CHRIST UNIVERSITY
BANGALORE, INDIA
Declared as Deemed to be University under Section 3 of UGC Act 1956

BiOLink

Newsletter, Department of Biotechnology *Volume 1, Issue 2, January 2013*

"Education- That which discloses to the wise and disguises from the foolish their lack of understanding."

~Ambrose Bierce,

The Team.....

Staff Coordinator:

Vasantha V. L

Student Coordinator & Editor:

Saranya Jayaram

Core Committee:

Aishwarya R

K. Karthik

Pragati Chengappa

Tanima Deb Malik

Shreya Harikesh P K

Namrata Shukla

Vimala Ashok Mani

FROM THE VICE CHANCELLOR...

The Department of Biotechnology has consistently shown keen interest towards conducting various seminars, certificate courses and innovative activities to orient the student minds to the upcoming field. Biotech as a field, is just a young branch of science and yet, offers great scope for talented and interested students to take up ventures in industry and research. To provide an insight to the young minds, the Department of Biotechnology came up with its first annual newsletter – *BIOLINK*. Continuing this trend, I understand that they have come up with the 2nd issue to provide a platform to encourage the students .

I wish them luck for all their future endeavours.

FROM THE EDITOR'S DESK...

"I dreamt about a painting and I painted my dream"

Life is a journey full of dreams, which when come true, enrich our experiences with ecstasy and joy. One such dream of ours was to publish a newsletter portraying the upcoming trends, latest news and complementing it with the bubbling talent and creativity of our students. And to make this a reality was a challenge, but nevertheless, it was a job well done. So, following the footsteps and continuing the legacy of *BIOLINK*, here we present to you the 2nd issue of our annual newsletter for the year 2013.Akin to our first issue, we have brought to light, the recent advancements in the field, the future of this field along with career opportunities and the hidden talents of our students. We hope this would be a fun and enriching reading experience for our readers, and would help them probe into their minds to channelize their thoughts and interest towards the bright future.

HAPPY READING !!!

- Prof. Vasantha V. L (Staff Editor)
& Saranya Jayaram (Student Editor)

CARBONATED LASSI DRINK FOR INDIA -THE NEW SOFT DRINK

Lassi, a common yogurt based Indian drink now can be available as a fizzing refresher low in calories and sugar content, offering the common soft drink some serious competition.

Recently after four years of research, scientists at the National Dairy Research Institute (NDRI) in Haryana have discovered a bacterial strain of *Leuconostoc* which will be used to manufacture carbonated sweet lassi, just like any soft drinks.

The developed bacterial strain of *leuconostoc* has the ability to produce an appreciable amount of mannitol, a low calorie natural sweetener, preserving the sweetness in curd. As reported by the three scientists: Falguni Patra, A K Singh and Rameshwar Singh;

"In this study mannitol producing strains of *Leuconostoc spp*. (210) were isolated from a wide array of sources such as raw milk, fermented milks, fermented cereal foods, fruits, vegetables and sugar factory syrup.

During initial screening, half of the population of these isolates (105) exhibited ability to produce mannitol to a variable extent.

Cultural and environmental factors affecting growth and mannitol production were studied for four high mannitol producing isolates. High mannitol production was favoured by high temperature and high pH."

The sweetened carbonated Lassi will be 35 per cent less in calories and 65 per cent low in sugar than any artificial sweetener. It also adds a tingling flavour with a characteristic effervescence due to its natural biofortification and carbon dioxide production during the process of fermentation of milk. The normal soft drinks contain a high amount of calorie content approximately in between 80 to 90.The researchers are hoping that it will find favour not only with diabetic patients, but also with the with teenagers for its low calorie content.

- SWAGATA MUKHERJEE
1st year BCZ

THE IMPORTANCE OF "JUNK"

Have you ever stopped and wondered, what it is that makes us tick? Yes, we've all studied about the various organs in our bodies that together form organ systems to help us function correctly. But what makes these organs work? A student of biology might say that the cells that make up the tissues are the reason behind their functioning. They wouldn't be wrong, but there is a lot more to these cells than what the average person would be aware of. The most crucial of all the cellular components are tiny. They lie in highly coiled and condensed structures and they are, without doubt, the reason behind our very existence. They are our DNA. Passing genetic information down generations, they make us what we are today. So one might wonder, why I'm talking about the most important part of us, in reference to junk. The answer lies in the work done by Susumu Ohno in the year 1972, he coined the term "Junk DNA" which was used to describe all the sections of the DNA whose use was unknown. They tried assigning the term non coding DNA for them, but that wasn't entirely true, most of the Junk DNA codes for proteins that have no purpose. There was a time when it was believed that 95% of our DNA was Junk DNA. Although over 80% of our DNA is transcribed, it's very difficult to say why exactly our DNA contains such large quantities of unnecessary matter. Correlations have been made between the complexity of an organism and their genomic size, which in turn would directly affect the Junk DNA size, but there are exceptions that cannot be ignored, for example, the genomic size of the unicellular *Polychaosdubium*, a freshwater amoeboid, is 200 times larger than that of humans. So while it is still entirely unknown as to why we have such vast stretches of our DNA without a definite use and why some of them even code for proteins that do not benefit the host organism, several scientists have ventured guesses on their existence. Some say that Junk DNA is only present in order to create spaces, so that the enzyme complexes that help transcribe or replicate them can get space to function more easily. Some say that they act as spacers to create gaps or delays before another functional sequence is coded, giving the previous protein time to get completed. Some say that these stretches used to have some specific use in our fetal development stages, and no longer have any use once we are born. However of all these theories, perhaps the most interesting is the one which says that Junk DNA is a way for an organism to evolve, by keeping reservoir of more DNA sequences than we actually require. Thus the organism may suddenly find some particular sequence that may code for a protein which will benefit us it the future.

-ASHIM PAUL DEB
2nd year BCB

VIRUSES- NOT JUST A NUISANCE, BUT A BLESSING?

Piezoelectricity can easily be defined as the harnessing of energy, specifically electrical energy, from mechanical movements or pressure. The concept of "piezoelectricity" was first introduced by French physicists Jacques and Pierre Curie in the year 1880. Over the years, many researchers have tried to tap into the power of the Piezoelectric crystals, and mostly, the Japanese have been at the forefront of Piezo-power research. Piezoelectricity can also be harnessed from ceramics, bones, proteins, and DNA. Although we understand how the energy can be harnessed through the mechanical movement of these molecules, the application of this phenomena has remained a mystery.

However, quite recently, a group of scientists in the Lawrence Berkeley National Laboratory in the United States have tapped into the most commercial way to use this technology. They have tried and tested the use of viruses to generate energy. They created a minute generator that was powered by the piezoelectric power of the biological movement of the viruses. This generator was then used to power a small display screen, so that when a finger tapped the touch-screen, the viruses would turn the energy from the tapping into an electrical charge to power the display.

Although in its baby stages at the moment, this small but monumental breakthrough shows us the potential of piezoelectric technology. Not only are these viruses harmless to humans, they also have the potential to create more efficient and sizeable technology, as the team at Berkeley predict that this technology may be used to create "paper-thin generators" that would not only be savvy and easy to use, they would also be durable and not require any upkeep of sorts, since they would be powered by such biologically viable molecules. According to the researchers of Piezoelectricity, we should all look forward to the possibility of a virus-powered phones and LCD Televisions in the near future.

- PRAGATI CHENGAPPA
2nd year BCB

INTERVIEW OF MR. RAVI C DASGUPTA, THE HEAD OF HR DEPARTMENT, BIOCON.

A man with many sojourns in his own field, he had been working with Smith Kline before its merger with Glaxo. He was also the HR director of an American MNC before he joined Biocon and has been associated with Biocon for the last 5 years.

Q: While recruiting a prospective candidate having a Biotechnology background, what would you look for in the candidate? Is work experience an integral criteria?

A: Given a choice, a candidate having industrial experience is preferred than the one who is freshly out of college. But campus recruitments from colleges like IIT Delhi are being done. Very often interns are recruited. In a year there may be around 100 interns, working generally for a period of 2-6 months. The internships are supported at a PG level generally. People usually opt for internships at the R & D level, as that is the most preferred route for entering the company.

Q: What sort of a higher education should a student of BSc. Biotechnology pursue in order to get recruited in prestigious Biotech companies like yours?

A:There are many options . It depends on two things- the inclination of the candidate and the position applied for. If one is interested in research, then he/she should opt for the technical areas like MSc, PhD etc. But if one is inclined towards the managerial aspects, then an MBA would be apt.

Q: Are BSc- MSc students at a disadvantage as compared to the B.Tech-M.Tech students when it comes to recruitment?

A:As said earlier, it depends on the field the candidate is being recruited into. When we recruit people in the production and managerial areas, we prefer a B.Tech candidate due to his knowledge of instrumentation and process orientation. But when we recruit people for core wet lab jobs, MSc s are preferred.

Q: So are the future prospects very different for MSc s and M.Tech s in companies like Biocon?

A:In India, degrees are very important. If one enters the work stream directly after a BSc, then he is eligible only for entry level jobs. Even for quality control, we prefer MSc s because when MSc s are available, then BSc s shall obviously not be preferred.

Q: So are the future prospects very different for MSc s and M.Tech s in companies like Biocon?

A:In India, degrees are very important. If one enters the work stream directly after a BSc, then he is eligible only for entry level jobs. Even for quality control, we prefer MSc s because when MSc s are available, then BSc s shall obviously not be preferred.

Q: Where does Biotechnology stand today in India? What are it's future prospects?

A:Among the different fields of Biotechnology, Biopharma is undoubtedly the largest and it is also doing well in India. Unlike chemical and regular pharmaindustries, which are about 50 to 100 years behind the US in India, Biotechnology is relatively new. We are not so far behind and can compete on a world stage.

About BIOCON...

Q:Where does Biocon stand and what are its future goals?

A:Biocon is not only a pure play Biotech company. We are also a commercial organization, unlike others who mostly deal with early stage discovery and development. We are the largest producers of Insulin in Asia. Presently, we are focusing on competing only with the MNCs on a world stage and building a world class company.

Our recent launch last October was INSUPEN, the insulin injecting device. Currently we are working on oral insulin tablets. The clinical trials are on with positive results. We are also working on the co- development of monoclonal antibodies. With all these advancements, we see Biocon as a billion dollar company within the next 5 years.

Q:What obstacles are you facing on your rise to the top?

A:Firstly, it is capital, as the equipments are extremely expensive and most of them are imported.

Secondly, it is the academic mindset of the institutions. Since IT industry has been on the rise recently, there is a boom of institutions pertaining to education related to IT, and it is very difficult for us to recruit people with that sort of a background.

What we need is high caliber and few people. Biotechnology industry is not people intensive, it is technology intensive. People misunderstand the scope of Biotech. Scope is there to do state of the art cutting edge stuff.

We are not so far behind and can compete on a world stage. Industries, which are about 50 to 100 years behind the US in India, Biotechnology is relatively new.

The "Brain-workout"…

FIND 5 DIFFERENCES

Genetically Modified Crops (GMCS)

Word Search

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

ANTIBODIES
CHROMOSOME
GENE
MUTATION
PROTEINS

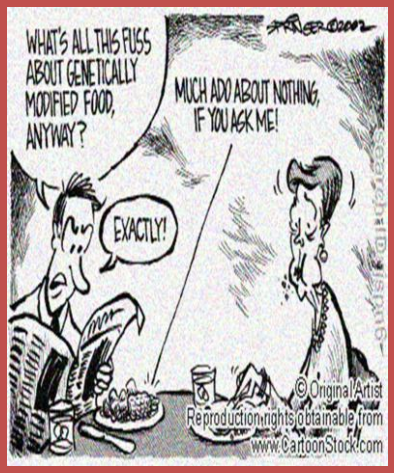
ANTIGENS
DOMINANT
GENOME
NUCLEOTIDE
RECESSIVE

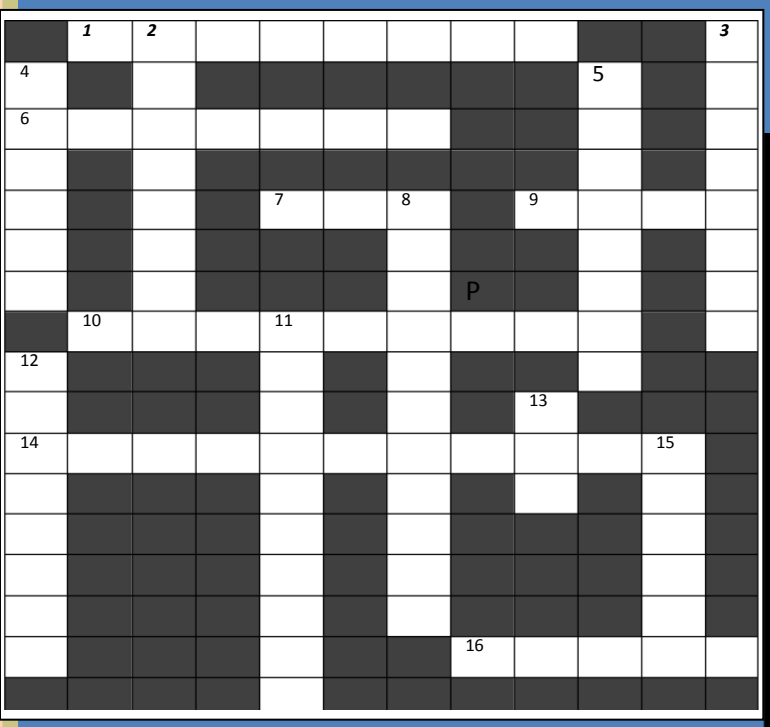
BASEPAIRS
ENZYME
HYDROGEN
NUCLEUS
SEQUENCE

FIND THE *MISTAKES* IN THE PICTURE

"Bio-comics"…

.....





crosstech

ACROSS

1.The genetic material that is found in plastids in plant cells (8)

6. First pharmaceutical product of rDNA technology approved for human use (7)

7. The portion of ER (endoplasmic reticulum) that is studded with ribosomes to give a granular appearance (3)

9. One of the 3 type of RNA, synthesized in the nucleus, enters the cytosol and participates in protein synthesis. (4)

10. Aka Endoglucanase, a type of enzymes produced chiefly by fungi, bacteria, and protozoans (9)

14.Friedrich Miescher is known for discovering these in 1869 (7,5)

16. A collection of tissues joined in a structural unit to serve a common function (5)

DOWN

2. Suicide bag of the cell (8)

3. Cheapest substrate for fermentation (8)

4. A monosaccharide with the formula $C_5H_{10}O_5$ (6)

5. Two strands of DNA are held together by this kind of bonds (8)

8. A biological polymerization processes proceeding in 3 enzymatically catalyzed and coordinated steps (11)

11. Unique enzyme present in fireflies that makes them fluoresces (10)

12. A sweet protein present in West African shrub called serendipity berry (8)

13. ... gene, the symbol for any gene controlling bacterial nitrogen fixation (3)

15. The central region where piles of thylakoids arelocated (6)

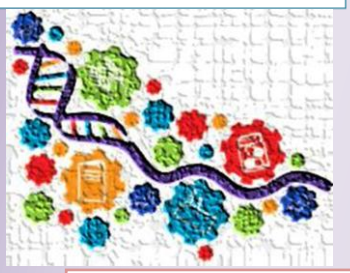
ANSWERS

ACROSS:1.PLASTOME 6 INSULIN 7. RER 9.mRNA 10. CELLULASE 14.NUCLEIC ACIDS 16. ORGAN

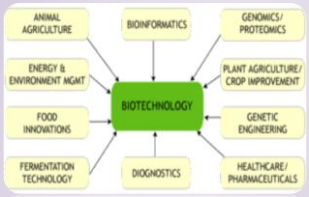
DOWN:2.LYSOSOME 3. METHANOL 4.RIBOSE 5.HYDROGEN 8. REPLICATATION 11. LUCIFERACE 12..MONELLIN 13.NIF 15. STROMA

-NEIHENUO CHUZHO
3rd year BCB

COLOURS OF BIOTECHNOLOGY...



Red Biotechnology-
medical applications



Blue Biotechnology-
Marine & aquatic applications

Green Biotechnology-
Agricultural applications

White Biotechnology-
Industrial Applications

THE "CUP-LIST"!!!

Voice for BT- Public Speaking(State level Contest by Novozymes):

Namrata Shukla

Science Exhibition:

1st Place - Vimala M, Madhumitha

2nd Place- Anjana S, Kunzangla, Shirin Patel

3rd Place- Karthik K, Anjali, Vaishnevi Raj

St. Joseph's Fest:

2nd Place (Quiz)-Anjana S (Quiz)

1stPlace(Model Exhibit) – Anjana S

2nd Place (Crisis Management)-Namrata S, Hugo De Souza, Radhe Shyam

3rd Place (Crisis Management)-Mishal A, PoojaAgarwal, Anindita

1st Place (Debate)-Namrata S, Hugo De Souza

1st Place (Product Launch)-PoojaAgarwal, AninditaGoswami

2nd Place (Product Launch)-Mishal, Shirin Patil

3rd Place (Poetry in Science)-Shirin Patil

Operon '12:

1st Place (Pot Pourri)-Priyanaka , Pooja A, Shirin Patil

2nd Place (Pot Pourri)-Saranya J, Michelle D'Souza, Pragati C

1st Place (Mindtwister)-Namrata S

3rd Place (Mindtwister)-Anjana

3rd Place (Product launch)-Pooja A, Anindita, Nidhi P

3rd Place (Quiz)-Neihenuo, Hugo De Souza, Namrata Shukla

Aplausos !!!

To get lucky, means nothing but to be prepared to grab the best opportunity that comes our way. Our fests and various competitions meant just that. The entire year gave us many such opportunities to horne our talents and discover our hidden abilities. The department of biotechnology organized the annual fest- OPERON '12 which was a common platform for students from various colleges and universities. In addition to the fest, we also had a 2 day workshop on "PLANT BIOTECHNOLOGY- A WAY TO THE FUTURE". This hosted many eminent speakers, scientists and professors from the Indian Academy of Sciences, students from IISC, GKVK and other prominent colleges. It helped open our minds to the bright and upcoming future of plant biotechnology to broaden our career opportunities. Lastly, we also inaugurated the Biotechnology association to weave together all the events and fests in the same year and give the students a better opportunity to participate , and experience many events to learn new things. But, though we had various events spanning throughout the year, the common aim was to give the students a never ending experience to learn new things and become acquainted with the fast growing world.