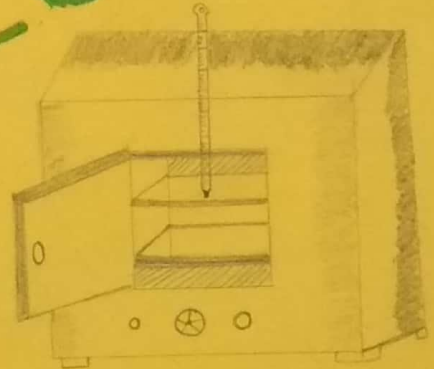
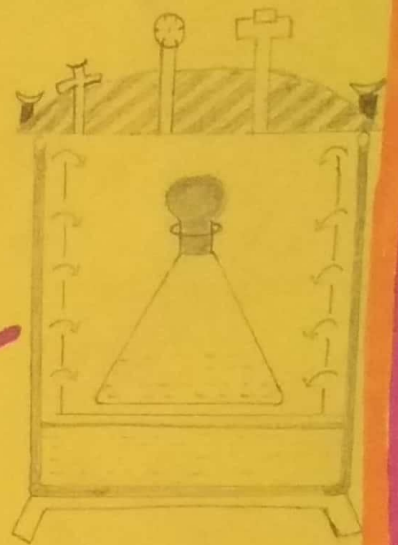
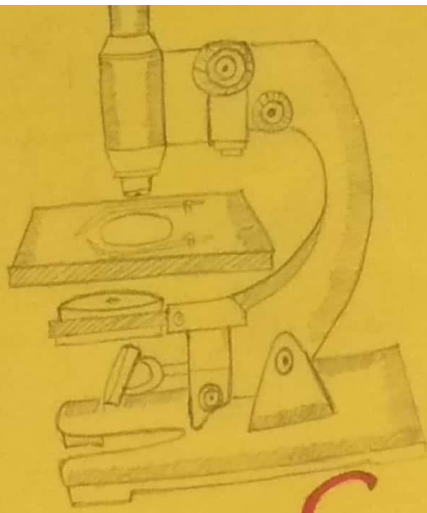


# MICROSCOPICA

## ISSUE - 2

## 2013-2014



24-01-2014

# INDEX

S.R. NO.	TITTLE	PAGE No.
1.	Microbiology Poem.	1
2.	Wisdom	2
3.	Eliminate Dengue Our Challenge	3
4.	News Corner	6
5.	What..... if microbes talk?	7
6.	Word Game	8
7.	News Corner	9
8.	Word Puzzle	10
9.	News Corner	11
10.	Laugh & make other laugh	12
11.	Quiz	13

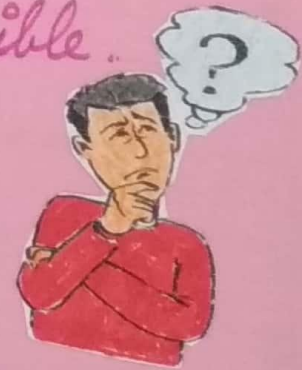


# Wisdom



②

- Use time as a tool, not as a couch.
- We see things as we are, not as they are.
- Winning is not everything but the effort to win is.
- You cannot be anything, if you want to be everything.
- Be not afraid of growing slowly, be afraid only of standing still.
- Challenges are what make life interesting, overcoming them is what makes life meaningful.
- Do not go where the path may lead, go instead where there is no path.
- Anything unattempted remains impossible.



by - S. S. Shalgar.

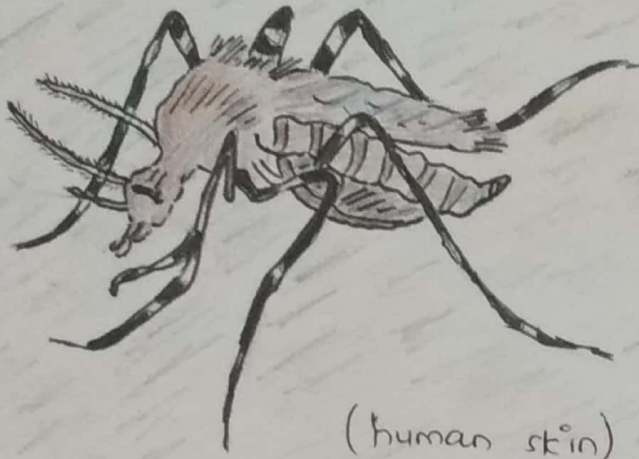
# ELIMINATE DENGUE

## OUR CHALLENGE

③  
A 'Wolbachia' strategy

'Dengue Fever' is an infectious tropical disease caused by 'Dengue virus'. The 'Dengue virus' is transmitted by several species of mosquitoes within Genus - 'Aedes', principally ;

→ Aedes aegypti mosquito



(human skin)

'Aedes aegypti' (female)

This mosquito likes to live near humans, in cool shaded places, under tables --- etc.

'Aedes aegypti' acquires the 'Dengue-virus' from a dengue-infected person & transmits it to another person.

The biggest tragedy is, No vaccine is available so far to cure this danger.

'Wolbachia' is a bacterium that lives naturally in upto 70% of diffnt. species of insects, including some mosquitoes that bite people but not in dengue carrying mosquito - 'Aedes aegypti'.

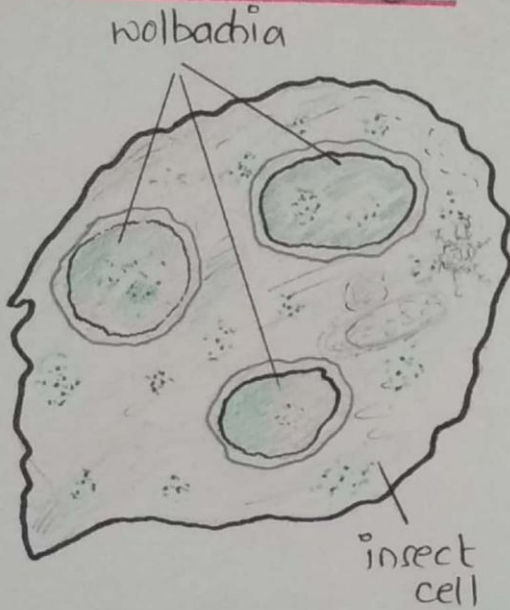
'Wolbachia pipiens' was first observed in the ovaries & testes of the mosquito Culex pipiens, in the 1920's.



Early studies showed that, it was not a pathogen of mammals but instead a naturally occurring & harmless, symbiotic bacterium. 'Wolbachia' lives only within insect cell & is passed from one generation to the next through the insect's eggs.

→ The latest research says ....

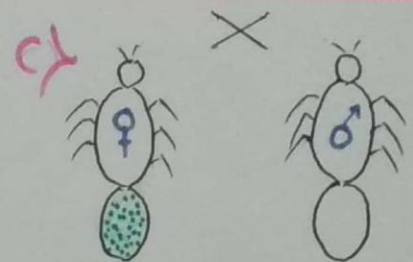
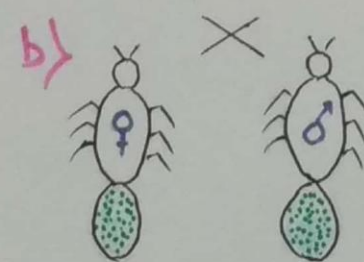
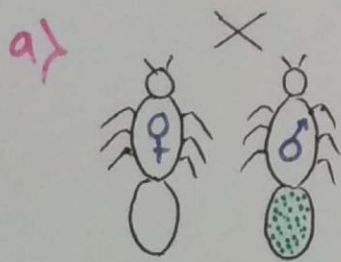
we can transfer 'Wolbachia' from a fruit fly into 'Aedes aegypti', mosquito with the help of microinjection. In doing so,



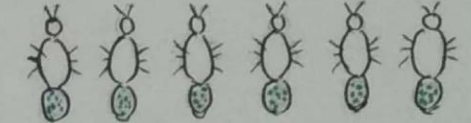
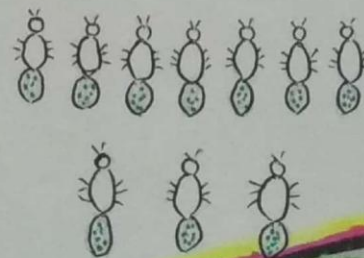
when 'Wolbachia' is present in the mosquito, it reduces their ability to transmit Dengue virus.

Thus, 'Wolbachia' acts as a 'Vaccine' for the mosquito by blocking dengue virus transmission & thereby preventing human infection & Dengue disease.

● How 'Wolbachia' spreads in the wild mosquito popl?



♀ Female  
♂ Male  
● Wolbachia



3  
In this strategy, we have to seed 'Wolbachia' into wild mosquito population, where dengue is endemic. These Wolbachia infected mosquitoes will then breed with the further wild mosquito population. Thus, 'Wolbachia' can be passed from one generation to the next, through the mosquito eggs. And thus there would be an effective biocontrol to disrupt Dengue transmission between people.

However, there are diffnt. kinds of control approaches like insecticide application, cleanliness of surrounding & all .... but Wolbachia based strategies have several advantages .... as ;

1. It could be the 'effective future vaccine' ...
2. The 'Wolbachia method' also has potential to be used on other insect transmitted diseases. Wolbachia infections in mosquitoes reduce their ability to transmit other human viruses such as chikungunya, yellow fever, malaria ... etc.
3. Wolbachia based strategies represent the dengue suppression with high potential for area wide implementation at low cost.

- by e

SURYA

(Akshay S. Sura)



## No human DNA in tiger scat: lab report

'Other evidence enough to prove that it fed on humans'

Special Correspondent

**BANGALORE:** Scat samples of the tiger captured in Bandipur Tiger Reserve, where three people were killed earlier this month, "do not show the presence of human DNA," concludes the first scientific analysis conducted to forensically confirm that the animal was indeed a man-eater and had fed on humans.

The DNA test was conducted by the National Centre for Biological Sciences (NCBS) and commissioned by the Forest Department and the Mysore zoo where the tiger is now housed.

This result, however, does not imply that a wrong tiger had been captured, said Uma Ramakrishnan, an ecologist with NCBS in whose lab the test was carried out. "There are several reasons why human DNA was not traceable in the sample. For instance, the scat sample was collected from the forest and could have been old, or not properly preserved," she told *The Hindu*.

NCBS is also yet to conduct a second test to confirm that the scat sample matches the captured tiger to rule out the possibility that it could have belonged to another individual, Dr. Ramakrishnan added. "But, if human DNA had been found in the tiger scat, we would have had irrefutable evidence that it had preyed on humans."

There was enough circumstantial evidence to suggest that the captured tiger was the one that killed three people between November 27 and December 3, said B.P. Ravi, executive director of Mysore zoo. "The tiger was found close to the site of its latest human attack, and the animal was also in poor health," he said.

It is also unclear how much the tiger actually fed on its human prey, Mr. Ravi said. "But there is no doubt that the tiger we have got is the one that killed three people." NCBS conducted the extraction of DNA using Himedia DNA protocol. Blood and scat samples have also been sent to the Centre for Cellular Molec-

### TIGER TALE



**NOV. 27:** Basavaraju (45) is killed by a tiger near Nidadihaadi village on the fringes of Bandipur Tiger Reserve, where he had taken his cattle to graze

**NOV. 29:** Tiger kills its second victim 35-year-old Cheluva in Seegevaadihaadi. Witnesses describe the tiger as 'emaciated and weak'

**DEC. 3:** A third person, Basappa (70) was killed by the tiger. His partly eaten body was found 100 m. away from the site of the attack. Angry residents protest against Forest Department

**DEC. 5:** Forest Department issues 'shoot at sight' orders, even as tiger is finally declared 'man-eater.'

Tiger was captured, with the help of tranquiliser darts, in the vicinity of where it had attacked its third victim Basappa in Chikkabargi forests of Bandipur Tiger Reserve and transported to Mysore zoo

**E** We have enough evidence to suggest that the captured tiger is the one that killed three persons. The tiger was found close to the site of its latest human attack, and the animal was also in poor health

**B.P. RAVI**, executive director, Mysore zoo

**THE TIGER WAS 10 YEARS OLD, WITH BROKEN TEETH AND INJURIES FROM A PORCUPINE QUILL IN ITS MOUTH**



**Scat and blood samples** were sent to NCBS and CCMB to

detect traces of human DNA to confirm that the captured tiger was indeed individual that had killed and eaten human prey

NCBS will now conduct a second test to see if the scat sample collected from the forest matches the DNA of the captured tiger

**E** There are several reasons why human DNA was not traceable in the sample. For instance, the

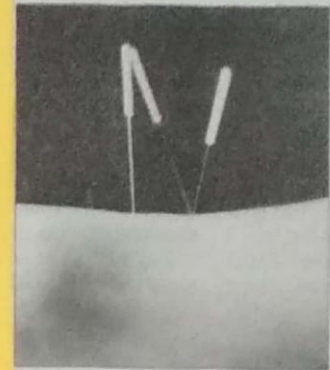
scat sample was collected from the forest and could have been old, or not properly preserved

**UMA RAMAKRISHNAN**, ecologist, NCBS



## Acupuncture, real or not, eases side effects of cancer drugs

⑥



**NEW YORK:** Both acupuncture and sham acupuncture were effective in reducing menopausal symptoms in women being treated with aromatase inhibitors for breast cancer, a small randomized trial found. Joint and muscle pain, hot flashes and night sweats are common side effects of those estrogen-lowering drugs. The trial, published online in *Cancer*, randomized 47 breast cancer patients to eight weekly sessions of either real or sham acupuncture. Those assigned to real acupuncture received treatment with needles in recognized acupoints believed to be helpful in relieving menopausal symptoms. The controls got non-penetrating needles placed in sham acupuncture points. Patients and researchers did not know which patients had received which treatment. The patients kept daily diaries or filled out several questionnaires on the frequency and severity of hot flashes and other symptoms. Patient-reported symptoms, especially hot flashes, improved significantly after both sham and real treatment. There was no statistically significant difference between the two groups.

— NYT

the cost needed to produce items to stringent military specifications, Dr. Tamilmalai told *The Hindu*. "Indian industry's potential to contribute to aeronautical development is yet

ved a crucial increasing the cancer. of the initial was erected for women to tails painted oration on er through plication.

## eme a 'cruel jo E employees

by- S.S. Shalgar.

ular Biology in Hyderabad for a similar DNA analysis.

A press release from the zoo said the tiger had maggot infested wounds, and porcupine quills embedded in its mouth and abdomen. The animal has

been treated with antibiotic and antibacterial drugs over a week. "The wounds have completely healed and the infection has come down," it said and added that the animal "appeared healthy".



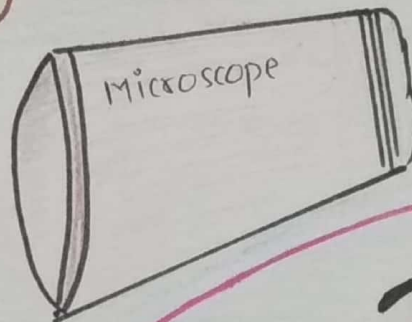
What .....

if

miCROBeS

7  
talk?

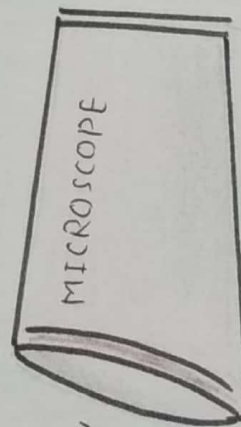
stop !! According to 'Intellectual Property Rights', I may permit you to study me only if you stain me with my FAVORITE COLOUR.



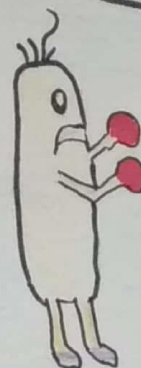
How's my new eight-pack body? Isn't it like, "AJAY DEVGAN", from Bol Bacchan!



Don't try to imitate him, "kahin nikal naa jaaye tumhare body se praan se..."



You fool !! If you can't understand who I AM! 'STOP STARRING AT ME.'



fun by - SURYA  
(Akshay surya)



# Word Game

8

Arrange the sequence of letters by using clue leading to a meaningful word :-

1) Broad spectrum Antibiotic -

P L A R H I N H E C O C L O N

2) Scientist who isolated DNA initially -

E R M H C S I E

3) Sporulating genus of bacteria -

T S I D M U C O L R I

4) Acidic stain -

I N O G I R S N E

5) Viral disease affecting liver -

S I P H E A T H T

6) Degree of Pathogenicity -

N I R C U V L A E

7) Sulphur containing amino acid -

T I M N E H E O N I

8) Chemical mutagen -

M O D R Y I H Y L A X N E

9) The component of Electron Transport Chain -

E V A P O L I N F R O T

10) The class of Enzyme -

A S I O M E S R E

by - N. J. Joshi  
S. V. Jambhale



## News Corner

### Doing her bit to eradicate polio

Special Correspondent

**BELGAUM:** Rutuja Patil, a first semester student of Electronics and Communication at Jain College of Engineering here, conducted a survey on polio immunisation programme in Peeranwadi village, Belgaum. She was inspired by reading about immunisation campaigns against polio and health-care programmes for young children immunised by the government, and a move proposed by World Health Organisation (WHO) to visit villages in the district for a survey on polio immunisation.

Rutuja formed a team of more than 150 houses in Mujawar Galli and adjoining areas in the village in two days to check whether children below five years of age were immunised and getting proper medical centres. The students found that most of the 250 children listed by her had been immunised against polio and were getting other medicines including for improvement of nutrition levels. As many as 20 children were not getting regular medical care. Rutuja said she was considering joining the WHO team to assist in conducting another survey to be conducted in Borgon village of Chikgo-d taluk soon.

9

### Genetics and microbes

A look at the Genetic Research Centre, Mumbai, and the Microbial Containment Complex, Pune, under the ICMR

**B.S. WARRIER**

[www.icmr-nic.in/pinstitute/grc/](http://www.icmr-nic.in/pinstitute/grc/)  
This is a unit of the National Institute for Research in Reproductive Health, Website: [www.nirrh.res.in](http://www.nirrh.res.in). The centre was established in 1976 at the institute for research in reproduction. It was made an independent centre of the ICMR in 1986. It stands committed to its service to families with mentally challenged children or children having multiple malformations. An important activity is counselling of needy parents regarding the risk of recurrent genetic disorders and the availability of prenatal diagnosis of problems. The diagnostic unit employs laboratory techniques embracing cytogenetic, biochemical and molecular methods.

**Research:** chromosomal disorders and single gene diseases particularly inborn errors of metabolism, genodermatoses and skeletal dysplasias (abnormalities in development).

**Service:** attending to individuals with genetic disorders, classifying them clinically in syndromes, diagnosis using state-of-the-art laboratory methods.

**Outpatient-based genetic counselling and follow-up:** Prenatal diagnosis in at-risk pregnancies. Creating a database for various genetic diseases. This helps in rapid screening and diagnosis.

**Prevention:** The unit plays its role in training people with competence in working in this specialised area. The participants often comprise post-graduate science students as well. Research conducted in the unit has made substantial contribution to the field.

**Complex Microbial Containment**

Nearly four decades ago, keen awareness of the need for studies on microbial agents, viruses in particular, emerged at the global level. Such studies are necessary for preventing public health and for the laboratory personnel in particular, steps for establishing a containment laboratory for the purpose of studying the pathogenesis of diseases under the ICMR.

Knowledge from foreign sources had to be borrowed heavily during the initial stages. This came the Microbial Containment Complex, Sus Road, Mumbai.

The high-containment bio-safety laboratory at the complex maintains laudable global standards. The history of the complex tells that it has lived up to the expectations.

### New genetic marker to predict bird flu severity



Australian scientists have discovered a genetic marker that can accurately predict the severity of the H7N9 avian influenza by using genetic markers in blood and lung samples to allow experts to better manage the disease.

by - S.S. Shalgar.



# Word Puzzle

10

Search vertically, transversally & backwardly in the grid given below for names of 12 blood components.

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

by- S.V. Tambhale  
N.J. Joshi



## मेंदूच्या कर्करोगाशी जुळी नव्या प्रथिनासह



जगण्याचा नवा विश्वास देणारे अलौकिक संशोधन केल्याचा दावा भारतीयांमूळ असलेल्या एका ऑस्ट्रेलियन शास्त्रज्ञाने केला आहे. या शास्त्रज्ञाने अशा एका प्रथिनाचा शोध घेतल्याचा दावा केला आहे जे कर्करोगाच्या गाठीच्या पेशीत तयार झालेल्या मुळाशी जाऊन (स्टेम सेल) परिणामकारक कार्य करू शकते. हे मूळ अधिक विकसित होऊ देण्याची काळजी हे प्रोटीन घेत असल्याचे अरुण धर्मराजन नावाच्या या शास्त्रज्ञाने म्हटले आहे. पर्थ येथील कार्टेन विद्यापीठातील जैविक औषधविज्ञान विभागात कार्यरत असलेल्या धर्मराजन यांनी शोधून काढलेले हे प्रोटीन कर्करोगाची वाढ होण्यास कारणीभूत ठरणाऱ्या स्टेम सेलला अटकाव करू शकते. चेन्नई विद्यापीठात शिक्षण घेतलेल्या धर्मराजन यांनी या स्टेम सेलमुळेच मेंदूच्या कर्करोगाचा झपाट्याने प्रसार होत असल्याचे आणि केमोथेरपीसह अन्य अनेक उपचारावर हे नवे प्रोटीन प्रभावी गुणकारी ठरत असल्याचे संशोधनातून दाखवून दिले. सिक्नेटिड फ्रिजल्ड प्रोटीन एसएफआरपी ४ नावाचे हे नवे प्रोटीन कर्करोगाचा फैलाव होण्यास पोषक पेशींना प्रतिबंध करून केमोथेरपीला पूरक कार्य करते. या उपचारपद्धतीत या प्रोटीनचा उपयोग उपचारावर हे नवे प्रोटीन प्रभावी गुणकारी ठरत असल्याचे धर्मराजन यांच्या निरीक्षणातून अत्यंत प्रभावी ठरत असल्याचे धर्मराजन यांच्या निरीक्षणातून पुढे आले आहे. या प्रोटीनची मात्रा कर्करोगावरील प्रमाण नेहमीच्या तुलनेत दुपटीने घटल्याचे दिसून आले. याच प्रकारे गळा, स्तन, मर्माशय, प्रोस्टेट तथा अन्य प्रकारच्या कर्करोगावरील प्रभावी उपचारास अत्यंत साध्यभूत ठरू शकत

चौकलेट खा आणि आजारपारसून दूर राहा, असा सल्ला मिळाल्यास चौकलेट शौकिनांसाठी यावेक्षा मोठा आनंद तो कोणता? परंतु असा सल्ला आरोग्याच्या दृष्टीने खरोखरच उपयुक्त आणि मौल्यवान ठरणारा आहे. आठवड्यातून दोन-तीन वेळा हे डार्क चौकलेट खाल्ल्यास रक्तातील गुळुळांची समस्याही दूर होते. चौकलेट खाल्ल्यास रक्तातील एवढेच नाही तर, धमत्यांमधील कोटिपापासूनही आपले शरीर सुरक्षित राहतो. या अर्थाने हे डार्क चौकलेट आपल्या शरीराला पोषक आणि आवश्यक असल्याचे एका संशोधनातून सिद्ध झाले आहे. या चौकलेटचे ब्रतही अनेक फायदे आहेत. रक्तातील रक्तापात्रांचे रुद्धत्व त्यामुळे आपल्या शरीराला रुद्धत्व आणि मेंदू यांच्यात समतोल राखण्यास मदत मिळते. तीव्रताही रुद्धत्वकाराच्या झटकाशी काही कमी होते. या चौकलेटमधील काही रासायनिक घटकांमुळे आपला कामातला उत्साह दिवून राहतो. प्रसन्नतेची अनुभूती घडते. त्यामुळे शेवटचे काम केंद्राळवाणे वाटत नाही, तसेच शरीराची ऊर्जाही दिवून



राहतो. रक्तवाहिन्यांना निरोगी ठेवून त्यातील रक्तप्रवाह सुरळीत डार्क चौकलेटमधील साखरेचे प्रमाणही बरेच संतुलित राहू शकते. चौकलेटमधील फ्लेवोनॉईड्स तसेच शरीरातील इन्शुलिनची पातळी योग्य प्रमाणात राखली जाण्यास मदत मिळते. डार्क चौकलेटमधील अँटीऑक्साइड्स मोठ्या प्रमाणात असल्याने यातील

## जुळी चौकलेट

रंडीकलस घटक वेहेत्यावर सुरुकृत्या येण्यास प्रतिबंध करते. हे चौकलेट खाण्याचे असे किती तरी फायदे तर आहेतच पण या चौकलेटपारसून अत्यंत महत्त्वाचा फायदा म्हणजे कर्करोगाला हेणारा अटकाव. शेओबोमाईन हा चौकलेटमधील महत्त्वाचा रासायनिक घटक असतो. हा घटक कोकोच्या बिद्यापासून मिळतो. तो दाताना किडीपासून वाचवतो. तसेच शेओबोमाईन कफ आणि सर्दीसाठीही अत्यंत गुणकारी असतो.

by- B.P. Meher



Laugh and World will laugh with you. <sup>(12)</sup>



1) Teacher is telling the children about monkeys that live in India. Suddenly he notices that Susan isn't listening him,  
"Susan, stop whatever you are doing and look at me, otherwise you will never know what a monkey looks like."

2) Professor :- Fools ask so many questions which make a wise man go mad.

Student :- You are absolutely right sir. We go through similar situations during viva.



by - S.S. Shalgar

# TEST YOUR KNOWLEDGE.

- Do all animals have brains?
- Which mammal lives the longest?
- How many mammal families are there?
- Which is longer, a monkey's arms or legs?
- Why do cats have whiskers?
- How much can a camel drink at one time?
- Which bird has the most feathers?
- What is the world's smallest bird?
- What animal makes the loudest noise on Earth?
- Which bird builds the biggest nests in the world?
- How long can birds survive without returning to land?
- How long can a penguin stay underwater?
- What proportion of the world's birds migrate each year?
- Which bird lays the largest eggs?
- What is the tail of a fox called?
- What are rabbit babies called?



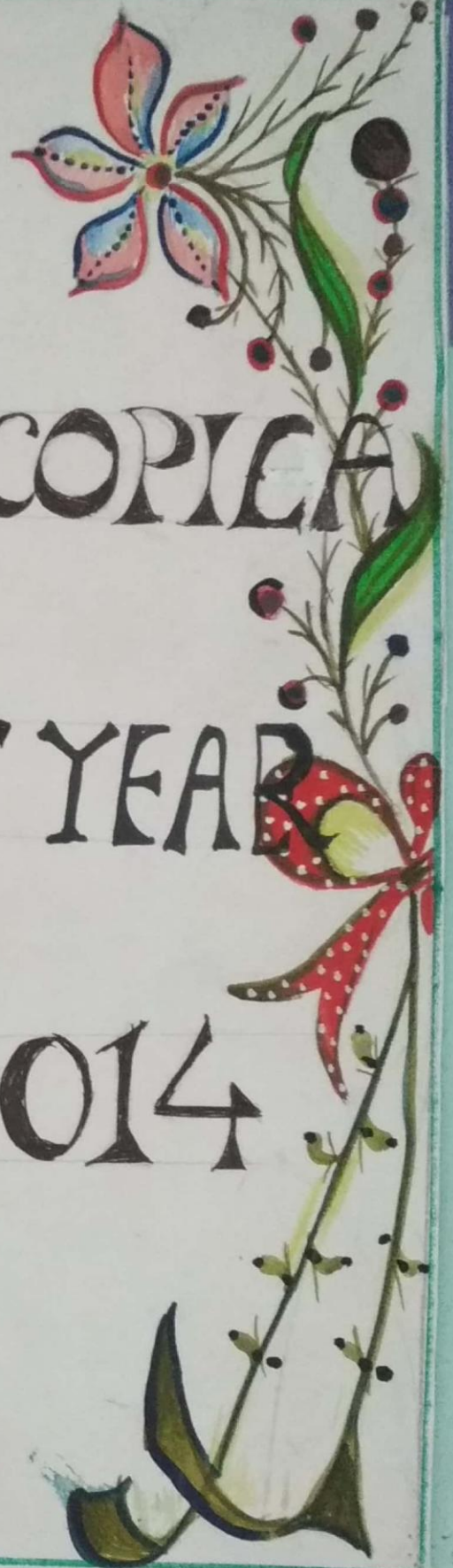
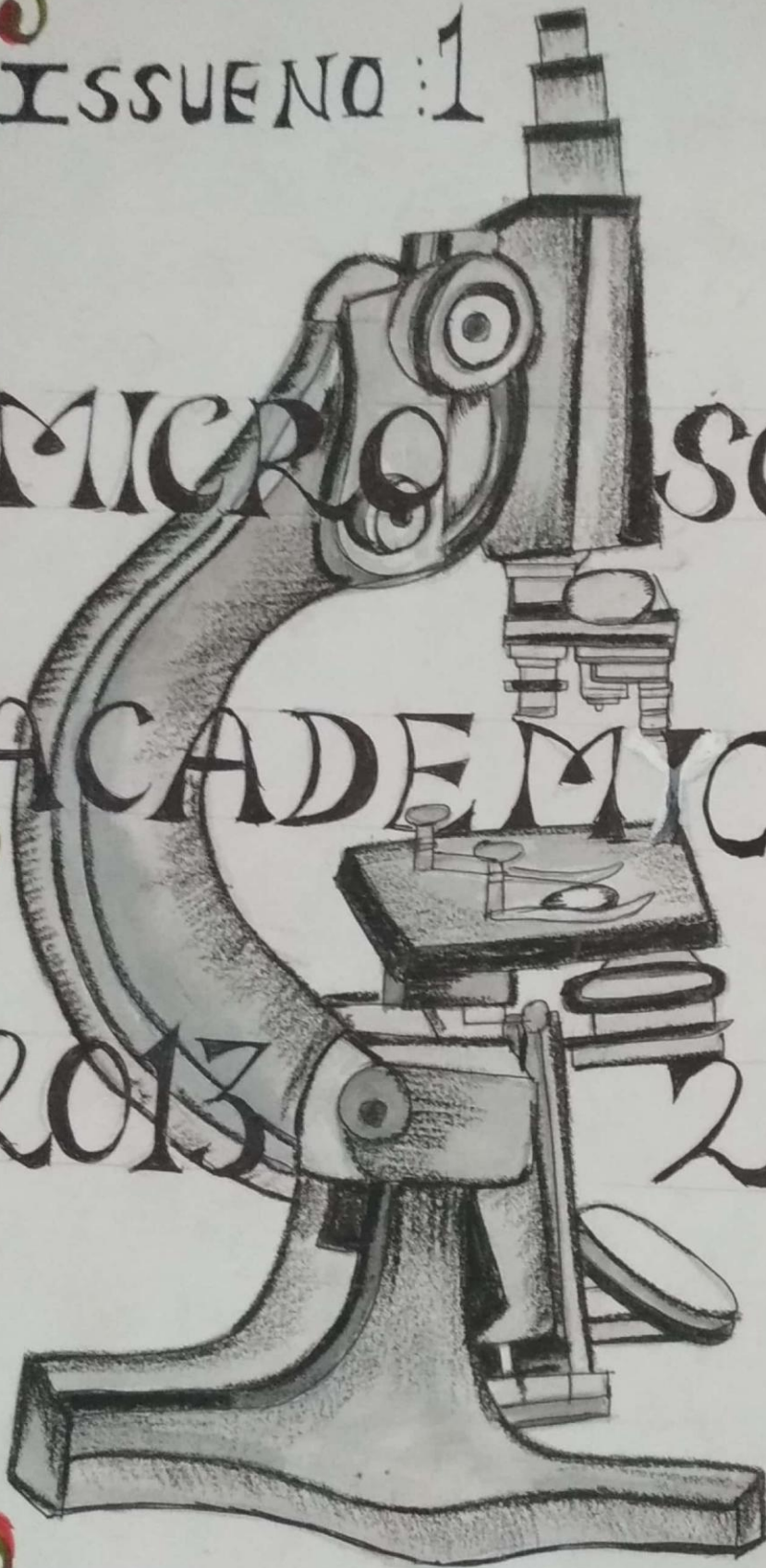
ISSUE NO : 1

Contribution by :- Kondi C. S.  
Varanasi

# MICROSCOPICA

## ACADEMIC YEAR

### 2013-2014





# INDEX

Sr. No.	CONTENT	PAGE No.
1.	We are proud of	1
2.	<del>Claree</del> in Molecular Biology	2
3.	News Corner [Aware about Diseases]	3
4.	News Corner [Donate the "Blood"]	4
5.	Useful Micro-organisms	5
6.	Harmful Micro-organisms	6
7.	Test your knowledge ...	7
8.	Puzzle Corner	8



We are proud of

class	Name	Percentage
B.Sc. III	Miss. Bandare P. P.	76.20 %
B.Sc. III	Miss. Konapure A. M.	75.48 %
B.Sc. III	Miss. Joshi S. G.	71.8 %

class	Name	Percentage
B.Sc. II	Mr. Lagshetti A. C.	90.5 %
B.Sc. II	Miss. Mandave A. A.	87 %
B.Sc. II	Miss. Bhoj S. I.	86.5 %

class	Name	Percentage
B.Sc. I	Miss. Shrichippa P. V.	88 %
B.Sc. I	Miss. Magar D. S.	86 %
B.Sc. I	Mr. Sura A. S.	86 %

**Congratulations!**



# रक्तगट सांगू शकणारा कागद तयार!

हानपणी अपण जादूच्या गोष्टी लक्षा आतून पाहा किवा आता या २१ व्या शतकातल्या हॅरी पॉटरच्या गोष्टी जादूने खरोखरच खूप काही मिळते असे आपल्याला वाटते. हॅरी पॉटरच्या कथेत स्वतःची स्वतः लिहिली जाणारी रोजनिशी पुन्हाला नक्कीच आठवेल, तर याच आयरीपासून प्रेरणा घेऊन संशोधकांनी एक असा पेपर

आधारित असून तो ए, बी, एबी आणि ओ या गटात रक्ताचे

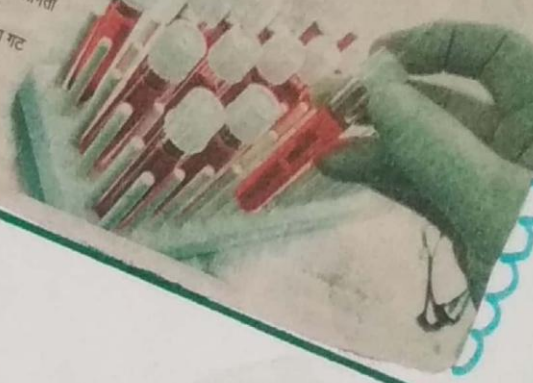
	A	B	AB	O
A	+	-	+	-
B	-	+	+	-
AB	+	+	+	-
O	-	-	-	+

ओ रक्तगटाच्या लालपेशीमध्ये कोणत्याही प्रकारचे अँटिजन असत नाही. मोगरा विद्यापीठातील या कागदी सेन्सरचे संशोधक अहेत घा: वेई रोन। रक्तगट तपासण्याच्या सर्व पद्धतींमध्ये ही कागदी सेन्सरची नवी पद्धत सोपी व युद्धस्थळीसुद्धा ही पद्धत स्वस्थ कार्यान्वित केली जाऊ शकते हे महत्त्वाचे।

## आपणास माहीत आहे?

म्हणजे कागद बनवलाय, जो आपला रक्तगट सांगू शकेल. ऑस्ट्रेलिया देशामधील मोनरा विद्यापीठातील संशोधकांनी कागदावर आधारित सेन्सर विकसित केला आहे, ज्यायोगे व्यक्तीचा रक्तगट त्यावर उमटू शकतो. विरोधत, आकस्मिक आपत्तीच्या काळात या तंत्रज्ञानाचा उपयोग होऊ शकेल याची खात्री संशोधकांना वाटते. हा कागदी सेन्सर एबीओ वर्गीकरणावर

रक्तपेशींमध्ये कोणते अँटिजन आहे, यावरून रक्तगट कोणता हे सांगता येते. ए अँटिजन असलेल्या रक्ताचा गट ए असतो, तर बी रक्तगटात बी अँटिजन असते. एबी रक्तगटात ए व बी हे दोन्ही अँटिजन असून,



# Career in Molecular Biology

## मोलेक्युलर बायोलॉजी

एखाद्या पदार्थाचा सगळ्यात लहान म्हणजे डोळ्यांना न दिसणारा अतिशय सूक्ष्म घटक म्हणजे अणू आणि रेणू. या अणू-रेणूसंबंधीच्या अभ्यासाला 'मोलेक्युलर बायोलॉजी' असे म्हटले जाते. मोलेक्युलर बायोलॉजी ही शाखा बायोलॉजी मध्येच जीवशास्त्राचाच एक भाग आहे. मोलेक्युलर बायोलॉजी या शाखेत मुख्यतः डीएनए, आरएनए, प्रोटीन आणि प्रक्रियांचा रेणूच्या स्तरावर अभ्यास केला जातो. या शाखेत मुख्यतः डीएनए, आरएनए, प्रोटीन सिन्थेसिस आणि त्यांच्या प्रक्रिया यांचा अभ्यास केला जातो. सर्वांच्याच आरीतील पेशींचे कार्य रेणूच्या स्तरावर समजून घेण्याकडे मोलेक्युलर बायोलॉजिस्टचा ओढा असतो.

आणि त्यांचे कार्य, कॅन्सर आणि इतर रोगासंदर्भातील रेणूच्या स्तरावरील अभ्यास, ज्ञावस, पेशीतील पेशी आणि सूक्ष्मजीव यांच्यातील आंतरक्रियांचा अभ्यास, डीएनएसंदर्भातील अभ्यास आदी विषय मोलेक्युलर बायोलॉजीच्या अभ्यासक्रमात समाविष्ट असतात. मोलेक्युलर बायोलॉजी ही विषय मुख्यतः पोस्ट ग्रेज्युएशन म्हणजेच पदव्युत्तर अभ्यासक्रम आहे. एखाद्या विद्यार्थ्याने पदवी अभ्यासक्रम हा जेनेटिक्स, मायक्रोबायोलॉजी, झूलॉजी किंवा बाॅटनी या विषयात पूर्ण करायचास हवा, तेच त्या विद्यार्थ्याला एम.एससी. इन मोलेक्युलर बायोलॉजी या अभ्यासक्रमाला प्रवेश घेता येतो.

मोलेक्युलर बायोलॉजी या शाखातील मोलेक्युलर बायोलॉजिस्ट एखाद्या रोगावरील औषध तयार करण्यासाठी काम करतात. याचबरोबर स्टेम सेल संदर्भातही काम करतात.

### मोलेक्युलर बायोलॉजीविषयक प्रशिक्षण देणाऱ्या संस्था

- महाराज सयाजीराव युनिव्हर्सिटी ऑफ बडोदा
- युनिव्हर्सिटी ऑफ मद्रास, मोलेक्युलर बायोलॉजी पोस्ट ग्रेज्युएशन
- युनिव्हर्सिटी ऑफ दिल्ली, मोलेक्युलर बायोलॉजी पोस्ट ग्रेज्युएशन
- राजीव गांधी सेंटर ऑफ बायोटॅक्नॉलॉजी, नवी दिल्ली मोलेक्युलर बायोलॉजी पोस्ट ग्रेज्युएशन
- सेंटर फॉर सेल्युलर अँड मोलेक्युलर बायोलॉजी, तिरुवनंतपुरम
- इन्स्टिट्यूट ऑफ मायक्रोबायल टेक्नॉलॉजी, वृंदीगड
- सेंट्रल इन्स्टिट्यूट ऑफ मेडिसिनल अँड अग्रोमॅटिक प्लांट, लखनौ
- इंटर्नॅशनल सेंटर फॉर जेनेटिक इंजिनीअरिंग अँड बायोटॅक्नॉलॉजी, नवी दिल्ली
- जवाहरलाल नेहरू सेंटर फॉर जेनेटिक इंजिनीअरिंग अँड बायोटॅक्नॉलॉजी, नवी दिल्ली
- नॅशनल बाॅटॅनिकल रिसर्च इन्स्टिट्यूट, लखनौ
- नॅशनल सेंटर फॉर सेल बायोलॉजी, पुणे.

क्लॉनिंग, सबक्लोनिंग, सिन्थेटिक आरम्भक ट्रान्सक्रिप्शन, जेन एक्सप्रेशन, रिवायट डीएनए डायनामिक्स आणि क्रोमोसोम स्ट्रक्चर आणि इतर प्रकारची लेबोरेटरीसंदर्भातील कामे करतात.













Contribution by:- shalgar S. K.  
Nard A. R.

# USEFULL MICROORGANISMS

## SACCHROMYCES CEREVISIAE

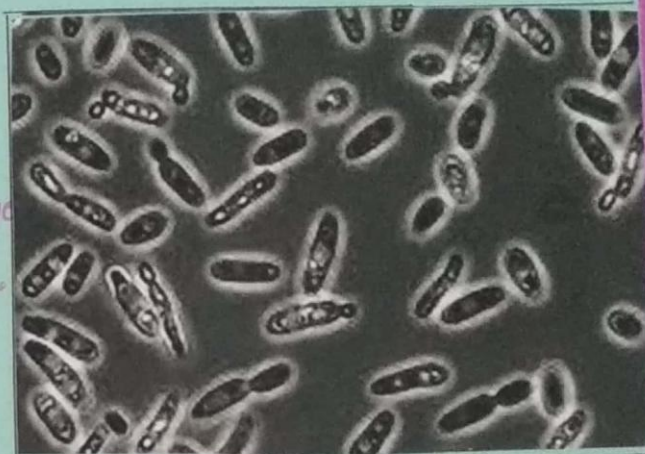
### • Sacchromyces

Sacchromyces cerevisiae

is called Baker's yeast.

• Sacchromyces produced in large quantities for baking industry.

• The substances containing carbohydrate such as fruit juice, potatoes, barley, cereals, honey can be used as substrate.



### • BACILLUS THURINGIENSIS

• There are certain species of bacteria & fungi that possess pathogenic property against insects or pests. Such cells are called biopesticides:

• They widely used as insect larvicide. Bacteria is also cultivated using submerged culture technique.



### • METHYLOPHILUS METHYLOTROPHUS

• There are few bacteria that utilize methylphilus methylotrophus.

• High aeration of the medium is required.

• Bacterial mass is continuously removed.



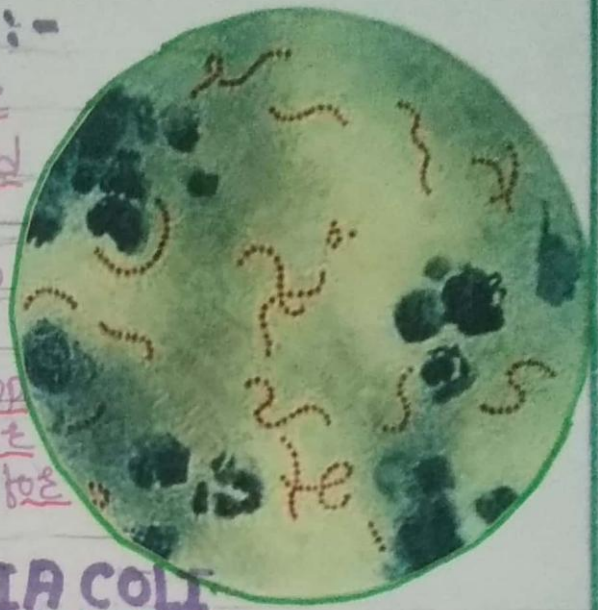


# HARMFUL BACTERIA

## STREPTOCOCCUS PYOGENS:-

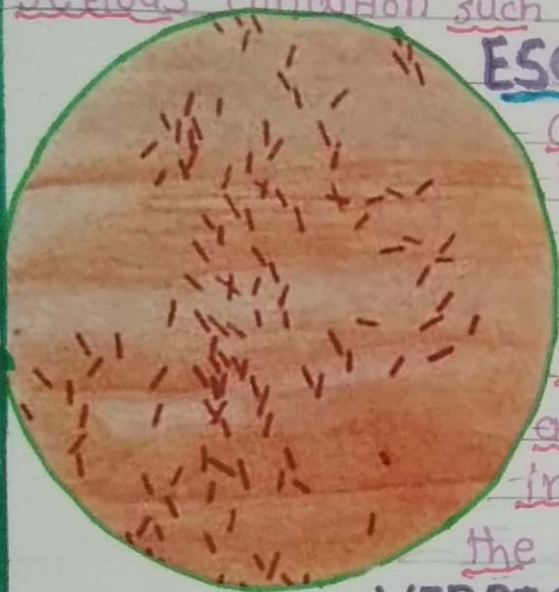
The streptococcus pyogens is the bacteria responsible including mild skin infection and sore throats.

The bacterium is spherical shape growing in chain and existing in the human body where the temp is right for its growth. The streptococcus pyogens is responsible for serious condition such as multiple.



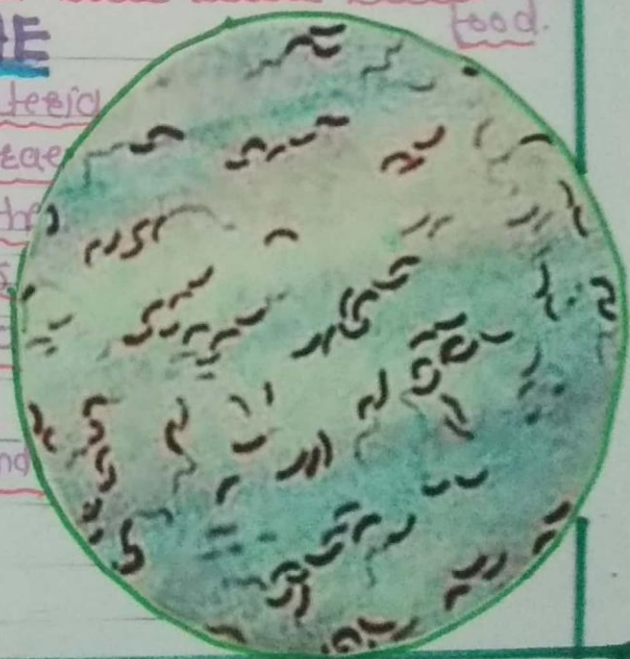
## ESCHERICHIA COLI

Commonly is known as E. coli this bacteria is the cause of gastrointestinal disease diarrhea and symptoms associated with food poisoning. This bacterium exists in various stains and naturally exists in the body's intestines. The best way to prevent the condition is to avoid undercooked and raw food.



## VIBRIO CHOLERAE

The vibrio cholerae is the bacteria responsible for outbreak of cholera killing many people throughout the course of history. The disease is marked with symptoms similar to the common cold, including high fever, runny nose, vomiting and diarrhea.







# TEST YOUR KNOWLEDGE ...

1. Which of the following is the study of fungi.  
a) Mycology b) Phycology c) virology d) Bacteriology.
2. After the decolouriser has been applied during gram stain but before saffranin has been applied gram negative bacterial cell would appear -  
a) Pink b) Blue c) violet d) colourless.
3. Which of the following correctly describes a cluster of spherical cells.  
a) streptococci b) staphylococci c) diplococci d) spirochate.
4. Which bacterial genera produce endospore.  
a) salmonella b) Lactobacillus c) bacillus d) enterobacter.
5. Who is the inventor of electron microscope  
a) Ruska b) Robert Hooke c) Robert Koch d) Louis Pasteur.
6. Which of the following is not basic stain  
a) Basic fuchsin b) saffranin c) crystal violet d) nigrosin.
7. Which of the following is an incorrect pair.  
a) endospore - bacillus. b) anaerobic - clostridium.  
c) motile - shigella. d) Normal flora of intestine E. coli.

Answers - 1. - a) 2. - d) 3. - b) 4. - c) 5. - a) 6. - b) 7. - c)



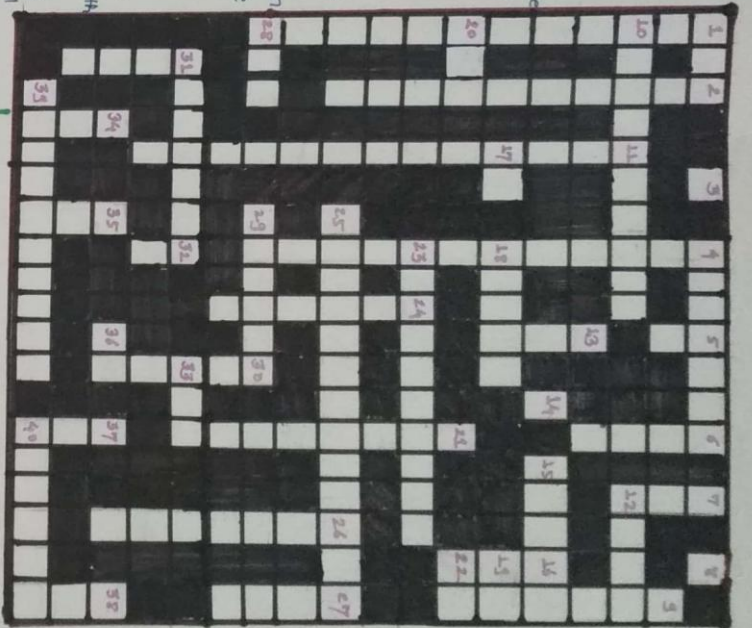
# Puzzle Corner

## \* Rows :->

- 1) AIDS virus
- 4) Transposons also called as gene
- 8) Antibody which passes through placenta.
- 10) cell wall lacking bacteria.
- 12) Diagnosis test of Syphilis
- 14) Antibody in the colostrum
- 15) common drug of HIV
- 17) Disease caused by M. tuberculosis
- 18) Joining segment between V region & C region of heavy chain
- 19) Genetically modified plant are also called xx plants
- 20) terminating codon -> \* G \*
- 22) one plant growth hormone
- 23) Blood group antigen are
- 25) Bacterial genes used by Griffith
- 28) N<sub>2</sub> fixing gene.
- 29) Microbe lacking their genome
- 31) Polysaccharide of Yeast cell wall
- 33) Vaccine against T.B
- 36) one blood group system
- 39) An antiviral glycoprotein involved in defence mechanism.
- 40) The toxins which lack their toxicity.

## \* Columns :->

- 1) In H<sub>2</sub>N, H stand for....
- 2) method of Artificial active immunity.
- 3) Pentameric antibody
- 4) Discoverer of serial dilution method
- 5) Prauznitz-Kusnetzky antibodies also known as \* \* antibody
- 6) Segment of DNA
- 7) Tobacco mosaic Disease caused by
- 8) The actual antibody producing cell
- 11) Preservative method used for liquid food
- 13) The initiation codon.



- 16) Generally used for cultivation of viruses
- 21) Inoculation is also called as
- 24) Clusture of gene having same function
- 26) The bacteriocin produced by E. coli
- 27) Infectable polio vaccine
- 30) Oral Polio vaccine
- 31) The stain used in spore staining
- 32) Natural killing cells also called as \* \* cell
- 34) Polymorphonuclear leucocytes also called as \* \* \*
- 35) Polymerase chain reaction also called as
- 37) Vaccine against diphtheria, cough & Tetanus
- 38) Biological oxygen demand also called as \* \* \*

## \* Contributed by :-

Laagashethi, A.C  
Paraswar S.R.

Rush with your answer to Mrs. Deshpande, S.N upto 25 sept 2013 and win the attractive prizes. Do not forget, to write your name, class on answer sheet.

