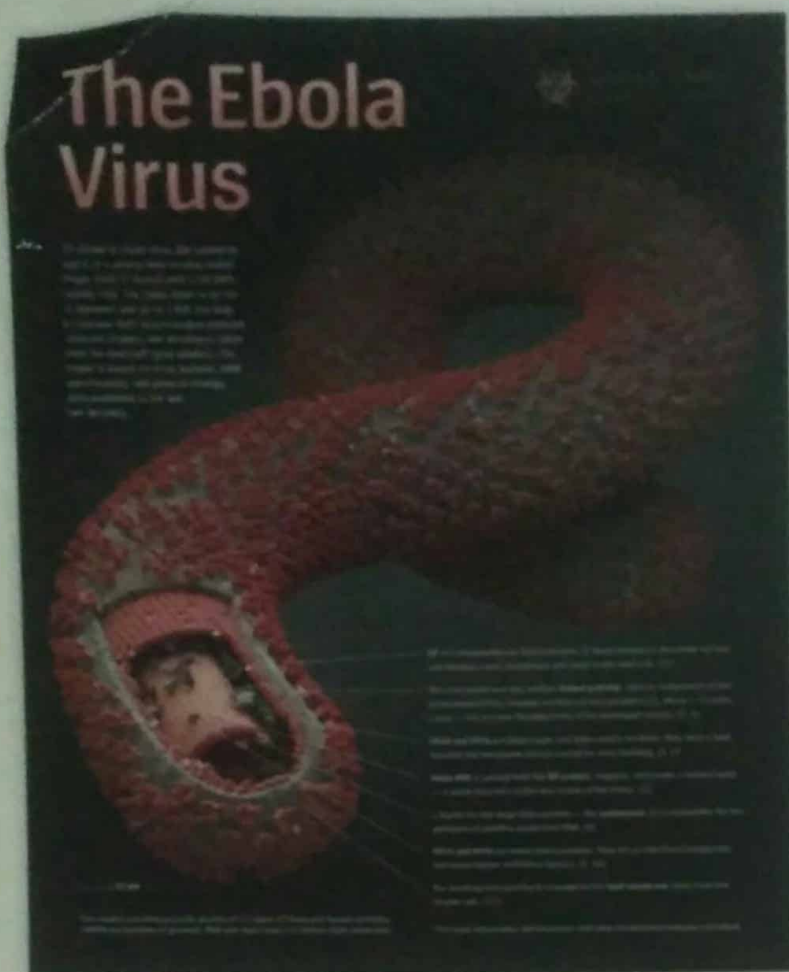
The background of the cover is a dark blue, almost black, space filled with various microscopic organisms. In the center is a large, spherical virus-like particle with a dark core and a lighter outer shell, covered in numerous long, thin, hair-like projections (spikes) that radiate outwards. Surrounding this central particle are many smaller, similar-looking particles, some appearing as simple spheres and others as more complex, multi-lobed structures. The overall effect is a dense field of diverse microbial life.

MICROBIOME

**A NEWSLETTER BY THE DEPARTMENT OF MICROBIOLOGY
VIJAYA COLLEGE, RV ROAD, BANGALORE**

THE DEADLY VIRUS - EBOLA



INTRODUCTION: The Ebola virus causes an acute, serious illness which is often fatal if untreated. Ebola virus disease (EVD) first appeared in 1976 in Sudan and Yambuku simultaneous. The latter occurred in a village near the Ebola River, from which the disease takes its name.

The current outbreak in West Africa, (first cases notified in March 2014), is the largest and most complex Ebola outbreak since the Ebola virus was first discovered in 1976. There have been more cases and deaths in this outbreak than all others combined. The virus belongs to the family Filoviridae.

TRANSMISSION: Ebola is introduced into the human population through close contact with infected animals such as chimpanzees, gorillas, fruit bats, monkeys, forest antelope and porcupines found ill or dead or in the rainforest. Ebola then spreads through human-to-human transmission via direct contact with the blood, secretions, organs or other bodily fluids of infected people.

Health-care workers are frequently been infected. People remain infectious as long as their blood and body fluids, including semen and breast milk, contain the virus. Men who have recovered from the disease can still transmit the virus through their semen for up to 7 weeks after recovery from illness

SYMPTOMS:

Incubation period is 2 to 21 days. Primary symptoms include sudden onset of fever fatigue, muscle pain, headache, and sore throat. Following symptoms are vomiting, diarrhoea, rashes, symptoms of impaired kidney and liver function and both internal and external bleeding

TREATMENT AND VACCINES:

The dehydration can be controlled using oral and intravenous fluids. There is as yet no proven treatment available for EVD. However, a range of potential treatments including blood products, immune therapies and drug therapies are currently being evaluated. No licensed vaccines are available.

Monisha R
Priyanka M R
Sushmitha P
VI sem BcGMB

RNA INTERFERENCE

RNA interference (RNAi) is a biological process in which RNA molecules inhibit gene expression typically causing the destruction of specific mRNA molecules. It is also known as co-suppression, post transcriptional gene silencing (PTGS). Andrew Fire and Craig C. Mello shared the 2006 noble prize in physiology for their work on RNA interference in the nematode worm *Caenorhabditis elegans*, which they published in 1998.

Two types of small ribonucleic acid (RNA) molecules -microRNA (miRNA) and small interfering RNA (siRNA) are central to RNA interference. It has an important role in defending cells against parasitic nucleotide sequences -viruses and transposons. It also influences development.

The RNAi pathway is found in many eukaryotes, including animals and is initiated by the enzyme Dicer, which cleaves long double stranded RNA (dsRNA) molecules into short double stranded fragments of 20 nucleotides siRNA. Each siRNA is unwound into two single stranded RNAs (ssRNA), the passenger strand and the guide strand. The passenger strand is degraded and the guide strand is incorporated into RNA Inducing Silencing Complex (RISC). RNAi is a valuable research tool both in cell culture and in living organisms, because synthetic dsRNA introduced into cells can selectively and robustly induce suppression of specific genes of interest.

RNAi is a RNA-dependent gene silencing process that is controlled by the RISC and is initiated by short dsRNA molecules in cell's cytoplasm. When dsRNA is exogenous, RNA is imported directly into the cytoplasm and cleaved to short fragments by Dicer. The dsRNA can also be endogenous as produced in cells expressed from RNA-coding genes in the genome. The primary transcript that form characteristic stem-loop structure then exported to the cytoplasm.

BIOLOGICAL FUNCTIONS:

Immunity: RNAi is a vital part of the immune response to viruses and other foreign genetic material, especially in plants where it may also prevent the self-propagation of transposons. RNAi is important in antiviral innate immunity and is active against pathogens such as *Drosophila X* virus.

Down regulation of genes: miRNAs include both intronic and intergenic are most important in translational repression and regulation of development and maintenance of undifferentiated cell types such as stem cells. miRNAs can function as both oncogenes and tumor suppressors. Up regulation of genes: RNA sequences (siRNA and miRNA) that are complementary to parts of a promoter can increase gene transcription.

APPLICATIONS:

Medicine: RNA interference is applied in the treatment of macular degeneration, respiratory syncytial virus, a cardiovascular diseases such as arteriosclerosis similar to heart attack due to blockage of blood flow in artery by deposition of a sterol i.e cholesterol.

Antiviral: Potential antiviral therapies use RNAi to treat infection by virus. Ex: Herpes virus. Treatment for neurodegenerative diseases caused by virus such as Huntington's diseases.

Cancer: RNAi is a way to treat cancers by silencing genes differentially upregulated in tumor cells or genes involved in cell division.

SCRAMBLE

1. lllsuceoe

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2. oodoctimcrinhn

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3. aptholscrol

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4. oilvcaelrt

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5. gabaogeit

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Swathi R
VI Sem BcGMB

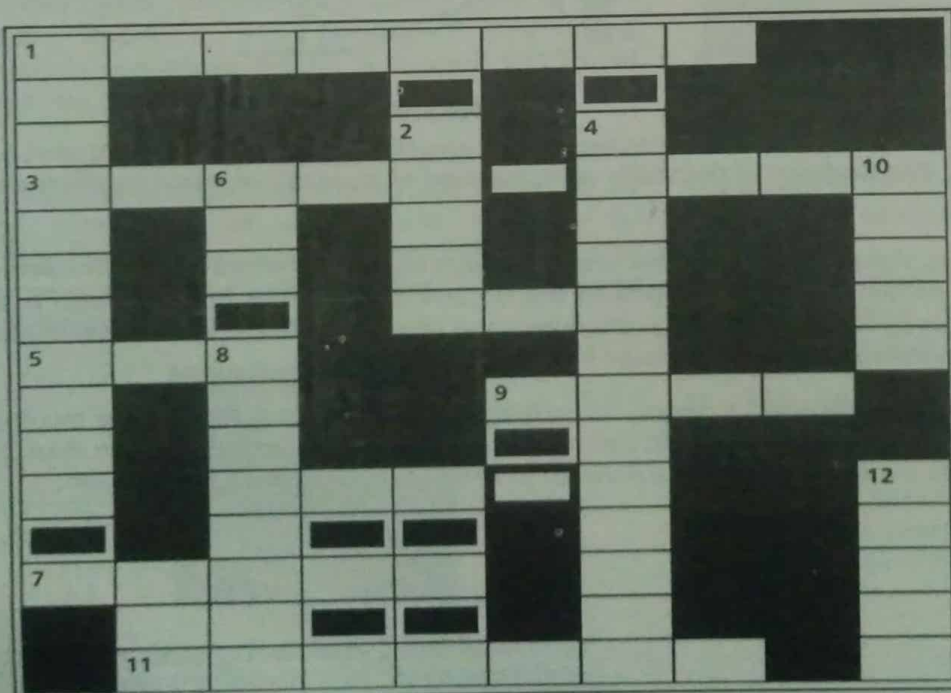
CLUES

ACROSS

- | | | | |
|---|-----|---|------|
| 2. Outer covering of bacteria | (8) | 3. Micro oranism (gentis) causing typhoid | (10) |
| 5. Genetic content of bacteria | (3) | 7. Bacteria used largely in genetic engineering | (5) |
| 9. conjugation tube is the extension of sex | (4) | 11. Anaerobes does this | (7) |

DOWN

- | | |
|---|------|
| 2. Chemical released by Bacteria, causing Food spoilage and other disease in humans | (5) |
| 4. phenomena of ligating a foreign gene into the host's genome | (13) |
| 6. Chamber with NPA filter | (3) |
| 8. Yeast is an _____ | (5) |
| 10. Cyanobacteria is an _____ | (5) |
| 11. Round shaped bacteria | (5) |



By,
Vaibhav V.
Sandeep N.
Vinay S.
BCGMB - 'H'

WHO AM I ?

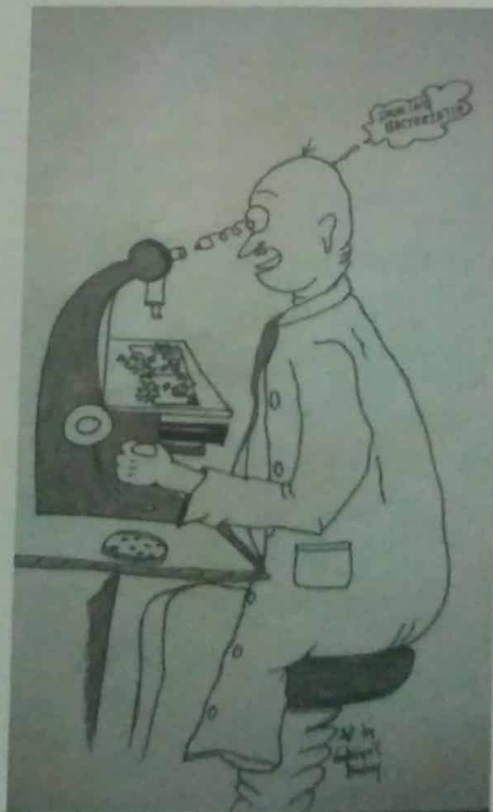
I am one of the smallest living things
Even when I am magnified , only my shadow can be seen
I am found in my places ,
Where many others cannot survive
One ocean floors and living things is where I tend to thrive

Unfavourable conditions cannot get me down
I just put my hard coat and lay around .
But when the conditions turn fair, I just start up my flagella
It whips me around and around , until I find next fine fella
Hopefully this next host is fat and plump too
For he will be my food supply until it is time to move

Please don't worry, I am not all bad without me , cows and termites would be sad
I bet you didn't know I am you right now
I help out humans everyday
In medicine, pickles, yoghurt and DNA

If you haven't guessed my name yet,
I would say you are pretty dumb.
I mean , it is not like there only one of me,
I came from a family that is pretty big, you see
Well, I guess I ll have to tell you because my poem is almost done .
I am bacteria, you crazy cohorts
And, thanks to you. I am having so much fun!

Lakshmi Shree B. R.
VI sem, BcGMb



Supriya S. Pissey
VI sem, BcGMb

AMAZING FACTS OF MICROBES

1. One single teaspoon of soil contains 1 billion bacteria & 120,000 fungi & 25,000 algae
2. Bacteria can be found virtually everywhere, from volcanic springs to arctic regions. The human mouth is home to more than 500 species of bacteria. Each square centimeter of your skin averages about 100,000 bacteria. *Deinococcus radiodurans*: withstand blasts of radiation 1,000 times greater than would kill a human being.
3. The largest organism in the world when measured by area is the Honey Mushroom fungus. It covers a whopping 8.9km² of a national forest in the USA.
4. Microbes have been around longer than anything else on Earth, longer even than dinosaurs.
5. There are 10 times more bacteria in the average human's digestive system than there are cells in the entire body. This is approximately 1kg of bacteria.
6. Botox is made from a deadly bacterial toxin which is used in very small doses to remove wrinkles.
7. There are more microbes on one person's hand than there are people on the planet.
8. Microbes generate at least half the oxygen we breathe.
9. Most microbes do not cause disease - less than 5% do.

Scramble

Answers: 1.Cellulose 2.Mitochondrion 3.Chloroplast 4.Vorticella 5. Beggiatoa

This newsletter aims to bring awareness about the recent issues related to health, techniques and research pertaining to the field of Microbiology. This is a platform for the students, teachers and alumni to express their talent in the form of write ups, drawings, pictures etc. along with various departmental activities.

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