

BIOTECHKNOWLEDGE

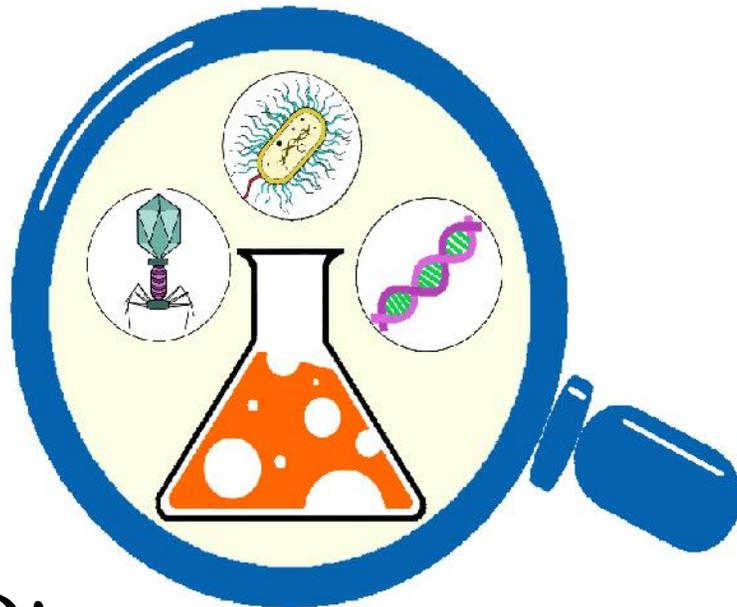
BIOTECHKNOWLEDGE

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HISLOP SCHOOL OF BIOTECHNOLOGY

**HISLOP COLLEGE
NAGPUR**



Biotech that matters

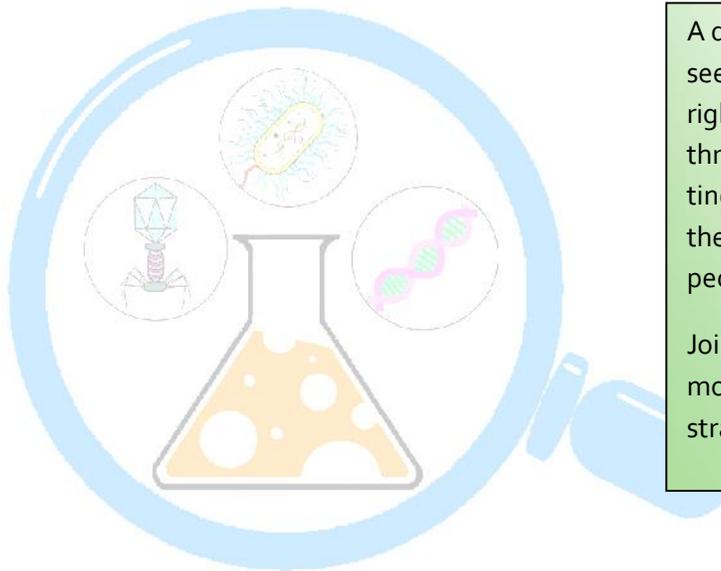
A STUDENT OPERATED INITIATIVE

SPECIAL MENTIONS

A salute to our student achievers.

A brief overview of both the past and present of biotechnology. Delving as far back as the beginning of various civilizations, ours is the hidden science behind the workings of many common articles.

Imagine staying 20 for the rest of your life. Nanotechnology and the recent research into nanorobots aims in achieving the unthinkable . Buckle up for an exciting future.



A disease that seems to come right out of a sci-fi thriller. The blue tinged Fugates and the reason for their peculiar skin tone. Join us as we learn more about this strange disease

A short list of conferences to be held both on national and international levels.

Students speak up about their views on the meaning of biotechnology

Our distinguished alumni Ms. Jyoti imparts her experiences as a researcher.

A nod to our in-house artists

A LETTER FROM THE EDITOR

Biotechnology can still be viewed as a new and emerging field of science. Many students remain unaware of the nuances and beauty of this field. Aiming to bridge the gap between the subject and its students, our young team of aspiring scientists and writers joined hands to prepare 'BIOTECHKNOWLEDGE', a magazine filled with recent research and informational tidbits packaged into user-friendly articles.

Focusing mainly on research oriented topics, we at BIOTECHKNOWLEDGE's aim at introducing the recent groundbreaking research and discoveries to the student generation. It is also a medium for students to try their hand at writing scientific articles, enabling them to find an interest in the research stream.

We at BIOTECHKNOWLEDGE wish to publish a new issue every 4 months filled with informational articles, crosswords, riddles and much more. Our team comprises of young and energetic members ready to tackle challenges and wish to continue doing so. This can be achieved only by virtue of the valuable help provided by you, our esteemed readers. We at "BIOTECHKNOWLEDGE" implore all the readers to support us in our new venture by submitting their articles as well as joining us in our discussions.

Awaiting your reviews,
Carren S. Thomas
Founder and Editor-in-Chief



BIOTECHNOLOGY – THE PAST AND PRESENT

- ***Carren Thomas***
- ***B.Sc Sem IV***

The etymology of a word can not only help define it, but can also explain the origins of said word. Take for example the word “Biotechnology”, in this word “Bios” is the ancient Greek word for “Life”. The “Techno” comes from the Greek word meaning “tools” or “skillfully made”, “logos” can be translated as “essence” or “the study of”. Therefore biotechnology can be derived as “The essence of tools from living things”. Though the term was coined by Karoly Ereky in 1919, the practice of biotechnology is far older.

Historically speaking, the invention of cheese can be considered as one of the first direct products of biotechnology. The use of yeast in the production of various products like wine, vinegar and bread can also be viewed as the same.

The studies of Mendelian genetics, Mieschers study of nuclein inside the nucleus of human WBC’s, discovery of Penicillin by Fleming, all come under the umbrella of biotechnology. One of the most interesting studies under biotechnology is the cloning of Dolly- the sheep which lead to the Human Genome Project that was completed in 2005, which interestingly showed the complete genetic blueprint for building a human being and lead to the formation of the “6th day law”.

Today, biotechnology is being used in countless areas including agriculture, bioremediation and forensics, where DNA

fingerprinting is a common practice. Industries and medicine alike use the techniques of PCR, immunoassays and recombinant DNA. Genetic manipulation has been the primary reason that biology is now seen as the science of the future and biotechnology as one of the leading industries.



Father of Biotechnology - Karoly Ereky

STUDENT ACHIEVERS

- *Shailendra Mohare*

- *M.Sc Sem II*



Aayushi Chafale (NET-JRF June 2018)



Jaya Singh (NET-LS June 2018)



1st Merit M.Sc. Biotechnology 2018
Ms. Gunjan Verma



3rd Merit M.Sc.
Biotechnology 2018
Ms. Nidhee Patil



Sanchita Das (NET-LS June 2018)

TIFR -2018 cleared students

**Deepak Khushalani, Nidhee patil,
Raunakk Rawal, Shaily Agrawal**

Guest Lecture by Shuchita Soman, NCBS

Date: 19/12/2018

Ms. Shuchita Soman, an alumna of Hislop School of Biotechnology, is currently working as a Research Fellow at National Centre for Biological Sciences, Bangalore. She was in the department to talk about her work she is currently pursuing. Her topic of research is "Studying the interactions of dopamine with serotonin 2A receptors." So basically she explained about crosstalk between one ligand which is dopamine and altogether a different receptor, 2A receptor, which is not a receptor for dopamine but a serotonin receptor. She explained briefly about the cell signaling mechanisms associated with these receptors. She talked about three phenotypes which get affected because of these signaling pathways i.e., Internalization of the receptor, increase in intracellular calcium levels and formation of cell adhesion mediated stress fibres. She gave very good information about the current status of treatment of various neurodegenerative disorders like Parkinson's disease and elaborately explained how her current research can help reduce the side effects of Levodopa Gold standard treatment for Parkinson's disease. Students from B.Sc and M.Sc attended the lecture and had an intellectual informal chat with Shuchita. All the faculty members also attended the lecture. An experience of watching a short video of

fluorescence coming out from the treated cell lines was very enlightening.



Dr. Avinash Upadhyay, Director, Hislop School of Biotechnology, introducing Shuchita



Blue Family Syndrome

- **Akshata Nandanwar**

Would you believe me, if I told you that there are mutants among us? The Fugates, a family that lived in the hills of Kentucky, commonly known as the “Blue Fugates” or the blue people of Kentucky, are notable for having been carriers of a genetic trait that led to the disease methemoglobinemia, which gives the sufferers a blue-tinged skin.



A family of people with blue skin lived in Kentucky for many generations. The Fugates of Troublesome Creek are thought to have gained their blue skin through combination of inbreeding and a rare genetic condition known as methemoglobinemia.

weird-facts.org

@factsweird

The Fugates family

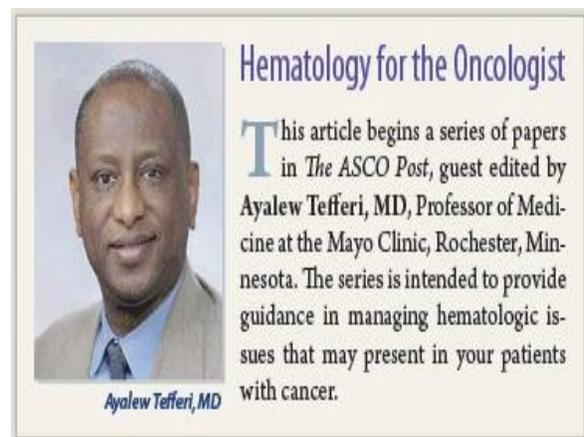
In their case, blue skin was caused by a rare genetic disease called Methemoglobinemia. This is essentially a blood disorder in which an abnormally high amount of Methemoglobin - a form of hemoglobin is produced. The reason behind this is Argyria or Argyrosis, which is a condition caused by excessive exposure to chemical compounds of silver, or to silver dust. The most dramatic symptom of Argyria is that the skin turns purple or purple grey. It may take the form of generalized Argyria or local Argyria.

The blue trait is a good example of something that does not fit the traditional

view of allele as being dominant or recessive. Treatment methods include practices like

1. Avoid the cold if you find that it is causing your hands to turn blue.
2. Descend to a lower location if you recently arrived somewhere with a high altitude.
3. Cut down on smoking or quit altogether.
4. For a bruise , ice and compression can help prevent swelling.

Dr. Ayalew Tefferi , a Heamatologist from Minnesota’s Mayo clinic during an interview explained that it also exemplified the intersection between the disease and society , and the danger of misinformation and stigmatization. He states that “You almost never see a patient with it today, it’s a disease that one learns about in medical school and it is infrequent enough to be on every exam in Hematology”



Dr. Ayalew Tefferi

THE WAY FORWARD- *Shailendra Mohare***Top Ph.D. Entrance Tests in India**

<u>ENTRANCE TEST</u>	<u>TENTATIVE DATES</u>	<u>CONDUCTED BY</u>
CSIR-UGC NET exam	June and December	Council of Scientific & Industrial Research, India
NCBS Joint Graduate Entrance Examination for Biology and Interdisciplinary Life Sciences (JGEEBILS)	December	National Centre for Biological Sciences, Bangalore
DBT JRF Biotech Entrance Test	February	Department of Biotechnology
ICMR JUNIOR RESEARCH FELLOWSHIPS	July	The Indian Council of Medical Research, New Delhi
JRF-GATE	February	Council of Scientific & Industrial Research, India
NIPER Ph.D. Entrance Exam	June	National Institute of Pharmaceutical Education and Research (NIPER)
AIIMS Ph.D. Entrance Exam	Jan, July	All India Institutes of Medical Sciences (AIIMS), New Delhi
BARC Ph.D. Admission Test	February	Bhabha Atomic Research Centre (BARC)

Ph.D. in Biotechnology: Course Highlights

<u>Course Level</u>	Post-Graduate
<u>Duration</u>	3 to 5 years
<u>Examination Type</u>	Semester System
<u>Eligibility</u>	Post-graduation in Biotechnology/Life Sciences
<u>Admission Process</u>	Post-graduation in Biotechnology
<u>Course Fee</u>	INR 50,000 to 4,00,000

Biosensors

- *Monika Lonhare*

Technically speaking biosensor is a probe that integrates biological components with electronic components so that we can get a measurable signal. The development of biosensor for analytical purposes has attracted a great deal of attention in the recent years.

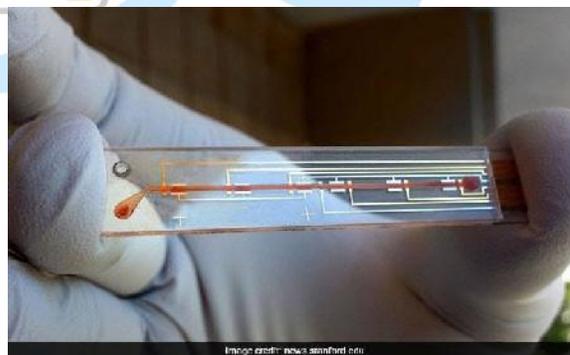


A chewing gum as a sensor

A biosensor is defined, as an analytical device which converts the biological signal or response into electrical signal. Biosensor consists of a biological component (enzyme, antibody, entire cell or DNA) and a physical transducer (electrode or, optical device). Biosensors are mostly designed for routine analyses like clinical diagnosis and quality control of food. Its process can be simply explained via the examples of control of fermentation and in environmental analysis. There are various type of biosensors such as enzyme based, tissue based, immunosensors, DNA biosensors or thermal and piezoelectric biosensors, etc....

The progress at present being made on biosensor is that they have been hailed as the solution to many analytical problems in a wide range of industry. The heterogeneity

of the proposed market is equaled by that of the technology called "biosensor". Many research groups worldwide are prolific in their publication of research papers and patents. Hence the field is not limited by a lack of information regarding the fundamental technology. However, there are a few successful commercial biosensor products that will be available to the general public in the near future. A prime example is chewing gums equipped with a biosensor that can be used to detect signs of oral disease. Their sensor is triggered by certain disease associated enzymes in the chewer's saliva. This leads to the action of the enzyme matrix metalloproteinases that break the sensor apart by targeting the protease cleavable fragment of the sensor. This frees a bitter taste inducing substance. The bio-sensing gum is as of today, yet to be tested in people.



A biosensor kit

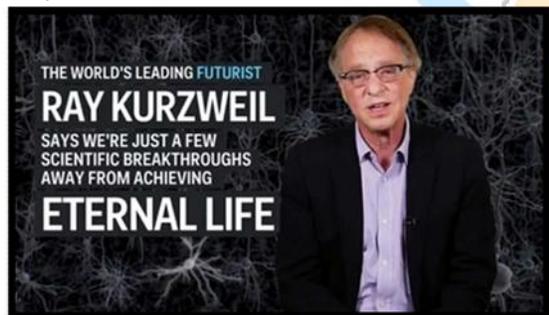
Nanotechnology and Anti-Ageing

- Neha Ambarkar

As with every new Technology, there is always a flip side to this coin. Do we really want to live longer and will planet Earth be able to cope with the burgeoning population? Will this Technology just work for only those with means while the rest are left to die?

According to Ray Kurzweil, a computer scientist and winner of the US national medal of technology, in the near future biotechnology and nanotechnology will be combined to manipulate atoms and molecules and stop the ageing process. He also states that anybody who will live to see 2050 will have a very high chance of living nearly 10 times longer.

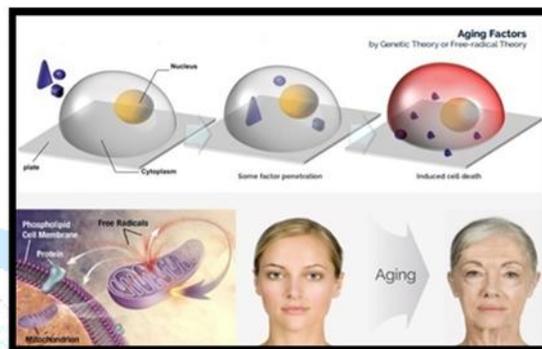
The study and application of minuscule matter can be used across all sciences. Nanoparticles consist of natural or synthetic polymers, lipids or metals.



Ray Kurzweil

Nanotechnology can be used to prevent diseases by introducing nanoparticles into the blood stream as microscopic robots. The Nanorobots can search for conditions,

mostly terminal. They then report back to computer and automatically secrete defective tissue lyases, which then stops the disease from its further spreading. .



Action of aging

During aging, cells which used to reproduce, slow down or stop altogether. Organs of the body start losing some of their functions, gray hair sets in, wrinkles appear and the skin becomes less elastic. What happens at this stage is that when a cell dies, our bodies replace it immediately. The problem that arises though is that our bodies do not produce exact copies. As the copying process to replace dead cell continues, many details are lost and the result is age. With the use of this technology, scientists believe that natural ageing process can be stopped altogether. Additionally the Nanorobots will report any threats in the form of diseases or organ failure and fix the situation on the spot.

THE VOICE OF ALUMNI

- *Yogita Ahuja*

“Learning science is not limited to research...”

Based in Delhi, Ms. Jyoti Singh is one among our wide array of distinguished alumni. Born and raised in Ballarshah, a city in the Chandrapur district of Maharashtra, she has completed her Masters from Hislop School of Biotechnology. Her research during her Ph.D was based on cellular localization and comparative analysis of rice blast resistance gene, earning a huge repertoire of knowledge under the mentorship of Dr. T. R. Sharma, who is the Executive Director, National Agri-food Biotechnology Institute. When questioned on the reasons why she decided to get into the field of plant biotechnology, she enthusiastically replied that it was her interest for the research field and her love for plants that led her in this direction. She mentioned that the opportunity to work on rice plant was a boon as rice is a staple food for many across the world.

Explaining more about how students can make a career in the field of science she stated that first and foremost, students should retrospect and discover the aspect of science which interests them. She declared that science is not limited to research and that scientific learning is necessary in every field and every aspect of life. Once a student has decided on the path that they wish to pursue they can apply for various exams like NET, SET or GRE and work accordingly.

When talking about her future plans, she mentioned about her interest in continuing her research on transgenic crops and whether

they grow equally well in natural conditions. Her aim is to let such genetically modified crops be available for commercial use. She also hopes in succeeding to establish her own laboratory someday.

Her message to students is that learning is an invariable and unending process. Learning new things leads to a greater development and awareness. She believes that the students have a plethora of untapped potential and that India has the greatest diversity when it comes to talent. She advises students to look constantly for opportunities, not limiting themselves to a single country.



Dr. Jyoti Singh

INTERNATIONAL CONFERENCES

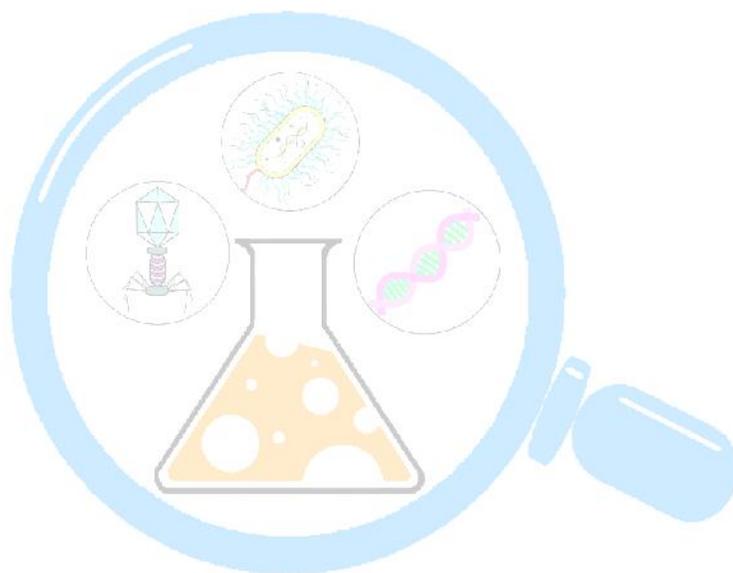
- **Vaikhari Kathawate**

DATES	NAME	LOCATION
1 st February	<u>5th International Conference on Life Sciences and Sustainability 2019 ?(ICLSS 2019)</u>	Kuching, Malaysia
15 th February	<u>2nd International Conf. on Communication Technology, System Engineering, Robotics, Software Technology & Applied Science</u>	Taipei, Taiwan
27 th February	<u>ACM--2019 The 2nd International Conference on Machine Vision and Applications (ICMVA 2019)-- Ei Compendex, Scopus</u>	Tokyo, Japan
11 th March	<u>6th Annual Sample Prep, Assay Development, and Validation</u>	San Francisco, United States of America
19 th March	<u>Bioprocessing Summit Europe Annual International Conference</u>	Lisbon, Portugal
25 th March	<u>on Emerging Issues in IT, Applied Sciences, Engineering Managements & Networking</u>	Accra, Ghana
28 th March	<u>2019 4th International Conference on Pharmacy and</u>	Tokyo, Japan

29th March

Pharmaceutical Science
(ICPPS 2019)
KEM--2019 the 9th
International Conference on
Key Engineering Materials
(ICKEM 2019)

Oxford, United Kingdom

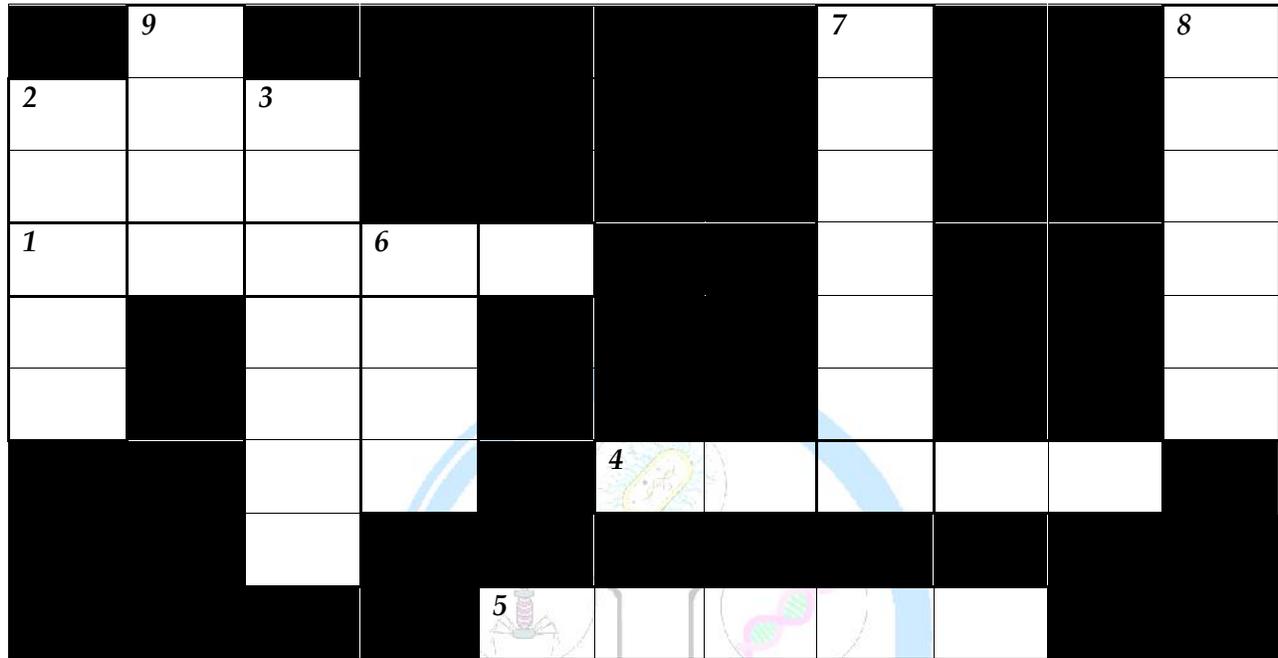


NATIONAL CONFERENCES- ***Lakshana Mandve***

DATES	NAMES	LOCATIONS
1st February	<u>International Conference on "Recent Developments in Chemical Research" 2019</u>	Jaipur, India
3rd February	<u>WRFER- International Conference on Forestry Food and Sustainable Agriculture (ICFFSA)</u>	Kochi, India
18th February	<u>National Conference on Advances in Science, Agriculture, Environmental & Biotechnology (NCASAEB)</u>	Chennai, India
23rd February	<u>ISETE - International Conference on Biological, Agricultural & Environmental Science(ICBAES)</u>	Dehradun, India
3rd March	<u>WRFER- International Conference on Forestry Food and Sustainable Agriculture (ICFFSA)</u>	Jaipur, India
17th March	<u>WRFER- International Conference on Forestry Food and Sustainable Agriculture (ICFFSA)</u>	Hyderabad, India
29th March	<u>RW- 569th International Conference on Applied Physics and Mathematics (ICAPM)</u>	Delhi, India
31st March	<u>WRFER- International Conference on Forestry Food and Sustainable Agriculture (ICFFSA)</u>	Jaipur, India

CROSSWORD – EXPAND YOUR MIND

- *Carren Thomas*



ACROSS

- 1) Greek word for essence
- 4) bond breaking enzyme
- 5) One of the scientists who got the
... Nobel Prize for Medicine in2006

DOWN

- 2) What was the name of the cloned
sheep
- 3) Who are the blue family
- 6) Bio-sensing gum detects ___ disease
- 7) Reason for Methemoglobin
- 8) Non cancerous tumour is also called
- 9) The study of the miniscule is a s
___-technology

ARTISTS CORNER

- **Shrihari Tote**



Srihari Tote



Madhavi Wele



Srihari Tote



Madhavi Wele



Madhavi Wele

STUDENTS SPEAK

-Saurav Angnani

Biotechnology has helped us discover micro organisms. This has helped understand the importance of even the smallest living organisms in this world.

-Karthik Shivkumar, B.Sc1

Biotechnology is multidisciplinary and involves cell biology, microbiology, genetics and biochemistry.

It has brought total revolution advancement and superiority in various fields in the past 2-3 decades

-Harshit Pardhi, B.Sc1

Biotech is basically a vast game changer field. Y' know it's like a wild card in the medical as well as industrial and engineering field. It literally merges with like, such a huge range of fields. From our own, microbiology to chemistry to even engineering! It's so vast!

-Sakshee Bhartiya, B.Sc1

What is
Biotechnology to
you?

BIOTECHKNOWLEDGE

Biotechnology is the science that allows us to connect with and understand even the smallest particles around us.

-Mihir Phadke, B.Sc1

Biotechnology for me is a way to connect with all living organisms and use them to improve the life of other organisms

-Mihir Raut, B.Sc1

For me, Biotechnology means a way to know about the ethics and techniques of studying the smallest living organisms. It's amazing to know every day the ways and techniques of analytical studies....

It simply proves the influence of technology over various fields and importance..

-Justin Thomas, B.Sc1

anwar

- 1) The use of biotechnology dates as far back as 1919. Roughly 50 years later researchers used bacterial genes to perform the first successful recombinant DNA experiment.
- 2) An octopus can re-grow its arm.
- 3) Women's heart beats faster than men's.
- 4) During your lifetime you will produce enough saliva to fill two swimming pools.
- 5) Your nose can remember 50000 different scents.
- 6) Humans are born without bacteria and acquire them over the first few years of life.
- 7) It takes 17 muscles to smile and 43 to frown.

RIDDLES...

- ***Akshata Nandanwar***

- 1) Blue is the color of the ocean, the study of water and bodies of water is termed as
- 2) When the son of water returns to the parent, it dies, what is it?
- 3) Many have heard it, but nobody has ever seen it. It will not speak back until spoken too, what is it?
- 4) What did the scientist say when he found two atoms of helium?
- 5) What is black when you buy it, red when you use it and grey when you throw it away?

