala.

In job interview:
Prashant ka kam kar gaya actually,
Baki ko bola meet me futurely.
Nikhil ne banayi hollywood ki duniya;
Yaro ye hai "MPHARM... ...... FUNIYA"......
Sabki life ho gayi settle, Jaise phul me petal pe tal....
Yeto hai FormBuilder,
Sabki liye bahut bhi kuch mein.
Sabhi chahiye ab koi ke baad,
Sabhi ko kal kuch ab hi bahut likhte hai.

Last but not the Least......Sab koi at one plate form:::
Hum sabne banayi Pharma company, bank ne di loan ki company
Har bekar ko di ek car car, PETROL bharvaiy bar bar....
Jab jab huiy PUBLIC BIMAR,
ki har din nai TABLET TAIYAR.
Aadhi zindgi bitne ke baad,
Humko hua "INSANIYAT"se pyar,
PADHAKE YE KHUD KHUDA BHI BOLE;
Vah YAR
TUJE OR TERE DOSTO KO MERA PYAR....
YE HAI HAMARA M.PHARM FUNIYA......
Photo Gallery...

EVENTS

At SCOP
First Year B. Pharm 2012-13

Second Year B. Pharm 2012-13
M. Pharm Students

Department of Pharmaceutical Chemistry

Department of Pharmaceutics
M. Pharm Students

Department of Quality Assurance Techniques

Department of Pharmacology
OUR STRENGTH

Faculty at SCOP

Non Teaching Staff of SCOP
Creative Editorial committee of SPANDAN

Our Enthusiastic Sports Committee
Our Dedicated NSS Team

Passionate Cultural Committee
Women Strength of SCOP

Training and Placement committee members with Industrial Tour Coordinators
Alumni Committee - *Keeping a strong connection between old and young.*

Winners of Various Competitions
Student Council Committee

Mastermind Faculty - Recipients of AICTE, UOP, DST grants
Winners of Group Dance Grand Finale at Sinhgad Karandak 2012-13

Dr. K. N. Gujar with HODs
Successful NBA Inspection
Institutional Animal Ethical committee

IAEC reviewing protocols
9th Alumni meet

Dr. K. N. Gujar addressing to Alumni

Dr. K. N. Gujar felicitating Dr. B.R. Mardikar

Dr. B. R. Mardikar giving keynote address to alumni members

Dr. B.R. Mardikar felicitating Dhaval Oswal as alumni of the year

Dr. B.R. Mardikar felicitating Chirag Jain as alumni of the year

Staff and students at 9th Alumni Meet
University of Pune Sponsored Seminars from 19th March to 24th March

Dr. Gujar, Dr. Sampada Joshi, Dr. Shirolkar and Mrs. Shrotriya at inaugural function of State Level Seminar on Credit system

Dr. Miniyar, Dr. Dhiman Sarkar, Dr. Gujar and Mrs. Jamkar at inaugural function of International Seminar on Tuberculosis

Dr. P. T. Pandit, Dr. K. N. Gujar and Ms. V. M. Shende at inaugural function of Seminar on Pharmacovigilance
Workshop on Preparation of Medicated Oil

Dr. B. R. Mardikar at workshop on ‘A Novel drug delivery system gifted by Ayurveda: Tāila (Medicated Oil)’

Dr. B. R. Mardikar demonstrating preparation of medicated oil

Mrs. S.K.Patwardhan felicitating Dr. B.R. Mardikar
Entrepreneurship Development Programme

Dr. K. N. Gujar addressing the audience at Entrepreneurship development programme

Dr. K. N. Gujar felicitating Prof. Deepak Bhivpatki

Seminar on Career Opportunities in Pharmacy

Dr. K. G. Bothra, Dr. S. B. Bhise, Dr. V. R. Sarode, Mr. Rajiv Lochan, Dr. Manjeet Singh and Dr. K. N. Gujar on at the seminar on career opportunities in pharmacy profession

Mr. Rajiv Lochan delivering lecture on career opportunities
Welcome Function

Dr. K.N. Gujar at M.Pharm orientation programme

Dr. K.N. Gujar at B.Pharm orientation programme

SCOP faculty members & students taking Pharmacist oath at B.Pharm Orientation programme
Mr. Dilip Vengsarkar, Former Cricketer at inauguration of Sinhgad Sports Karandak 2013

Former Cricketer Mr. Dilip Vengsarkar at STES cricket ground with Hon. Founder President, Prof. M. N. Navale

Hon. Founder President, Prof. M. N. Navale with Famous bodybuilder Mr. Suhas Khamkar at Prize Distribution ceremony of Sinhgad Sports Karandak 2013
Sinhgad Cultural Karandak

Renowned actor Farhan Akhtar at inauguration of Sinhgad Cultural Karandak

Farhan Akhtar Live in Concert

Renowned actresses Shahzan Padamsee and Sagarika Ghatge at Prize Distribution ceremony of Sinhgad Cultural Karandak 2013
Afsinfar Mhasa at Fashion show of Sinhgad Karandak 2013

Famous actress and model Zarin Khan as a judge at Sinhgad Fashion week 2013

Sinhgad College of Pharmacy’s Winning Team of Grand finale of Group Dance Competition at Sinhgad Karandak 2013
Internal College Gathering: Pharma Cultural Fiesta

Dr. K.N. Gujar inaugurating Pharma Cultural Fiesta

SCOP faculty & Students internal cultural Programme

Rangoli competition

“Best out of Waste” competition

Food Making compétition

Mehndi Ccompetition
Dr. K. N. Gujar addressing audience on the occasion of Final year farewell held on 13th April 2013

Dr. K. N. Gujar Felicitating Best outgoing student from final Year B. Pharm: Parth Shah

Release of Alumni Bulletin on the occasion of Final year Farewell Function
Annirudha Girme, Nachiket Shevale and Madhuri Jain receiving Best T. Y. B. Pharm Project Award

Visit To NARI

B. Pharm students at National AIDS Research Institute on the occasion of World’s AIDS Day
Blood Donation Camp

Hon’ble Navale Sir inaugurating Blood Donation Camp held on 30th December 2012

Dr. K. N. Gujar & Mrs. M. N. Nagras wishing Hon’ble Sir on his birthday

SCOP students & faculty donating blood at Blood Donation Camp
Industrial Visit

T.Y. & Final Year B. Pharm Students at Industrial Visit to INDI Pharma

NSS Camp

Dr. K. N. Gujar at the inauguration of NSS camp at Kolewadi

SCOP staff & students at NSS camp

Dr. H.K. Jain giving a training of Yoga

B. Pharm Student taking different activities
Parents - Teacher Meet

Dr. K. N. Gujar addressing the parents

Parents teacher meet of F.Y., S.Y., T.Y., Final Y. B.pharm

National Pharmacy Week

Dr. K. N. Gujar with Staff and Students at Pharma Rally

Interview Skill Competition at SCOP
B. Pharm Toppers

F. Y. B. Pharm

Charul Avachat  72.66 %
Sana Malhotra  71.66 %

S. Y. B. Pharm

Aniruddha Girme  74.08 %
Mitali Gokhale  73.58 %

T. Y. B. Pharm

Prajakta Kapadnis  75.00 %
Akanksha Gupta  73.75 %

Final Year B. Pharm

Sunil Goodwani  72.33 %
Harshad Topkar  71.50 %
M. Pharm Toppers Semester I

Anuj Kale          Farheen Kapasi          Shrishti Namdev          Piyush Navadiya
61.50 %            68.18 %                73.66 %                60.83 %

M. Pharm Toppers Semester IV

Yogesh Mohite          Mayuri Lawar          Rupali Patil          Supriya Mandrupkar
73.50 %                71.67 %                70.85 %                69.57 %
Best Outgoing Student B. Pharm

**Academic achievements**
1. F.Y.B.Pharm: 61.83%
2. S.Y.B.Pharm: 64.08%
3. T.Y.B.Pharm: 67.66%
4. Professional Diploma in Clinical Research (Distance Learning)

**PARTH SHAH**

**Publications and Presentations:**
- Protective effect of ethanolic extract of Asparagus racemosus on streptozotocin induced diabetic depression in rats is communicated to the Indian Journal of Experimental Biology.
- Protective effect of silibinin against 3-Nitro propionic acid induced Huntington’s like symptoms in rats is under the process for communication.

**Poster Presentations:**
- Combinatorial effect of papaverine, quercetin and poloxamer 188 against cognitive and motor deficits in 3-Nitro propionic acid induced huntington’s model.
- Combinatorial effects of ethyl pyruvate, berberine and poloxamer 188 provides better protection against Huntington’s like symptoms.
- Received 1st prize for a poster presentation on “Protective effect of silibinin against 3-Nitro propionic acid induced huntington’s like symptoms in rats” at the Satellite symposium on Neurobiology of cognition organised jointly by Indian Academy of Neuroscience and National Institute of Mental Health and Neuroscience.
- The above poster’s abstract is also to be published in the Journal “Annals of Neuroscience”.

**Awards and Achievements:**
- Got selected as a student’s leader among the top 18 students from India to discuss on the topic CSR Business Beyond Profit, at the 2nd Indian Students Parliament, 2012 organised by Maaers’s MIT School Of Government, Pune.
- Winner in B. Pharm category and overall winner in the D.Pharm, B. Pharm and M. Pharm categories in the “Interview Techniques” event organised during the National Pharmacy Week, Year 2011-12.
- Received 1st prize in a State Level Pharmacy Quiz, organised at the Allana College of Pharmacy under the name of VIGOR.
- Got selected to represent the college in the General Knowledge Quiz organised by the “All India Institute of Management”.

**Extra-curricular activities:**
- Participated in National Pharmacy Week’s “Quiz Competition”, Pune on Dec 12th 2012.
- Captain of the College Basketball team for all four years.
- Part of the college table tennis team in the year 2009-10.

**Honours:** Selected as the Head Co-ordinator of the Student’s Journal Club at Sinhgad College of Pharmacy.
Best Outgoing Student M. Pharm

Academic achievements

1. GPAT (Graduate Pharmacy Aptitude Test) AIR – 629
2. PTSE (Pharmacy Talent Search Exam) AIR – 03
3. B. Pharm – 69%

ROHIT SHAH

Scholarships and Awards

- 3rd Prize in All India Pharmacy Talent Search Exam with cash prize of Rs. 15,000/- for the year 2012.
- Recipient of the stipend of Rs 8000/- per month by AICTE New Delhi during 2011-2013.
- Best Student Award of Bharat Junior College of Science for the year 2007.
- 4th prize for National Level Quiz Competition held at Madras Medical College, Chennai in the year 2011.
- 1st prize for National Pharmacy Week Quiz Competition, Pune in the year 2011.
- 1st prize in VIGOR-2012 State level Quiz competition held at Allana College of Pharmacy, Pune.
- 1st prize for National Pharmacy Week Quiz Competition, Pune in the year 2012.
- 2nd prize for Young Innovators Choice Competition (YICC) held at Institute of Chemical Technology (ICT), Mumbai in the year 2013.

Posters and Papers Presented

- Presented poster in 2008 on “Punica Granatum” organized by College of Science, Bangalore.
- Presented poster in HSDS-2011 on “Ultrasound Contrast Agents-A New Era in Drug Delivery” organized by Allana College of Pharmacy, Pune.
- Presented poster on “Pharmacist as a Person for Healthcare and Safety” organized by National Pharmacy Week, Pune.
- Presented poster on “Needle free Injections” organized by Bombay College of Pharmacy, Mumbai.
- Presented poster in APTI-2010 on “Pharmacological Actions of “Zingiber officinale” held at Hyderabad organized by Association of Pharmaceutical Teachers of India (APTI).
- Presented poster in Avishkar-2012 on “Novel fast-acting thermoreversible in situ nasal gel of venlafaxine hydrochloride”.

Paper Publications

- Preparation and characterization of Rivastigmine loaded Human Serum Albumin (HSA) nanoparticles, Current Drug Deliv., 2013 (communicated).

Books: MISSION GPAT: For the students preparing for Graduate Pharmacy Aptitude Test (Under Publication).
Chronicle

"Reflection of capabilities"

Publications
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Awards & Achievements
Seminars
Conferences
Guest Lectures
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<td>No.</td>
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<tr>
<td>58</td>
<td>A. M. Avachat J.R. Madan</td>
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<td>A. M. Avachat, Mukesh Hotkar, Yogesh Oswal, Sagar Bhosle</td>
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<td>A. M. Avachat, Yogesh Oswal, Rohit Shah</td>
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**Poster presentations**

1) Indira Pharma Zeal (pharma poster competition) on 25\(^{th}\) feb, 2012

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<th>Title of presentation</th>
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<tbody>
<tr>
<td>1</td>
<td>H.K. Jain</td>
<td>Simulteneous determination of Pentoprazol Sodium and Cinitapride Hydrogen Tartarate using HPTLC</td>
</tr>
<tr>
<td>2</td>
<td>S.P. Vassa</td>
<td>Simulteneous determination of Pentoprazol Sodium and Cinitapride Hydrogen Tartarate using HPTLC</td>
</tr>
<tr>
<td>3</td>
<td>S.V. Mulgund</td>
<td>Simulteneous determination of Pentoprazol Sodium and Cinitapride Hydrogen Tartarate using HPTLC</td>
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2) 64\(^{th}\) Indian Pharmaceutical Congress at Chennai 7\(^{th}\)-9\(^{th}\) Dec. 2012

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<thead>
<tr>
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<th>Title Of The Project</th>
<th>Name Of The Guide</th>
<th>Name of The Student</th>
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</thead>
<tbody>
<tr>
<td>1.</td>
<td>Evaluation of analgesic activity of <em>Tamarindus indicus</em> on Albino mice</td>
<td>Mrs. S. K. Patwardhan</td>
<td>Aswini Jadhav and Priya Karambelkar</td>
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<tr>
<td>2.</td>
<td>Sustained release floating in-situ gel of acyclovir</td>
<td>Dr. K. N. Gujar Dr. Mrs. N. S. Ranpise</td>
<td>Sagar Paygude</td>
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<tr>
<td>3.</td>
<td>Formulation and development of sintered matrix tablets of Tianeptine sodium</td>
<td>Dr. Mrs. N. S. Ranpise</td>
<td>Swati Korabu</td>
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<tr>
<td>4.</td>
<td>Monolithic matrix type TDDS of Licardipine HCl</td>
<td>Dr. Mrs. N. S. Ranpise</td>
<td>Shivasambh Narwade</td>
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<tr>
<td>5.</td>
<td>Formulation and evaluation of sublingual tablet of Lercanipine HCl</td>
<td>Dr. K. N. Gujar Dr. Mrs. N. S. Ranpise</td>
<td>Vinod Ghodake</td>
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<tr>
<td>No.</td>
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<td>6.</td>
<td>Photostability enhancement of Lercandipine hydrochloride by complexation with beta -cyclodextrin</td>
<td>Dr. Mrs. N. S. Ranpise</td>
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<td></td>
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<td>Deshpande Amey</td>
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<tr>
<td>7.</td>
<td>Synthesis and biological evaluation of novel azetidinone derivatives as antihyperlipidemic agents</td>
<td>Mrs. M. S. Phoujdar</td>
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<td></td>
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<td>Mayer Akbari</td>
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<td>8.</td>
<td>Stability indicating HPLC method development and validation for estimation of Tolperosone HCl and Paracetamol</td>
<td>Mrs. M. S. Phoujdar</td>
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<td></td>
<td></td>
<td>Kavita Aare</td>
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<tr>
<td>9.</td>
<td>Molecular modeling studies on anti TB drugs</td>
<td>Dr. M. K. Kathiravan</td>
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<td>Abhishek Pandey</td>
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<tr>
<td>10.</td>
<td>Synthesis and evaluation of Rutacarpine analogues employing Ionic Liquies/DMSO</td>
<td>Dr. M. K. Kathiravan</td>
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<td></td>
<td></td>
<td>Shrikant Nilewar</td>
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<tr>
<td>11.</td>
<td>Synthesis and in-vitro evaluation of novel anti-proliferative agents</td>
<td>Dr. M. K. Kathiravan</td>
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<td></td>
<td></td>
<td>Ajinkya Porlewar</td>
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</table>
3) OMICS Group Organized 3\textsuperscript{rd} International Conference on Analytical and Bioanalytical Techniques, 22-24\textsuperscript{th} Nov. 2012 at Hyderabad

<table>
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<tbody>
<tr>
<td>1</td>
<td>Simultaneous HPTLC analysis of Lafutidine and Domperidone</td>
<td>Dipmala Wagh</td>
<td>Sugandha Mulgund</td>
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<tr>
<td>2</td>
<td>RP-LC method development and validation for simultaneous estimation of Lafutidine and Domperidone</td>
<td>Bhushan Gawale</td>
<td>Sugandha Mulgund</td>
</tr>
<tr>
<td>3</td>
<td>Development and validation of RP-LC method for an anticol formulation</td>
<td>Shrikant Oza</td>
<td>Sugandha Mulgund</td>
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<tr>
<td>4</td>
<td>Stress Degradation studies on Acenocoumarol by RP-HPLC</td>
<td>Shital Tekawade</td>
<td>Sugandha Mulgund</td>
</tr>
</tbody>
</table>

**Pharmaceutical Chemistry**

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<tbody>
<tr>
<td>5</td>
<td>Development and validation of HPTLC method for an anticol formulation</td>
<td>Gauri Joshi</td>
<td>Manisha Phoujdar Sugandha Mulgund</td>
</tr>
</tbody>
</table>

4) National Seminar on “Reformation of Pharma Education in India”

11\textsuperscript{th} Nov., 2012, New Delhi

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<tbody>
<tr>
<td>1</td>
<td>Acid degradation studies of Cinitapride Hydrogen Tartarate and its determination by RP-HPLC</td>
<td>Shrikant Oza</td>
<td>Sugandha Mulgund and Smita Kale</td>
</tr>
</tbody>
</table>
5) Other Presentations:

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<tbody>
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<td>Paper Presentation as part of NPW at AISSMS College of Pharmacy</td>
<td>Poster Presentation as part of NPW</td>
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<tr>
<td>2</td>
<td>International Symposium at ICT, Mumbai- 16th- 17th Jan 2013.</td>
<td>Poster Presentation – (3) B. Pharm Students</td>
<td>Mr. P. B. Dudhe</td>
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**Avishkar**

1) Avishkar – (Interuniversity Research Competition): Zonal level

10th December 2012 at Fergusson College, Pune.

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<th>Sr. No.</th>
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<tr>
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<td>Delivery Of Nano – Species Using Traditional- Wisdom As Smart Ophthalmic Products</td>
<td>Dr. K.N.Gujar</td>
<td>Shelke G.T. Salunkhe S.M.</td>
<td>PG</td>
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<tr>
<td>2</td>
<td>Effect Of Various Polymers Concentrations On Physicochemical Properties Of Floating Microspheres</td>
<td>Dr. N.S.Ranpise</td>
<td>Dube T. S. Ingole N.S.</td>
<td>PG</td>
</tr>
<tr>
<td>3</td>
<td>Novel Fast Acting Thermoreversible Nasal In Situ Gel Of Venlafaxine Hydrochloride</td>
<td>Dr. A.M. Avachat</td>
<td>Nangare R. H. Shah R. D.</td>
<td>PG</td>
</tr>
<tr>
<td>4</td>
<td>Novel Heterocyclic Anticancer Agents</td>
<td>Mrs. M.S. Phoujdar</td>
<td>Ashwini Inamake, Shweta Swami</td>
<td>PG</td>
</tr>
<tr>
<td>Sr. No.</td>
<td>Title Of The Project</td>
<td>Name Of The Guide</td>
<td>Name Of The Participant</td>
<td>Level</td>
</tr>
<tr>
<td>-------</td>
<td>--------------------------------------------------------------------------------------</td>
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<td>---------</td>
</tr>
<tr>
<td>5.</td>
<td>Formulation And Evaluation Of Enteric Coated Capsules Of Embelin</td>
<td>Mrs. S.N.Shrotriya</td>
<td>Dalvi.A.V. Gomes.O.R.</td>
<td>UG</td>
</tr>
<tr>
<td>6.</td>
<td>Development of a tablet dosage form for hygiene maintenance in stagnant water</td>
<td>Mrs. A.N.Ranade</td>
<td>Shewale N.N. Kulkarni T.S.</td>
<td>UG</td>
</tr>
<tr>
<td>7.</td>
<td>2D &amp; 3D-QSAR Study Of 8-Biarylchromen-4-One Inhibitors Of The DNA-Dependent Protein Kinase (DNA-PK).</td>
<td>Mr. P.B.Dudhe</td>
<td>Valecha R. S. Vaishnav L.G. Bachhav S.V.</td>
<td>UG</td>
</tr>
<tr>
<td>8.</td>
<td>LC And LC-MS/MS Studies For Separation, Identification And Characterization of Degradation Impurities Of Finofibrate</td>
<td>--</td>
<td>Mrs. S.V.Mulgund (Teacher)</td>
<td>Teacher</td>
</tr>
<tr>
<td>9.</td>
<td>Exploring The Potential Of Piper Cubeba As Penetration Enhancer As Compared To Synthetic Enhancer</td>
<td>--</td>
<td>Mrs. S.K.Patwardhan (Teacher)</td>
<td>Teacher</td>
</tr>
</tbody>
</table>

2) Avishkar – (Interuniversity Research Competition): University level

27th Dec. 2012

<table>
<thead>
<tr>
<th>Sr. No.</th>
<th>Title Of The Project</th>
<th>Name Of The Participant</th>
<th>Level</th>
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</thead>
<tbody>
<tr>
<td>1.</td>
<td>LC And LC-MS/MS Studies For Separation, Identification And Characterization Of Degradation Impurities Of Finofibrate</td>
<td>Mrs. S.V.Mulgund (Teacher)</td>
<td>Teacher</td>
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</table>
### Innovation

<table>
<thead>
<tr>
<th>Sr. No.</th>
<th>Name of Faculty member</th>
<th>Title of Presentation</th>
<th>Place and Date</th>
<th>Organised By</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Dr. K. N. Gujar</td>
<td>Design and evaluation of Nanometric Novel Drug Delivery Systems (NDDS) for Model Anti Diabetic Drugs (Glipizide/ Repaglinide)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Dr. N. S. Ranpise</td>
<td>Formulation and characterization of Pulmonary targeted microsheres</td>
<td></td>
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<tr>
<td>3</td>
<td>Dr. A. M. Avachat</td>
<td>Solubility and Bioavailability Enhancement of Selected Antihypertensive Drugs Using Novel Pharmaceutical Interventions</td>
<td>Innovation 2013 at Amrutvahini college of Pharmacy, Sangamner on 17/4/2013</td>
<td>Pune University</td>
</tr>
<tr>
<td>4</td>
<td>Mrs. M. S. Phoujdar</td>
<td>Biological activity of some MWI synthesized condensed pyrimidines for specific kinase inhibitory activity</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>Mrs. A. N. Ranade</td>
<td>Oral : Gastro retentive drug delivery Systems</td>
<td></td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>Mrs. S. N. Shrotriya</td>
<td>Mucoadhesive Buccal Drug Delivery Systems Using Natural Polymers</td>
<td></td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>Mr. P. B. Dudhe</td>
<td>Oral: Synthesis, biological evaluation and QSAR studies of PMSB as PPI</td>
<td></td>
<td></td>
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<tr>
<td>8</td>
<td>Dr. H. K. Jain</td>
<td>Prediction modeling of biomembrane permeability using computational chemistry</td>
<td>Innovation 2012 at Alard college of Pharmacy, Pune.</td>
<td></td>
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<tr>
<td>Sr. No.</td>
<td>Title of Seminar/Workshop</td>
<td>Sponsored By</td>
<td>Date</td>
<td>Coordinator</td>
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<td>----------------------</td>
</tr>
<tr>
<td>1.</td>
<td>Applications of Biostatistics in Pharmaceutical research</td>
<td>Pune University</td>
<td>17/3/12</td>
<td>D. P. Jain</td>
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<tr>
<td>2.</td>
<td>Theory and Practice of Pharmaceutical organic chemistry</td>
<td>Pune University</td>
<td>19/3/12 to 20/3/12</td>
<td>M. S. Phoujdar</td>
</tr>
<tr>
<td>3.</td>
<td>Carrier opportunities in Pharmacy Profession</td>
<td>-</td>
<td>25/6/12</td>
<td>V. R. Sarode</td>
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<tr>
<td>4.</td>
<td>Courses and competitive exams in Pharmacy</td>
<td>-</td>
<td>4/7/12</td>
<td>D. P. Jain</td>
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<td>5.</td>
<td>Workshop on Research orientation in Pharmaceutical sciences</td>
<td>-</td>
<td>19/7/13</td>
<td>N. S. Ranpise</td>
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<tr>
<td>6.</td>
<td>Optimization techniques statistical and factorial designs</td>
<td>-</td>
<td>4/8/12</td>
<td>P. S. Bhutada S. K. Mandlik</td>
</tr>
<tr>
<td>7.</td>
<td>Entrepreneurship development program</td>
<td>-</td>
<td>25/8/12</td>
<td>A. M. Avachat</td>
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<tr>
<td>8.</td>
<td>Advancement in Texture analysis with various Pharmaceutical applications</td>
<td>M. J. experts Pvt. LTD</td>
<td>12/9/12</td>
<td>A. M. Avachat</td>
</tr>
<tr>
<td>9.</td>
<td>A Novel drug delivery system gifted by Ayurveda: Tāila (Tōla-Medicated Oil)</td>
<td>In-house R&amp;D department</td>
<td>27/9/12</td>
<td>S. K. Patwardhan</td>
</tr>
<tr>
<td>10.</td>
<td>Perspectives and challenges in implementation of credit system in curriculum of UOP at PG level</td>
<td>Pune University State Level</td>
<td>19/3/13</td>
<td>S. N. Shrotriya</td>
</tr>
<tr>
<td>12.</td>
<td>MDR/ XDR Tuberculosis: A healthcare menace to developing countries</td>
<td>Pune University International Level</td>
<td>22/3/13-24/3/13</td>
<td>P. M. Jamkar</td>
</tr>
</tbody>
</table>
Conferences Attended:

<table>
<thead>
<tr>
<th>Sr. No.</th>
<th>Title of the Conference</th>
<th>Venue/ Place</th>
<th>Date</th>
<th>Attended By</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>World education Summit</td>
<td>Le Meridian, New Delhi</td>
<td>23/7/12 to 24/7/12</td>
<td>Dr. K. N. Gujar</td>
</tr>
<tr>
<td>2.</td>
<td>workshop on Career Advancement Scheme (CAS) for Teachers on</td>
<td>Pune University</td>
<td>25/2/2012.</td>
<td>H. K. Jain</td>
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</table>

Seminars/ workshops Attended

<table>
<thead>
<tr>
<th>Sr. No.</th>
<th>Title of the Seminar</th>
<th>Venue/ Place</th>
<th>Date</th>
<th>Attended By</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Pune University sponsored State Level Seminar on “Advances in Chromatography-A Practical Approach”</td>
<td>Modern College of Pharmacy, Nigdi, Pune</td>
<td>10/2/12 to 11/2/12</td>
<td>H. K. Jain</td>
</tr>
<tr>
<td>2.</td>
<td>workshop on Career Advancement Scheme (CAS) for Teachers</td>
<td>Pune University</td>
<td>25/2/12.</td>
<td>H. K. Jain</td>
</tr>
<tr>
<td>3.</td>
<td>Convention Biocrats</td>
<td>Persistent Lab, Pune</td>
<td>17/8/12</td>
<td>A. M. Avachat P. M. Jamkar</td>
</tr>
<tr>
<td>4.</td>
<td>Workshop cum training programme for Chief Examination officer</td>
<td>Modern college of Pharmacy,Nigdi</td>
<td>6/11/12</td>
<td>S.K. Patwardhan</td>
</tr>
<tr>
<td>5.</td>
<td>Workshop for teachers Igniting spark for teachers</td>
<td>SKNCOP Kondwa</td>
<td>27/11/12</td>
<td>All Teaching Faculty of SCOP</td>
</tr>
<tr>
<td>6.</td>
<td>Workshop on advancement in Pharmacovigilance</td>
<td>B.J. Medical college</td>
<td>7/12/12</td>
<td>D.P. Jain Dr. P.S.Buthada</td>
</tr>
<tr>
<td>7.</td>
<td>MCED and VAMICON organized FDP on Entrepreneurship development</td>
<td>Pune University</td>
<td>31/12/12 to 12/1/13</td>
<td>P.M. Jamkar Dr. A .M. Avachat</td>
</tr>
<tr>
<td>Sr. No.</td>
<td>Date</td>
<td>Names of Resource Person</td>
<td>Background Industry/Academic/R&amp;D</td>
<td>Topics Covered</td>
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<tr>
<td>--------</td>
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<td>---------------------------------------------------</td>
</tr>
<tr>
<td>1</td>
<td>21/12/12</td>
<td>Dr. Amod Kulkarni</td>
<td>Academics</td>
<td>Cell signaling mechanisms</td>
</tr>
<tr>
<td>2</td>
<td>11/02/13</td>
<td>Dr. S. R. Lahoti</td>
<td>Academics</td>
<td>In vitro in vivo correlation</td>
</tr>
<tr>
<td>3</td>
<td>13/02/13</td>
<td>Mr. Nitin Rashinkar</td>
<td>Industry</td>
<td>Homogenization for micro-encapsulation</td>
</tr>
<tr>
<td>4</td>
<td>25/02/13</td>
<td>Ms. Roshnai Saha</td>
<td>Industry</td>
<td>Universities and scholarships abroad (US and UK)</td>
</tr>
<tr>
<td>5</td>
<td>1/03/13</td>
<td>Dr. C. R. Kokare</td>
<td>Academics</td>
<td>Actinomycetes and its importance in Pharmaceutical sciences.</td>
</tr>
<tr>
<td>6</td>
<td>19/3/12</td>
<td>Dr. S. B. Pandhye</td>
<td>Industry</td>
<td>Latest cure for Cancer</td>
</tr>
<tr>
<td>Sr. No.</td>
<td>Particulars</td>
<td>Achieved By</td>
<td></td>
<td></td>
</tr>
<tr>
<td>--------</td>
<td>-------------</td>
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<td></td>
<td></td>
</tr>
</tbody>
</table>
| 1.     | Satellite Symposium on Neurobiology of Cognition at Banglore | **Best Poster award**  
Parth Shah and Arati Panchal  
(Final Year B. Pharm) |
| 2.     | YICC competition at ICT | **2nd Prize:**  
PG team  
Rohit Shah, Swati Korabu  
Bhakti Chorge (M. Ph Sem II) |
| 3.     | Pharma – meet 2013 – A national conference on “ Opportunities in Pharmaceutical Industry” at MITCON Institute of Management | **2nd Prize for Poster**  
Sana Malhotra and Rucha Vitonde (S. Y. B. Pharm) |
<table>
<thead>
<tr>
<th>4.</th>
<th>All India Pharmacy Quiz (National Level), at College of Pharmacy, Madras Medical College, Chennai</th>
<th><strong>Semi-finalist:</strong> Chinmay Karmarkar (T. Y.B. pharm), Charul Avachat (S. Y. B. pharm) Samrat More (M. Pharm II sem), Rohit Shah, Shivasambh Narwade (M. Pharm IV sem)</th>
</tr>
</thead>
<tbody>
<tr>
<td>5.</td>
<td>VIGOR Quiz Competition (Intercollegiate) at Allana College of Pharmacy, Pune.</td>
<td><strong>1st prize:</strong> Parth Shah (Final Year B. Pharm, Rohit Shah (M. Pharm IV sem) and Charul Awachat (S. Y. B. pharm)</td>
</tr>
<tr>
<td>6.</td>
<td>6th State level Elocution Competition on “My Dream Concept of Pharmacy Education” at Satara College of Pharmacy, Satara,</td>
<td><strong>1st prize:</strong> Priya Vadgaonkar (F. Y. B. Pharm)</td>
</tr>
</tbody>
</table>

### 51st National Pharmacy Week (NPW) 2012

<table>
<thead>
<tr>
<th></th>
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</thead>
<tbody>
<tr>
<td>8.</td>
<td>Pharma Ad/Mad-Ad Competition</td>
<td>PG: Runner up Vishakha Wankhede and Team (M. Pharm)</td>
</tr>
<tr>
<td>9.</td>
<td>Quiz Competition</td>
<td>PG: Winner Rohit D. Shah and Shivasambh Narwade (M. Pharm)</td>
</tr>
<tr>
<td>10.</td>
<td>Poster Competition</td>
<td>PG: Runner Up Monali P. Sanghvi, Vimala P. V (M. Pharm)</td>
</tr>
<tr>
<td>11.</td>
<td>Interview Skills Competition</td>
<td>UG and Overall winner: Parth R. Shah (Final Y. B.Pharm)</td>
</tr>
</tbody>
</table>

#### Avishkar 2012

| 12. | Zonal level on 10th December 2012 | S. V. Mulgund and S. K. Patwardhan |

#### Troikaa Award

51st National Pharmacy Week (NPW) 2012

IPA, Pune Branch along with all Pharmacy institutes from Pune organized various competitions and events for the celebration of National Pharmacy Week, NPW from 12th - 18th December, 2012. On this occasion SCOP has took a lead to organize Pharma Rally on 12th December, 2012, to initiate the celebration of 51st National Pharmacy Week NPW 2012.

SCOP has successfully organized the Interview Skills Competition where more than 45 students from different colleges were participated. More than 300 SCOP students from UG and PG courses were participated in different NPW events viz, Paper Presentation Competition, Essay Competition, Pharma Ad/Mad-Ad Competition, Quiz Competition, Patient Counseling Competition, Elocution Competition, Poster Competition, Interview Skills Competition, Pharma JAM....extempore Competition, Debate Competition, Pharma Detailing Competition, Group Discussion, Drawing Competition, General Aptitude.

Grants sanctioned from AICTE for the academic year 2012-2013

<table>
<thead>
<tr>
<th>S. No.</th>
<th>Title of the Scheme</th>
<th>Title of the Project</th>
<th>Name of the Coordinator</th>
<th>Grant Sanctioned (Rs.)</th>
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</thead>
<tbody>
<tr>
<td>1.</td>
<td>Seminar Grant</td>
<td>MDR/ XDR Tuberculosis: A healthcare menace to developing countries</td>
<td>Dr. K. N. Gujar</td>
<td>1,00,000/-</td>
</tr>
<tr>
<td>2.</td>
<td>Seminar Grant</td>
<td>Problem based learning: A self directed learning strategy for solutions to real world problems</td>
<td>Mrs. M. A. Nagras</td>
<td>1,00,000/-</td>
</tr>
<tr>
<td>3.</td>
<td>Staff Development Programme</td>
<td>Research and Practice in Metabolic Disorders: Past, Present and Future</td>
<td>Dr. P. S. Bhutada</td>
<td>3,50,000/-</td>
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<tr>
<td>No.</td>
<td>Title of the Project</td>
<td>Name of the Principal Investigator</td>
<td>Amount Grant Sanction (Rs.)</td>
<td>Status</td>
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<tr>
<td>-----</td>
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<td>-----------------------------</td>
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</tr>
<tr>
<td>1</td>
<td>Desin, synthesis and evaluation of rutaecarpine and terthiophene for their anticancer activity</td>
<td>Dr. M. K. Kathiravan</td>
<td>25,00,000</td>
<td>Granted</td>
</tr>
<tr>
<td>2</td>
<td>Developing a facility for Design, Preparation and Evaluation for Nanotechnology based drug delivery systems</td>
<td>Dr. (Mrs.) N. S. Ranpise</td>
<td>20,00,000/-</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Perspectives and challenges in implementation of credit system in curriculum of UOP at PG level</td>
<td>Mrs. S. N. Shrotriya</td>
<td>15,000/-</td>
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<tr>
<td>4</td>
<td>Pharmacovigilance: ensuring safe use of Medicines</td>
<td>Ms. V. M. Shende</td>
<td>50,000/-</td>
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</tr>
<tr>
<td>5</td>
<td>MDR/ XDR Tuberculosis: A healthcare menace to developing countries</td>
<td>Mrs. P M. Jamkar</td>
<td>1,00,000/-</td>
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</table>
### Research Grants received from University of Pune

<table>
<thead>
<tr>
<th>Sr. No.</th>
<th>Name of the Coordinator</th>
<th>Title of the Project</th>
<th>Grant Sanction (Rs.)</th>
<th>Status</th>
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</thead>
<tbody>
<tr>
<td>1.</td>
<td>Dr. K. N. Gujar</td>
<td>Design and evaluation of Nanometric Novel Drug Delivery System for model antidiabetic Drugs (Glipizide/Repaglinide)</td>
<td>3, 00, 000</td>
<td>Granted</td>
</tr>
<tr>
<td>2.</td>
<td>Mrs. M. S. Phoujdar</td>
<td>Biological evaluation of MWI synthesised condensed pyrimidines for specific kinase inhibitory activity</td>
<td>2, 95, 000</td>
<td>Granted</td>
</tr>
<tr>
<td>3.</td>
<td>Dr. N. S. Ranpise</td>
<td>Formulation and characterisation of pulmonary Targeted Microspheres</td>
<td>3, 00, 000</td>
<td>Granted</td>
</tr>
<tr>
<td>4.</td>
<td>Dr. A. M. Avachat</td>
<td>Solubility and bioavailability enhancement of selected antihypertensive drug using novel pharmaceutical interventions</td>
<td>3, 00, 000</td>
<td>Granted</td>
</tr>
<tr>
<td>5.</td>
<td>Mrs. S. N. Shrotriya</td>
<td>Mucoadhesive Buccal Drug Delivery System Using Natural Polymers</td>
<td>2, 00, 000</td>
<td>Granted</td>
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</table>
Ongoing Research Projects

<table>
<thead>
<tr>
<th>Sr. No.</th>
<th>Project Title</th>
<th>Year of Inception</th>
<th>completion Year</th>
<th>Grant received Till date</th>
<th>Name of Principal Investigator and Co-investigator</th>
<th>Status</th>
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<tbody>
<tr>
<td>1</td>
<td>Gastro Retentive Drug delivery Systems</td>
<td>2011</td>
<td>2013</td>
<td>1.70 Lakhs</td>
<td>Mrs. A. N. Ranade</td>
<td>Ongoing</td>
</tr>
<tr>
<td>2</td>
<td>Synthesis, biological activity and QSAR study of some pyrimidylthiomethyl and pyrimidylsulphenylmethylbenzimidazole as potential reversible proton pump inhibitors (PPIS)</td>
<td>2011</td>
<td>2013</td>
<td>1.70 Lakhs</td>
<td>Mr. P. B. Dudhe</td>
<td>ongoing</td>
</tr>
</tbody>
</table>

Faculty members invited as Resource Person:

1. Guest lecture delivered by Dr. K. N. Gujar through video conferencing on “Optimization of Pharmaceutical formulation and processes” at JSPM on 19th Dec 2012.

2. Lecture delivered by Mrs. S. K. Patwardhan at two day state level seminar on ‘Recent advances in Natural Product Extraction’ organized by Sinhgad College of Engineering, Department of chemical Engineering, on the topic ‘Extraction, Formulation development and evaluation of herbal products’ on 21st March 2013.
# B. Pharm Result 2011-2012

## B. Pharm

<table>
<thead>
<tr>
<th>Course</th>
<th>Percentage of Passing</th>
<th>Distinction Holders</th>
<th>Rankers</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>F. Y. B. Pharm.</td>
<td>88.89</td>
<td>05</td>
<td>Avachat Charul</td>
<td>74.08</td>
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<tr>
<td>S. Y. B. Pharm.</td>
<td>95.89</td>
<td>04</td>
<td>Girme Aniruddha</td>
<td>72.66</td>
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<tr>
<td>T. Y. B. Pharm.</td>
<td>95.52</td>
<td>07</td>
<td>Kapadnis Prajakta</td>
<td>75.00</td>
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<tr>
<td>Final Y. B. Pharm.</td>
<td>92.98</td>
<td>03</td>
<td>Goodwani Sunil</td>
<td>72.33</td>
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</table>

## Final Year B. Pharm G- PAT Result 2012

<table>
<thead>
<tr>
<th>Sr. No.</th>
<th>Name of Student</th>
<th>Rank</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Topkar Harshad</td>
<td>7</td>
</tr>
<tr>
<td>2.</td>
<td>Kapadnis Gaurav</td>
<td>73</td>
</tr>
<tr>
<td>3.</td>
<td>Joshi Mihir</td>
<td>602</td>
</tr>
<tr>
<td>4.</td>
<td>Wani Akash</td>
<td>888</td>
</tr>
<tr>
<td>5.</td>
<td>Kute Vaishali</td>
<td>899</td>
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<tr>
<td>6.</td>
<td>Langote Harshda</td>
<td>1314</td>
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<tr>
<td>7.</td>
<td>Desale Jayesh</td>
<td>3077</td>
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</table>
## M. Pharm Result 2011-12

### M. Pharm

#### First Semester

<table>
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<tr>
<th>Course</th>
<th>Percentage of Passing</th>
<th>Distinction Holders</th>
<th>Rankers</th>
<th>Percentage</th>
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#### Second Semester

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M. Pharm Result 2012-2013

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Sports

- Sinhgad college of pharmacy, Vadgaon (BK) co-ordinated over all Sinhgad Sports Karandak 2013 smoothly and successfully. Sinhgad Sports Karandak 2013 inaugurated with the hands of Former Indian Cricket Captain Mr. Dilip Vengsarkar. SCOP organized throw ball (girls) event on 17th to 19th Jan 2013 at Narhe campus and also coordinated sports prize distribution ceremony smoothly and successfully. Total number of students participated were 107 in different events like Cricket (Boys and Girls), Football, Volleyball, Throw ball, Basketball, table tennis, lawn tennis, running, relay and chess
Student’s achievements in Sinhgad Sports Events:

- Radhika Bahir (F.Y.) was a runner-up in Lawn tennis (Girls)
- Pankaj Sandhikar (T.Y) was reached in semi-final of Lawn tennis (Boys)
- Basket ball (girls) team was reached in quarter final.

Student’s achievements in other Sports Events:

- **Nihar Patil** (T. Y. B. Pharm student) selected and played in Kho-Kho team of University of Pune. His team bagged 3rd prize in state level Kho-Kho tournament at Nagpur and 2nd prize in national level Kho-Kho tournament at Jalandhar, Punjab.
- **Ishaan Talwarkar** (S. Y. B. Pharm student) Won the State level Badminton Championship (1st prize) at Latur. Auctioned in Maharashtra Badminton League and finished with 3rd position in the tournament Pune district Badminton Championship with 1st prize Participated in Annual National Sports Festival ‘SPREEE 2013’ organized by Birla Institute of Technology, Pilani, Goa Campus held from 27th Feb to 5th March 2013.

Cultural events:

- **Internal cultural festival “Pharm –Fiesta 2012-13”:**
  This year Cultural activities organised by the committee included the seven days internal cultural festival “Pharm –Fiesta 2012-13” and intercollege festival “Sinhgad Karandak”. The Interclass cultural activities “Pharm –Fiesta 2012-13” was organised from 17th-22nd Dec 2012 in college building. Various competitions like cooking, Best of west, Mehendi, T-shirt painting, Just a minute were organized.
The last day of the event was a cultural fest organized at I.T. Seminar hall from 1:30 pm onwards. Singing (Solo & Duet), Dance (Solo & Group), Fashion show, skits; Mimicry was performed by the students of all classes.

✓ **Sinhgad Cultural Karandak:**
The Sinhgad Cultural Karandak was organised this year in the month of February. It was organised from 1\textsuperscript{st}-6\textsuperscript{th} Feb 2013 at Cultural centre. The inauguration was done by the renowned actor and director Farhaan Akhtar followed by a live concert at Sinhgad school ground. Apart from the regular events A grand fashion show having well known fashion models was also organised on 5\textsuperscript{th} Feb 2013 at 6:30pm at cultural centre.

On the last day prize distribution ceremony was done by well known actresses Sahzahn Padamsee & Sagarika Ghatge. The same day well known rock band of Raghu Dixit performed at cultural centre.

It included a number of inter-class and inter-college competitions in Mehndi, Rangoli, Short Plays, Fancy Dress, Cooking competition, Singing (Solo & Duet), Dance (Solo & Group), Fashion show, Street play, Mr and Miss Sinhgad, College days etc. Winners of the competitions were awarded certificates, trophies in the intra-college events.

**Achievements of Sinhgad College of Pharmacy Team:**

- Winner(1\textsuperscript{st}) in Duet Singing at Intercampus competitons in Sinhgad karandak on 2nd Feb 2013
- Winner(1\textsuperscript{st}) in Group Dance at Intercampus competitons in Sinhgad Karandak on 5\textsuperscript{th} Feb 2013
- Winner(3rd) in Group Dance at Symbiosis college, Vimannagar on 8\textsuperscript{th} Feb 2013
- Winner(1\textsuperscript{st}) in Group Dance (preliminary round & final round) at AISSMS, Shivajinagar on 13\textsuperscript{th} -14\textsuperscript{th} Feb 2013
- Winner(1\textsuperscript{st}) in Group Dance at Symbiosis college, Lavale on 14\textsuperscript{th} Feb 2013
- Winner(1\textsuperscript{st}) in Group Dance at SIMC, Lavale on 17\textsuperscript{th} Feb 2013
Blood Donation Camp:
This year the blood donation camp was organized by NSS unit of our college. The camp was conducted in association with SKN Medical College and Hospital, Narhe and was held on 30th Dec. 2013 on the occasion of the Birthday of STES Founder President Prof. M. N. Navale. Students and staff members of Sinhgad College of Pharmacy attended the camp. Staff members of Sinhgad Institute of Management also participated in this event. The inauguration was done at the hands of STES Founder President Prof. M. N. Navale, held in the presence of Dr. K. N. Gujar Principal, Faculty and Students of Sinhgad College of Pharmacy.

The total collection of seventy six blood bags was successfully done by the end of the day. It was also discussed that a similar camp for checking the hemoglobin levels of lady staff members and girl students of our college will be held in the months to come along with professional counseling by doctors for those diagnosed with low Hemoglobin levels. Dr. (Mrs.) Harke and her team of doctors from Blood Bank of SKN Medical College and Hospital, Narhe were felicitated for their support in conducting the camp.

NSS Camp
Sinhgad College of Pharmacy's organised NSS CAMP from 28th Jan. to 3rd Feb. 2013 at Kolewadi, Pune. Inauguration of the Camp was done at the hands of Dr. K. S. Mohite, Principal, Sinhgad Arts and Commerce College, Narhe and Dr. K. N. Gujar, Principal Sinhgad College of Pharmacy, Vadgaon in the presence of members of the Kolewadi/Jambhulwadi Gram Panchayat and Villagers.

Speakers discussed the History and Philosophy behind the establishment of NSS in our country and the role of NSS volunteers. After the inauguration, NSS volunteers, coordinator and other staff members spoke to the students of school, teachers and villagers and about the objectives of the camp.
Thereafter, volunteers with the help of villagers and school teachers planned the activities for the camp. The activities like rally and some street plays on the subject of addiction and treatment given to women in the society, plantation of the trees, lecture on Development of Village and Women’s Empowerment, medical checkup and various sports and cultural events were organized.

**Industrial Visit**

T. Y and Final Year B. Pharm students were visited to Pharmaceutical industries in Goa from 12th Feb- 16th Feb 2013. The industrial tour was organized by Punekar Educational Tours Pvt. Ltd.

We arrived on 13th Feb 2013 at Madgoan Railway Station and on the same day students visited to Dona Paula & Boat cruise (Mandovi River), Panaji, Goa.

Next day i.e. on 14th Feb 2013, students visited Indi Pharma Pvt. Ltd., Panaji, Goa. In Indi Pharma, students visited manufacturing, quality control, quality assurance, chemical testing & packaging area of ointment formulation. After the industrial visit, students went for fun on Calangut Beach & Shopping.

On 15th Feb 2013, Students were taken to Old Goa Church & in the afternoon departed for Pune. Next day on 16th Feb 2013 arrived at Pune and tour was concluded with sweet memories.

**9th Alumni Meet:**

The 9th Alumni meet was organized on 5th January 2013 in the Seminar Hall of Sinhgad College Of Pharmacy. The Meet was attended by more than forty alumni. Prof. B. R. Mardikar was the Chief Guest of the inaugural function of the Alumni Meet. Dr. K. N. Gujar, Principal, SCOP, welcomed the Chief Guest and Alumni. Dr. Amelia M. Avachat gave the welcome address followed by an address by Dr. K. N. Gujar.
Mayur Kardile –M. Pharm. (2010), Chirag Jain- B.Pharm. (2007) and Dhawal Oswal (2007) were felicitated for their achievements as best Alumni of the year. The program was concluded with Antakshari and other games, photography session, followed by dinner on the Terrace of College.

**The Training and Placement Activity 2012-13**

**For M.Pharm:**
This year campus interview have successfully conducted for Lupin Pharmaceutical Limited for M.pharm 4th Semester students in the month of July-August. Two students were placed through campus interview in Lupin Pharmaceutical Limited. The other companies which are expected for campus interview are Syntel Inc. Limited (for Clinical Research) and Oxygen healthcare, Ahmedabad.

**For B. Pharm:**
Campus Interviews for B. pharm. final year students have successfully conducted for Bayer Pharmaceutical Limited on 5/3/2013. Total 14 girl candidates from pharmacy colleges of Vadgaon, Kondhwa and Narhe campuses appeared for the interview. Among five candidates of Sinhgad College of pharmacy, three candidates got selected for the post of Medical Representative.

**Demonstration of Texture Analyser**

Sinhgad College of Pharmacy, Vadgaon (Bk.), Pune had jointly organized a seminar with demonstration of Texture Analyzer with M. J. Export Pvt. Ltd. on 12th September 2012. The seminar was based on “Advancement in Texture analysis with various pharmaceutical applications”.

The welcome speech was given by Dr. K. N. Gujar, Principal, Sinhgad College of Pharmacy.

Mr. Christopher Freeman (Product Manager), Brookfield, UK and Mr. Nilay Shah (MKTG Manager, Brookfield, India) conducted an informative session on
Application of Texture Analyzer in Pharmaceuticals by sharing various videos for the same. This was followed by demonstration of Brookfield’s Texture Analyser. The workshop was co-ordinated by Dr. (Mrs.) A. M. Avachat, Professor, Pharmaceutics, Sinhgad College of Pharmacy. The valedictory speech was given by Mrs. S. N. Shrotriya, Assistant Professor, SCOP. Around 110 students and faculty from different colleges attended the workshop.

**Earn and Learn Scheme**

K. B. P. Earn and Learn Scheme started in Sinhgad College of Pharmacy - Pune 41 after receiving the approval for the same from Univ. of Pune's Vidyarthi Kalyan Mandal in August 2012. Two students were selected on the basis of applications, verification of caste/income certificates and personal interviews. The interviews were conducted by a committee of faculty members. One student is from ST category and one from Open category and started work under this scheme from Oct. 2012 till present date. These students are working in the Pharmacy section of the Central Library in our campus.

**Parents Meet Report**

This year we have successfully conducted two parents – Teacher meet. The first and second parents – Teacher meet was conducted on 21\textsuperscript{st} Aug and 21\textsuperscript{st} October 2012 respectively. Almost 40 and 60 parents were present for first and second parents - Teacher meet respectively. Dr. K. N. Gujar welcomed all parents and briefed about college progress.

The parents - teacher meet ended with the interaction of each guardian teacher with the respective parents. The discussion was based on attendance, performance and overall progress of each student. The feedback of this meet was good.
College Katta....

Sinhgad College of Pharmacy, Pune-41.
SCOP NEWS & ANNOUNCEMENTS.......