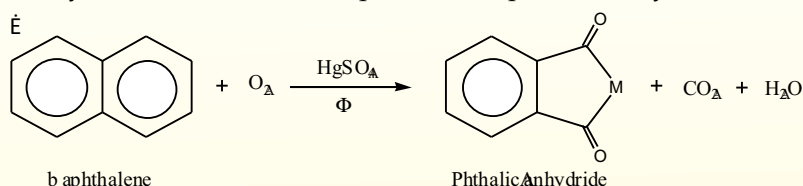


HOW AN ACCIDENT IN THE CHEMISTRY LABORATORY BECAME THE REASON OF MAHATMA GANDHI LAUNCHING HIS FIRST NONVIOLENT MOVEMENT IN INDIA !

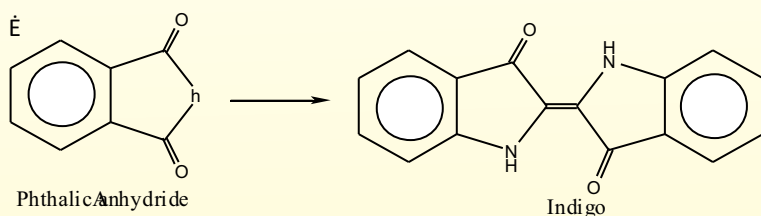
Prof. R. K. Bansal
Department of Chemistry

Sometimes unusual things happen, which give a new direction to the history of a nation. It is one such story. A relationship between an accident in the chemistry laboratory and the first nonviolent movement launched by Mahatma Gandhi in India! Doesn't it look strange? But it is a reality! Let us look into this strange coincidence of the history of Indian freedom movement.

Sometime in 1893, Mr. Sapper, a chemist at the BASF (A German chemical giant) was trying to sulphonate naphthalene by heating it with fuming sulphuric acid when the thermometer broke accidentally and mercury of its bulb fell into the reaction mixture. Sapper, certainly an alert chemist with sharp observation, noticed that the reaction proceeded in some unusual manner. He could isolate phthalic anhydride (instead of naphthalenesulphonic acid) as the major product. It was subsequently explained that mercury reacted with sulphuric acid to form mercuric sulphate, which acted as catalyst for the oxidation of naphthalene to phthalic anhydride.



Karl Heumann at BASF soon developed a successful commercial synthesis of indigo from phthalic anhydride.



Aftermath of the discovery

Indigo was used as the only blue dye by ancient civilizations and until the last decade of the nineteenth century, it was obtained only from plants. In India, in 1897, nearly two million acres of land were used for cultivating indigo plants and for the British rulers, it was a good source of revenue. However, when the German company started selling synthetic indigo at a much lower price than the natural indigo, the international prices of indigo fell dramatically and an economic upheaval ensued in India and other countries that produced indigo. The British government and the planters imposed an additional levy of 23% to cover the revenue loss without any concern for the poor farmers of Bihar. The poor farmers, who were already suffering because of extreme exploitation, rebelled, but they did not have a leader who could channelize their anger and give it the shape of a mass movement.

Arrival of Mahatma Gandhi in India

Mahatma Gandhi, a Barrister-in-Law from England, who had the ability and confidence to face British Government, and who had already experimented with nonviolent movement in South Africa, arrived in India in January, 1915. In December, 1916, Raj Kumar Shukla, a Champaran farmer invited Mahatma Gandhi to Champaran.

On April 15, 1917 Gandhi arrived at Motihari, head-quarter of Champaran and started a long and sustained movement against the exploitation of the farmers.

Finally on November 2, 1917, Champaran Agrarian Bill was



passed, which became the Champaran Agrarian Law (Bihar and Orissa Act I of 1918).

The government accepted the Law in March of 1918.

Contrivances of Pollination: A Unique Mechanism in Fig

Dr. Anuja Joshi
Department of Botany



Fig (*Ficus carica*) is a unique tree whose benefits have been reaped by the humankind since antiquity. Figs belong to the genus *Ficus* which is part of the mulberry family (Moraceae). They have a unique, sweet taste, soft and chewy texture and are littered with slightly crunchy, edible seeds. The uses of Fig can be traced back to the earliest historical documents and also feature prominently in the Bible. Figs were used as a dietary food by the early Olympic athletes, and were also presented as laurels to the winners as the first Olympic medal. This tree is no less than a full-fledged biological laboratory. There are no flower blossoms on fig trees... instead, the flowers blossom inside of the fig fruit. One fact about their pollination might cause some admirers to squirm with distaste. All figs are pollinated by a fig wasp, after which the wasp dies and decomposes inside the fruit! Inside the rounded fruit of a fig tree is a maze of flowers. That is, a fig is not actually a fruit; it is an inflorescence - a cluster of many flowers and seeds contained inside a bulbous stem. Because of this unusual arrangement, the seeds, technically the ovaries of the fig require a specialized pollinator that is adapted to navigate within these confined quarters. Here begins the story of the relationship between figs and fig wasps (Blastophagapsenes). The queen of the fig wasp is almost the perfect size for the work. She often loses her wings and antennae as she enters through a tight opening in the fig. "The only link the fig cavity has to the outside world is through a tiny bract-lined opening at the apex of the fig, called the ostiole, and it is by means of this passage that the pollinating fig wasp gains access to the florets. Once inside, the queen travels within the chamber, depositing her eggs and simultaneously shedding the pollen she carried with her from another fig. This last task, while not the queen's primary goal, is an important one: She is fertilizing the fig's ovaries. After the queen has laid her eggs, she dies and is digested by the fig, providing nourishment. Once the queen's eggs hatch, male and female wasps assume very different roles. They first mate with each other, and then the females collect pollen—in some species, actively gathering it in a specialized pouch and in others, accumulating it inadvertently—while the wingless males begin carving a path to the fig's exterior. This activity is not for their own escape but rather to create an opening for the females to exit. The females will pollinate another fig as queens. The males will spend their entire lifecycle within a single fruit. While this tree-wasp relationship may not be shared knowledge to all fig-eaters, it is well-known to biologists as one of the most solid examples of coevolution. The most common question after reading this story is, "Do we eat wasps when we eat figs?" The short answer is that it depends—that is, some figs are parthenocarpic, meaning they are seedless. The commercially cultivated fig tree is usually a female parthenocarpic variety of the ancient common fig and does not need pollination to produce fruit. There is an impressive array of dietary components in it surpassing that of most common fruits. Fig is naturally rich in many health benefiting phytonutrients, anti-oxidants and vitamins. Dried figs, indeed, are highly concentrated source of minerals and vitamins. Fresh, as well as dried figs contain good levels of B-complex group of vitamins such as niacin, pyridoxine,

folates, and pantothenic acid. These vitamins function as co-factors for metabolism of carbohydrates, proteins and fats. Dried figs are exceptional sources of minerals like calcium, copper, potassium, manganese, iron, selenium and zinc. Furthermore, research studies suggest that chlorogenic acid in them help lower blood sugar levels and control blood-glucose levels in type-II diabetes mellitus (adult onset) condition. Being high in alkaline content, figs curb acid levels in the body. Therefore, we can definitely conclude that figs are a storehouse of nutrients.

THE GREEN MEDICINE SERIES - *Cassia fistula*



Dr. Shilpi Rijhwani
Department of Botany

Medicinal plants are moving from borderline to mainstream use with an increasing number of people seeking remedies and approaches free from side effects caused by synthetic chemicals. It is generally estimated that over 6000 plants in India are in use in traditional, folk and herbal medicine. This article reflects the phytochemical and pharmacological aspects of *Cassia fistula*. *Cassia fistula* Linn. (Cassia) family Caesalpiniaceae commonly known as "Amaltas", "Senna", "Golden shower" or "Indian Laburnum" has been extensively used in traditional as well as modern systems of medicine for various ailments. It has been reported to possess hepatoprotective, anti-inflammatory, antitussive, antifungal and antibacterial potential. It is known as a rich source of tannins, flavanoids and glycosides.

Cassia fistula is a beautiful tree known for its vibrant bunches of yellow flowers in lax racemes. The leaflets are bright green and glabrous and the fruit is a cylindrical pod which is green when unripe and turns black on ripening. The root is prescribed as a tonic, astringent, febrifuge and strong purgative. The leaves are laxative and used externally as emollient, a poultice used for chilblains, in insect bites, swelling, rheumatism and facial paralysis and also externally for skin eruptions, ring worms, eczema. The leaves and bark mixed with oil are applied to pustules, insect bites and as dressing for ringworm, relieving irritation and relief of dropsical swelling.

The pulp of the fruit is a mild purgative and is also used in biliousness and in diabetes. The seeds are slightly sweet and possess laxative, carminative, cooling and antipyretic activity.

Senna is an important ingredient of preparations commonly used as bowel regulator for relieving constipation. It is sold commercially as Constivac (Lupin Herbal) and also as Pilex and Purian (Himalaya Drug Company) that is used as a remedy for piles.

BHOPAL GAS TRAGEDY

30 YEARS

■ Prof. Pradeep Bhatnagar
Dean, Faculty of Science

On the intervening night of December 2-3, 1984 methyl isocyanate (MIC) gas leaking from Union Carbide's factory in the capital city of Madhya Pradesh, Bhopal, claimed more than 5,000 lives. Over 50,000 people still suffer from the effects of that exposure. Toxicity of the gas has been passed on to the second even to third generation. It was world's biggest industrial disaster.

The Killer Company: Union Carbide

This company is the third largest manufacturer of chemicals and 37th largest industrial corporation in the US. It owes seven hundred chemicals plants, mines, mills and other business establishments in thirty seven countries.

Union Carbides operations are extremely diverse. It has been in the nuclear weapons game since the Manhattan Project of World war II and it is the only contractor manufacturing enriched uranium and weapon components for US Government. It also makes consumer products like Eveready batteries—it is the world's largest producer of batteries, industrial gases etc. The Company has been particularly lax about health and Environmental safety in the third world. At Bhopal Union Carbide Company was manufacturing carbamate insecticide, the Sevin using MIC as intermediate substance. The company in Feb 2001 was taken over by Dow chemicals company USA.

The Deadly night of Dec 2/3, 1984

The macabre drama of MIC started technically for the city's poor, living in the sprawling settlements opposite and around the union carbide factory at 11:30 pm. One of the employee of union carbide had started sensing MIC around 11:30 pm. But he stayed on for at least another 45 minutes because this much gas used to leak every eight day and they used to feel irritation in the chest and in the eyes. But finally everything used to calm down. Even if the company had set off its warning siren then many could have escaped.

But nothing happened and many thousands woke up only between 12:30 and 1 am by which time gas was spreading in high concentration and was

everywhere. People woke up coughing violently with eyes burning as if chilli powder had been flung into them. People were running for their lives in every direction, with no body to tell the safe way out. As the irritation grew and breathing became impossible they fled, some with families and many without. They got on to whatever they could – cycles, bullock carts, buses, cars, autorickshaw, tempo, truck and woped. Trucks were full but people hung on outside, some grabbing the legs and hands of those around inside. Small children, old men and women were pushed in handcarts or carried. By 3 am the main streets were jammed with an unending and uncomfortable stream of humanity. The streets were foul with vomit. Those who fell were trampled by crowd. The worst affected were the children, unable to walk and breathe, they simply suffocated and died.

The gas that spread over 40 sq km and affected people seriously as distant as 5 km to 8 km downwind. For nearly 2,00,000 people a quarter of the Bhopal population, Bhopal became a gas chamber. After over 30 years 345 tones of toxic waste is still stored at the sites, underground water is still contaminated with different types of toxicants and above all the sufferers are still waiting for adequate compensation which is hanging between legal battle between the multinational company and Indian government. UCIL gave only one seventh of the compensation amount (US\$ 470 million) of the originally claimed. This is because of the out of court settlement between Government of India and Multinational company; UCIL in Feb 1989. This is how our political leaders and MNCs handled the world's biggest industrial disaster.

NOTE: No person booked for this heinous crime till date. On Sept 29th 2014 main accused of Bhopal gas tragedy, Warren Anderson died natural death.

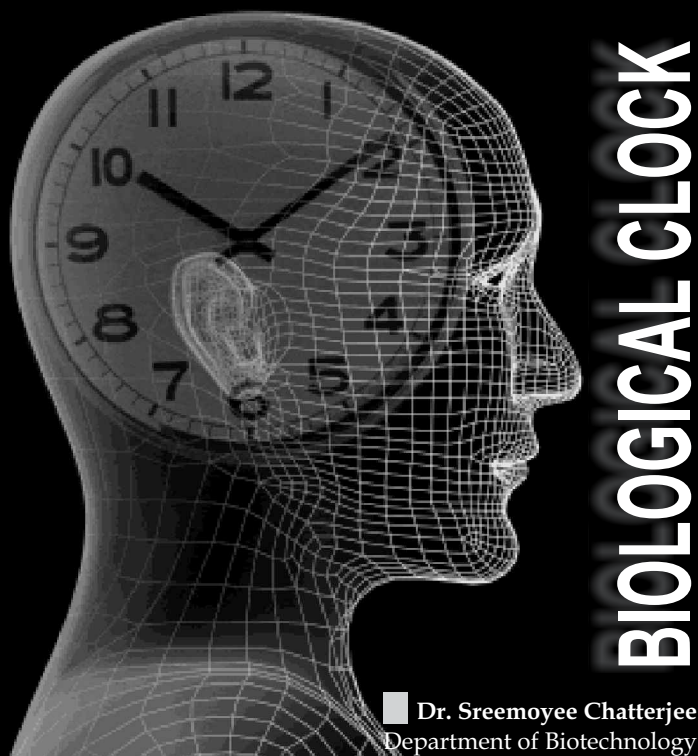
Source: Bhopal Gas Tragedy. After 30 years
2014. Center for Science and Environment ISBN 978-81-86906-78-1

Effect of Adiponectin on Obesity related diseases

■ Pooja Nowal

M.Sc., Department of Home Science

Adiponectin is a protein hormone which is exclusively secreted from adipose tissue into the bloodstream, also known as gelatin-binding protein-28 (GBP28), adiponQ, adipocyte complement-related protein (ACRP30) or apM1. Adiponectin is an insulin sensitizing hormone that exerts its action through its receptors. It is inversely proportional to obesity, diabetes and other insulin-resistant states. According to the researches it has been found that this hormone regulates insulin sensitivity in people. A person carrying more fat has lower levels of adiponectin circulating in the blood (because of obesity there is also a growing number of diseases such as type-2 diabetes, heart disease, high blood pressure, etc). The deficiency of this hormone causes metabolic dysfunction, as well as it also contributes to coronary heart disease, insulin resistance, non-alcoholic fatty liver disease and a wide array of cancers such as breast cancer, etc. Thus, there is a need to increase adiponectin levels as it increases insulin sensitivity by increasing tissue fat oxidation, resulting in reduced circulating fatty acid levels and decrease intracellular triglyceride contents in liver and muscle. Thus, adiponectin has been reported to exert an antiatherosclerotic effect as well as also has anti-inflammatory properties. However, diet and exercise are the two main factors that help to increase the levels of adiponectin in the blood. Diet rich in fish, fruits, vegetables and healthy fats helps to lower cholesterol and raise adiponectin levels. Therefore, this hormone shows distinct potential for having therapeutic value in the treatment of obesity related diseases.



■ Dr. Sreemoyee Chatterjee
Department of Biotechnology

the small pineal gland, which produces a hormone called melatonin. This hormone is produced in the dark and its secretion is inhibited by light. Melatonin is connected with the sleep-wake cycle and responsible for making us feel sleepy. Melatonin is one hormone responsible for our body's daily cycle. During night there is less light input to the SCN, the production of melatonin increases. In dark, more melatonin is secreted, which signals the brain to go into sleep mode. When the sun rises, melatonin secretion is inhibited and the brain's awake circuits resume. The natural clocks can be hampered by some forceful external environmental conditions like, Jet lag and shift work.

Jet Lag

Flying across the country is an interesting example of how we can disrupt our own clocks, and a far more extreme example than the spring forward/fall back ritual in many parts of the U.S. When jet lag sets in, we feel disoriented, foggy and sleepy at the wrong times of day because, after changing time zones, our body clock tells us its one time and the outside environment gives its own. Jet lag can be considered one type of circadian rhythm disorder and can be treated simply by allowing the body to adjust to the new time, although it may take several days for external cues (light) to help the internal clock catch up or fall back with its new cycle. Whereas, exogenous melatonin may be used as an aid to reset the inner clock in this case.

Shift Work

Shift work is another example of how we can get ourselves off-cycle and this too can develop into a circadian rhythm disorder over long term. People who work in the night shift not only have a hard time to adjust with their sleep patterns but other systems in their bodies can also feel the effects which can become chronic. It is still not clear why this connection exists, but weight gain or metabolic changes may be associated to this. The phenomena underline how particular behaviors or lifestyles can affect the body's clock, though genetic and body chemistry also play pivotal role in it. Disruption of circadian clocks is believed to be a cause of type 2 diabetes, obesity and cancer. It is advised to avoid iron-rich food during night shift, as it may hamper the circadian clock of the liver releasing high levels of glucose in blood.

Many human functions follow a cyclic behavior that results from the existence of certain inner oscillators, coordinating different functions. These inner cycle regulators are called biological clocks. One of the most obvious ones is in charge of the sleep-wake cycle in humans. This clock resides in the Supra-Chiasmatic Nucleus (SCN) of the brain and its period is between 24 and 25 hours. Thus, without any other additional factors, humans would go to sleep progressively about an hour later each day and wake up an hour later. However, humans live their lives in a 24 hours or day-night recurring pattern called a circadian rhythm. The light arriving to the eyes signals the SCN to reset the sleep wake cycle to a 24 hours pattern. This influence is mediated by

Source: (1) Seeger C., Mason W. S. and Zoulim F. (2007) *Hepadnaviruses*. In: Knipe DM, Howley PM, editors. *Fields virology*. Philadelphia: Lippincott Williams and Wilkins. pp 2977.
(2) Gupta N., Sood V., Bano A.S. and Banerjee A.C. (2007). *AIDS* (21) 1491-92. X protein of hepatitis B virus potently activates HIV-1 subtype C LTR promoter: implications of faster spread of HIV-1 subtype C.

Scrubbing-and-shining India: The Ugly Indians

■ Dr. Payal Mehtani
Department of Biotechnology



No lectures, no moralizing, no criticizing, no advices. They believe in 'Kaam chalu mooh bandh' (Stop Talking, Start Doing). They call themselves 'The Ugly Indians (TUI)', a group of anonymous volunteers, working on cleaning the streets of Bengaluru. TUI is not an NGO, but a bunch of self-driven and motivated

people who do not believe in publicizing but in effective functioning. In their opinion, the problem of visible filth in India cannot be solved by changing the system or legislations but by changing the deep rooted cultural behavior of the people.

Everyone else responded. More than hundred such spots have been fixed up till date.

Efforts of Ugly Indians turned a messed up footpath into spotless and hygienic one.

The group refuses to depend and blame civic bodies. They insist that all of us need to take the responsibility for the hygiene and upkeep of our localities. We need to change our attitude. Most of us talk about cleanliness of other countries. But consider throwing rubbish out of a window in a public area as a normal behavior.

So, if you think the initiative of TUI is worth, then do your bit and next time don't make an excuse after throwing waste at a garbage-piled place, saying "This place is already dirty, we are not messing a clean place" or "Oh this! It's just a banana peel, its biodegradable."

If you are also concerned for your society, you can join this initiative by sending a mail to The Ugly Indians or by registering your name and email address on their Facebook page.

Source: www.theuglyindian.com
The Ugly Indians make Bangalore shine"- The Times of India (April 21, 2014)

Every week they 'spot fix' a minimum of 5-6 places in Bengaluru. Be it rubbish heaped footpaths, open holes on roads, stinky public urinal spots, open dumps, or dirty paan stained underpasses. They don't just clean but increase the aesthetic value of the place by painting the walls, keeping planted pots, hanging pictures on the walls etc. Many times even the bystanders join them to help.

One such spot fix was done on a small stretch of broken footpath that lied between two commercial complexes and was a dump yard for nearby shops. TUI members took an initiative and mended this place by cleaning followed by repairing of the footpath, painting of the walls and placing

Why Protein is important in diet?

1. Muscle mass and lean tissue development

Protein intake enhances muscle protein synthesis and decreases protein breakdown for several hours so that eventually we end up with more lean tissue. The human body constantly keep on switching between muscle loss and gain depending upon the availability of amino acids. So whenever, the pool of building blocks is replenished by eating protein, it promotes muscle development.

2. Low calorie Intake

Eating protein gives a feeling of fullness, it is actually filling and hence after eating more of it we are quickly satisfied and hence take less calories. This is the reason why high protein diets are known for their fat reducing benefits.

3. Better bone density and less risk of osteoporosis

Research shows that a higher protein intake increases bone density and hence decreases the risk of osteoporosis. The myth that a high protein intake is bad for bones is just based on misunderstanding of bone metabolism.

4. Better brain function

Protein is a vital food, eating high quality protein provides the building blocks to make chemical messenger involved in energy production, hunger, motivation, wakefulness and optimal cognition.

5. Better sleep

Proteins optimize chemical transmitter balance, making us wakeful and energetic during the day but sleepy and restful at night. Protein diets have been found to make people sleep better and wake up less frequently during the night.

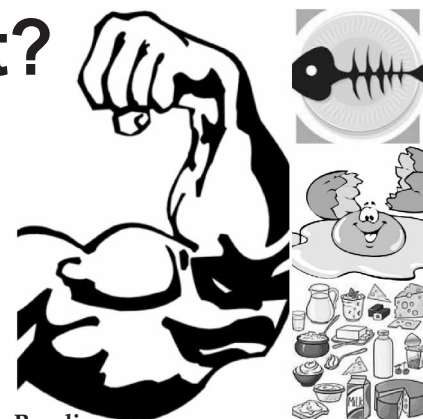
6. Faster recovery from injury and stronger tendons

Greater protein synthesis fastens the repair of tissues and strengthens connective tissue and hence decreases the risk of injury.

7. Greater lifespan and better quality of life as you age

Quality that increases longevity that is physical strength, muscle mass, leanness, bone health, lower blood pressure and brain function and all are principal players in keeping you alive. Animal studies that have tested the affect of a high amino acid intake on longevity suggest that adequate protein can increase lifespan in human by nearly 10 years.

S. No.	Food Source of Protein	Amount of Protein in 100 Grams	Amount of Calories in 100 Grams
1.	Turkey and chicken breast	30g	4.5
2.	Halibut, salmon and tuna	26g	4.5
3.	Cheese	32g	4.7
4.	Pork ioins	25g	5.2
5.	Lean beaf	36g	5.3
6.	Tofu	7g	7.4
7.	Soy beans	17g	10.4
8.	Eggs	13g	12
9.	Yoghurt and Milk	6g	18
10.	Nuts and seeds	33g	15.8



■ Richa Pundir

Research Scholar, Department of Biotechnology

SCIENTIFIC REASONS OF INDIAN TRADITIONS

■ Dr. Deepak Rajawat

Department of Chemistry

Indian culture is the world's oldest culture. Culture and traditions in India go together. Beliefs of a culture in the form of traditions are carried forward from one generation to another. We follow these traditions because of the faith, but most of the traditions have some scientific values. Some of them are mentioned below:

1. Why we offer water to sun

Offering water to the Sun is generally attached with the worship of the Sun. There is scientific reason behind it. Water is offered to the sun by raising both the hands towards the Sun, in this situation a wide film of flowing water forms. The rays of the Sun coming through the film energize their entire body and soul. Many diseases can be cured by sun rays e.g. ailments of the heart, eyes, jaundice, leprosy and weak mind.

2. Why not to sleep with head toward North

There is a myth that the sleeping with our head in north invites ghost. The scientific reason behind it, our body has a magnetic field. Earth also has a magnetic field which interacts with the magnetic field of our body. When we sleep with our head in the north the magnetic field of our body is asymmetrical with the magnetic field of the Earth. Which creats problems related to blood pressure and heart.

3. Why apply mehendi on hands for weddings

Mehandi is a powerful medicinal herb. The occasion of wedding is very stressful to the bride and groom. Which creates tension, headache and other problems. Use of mehndi on hand cools our body, prevents too much stress and keeps the nerves from becoming tense. Application of mehendi on the feet heals different type of problems cut marks, burns appeared during the occasion. It also improves the blood circulation.

4. Why we apply Tilak/Bindi on forehead

Tilak/Bindi is applied on the fore head at the place which is considered as the point of latent wisdom and concentration. When we apply Tilak/Bindi on this spot it regularly stimulate which improves the mental and intellectual concentration.

5. Why the bells are used in temples

The bells are generally used in the temples. The scientific reason behind using the bells is that the ring of the bells clears our mind, sharpen it and increase our concentration for worship. Another reason is that the sound produced by the bells creates unity in between the left and right parts of the mind. When the bell rings, a sound is produced which persists in echo mode for at least 7 seconds. This activate all the seven healing centers in our body. This results in increase of positive thoughts in our mind and removes negative thoughts.

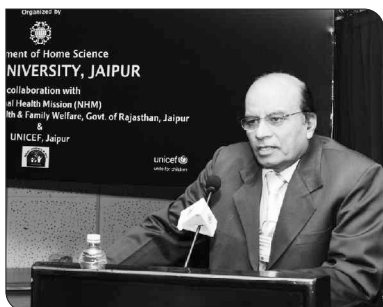


Sh. Neeraj K. Pawan, IAS



Prof. G.S. Toteja
Sr. Deputy Director, ICMR

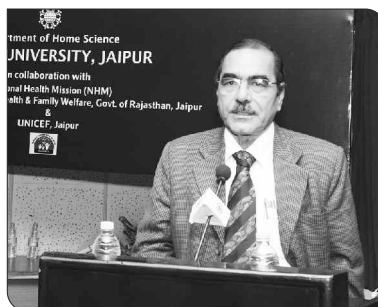
**National Conference on
"Food Based Strategies :
An Initiative to Combat
Micronutrient
Deficiencies" on 21-22
Jan. 2014**



Dr. P.N. Kalla
Director, SKRAU, Bikaner



Dr. Anupa Siddhu
Director, Lady Irwin College, New Delhi



Dr. Umesh Kapil
AIIMS, New Delhi

National Seminar on "Reproductive Health Awareness" (RHA 2014) on 12-13 Sept. 2014



Dr. V.M. Katoch, Secretary General
Ministry of Health, GOI



Dr. D.N. Sharma
AIIMS, New Delhi



Dr. Sunil Kumar
NIOH, Ahmedabad



Prof. N.K. Lohiya
President, ISSRF



Dr. Anil Suri
NII, New Delhi



Dr. Ashok Pangariya
SMS Medical college, Jaipur

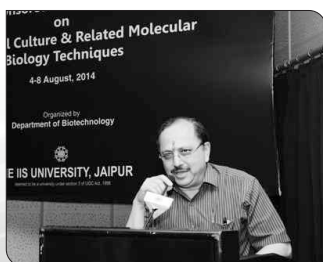


Dr. P.K. Goyal
UOR, Jaipur



Dr. R. S. Sharma
ICMR, New Delhi

**CSIR Sponsored National Workshop on "Animal Cell Culture & Related Molecular Biology
on 4-8 Aug. 2014**



Prof. Akhil C. Banerjee
NII, New Delhi



Dr. Lalita Gupta
BITS, Pilani



Hands on Training

National Conference on "Emerging Areas in Chemical Education & Research and National Convention of Chemistry Teachers" on 16-18 Oct. 2014



PADMA Vibhushan
Prof. M.M. Sharma



Prof. Savita Ladage
Homi Bhabha Institute, Mumbai



Prof. S. Chandershekar
IISc, Bangalore



Prof. Panchanan Pramanik
IIT Kharagpur



Prof. Anshu Dandia
UOR, Jaipur



Prof. P.S. Kalsi, Ex Dean
PTU, Punjab



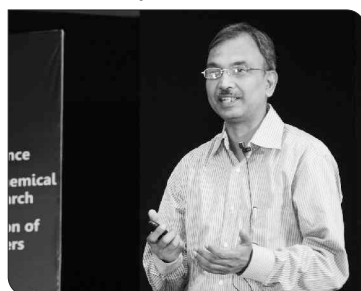
Prof. Udai Maitra
IISc, Bangalore



Prof. R.T. Pardashani
Central University of Rajasthan



Dr. D.V. Prabhu
Wilson College, Mumbai



Prof. A.B. Gupta
MNIT, Jaipur



Prof. A.K. Singh
IIT Bombay



Poster Session

National Conference on "Biodiversity : Harmonizing Conservation with Life and Landscape of Arid and Semi-arid Areas " on 29-30 Oct. 2014



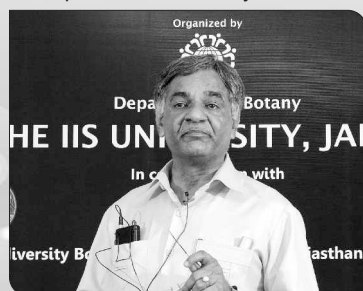
Prof. LMS Palni, Dean
Graphics Era University, Dehradun



Prof. K.C. Sharma
Central University of Rajasthan



Dr. Harshwardhan
Renowned Ornithologist, Jaipur



Prof. P.C. Trivedi
Former V.C. DDU & RML University



Prof. S.S. Katewa
Former Head, MLS University, Udaipur



Prof. Amla Batra
Emeritus Professor, UOR

Techniques"



Life style

- Cars without drivers will share roadways with conventional cars, within 5 to 10 years. This will happen in cities first and will take a decade to fully diffuse.
- In long run people won't own cars at all. When we need to go somewhere, we'll have a subscription to an auto service and it will show up at our door.
- We are moving away from a purchase economy. We will subscribe to access rather than pay money for possessions such as smart phones. We won't buy software anymore, we will subscribe to it.
- A new religion could emerge in next decade or two, perhaps based around the environment

■ Prof. Pradeep Bhatnagar
Dean, Faculty of Science

What is our future?

Health

- Within 10 to 20 years medicine and health care will be about using technologies and keeping the human touch in practicing medicine. Everyone's genomes will be sequenced to access personalized treatments.
- We will measure almost any health parameter at home with diagnostic devices and smart phones.
- The 3-D printing revolution will produce affordable exoskeletons and prosthetic devices.

Energy

- Within 50 years, the world should be able to achieve a 100% clean energy economy. Within the next few decades, every time we turn on a light, every bit of that electricity will come from clean, renewable, carbon-free sources. Soon after that, solar and wind will displace nuclear as well, at which point we will be getting 100% of our electricity from renewable. By 2030, we should be able to cut transportation oil use in half and then cut it in half again in a decade later.
- Once we are fossil-fuel free, we will not only see our climate stabilize but we will also get all our power from sources that are safe, secure and sustainable. It is within our grasp.

Source: Paul Saffo, Technology Forecaster, Bertalan Mesko, Medical Futurist, Michael Brune, Executive Director, The Sierra Club, National Geographic, January 2015.

INTERESTING NOMENCLATURE

■ Megha Kedia, Sakshi Jain, Shivani Panwar



A small group of employees from Odeo, the San Francisco podcasting startup where Twitter initially began, were trying to come up with the names that fit with the theme of a mobile phone buzzing an update in your pocket.

They wrote down the names, put them in a hat, and let fate decide. Fate decided on Twitter. A tweet by any other name just wouldn't be the same.

Go 00000 00000 00000 0
00 00000 00000 00000 0
0000 00000 0000

In 1997, Google was called BACKRUB. Google comes from "GOOGOL" which means a very large number followed by 100 zeros. The name acts as a metaphor for founders LARRY PAGE and SERGEY BRIN's mission to organize a seemingly infinite information on the web.



Wikipedia is a synonym for acquiring quick access to multiple sites for an ocean full of knowledge. "WIKI" got its name from a HAWAIIAN term "wiki wiki" meaning "Quick".



In early 2004, Mark Zuckerberg gave birth to Facebook. The idea for all students and faculty called facebook came from Mark's days at Harvard University, which annually published a student directory with headshot photos 'A Facebook'. Facebook started as an idea and grew into a company that employs more than 1,000 people and is home to more than 400 million active users.

Source: The Economic Times

TEN WAYS SMARTPHONES ARE MAKING US DUMBER

ATTENTION

Attention span is an early victim

MEMORY

We are outsourcing memory to smartphone by choosing not to remember since we have 'fed' the phone data

DISTRACTION

Night hours spent on phones imply greater distraction the next morning.

UNREAL

By easing our lives, smartphones are making us happy and thus making us tune out of the real world

DEPENDENCE

Remembering numbers, names, faces, even simple calculations, is tougher.

ECHO

If we hold obnoxious views, the phone media can help us find other obnoxious people to hang out with and opt out of where we feel criticised.

NARCISSISM

I-me-myself problems stemming from overuse of social media.

DIRECTION

We are forgetting "where" we are as our brains rely on maps to get us around.

TIES

family time, class work, relationships etc all are affected due to phones.

ANALYSIS

Being prone to intuitive guesswork rather than analysis, we end up doing more guesswork than hardwork.

■ Richa Pundir
Research scholar, Department of Biotechnology

Source: OUTLOOK@20, April 2015.

The Day That Albert Einstein Feared Has Arrived!



Having coffee with frens



A day in a beach



Cheering your team



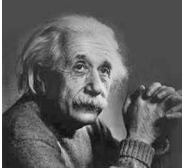
Out on an intimate date



Enjoying the sights



Having dinner



"I fear the day that technology will surpass our human interaction. The world will have a generation of idiots"

Albert Einstein

■ Science Spectrum Team

Teixobactin

A wonder Antibiotic which confers imperceptible resistance

Ritu Kedia

Research Scholar, Department of Biotechnology



The inopportune and imprudent use of drugs by humans has caused microorganisms to develop potent defense mechanisms against antibiotics. Thus, it resulted in increased clinical worries to combat diseases given by pathogens. About 23,000 people die in US due to failure of antibiotics as it parades multi-drug resistance. The application of broad spectrum antibiotics namely Amoxicillin, Tetracycline, Cephalosporin, Streptomycin,

Ciprofloxacin, Erythromycin, Chloramphenicol in current era is becoming limiting with the advent of superbugs formed by mutations. The World Health Organization studies assert 2014 to be the sensitive zone for antibiotics resistance. The increased susceptibility to diseases and altered protein assembly of viruses and bacterial cells has made difficult for immune system to detect and target for their clearance. So culturing of antibiotics with least toxicity and positive effect on gram negative and gram positive cell walls is our utmost concern for their elimination. A novel approach is made by US scientists, as they have evolved a new antibiotic from *Eleftheria terrae* to which resistance may not develop so easily. The former bacterial species that belongs to class beta-proteobacteria is a gram negative bacteria which has not shown production of any antibiotic so far. The study was published in nature journal recently. Dr. Kim Lewis and his co-workers together used an isolation chip called i-chip to culture it from different strains from soil from the grassy field of Maine. The i-chip contains tiny chambers to hold single bacterial cells and is enveloped with semi-permeable membranes coated with nutrient agar. The i-chip can hold about 10,000 bacterial strains. It is then placed in soil for nutrient enrichment and other growth factors by diffusion. During screening of strains, *Teixobactin* proved to be a game changer as it has exhibited effective response to many humans pathogens, gram positive microbes and specifically to *Mycobacterium tuberculosis* and *Staphylococcus aureus* after prolonged exposure at sub-lethal levels. But resistance to gram negative bacterium is yet to be considered. The *Teixobactin* antibiotic acts on lipid II (peptidoglycan) and lipid III (teichoic acid) restraining cell wall synthesis by binding to highly conserved sequences and developing resistance. The experiments *in-situ* done by scientists have not shown any side effects on mice. The availability in market will be announced from 2 to 5 years from now. The Tuberculosis disease is an issue of concern as it causes nearly 5 lakhs of casualties each year in India and *S.aureus* both are MRSA type. Thus discovery of such a promising drug is a boon for mankind.

Source: Kim Lewis et al., A new antibiotic kills pathogens without detectable resistance; January 2015, Nature Journal

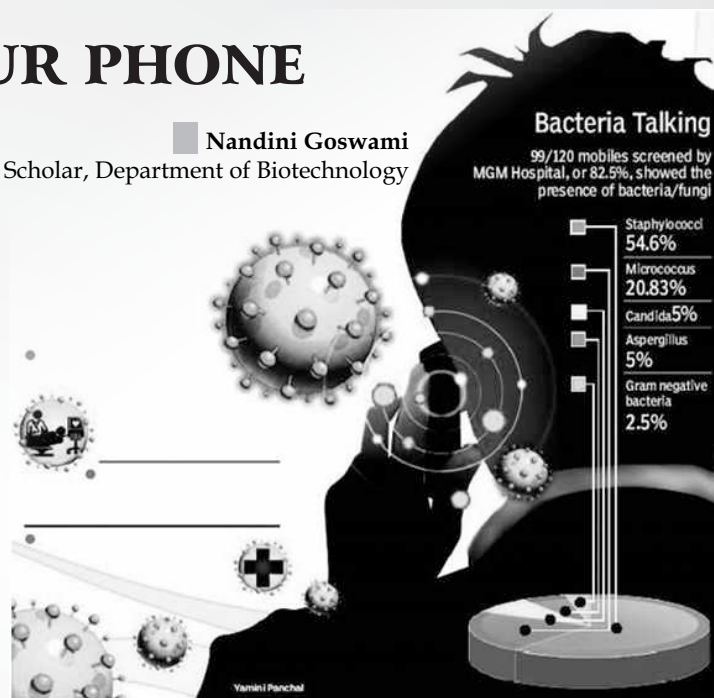
THE HIDDEN LIFE ON YOUR PHONE

GUESS WHAT?

Nandini Goswami

Research Scholar, Department of Biotechnology

Want to hear something scary? Halloween's ghouls, ghosts and zombies have nothing on your smartphone. That little electronic device of yours can be downright frightening. We take our cell phones everywhere. They live in our pockets and purses, rubbing up against loose change and the receipt from the gas station. We use them almost everywhere, and set them on nearly any available surface – the kitchen counter, the table at a cafe, a park bench. We even share them with others. An article published in 2009 in the journal "Annals of Clinical Microbiology and Antimicrobials" details a study involving the phones of 200 hospital staff members. The researchers found that 94.5 percent of the phones were contaminated with some kind of bacteria, many of which were resistant to multiple antibiotics. These disease-causing bacteria transfer from person to person through touch, which means that once the bacteria is on your hands, you only have to then touch your eyes or nose for the bacteria to find an easy route into your body. This is especially frightening when you consider how often your phone hangs out only millimeters away from your face. Studies like the one mentioned above have found colonies of streptococcus, staphylococcus and diphtheroids on people's cell phones. And there's even been one reported case of a person contracting an MRSA (methicillin-resistant staphylococcus aureus) infection – a so called flesh-eating bug – from a phone. From these results, it seems that the mobile phone doesn't just remember telephone numbers, but also harbours a history of our personal and physical contacts such as other people, soil and other matter. Some companies offer anti-microbial shells and screen protectors to guard against these scary germs, but you can keep your phone relatively germ free by simply remembering to clean it occasionally. Wipe it off with antibacterial wipes, swab it with some rubbing alcohol or even roll it around in your damp hands the next time you use hand sanitizer. With just a few simple steps, you can banish the boogiemens bacteria from your smartphone for good.



Source: 1. <http://www.aarogya.com/news-and-updates/year-2011/7258-microbesfind.html>

2. James F. Meadow, Adam E. Altrichter, Jessica L. Green. Mobile phones carry the personal microbiome of their owners. PeerJ, 2014; 2: e447 DOI:10.7717/peerj.447

Chemistry in Your Smartphone

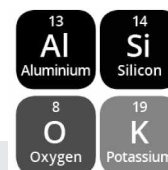
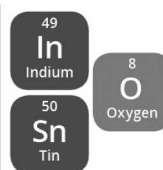
■ Pooja Maheshwari

Research Scholar, Department of Chemistry



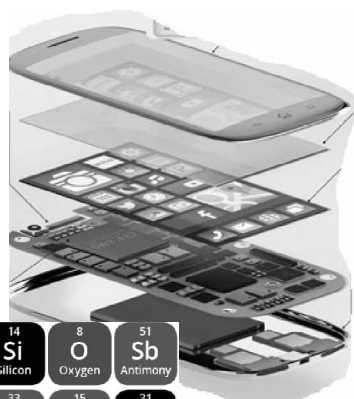
TOUCHSCREEN:

A transparent film of indium tin oxide- a mixture of indium oxide and tin oxide in the screen, conducts electricity. This allows the screen to function as a touch screen.



CIRCUIT:

Copper is used for wiring in the phone. The circuit board has gold, copper and silver-good electrical conductors. A mixture of tin, copper and silver is used to solder electronics in the phone.



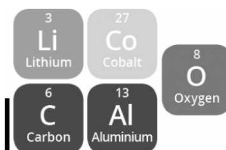
COMPUTER CHIP:

The chip is the brain of phone made up of silicon. Transistors act as paths and switches that tell the phone to follow or stop following commands, are made of antimony, phosphorus and gallium.



BATTERY:

It is made up of lithium cobalt oxide as a positive electrode and graphite as negative electrode. When you turn on your phone, lithium ions move through a lithium salt solution that conducts electricity and powers your phone. Aluminium is used in rechargeable battery's casing.

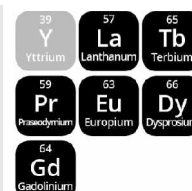


GLASS:

Smartphone screens contain aluminosilicate glass, composed of a mixture of alumina and silica. If you have ever dropped your phone and its screen has stayed intact, you can thank potassium ions, which help to strengthen the glass.

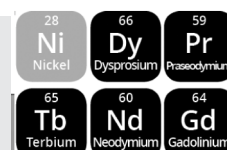
DISPLAY:

A variety of rare earth elements like yttrium, europium and dysprosium are used in small quantities to produce the colors on the phone LCD screen. Gadolinium, lanthanum and terbium give the screen its glow.



MICROPHONE AND SPEAKERS:

The microphone's wafer-thin diaphragm, which vibrates when sound waves strike it, is made of nickel. The vibrations are converted into an electrical current that becomes the audio signal. Magnets vibrate in the speaker to create audible sound. Magnets of neodymium are used because they're the strongest magnets, so even though they're small, they're powerful. Neodymium, terbium and dysprosium are used in the vibration unit.



The Nobel Prize in Science (2014)

■ Dr. Charu Sharma

Department of Biotechnology



Eric Betzig

Janelia Research Campus, Howard Hughes Medical Institute, Ashburn, VA, USA



Stefan W. Hell

Max Planck Institute for Biophysical Chemistry, Göttingen, Germany, German Cancer Research Center, Heidelberg, Germany



William E. Moerner

Stanford University, Stanford, CA, USA

Achievement - Development of super-resolved fluorescence microscopy

Isamu Akasaki

Meijo University, Nagoya, Japan, Nagoya University, Nagoya, Japan

Hiroshi Amano

Nagoya University, Nagoya, Japan

Shuji Nakamura

University of California, Santa Barbara, CA, USA

Achievement - Invention of efficient blue light-emitting diodes which has enabled bright and energy-saving white light sources



John O'Keefe

University College, London, United Kingdom



May-Britt Moser

Norwegian University of Science and Technology (NTNU), Trondheim, Norway



Edvard I. Moser

Norwegian University of Science and Technology

Achievement - Discoveries of cells that constitute a positioning system in the brain

Visits Organised

Department	Place
Botany	<ul style="list-style-type: none"> Nahargarh wildlife century Mansamata nursery and Sagar dam
Home science	<ul style="list-style-type: none"> Lotus dairy plant Hotel "Country inn and suits" Hotel "The Fern"
EVS	<ul style="list-style-type: none"> Sewage Treatment Plant at Delawas Hotel "Country inn and suits"
Biotechnology	<ul style="list-style-type: none"> Morarka organic private limited, DST-Science Park
CS & IT	<ul style="list-style-type: none"> Tech vista

Achievements 2014-15

Awards in Conferences/ Seminars



Prof. R. K. Bansal
Chemistry

- Best Teacher Award in 2014 from Association of Chemistry Teachers, Mumbai.
- Felicitation by Chief Minister, M.P. in 2014 on Hindi Diwas



Dr. Ameeta Sharma
Biotechnology

Third prize in National seminar and science model exhibition on Innovations in Science and Technology, Dr. B Lal's Institute & ISCA, Jaipur Chapter.



Dr. Sreemoyee Chatterjee
Biotechnology

- **First prize** in National conference on Ecologically Sustainable Development and Limitations of Growth, BBD College, Chimanpura.
- **First prize** in National conference on Emerging Trends in Water Quantity and Quality Management, Poornima University.



Dr. Neha Batra
Biotechnology

Second prize in Rajasthan Science Congress III 2015: Science, Technology and Innovation for Food, Energy and Water Security (FEW), Manipal University, Jaipur.



Dr. Radhika Sharma
Biotechnology

Second prize in National Conference on Bioprocess Technology: Basics, Advancements & Challenges, Jaipur National University.

Faculty

Ph. D Awards (The IISU)



Priyanka
Zoology
Supervisor: Dr. Priyanka Mathur



Navnet Sharma
Computer Science & I.T.
Supervisor: Dr. Vijay Singh Rathore



Payal Mehtani
Biotechnology
Supervisor: Prof. Pradeep Bhatnagar



Charu Sharma
Microbiology
Supervisor: Prof. Pradeep Bhatnagar

Departmental achievements

Event : 3rd Bazar on campus



CHEMISTRY

Most innovative business concept award & Campus company award



HOME SCIENCE

Best management theme award

Research Publications: International & National (2014)

Department	Total No. of Publications	Cumulative Impact Factor
Biotechnology	10	6.718
Botany	1	-
Chemistry	16	15.936
Computer Science & I.T.	1	-
Environmental Sciences	1	-
Home Science	10	-
Psychology	-	-
Zoology	9	2.500

Achievements 2014-15

Students

Ph. D Awards (The IISU)



Nupur Sobti
Environmental Sciences
Supervisor: Dr. Shelja K. K. Juneja



Suman Krishania
Botany
Supervisor: Dr. Kalpana Agarwal



Deepika Mehta
Home Science
Supervisor: Dr. Swati Vyas Ramani



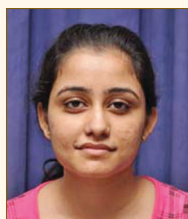
Meghana Agrawal
Botany
Supervisor: Prof. Madhu Kumar



Ravika Vijay
Physics
Supervisor: Prof. K.S. Sharma



Urvashi Vijay
Zoology
Supervisor: Prof. Pradeep Bhatnagar



Neha Rawat
Microbiology
Supervisor: Dr. Pallavi Kaushik



Priyanka Tiwari
Environmental Sciences
Supervisor: Dr. Shelja K. Juneja



Harleen Kaur Flora
Computer Science & I.T.
Supervisor: Dr. Swati V. Chande

Awards in Conferences/ Seminars



Pooja Maheshwari
Chemistry
First prize in
Oral Presentation



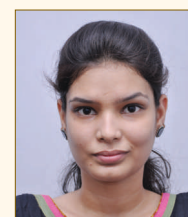
Nidhi Sogani
Chemistry
Third prize in
Oral Presentation



Sudesh
Chemistry
Third prize in
Poster Presentation



Komal Jangid
Home Science
Second prize in
Oral Presentation



Kuldeep Kaur
Home Science
Consolation prize in
Poster Presentation

National Conference on "Emerging Areas In Chemical Education & Research And National Convention of Chemistry Teacher" Organized by The IIS University, Jaipur on 16-18 Oct. 2014

National Conference on "Food based strategies. An Initiative combat micronutrient Deficiencies" organized by The IIS University, Jaipur on 21-22 Jan. 2014



Shruti Agrawal
Biotechnology

Third prize in Poster Presentation in Intercollegiate Annual Techno-Cultural Fest BIOCHROME 2014 (21-23 Nov. 2014).



Anita Chauhan
Botany

Second prize in Poster Presentation in National Conference on "Biodiversity: Harmonizing Conservation with Life and landscape of Arid and Semi Arid areas", The IIS University, Jaipur (29-30 Oct. 2014).



Ms. Sonal Jain
Environmental Sciences

♦ **First prize in** Poster Presentation in 3rd Annual Convention on Climate Change and Water (SGVU C3W 2014), Suresh GyanVihar University, Jaipur (26-28 Sept. 2014).
♦ **Second prize in** Poster Presentation in National Conference on "Biodiversity: Harmonizing Conservation with Life and Landscape of Arid and Semi-arid Areas", The IIS University, Jaipur (29-30 Oct. 2014).



Ruchi Middha
Environmental Sciences

Second in merit and was graded as excellent in Six Weeks Summer Training course on "Remote Sensing and Geographical Information System (GIS)" at HARSAC, Hisar (09 Jun.-18 Jul. 2014).

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Dr. Raakhi Gupta, Registrar

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Student Coordinators: Ms. Pooja Maheshwari, Ms. Manjinder Kour, Ms. Nandini Goswami, Ms. Richa Pundir, Ms. Gajal, Ms. Smriti Ghosh
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