

Мікроскопіка

* 2014-15 *

* Issue No. - 01 *

From the Editor-in-Chief's desk.....

I am extremely happy to present in front of you 'MICROSCOPICA' the wall paper of our microbiology deptt.

In this issue we focus on 'Ebola' one of the deadliest epidemic because for Indians it is completely new & we have no natural immunity against it.

We also take a look at latest new researches in microbiology.

To the readers, I can definitely say that you will have wonderful time reading 'MICROSCOPICA - ISSUE - 1/2014'.

I congratulate Mr. Mane V., Mr. Rathod S. & Mr. Chawadi S. for putting their efforts to make this wallpaper an inspiration for all microbiology students.

All the Best !

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Preface

'Microscopica' is all about an access to the microbial world. Here, information of the very small world is disclosed and we are really very honoured & proud to be the part of this very initiative. —

— Our sincere thanks to HOD-microbiology dept. and all members i.e, teachers of our microbiology dept. We are really very grateful to our Editor-in-chief for her recommendations & help in carving this very Journal.

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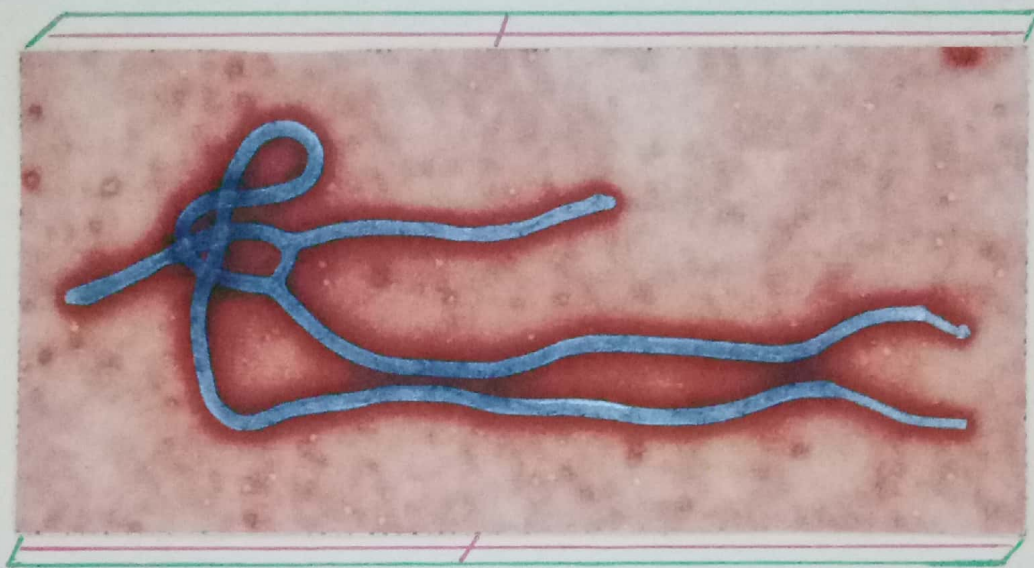
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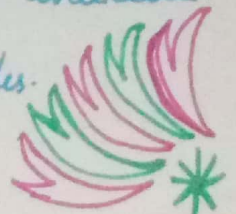


Ebola Virus is one of the deadliest strain of virus originated & found first in the Democratic Republic of Congo (Central Africa). First found in 1976. It belongs to the *Filoviridae* family and the sole *Ebola virus* genus. It is an *zoonotic* virus. Fruit bats of *Pteropodidae* family are its natural host. Basically there are 5 strains of Ebola virus i.e., *Zaire Ebolavirus*,



TEM
of a
Ebola
Virion

Bundibugyo Ebola virus, *Reston Ebola virus*, *Sudan Ebolavirus* & *Tai Ebola virus*. *Bundibugyo* & *Reston* strains were found in China & Philippines. It is also considered as nearest relative of *Marburg virus*. Its genetic material - ssRNA of 19000 nucleotides. It is responsible for *Ebola virus Disease* in humans. Fatality is 90%. Symptoms include muscle pain, diarrhoea, etc. In severe cases *platelet count* reduces & *Haemorrhage* takes place. Spread of disease is through Body fluid contact. No perfect treatment yet available. It is responsible for the 2014 Pandemic killing 1000 peoples.



Ebola Alert

The disease is spreading and India needs to be on guard

The manner and extent to which the current outbreak of Ebola virus disease has spread seems straight out of a disaster movie. An epidemic with a high fatality rate that was once confined to isolated rural pockets in Africa has now begun to show up in urban areas and crossed national frontiers on account of air travel. This virus which can be transmitted between humans through blood or other body fluids has no known antidote.

Airports across the world are on alert, while the World Health Organisation is meeting to decide whether Ebola should be declared an international crisis. The government has said that 44,700 Indians live in Ebola-affected countries. Indian airports need to be on alert and screen passengers coming from affected parts of the world. Health minister Harsh Vardhan says he is personally supervising preventive measures. These should include establishing diagnostic centres and testing facilities. Treatment centres and isolation wards too must be available if someone tests positive, while efforts need to be made to trace who they came in direct contact with.

The good news, however, is that no evidence has been found that the virus can spread through airborne transmission or through acts such as sneezing and coughing. Moreover symptoms are easily visible in infected persons (unlike HIV/AIDS where infected people can remain outwardly healthy while spreading disease). So even if there is no known cure at present, spread of the disease can be checked if effective measures are taken. However, most states have allowed public health systems to wither. A bird's-eye view of health is a specialised calling and Harsh Vardhan should find a way to revive this dimension of healthcare. Improved public health and sanitation will help India tackle not only distant threats such as Ebola but everyday killers such as malaria, diarrhoea and typhoid.

Ebola virus disease causes massive damage to human race. As it is becoming global, necessary steps are taken by the countries to avoid spread of infection.

WHO: Ebola outbreak global emergency

Kounteya.Sinha
@timesgroup.com

London: The World Health Organization (WHO) has called the Ebola outbreak an "extraordinary event" and announced the spread of the infection in west Africa an international health emergency.

After a two-day meeting of its emergency committee, the WHO has said a co-ordinated international response was essential to stop the spread of the virus. The committee has said the Ebola outbreak in west Africa is "a public health risk to other states" and "the possible consequences of further international spread are particularly serious in view of the virulence of the virus, the intensive community and health facility transmission patterns and the weak health systems in the currently affected and most at-risk countries".

The WHO has asked states to ensure that appropriate medical care is available for the airlines crew working in the country and



WATCHFUL EYE: A South Korean quarantine officer checks a flyer's temperature at the Incheon airport on Friday

ordered to conduct exit screening of all persons at the international airports, seaports and land crossings. "The exit screening should consist of a questionnaire, a temperature measurement and, if there is a fever, an assessment of the risk that the fever is caused by Ebola. Any person with an illness consistent with Ebola should not travel unless the travel is part of an appropriate medical evacuation," it has said.

The WHO has asked health ministers to assume leadership roles in implementing emergency Ebola response measures.

For the full report, log on to www.timesofindia.com

The viral phenomenon

In 1976, Dr Frederick Murphy came upon a box containing some broken tubes holding samples of a virus from a patient in Zaire. Murphy and his colleague Dr Patricia Webb recovered the virus and put it in tissue culture. He then examined the virus under an electron microscope. What he saw made him bleach the area, autoclave his equipment and his protective coverings. Urgently, Murphy thought he was looking at the deadly Marburg filovirus. What he was actually looking at was something far deadlier. He was the first person to photograph the Ebola virus, writes Leigh Cowart at Hazlett.

Ebola. The name itself is terrifying, a fear fanned by the lack of information about the virus – and darkly dramatized in movies like *Outbreak*. What is known about the virus does little to assuage those fears. "...your body contains everything Ebola needs to make more of itself: by providing the blueprint for more virions, the virus uses your own

cellular machinery to replicate. To Ebola, we are nothing but machinery. And it is our own machinery that conspires to kill us," writes Cowart.

But for all the horrors of an Ebola infection – during which the virus replicates itself leaving dead zones in which clots form leading to blockages, thus starving the body of blood and infected people haemor-

**SIMPLE PRECAUTIONS
LIKE GLOVES AND
BLEACH CAN CONTAIN
EBOLA OUTBREAKS**

rhage to death – an outbreak is actually pretty easy to control. "Modest containment efforts, such as gowns and gloves and dilutions of bleach, tend to be successful. People who are infected with Ebola, after all, aren't out running around spreading the disease for long before they're too sick to leave the bed," writes Cowart.

For more: randomhouse.ca/hazlett

Transmission by means of body fluids & exposure of infected persons make it deadly vulnerable disease.

Ebola threat looms over India

Many Living In Affected Area, May Bring Virus Home

Durgesh Nandan Jha | TNN

New Delhi: A total of 44,700 Indians are living in different countries affected by Ebola, a deadly virus that has claimed 932 lives so far. Of this, 300 are CRPF personnel deployed in Liberia for UN peacekeeping operations. Union health minister Harsh Vardhan said this on Wednesday in a written statement to Parliament.

Vardhan said 500 Indians were in the Republic of Guinea, 3,000 in Liberia and 1,200 in Sierra Leone, from where the maximum cases have been reported. Nigeria has a much larger presence of nearly 40,000 Indian citizens. "If the situation worsens, there is a possibility of these people returning home," Vardhan said.

To prevent the disease from spreading to India, the government is taking several precautionary measures — like obtaining details of travellers originating from or transiting through affected countries and tracking them after their arrival, up to their final destination.

Health ministry sources said director general of

health services (DGHS) Jagdish Prasad held two meetings on August 1 and 2 to review the situation. Advisories have been issued to the state disease surveillance units to be on alert. On Tuesday, the health minister held another meeting that was attended by immigration, external affairs ministry, civil aviation, armed forces and WHO officials to assess the threat perception to India.

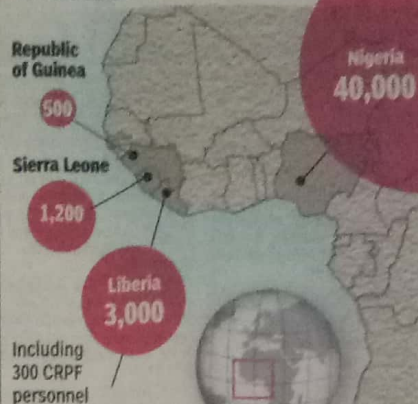
"With many of their personnel deployed in Ebola-hit countries, the armed forces would be suitably advising their staff for appropriate precautions. Soldiers returning to India on leave or otherwise would be tracked and monitored for symptoms," said a senior health ministry official. He said there was no confirmation of any Indian being infected with the virus yet.

As a precaution, the government has asked people to defer non-essential travel to that region.

WHO has reported 1,603 cases and 887 deaths till August 4 in four countries — Guinea (485 and 358), Liberia (468 and 255), Sierra Leone (646 and 273) and Nigeria (4 and 1).

THE OUTBREAK

NO. OF INDIANS IN COUNTRIES AFFECTED BY EBOLA



MEASURES BY GOVT TO CONTROL DISEASE SPREAD

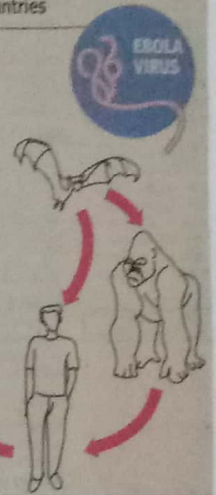
- 1 Travellers from affected nations to be screened thoroughly
- 2 Mandatory self-reporting by passengers from or transiting through the affected countries at the time of immigration check
- 3 Designated facilities at airports/ports to manage travellers manifesting symptoms of the disease
- 4 States asked to identify nodal officers and designate hospitals with isolation wards and keep ready personal protective equipment
- 5 Indian Medical Association roped in to sensitize doctors about diagnostic and treatment protocols
- 6 Check on non-essential travels to affected countries

WHAT IS EBOLA?

A viral illness of which the initial symptoms can include a sudden fever, intense weakness, muscle pain and a sore throat. In some cases, it can lead to severe symptoms like vomiting, diarrhea and bleeding

HOW DOES IT SPREAD?

The disease infects humans through close contact with infected animals, including chimpanzees, fruit bats and forest antelope. It then spreads between humans by direct contact with infected blood, bodily fluids or organs, or indirectly through contact with contaminated environment



HISTORY

Ebola was first discovered in the Democratic Republic of Congo in 1976, since then it has affected countries further east, including Uganda and Sudan. The recent outbreak, which has already claimed 887 lives, is unusual because it started in Guinea, which has never before been affected, and is spreading to urban areas

WHO: Use survivors' blood to fight Ebola

London: The World Health Organization has recommended that doctors should use blood from survivors to treat patients in an effort to combat the biggest-ever outbreak of Ebola.

At a press briefing on Friday, WHO expert Dr Marie Paule Kieny said that survivors' blood may be used to treat Ebola and that all efforts should be taken to help countries use the strategy.

At a meeting in Geneva this week, the UN health agency invited more than 200 experts to discuss which experimental treatments and

vaccines for Ebola should be fast-tracked for testing.

The agency also said it had identified two promising vaccine candidates, one of which is being tested in the US.

Ebola has so far infected more than 2,100 people and the death rate is nearly 50%.

Dr Kieny added, "There is a real opportunity that a blood derived product can be used now and this can be very effective in terms of treating patients. She also added that this was the one of the positive points of so many people being infected by the Ebola virus. AGENCIES

Globalisation of Ebola

is becoming a threat for entire world. World Health

Organisation (WHO) experts

suggests to preserve blood

samples of survivors to

enhance protection prophylaxis.

It's the deadliest strain, says the man who discovered Ebola

RED ALERT AS SHADOW OF DEATH GROWS

What is Ebola and how does it spread

Viral infection results in death in **90% cases**

Incubation between **2 & 21 days** after infection

SYMPTOMS: Fever, weakness, muscle pain, headache and sore throat

Disease progresses to vomiting, diarrhoea, impaired organ function and bleeding. Affects central nervous system

NO VACCINE TO PROTECT AGAINST EBOLA, NO SPECIFIC TREATMENTS BEYOND MANAGING SYMPTOMS

WIDE SPREAD: 3 COUNTRIES & THEIR CAPITALS HIT

Sierra Leone (Freetown), Liberia (Monrovia) and Guinea (Conakry)

Ebola virus
Ebola transmits to people from animals: Most likely reservoir is fruit bat

Spreads from person to person on contact with blood or bodily fluids of infected person or through exposure to instruments contaminated with infected bodily fluids

Who are at risk: Family members and/or healthcare workers caring for the Ebola-infected

- 'Mysterious disease' first reported in February in Guinea this year
- The first Ebola case confirmed on March 21
- Team of 'Doctors Without Borders' reached Gueckedou on March 18
- Only on July 2 did WHO call a meeting of states, ministries and health workers to address the issue

- WHO has said current strain **unrelated to past outbreaks**
- First time West Africa has seen an outbreak
- Among deaths so far is Sierra Leone's top doctor who treated Ebola patients
- High alert after a US doctor working in Liberia contracted the virus and died in Laos, Nigeria

What Makes It Difficult To Contain

- Outbreak across three countries making **coordination** a major problem
- Sierra Leone and Liberia have witnessed devastation because of **civil wars**
- Guinea overburdened by refugees fleeing the conflicts in Sierra Leone and Liberia

- All three have **very poor health infrastructure**. Liberia has just 0.014 doctors per 1,000 people
- Ebola **tests need sophisticated labs**. Infection difficult to confirm, requiring multiple tests
- In the early weeks, samples had to be sent to Senegal, France and Germany

THIS OUTBREAK
Deaths **729** Cases **1300**

CASES REPORTED IN **over 60 locations** (across three countries)



Mutant strain of Ebola virus is the reason for the potency of the virus.

The scientist who discovered the Ebola virus in Congo in 1976 warns that the latest outbreak is caused by the deadliest strain of the virus.



Peter Piot

In an exclusive interview to TOI's Kounteya Sinha, Peter Piot, who was 27 when he made the discovery, says the current outbreak could spread across the world. Piot, 65, is now director of the London School of Hygiene and Tropical Medicine.

How did you discover the virus? Recall for us the path to the discovery.

The virus was isolated from blood samples of a nun who was suspected of having yellow fever in Zaire (now called Democratic Republic of the Congo) in 1976. The sample was sent to Antwerp, Belgium, where we applied regular virus isolation techniques. It became clear this was a new virus and this was also confirmed by a team at CDC (Centers for Disease Control and Prevention) in the US.

How deadly is the virus?

There are four types of Ebola virus that infect humans. The strain from the current epidemic, known as the

'Zaire strain', is the deadliest. Nine out of 10 people who have it, die.

How serious is the current outbreak? Do you think it could become a mass killer if exported outside Africa?

It is the largest ever, the longest ever, the first one that involves three countries, their capitals and it is disrupting entire societies, not only because of the deaths, but also hospitals stop functioning, commerce comes to a halt and then there's the panic and fear. Ebola outbreaks are always happening in a context of poverty, dysfunctional health services with poor infection control and hygiene practices.

How is Ebola unique from other viruses?

Ebola is part of a small group of viruses that kills infected people within a couple of weeks.

What should Africa do to control this outbreak?

The classic ways to contain an Ebola outbreak are straightforward because the virus can only be transmitted in two ways: through close contact with someone who is ill from Ebola, and through contaminated needles and injections. To control the spread, you should isolate patients, in what they call barrier nursing, so that healthcare workers don't become

infected. Also surveillance of people who have had contact with Ebola patients should be carried out. Safe burial practices or safe preparation of the body for funeral is critical. Should countries be worried about importing it? India has started checking passengers for Ebola symptoms in its airports. Is that a right move?

With ever growing mobility of people and travel, it's not unlikely that people during the incubation period of Ebola may go to another country. Someone who has a full blown Ebola infection would not travel as they'd be too sick. The critical thing is to make sure that when you see a patient with the early symptoms of Ebola, is to ask 'where have you been in the last month?' This should be done by health officials in India. If the patient's answer is that they've just come from an infected country, such as Sierra Leone, then you have to be really alert. That patient should be referred to specialized units. I don't think checking passengers for fever at airports has been proven to stop import of the virus. The most important thing that India can do is to make sure that all healthcare workers know about Ebola.

For the full report, log on to www.timesofindia.com

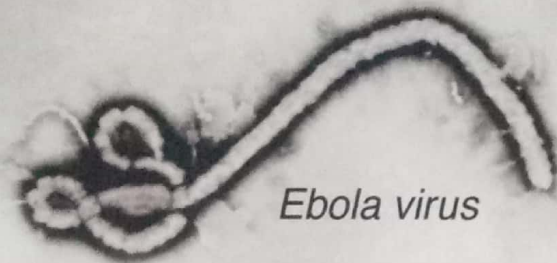
History of Ebola Haemorrhagic fever

Ebola hemorrhagic fever

Ebola is a severe, often-fatal disease that affects people, as well as monkeys, gorillas and chimpanzees.

Origins of the disease

■ Infection with Ebola virus, named after river in Congo, where disease was first recognized in 1976



Ebola virus

Symptoms

- 1 Fever, headache, joint and muscle pain, sore throat, weakness
- 2 Followed by diarrhea, vomiting
- 3 Rash, internal and external bleeding

Confirmed human cases

Since 1976



How it spreads

- Direct contact with blood, secretions of infected person
- Contact with contaminated objects, such as needles
- Contact with infected animal; possibly eating contaminated meat

Treatment

- No standard treatment; sick person isolated, given fluids, oxygen; treatment for secondary infections

Source: U.S. Centers for Disease Control and Prevention
Graphic: Pat Carr

© 2004 KRT

Overview of Ebola Virus Disease.

EBOLA VIRUS

SIGNS AND SYMPTOMS OF INFECTION



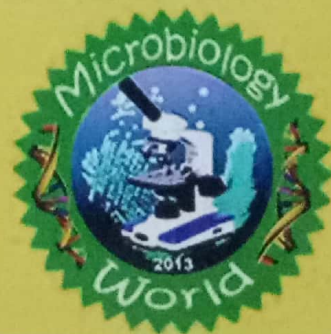
* bleeding from body openings may be seen in some patients

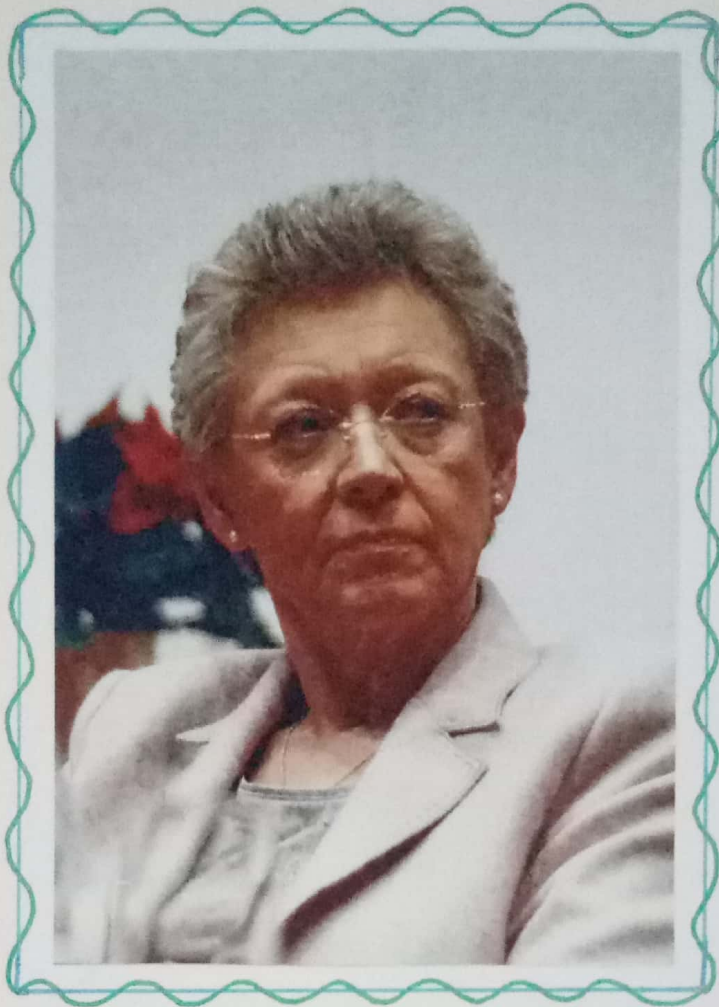
Sharing
is Caring

Share this info
to let the
world know
the signs and
symptoms and
Prevention of
EBOLA VIRUS

PREVENTIVE MEASURES

- Avoid areas of known outbreaks.
- Wash your hands frequently.
- Avoid bush meat.
- Avoid contact with infected people.
- Follow infection-control procedures.
- Don't handle remains.





Born: 30 July 1947

Nationality: French

Institutions: Pasteur
Institute

== Françoise Barré-sinoussi ==

Françoise Barré-sinoussi is a french virologist and director of Retroviral Infections division at the Institut Pasteur in Paris, France.

Barré-sinoussi performed some of the fundamental work in the identification of the Human Immunodeficiency virus (HIV) as the cause of AIDS.

In 2008, she was awarded the Nobel prize in physiology or medicine.

She received her PhD in 1975 and interned at the U.S. National Institute of Health.

Among Barré-Sinoussi's many recent research contributions are studies of various aspects of the adaptive immune response to viral infections, the role of innate immune defenses of the host in controlling HIV and characteristics that allow a small percentage of HIV-positive individuals known as *Elite suppressors*.

She is an international consultant at *UNAIDS-HIV*.

In 2012, she became President of the *International AIDS Society*.

In addition to Nobel prize, she received:

The Sovac prize

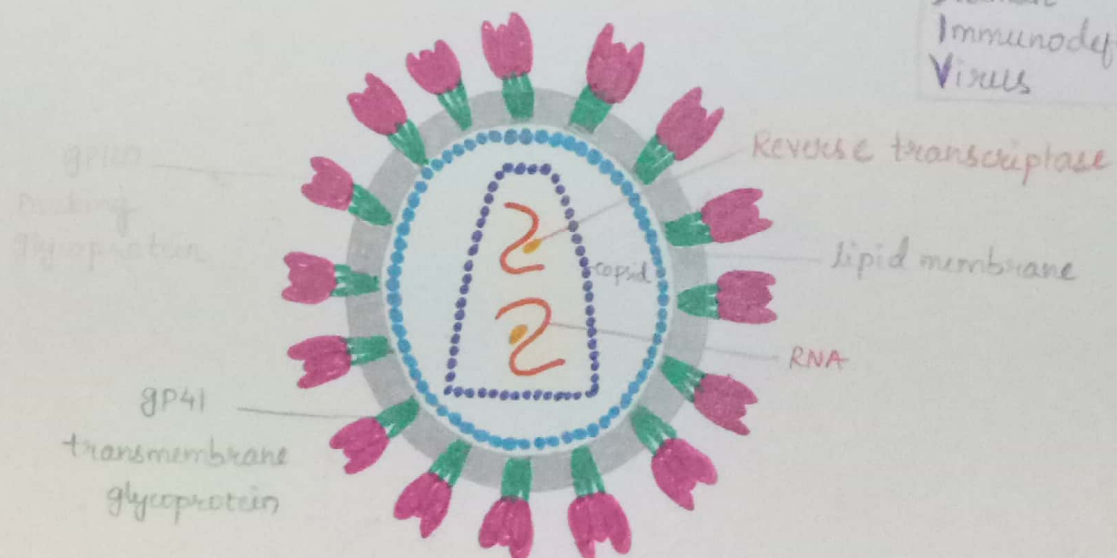
The Körber European science prize

Prize of Académie des Sciences.

The King Faisal International prize

The International AIDS society prize

National ordre de la Légion d'honneur



The Immortal — — cell lines

HeLa cells. —



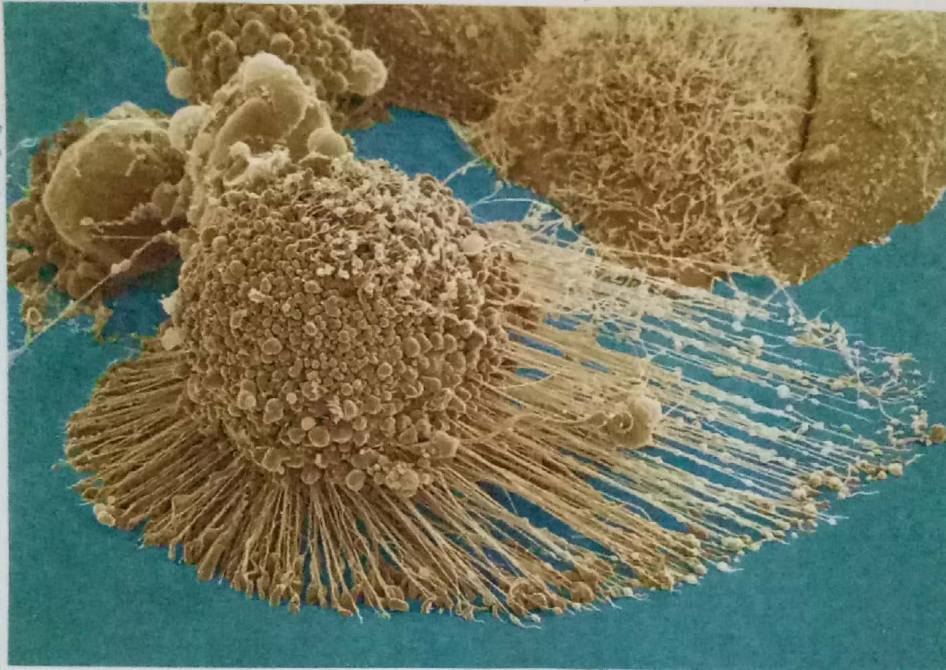
Henrietta Lacks Circa

Henrietta Lacks was the lady who died because of cervical cancer in 1953. The cancer was HPV induced. Her contribution to microbiology is legendary & immortal because her cell lines were the first human cell line to prove successful in-vitro cultivation since 1953 till today.

To commemorate her contribution, the cell lines are named as *HeLa cell lines*. It is used as continuous cell culture.

HeLa cells have been used as trial for *poliomyelitis* vaccine. They have been used to study *Poxvirus* that infects cells of humans, cats and dogs.

HeLa cells are used to define cancer markers in RNA & have been used to establish an RNAi based Identification system and interference of specific cancer cells.



SEM
of
Dividing
HeLa
cells

HeLa cells have an active version of *telomerase* during cell division which prevents the incremental shortening of telomeres that is implicated in aging and eventual cell death.

Horizontal gene transfer from *HPV 18* to human cervical cells created the HeLa genome different from parental genome. The current estimate is a *Hypertriploid chromosome number* ($3n+$) i.e., 76-80 chromosomes.

Bacteria found in bees an alternative to antibiotics?

Kounteya.Sinha
@timesgroup.com

London: Scientists now say that lactic acid bacteria found in honeybees have shown promising results as an alternative to antibiotics in a series of studies at Lund University in Sweden.

The group of bacteria counteracted antibiotic-resistant MRSA in lab experiments. The bacteria blend has already been tested on horses and healed persistent wounds. Raw honey was used to treat infections for millennia before it was processed and sold in stores.



Researchers at Lund University identified a unique group of 13 lactic acid bacteria found in fresh honey, from the honey stomach of bees. The bacteria produce a myriad of active antimicrobial compounds. The bacteria were mixed with honey and

applied to 10 horses whose owners had tried several other methods to no avail. All of the horses' wounds were healed by the mixture.

The researchers believe the secret to the strong results lie in the broad spectrum of active substances involved.

"Antibiotics are mostly one active substance, effective against only a narrow spectrum of bacteria. When used alive, these 13 lactic acid bacteria produce the right kind of antimicrobial compounds as needed, depending on the threat.

► Continued on Page 10

Bacteria found in bees an alternative to antibiotics?

► Continued from Page 1

It seems to have worked well for millions of years of protecting bees' health and honey against other harmful microorganisms. But since store-bought honey doesn't contain the living lactic acid bacteria many of its unique properties have been lost in recent times," said Tobias Olofsson, professor of Medical Microbiology.

The study said, "Today due to overuse of antibiotics and emerging antibiotic-resistant pathogens, we are facing a new era of searching for alternative tools against infectious diseases. Chronic wounds infected by pathogens are subjects for in-

tensive research efforts because of the bacteria's ability to sustain antibiotic treatment and maintain chronic infections."

The Lund scientists isolated 42 different pathogens in the open wounds of 22 patients - *Pseudomonas aeruginosa* and vancomycin-resistant *Enterococcus* as well as MRSA - and treated them with the 13 lactic acid bacteria from honey.

The results were "comparable" with antibiotics. The findings could be vital both in developing countries, where fresh honey is easily available, as well as for Western countries where antibiotic resistance is an increasingly concerning issue.

→ Eating Chicken Could make you Antibiotic resistant.

Eating chicken could make you antibiotic-resistant

TIMES NEWS NETWORK

New Delhi: Each time you eat chicken, you could also be consuming a cocktail of antibiotics. A lab study released by Centre for Science and Environment (CSE) found antibiotic residues in 40% of chicken samples bought from outlets in Delhi and NCR.

While the amount of antibiotics found in each sample was not very high, experts said regular consumers of such meat could be in danger of developing antibiotic resistance. In other words, eating chicken with drug traces over a period of time could make you immune to important antibiotics prescribed to treat common illnesses.

The study said it had evidence of large scale and reckless use of antibiotics by poultry owners, which can also lead to antibiotic-resistant bacterial strains in the chicken itself.

CSE said it conducted the study after being alerted by doctors, including Bangalore-based cardiac surgeon Devi Shetty, about a rising trend of antibiotic resistance among patients.

CSE said 22.9% of the 70 samples it collected contained residues of one antibiotic while 17.1% had more than one. One sample purchased from Gurgaon was found to have a cocktail of as many as three antibiotics.

The CSE report, released on Wednesday, said poultry owners routinely pumped antibiotics into chicken dur-

DRUGGED BIRDS

► CSE gets 70 chicken samples from Delhi-NCR tested for presence of 3 classes of antibiotics—tetracycline, fluoroquinolone & aminoglycoside

► Residues found in 40% of samples. 17.1% had more than one antibiotic

WHY IS IT DANGEROUS?

Though the traces found were within safe limits prescribed in US, experts say frequent consumers could develop resistance to antibiotics

► Cooking doesn't remove the drugs

WHERE IS IT COMING FROM?

Poultry owners liberally feed drugs to chicken to prevent diseases and promote growth



ing their short life of about 35 to 42 days, to promote growth so that they look bigger and also to treat or prevent infections. India has no law to regulate antibiotic use in the poultry sector.

CSE's research team tested chicken samples at its Pollution Monitoring Laboratory. Three tissues in each sample were tested — muscle, kidney and liver. Residues of five of the six antibiotics were found in all three tissues of the samples in the range of 3.37 to 131.75 micrograms per kg.

According to Dr Shetty, after a researcher conducted

a study on antibiotic resistance at his hospital, they found about 10% of the patients to be resistant to common antibiotics.

"These are people who probably haven't taken antibiotics before. They are villagers. We started thinking it could be caused from the food they are eating. That is why I approached CSE to do a study and now the data says it all," he said on a live video chat from Bangalore during the presentation of the findings.

Dr Shetty also said that the likelihood of becoming antibiotic resistant after eating chicken depends on how often we eat chicken. "If you are eating poultry chicken on a daily basis then you could be at a higher risk. That is why I asked my family to get only village reared chicken not the poultry ones," he said.

Dr Randeep Guleria, head pulmonary medicine at AIIMS said he wasn't surprised that antibiotics were entering the food chain through poultry.

"The findings aren't surprising. It's a big concern and in the last few years after the NDM1 superbug scare, the medical community has been raising concern about indiscriminate use of antibiotics in poultry and agriculture," Dr Guleria said.

Said Chandra Bhushan, CSE's deputy director general, "Our study is only the tip of the iceberg. There are many more antibiotics that are rampantly used that the lab has not tested," Bhushan said.

When contacted by TOI, Union health minister Harsh Vardhan said he would react to the findings only after reading the entire lab report.

For the full report, log on to www.timesofindia.com

Chicken feeded liberally with drugs to promote growth could be dangerous to all chicken-lovers. Trace of antibiotics like Tetracycline, fluoroquinolone, aminoglycoside were found in chickens. Frequent eaters over a long period of time may become resistant to antibiotics.

“ Always choose Homemade food... especially Vegetarian ”



Fewer H1N1 cases, but state's death rate high

14 People Have Died Of Infection Till August 18

Umesh.Isalkar@timesgroup.com

Pune: The mortality rate after swine flu infection continues to remain high though the number of cases has dropped. Fourteen of the 52 patients found with the infection in the state between January and August 18 died, states a state health department report.

In 2013, the mortality rate had gone up from 8% in 2012 to 23%. This year it stands at 26%.

Associated illnesses were the predominant factors responsible for most deaths. In 2013, as many as 643 people got the infection while 149 people died.

Of the 14 swine flu deaths, Nagpur accounted for the highest (5) followed by Nashik (3), Pune and Sangli (two each). Amravati and Kolhapur reported one casualty each.

Pune, the epicentre of swine flu infection from 2009 when the virus was declared a pandemic by the World Health Organisation, reported the maximum cases (19) in the state. Sixteen patients were from Pune city while three were from Pimpri Chinchwad.

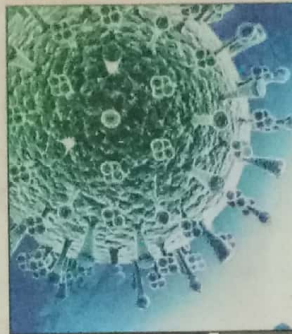
Mumbai and Nashik recorded nine positive cases each. Kolhapur, Sangli and Bhayandar reported two cases each.

"Two persons who died of swine flu at private hospitals in Pune city were not local residents but people from rural parts of the district who had come to the city for advanced treatment. As per our records, the victims delayed treatment," said ST Pardeshi, medical officer of health (MoH), Pune Municipal Corporation (PMC).

Of the 14 people who succumbed to H1N1, eight had other associated illnesses like epilepsy, hepatitis B infection, diabetes, hypertension and bronchial asthma. "A 45-year-old man from Amravati who died on August 7 had severe digestive problems which may have precipitated his death," said a state health official.

Two victims were pregnant. "A 23-

BREAK-UP OF CASES IN STATE



(January to August)

■ Mumbai	9
■ Bhayandar	2
■ Pune city	16
■ Pimpri Chinchwad	3
■ Sangli	2
■ Kolhapur	2
■ Nashik	9
■ Nagpur	9
■ Total	52

Month-wise

Months	Deaths
■ January	0
■ February	1
■ March	1
■ April	2
■ May	4
■ June	1
■ July	4
■ August (Till Aug 18)	1
■ Total	14

District-wise

District	Deaths
■ Nagpur	5
■ Nashik	3
■ Pune	2
■ Kolhapur	1
■ Sangli	2
■ Amravati	1
■ Total	14

(Source: Directorate of Health Services, Pune)

SYMPTOMS

- Fever, cough, sore throat, stuffy or runny nose
- Body aches, headache, chills,
- In some cases, respiratory problems, diarrhoea and vomiting
- Lethargy, lack of appetite

PREVENTIVE MEASURES

- Ensure good hand hygiene, washing hands with soap thoroughly and frequently
- Cover your mouth and nose while coughing or sneezing
- If you have caught the disease, stay away from people, especially the vulnerable ones till about seven days after being disease-free
- Those in the high-risk groups must consider avoiding crowded place during flu season
- Avoid touching your eyes, nose or mouth as germs may spread this way

year-old woman from rural Nagpur died on July 3. She was 23 weeks pregnant," the official said.

"Swine flu has always been more severe than the regular seasonal influenza. Those who died may have had some underlying medical condition or could have delayed approaching the doctor," said a senior scientist from National Institute of Virology (NIV).

Experts say that since the virus is here to stay, the focus should now be on protecting the high-risk groups, which includes pregnant women, peo-

ple with respiratory troubles, those with liver and heart diseases and the medical and paramedical staff that routinely get exposed to different viruses. An annual flu shot should help, said officer-bearers of the Indian Medical Association (IMA).

"About four lakh people, who complained of influenza-like illness, have so far been screened for swine flu in the state. Of them, 12,532 people, who were suspected to have contracted the infection, were administered Tamiflu tablets," said a state health official.

H1N1 cases lowered but still some people who are infected should take care & Maharashtra leads in no. of deaths by swine flu.

Vulnerable persons should avoid contact with infected ones.

“Prevention is better than cure”



Dengue strain resurfaces in city

NIV Scientists Find DENV-4 Strain Again In Pune After A Gap Of Four Years

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Pune: After a gap of four years, dengue virus type 4 (DENV-4) has surfaced in the city and is currently predominant among two serotypes of the virus co-circulating in Pune, scientists at the city-based National Institute of Virology (NIV) have found. However, scientists did not say if it was a more virulent strain.

The emergence of DENV-4 was reported in 2003 in Delhi and in 2007 in Hyderabad. The first report of DENV-4 from Maharashtra was in 1975 from Amalner. The NIV reported on the detection of DENV-4 in Pune (Maharashtra) after an absence of almost 30 years when two cases were detected in 2009-10.

This year, the premier virology institute has received a total of 2,358 blood samples from Pune and adjoining districts till August 21. Of them, 495 samples tested positive for dengue virus, accounting for 20% positivity rate.

Scientists identified the serotypes through a molecular study of some of the blood samples of dengue-infected patients from Pune. "DENV-4 was found to be the causative agent in blood samples of 10

VIRUS HISTORY

■ Till the 1980s, India and Sri Lanka reported low number of dengue hemorrhagic fever (DHF) cases despite circulation of all four serotypes of dengue virus (DENV)

■ The occurrence of DHF has increased since the 1990s, due to changes in virus lineage with regard to DENV-2 and DENV-3

■ DENV-1 has been associated with dengue fever outbreaks. DENV-4 reports have been rare

■ The emergence of DENV-4 was reported recently in 2003 in Delhi and in 2007 in Hyderabad. The last report of DENV-4 from Maharashtra was in 1975 from Amalner

■ NIV reported DENV-4 in Pune after almost 30 years

when two cases were detected in 2009-10, serotyped by multiplex reverse transcriptase polymerase chain reaction (RT-PCR)

■ Both the cases were recorded as severe dengue (Category 3) requiring intensive care unit (ICU) level of treatment



■ The first DENV-4 case, Case 1, occurred at the end of the seasonal outbreak period in November 2009. The second case, Case 2 was in the early phase of the season in June 2010

Testing at NIV (till Aug 21)

Month	Samples received	Positive
January	405	70
February	143	29
March	182	17
April	166	20
May	145	53
June	361	132
July	398	93
August	392	81
Total	2,358	495

(Source: National Institute of Virology, Pune)

■ The two cases were hospitalised. Neither patient had any recorded history of dengue infection. Both cases presented severe manifestations

■ Case 1 recovered while Case 2 died. Both cases had thrombocytopenia, however the counts normalized by day 5 (post hospitalisation) in Case 1 while it continued to decline in Case 2

patients with the results of the dengue sero-typing."

Dengue has four different serotypes, dengue types 1, 2, 3, and 4, which are quite different from each other at the genomic level, but were clubbed together because of similarity at the immunological level. This means there is similarity in the body's immune response when it is infected by any of these strains.

"Infection with one serotype endows one with lifelong protection against the same serotype, but does not protect against infection with a different serotype. Therefore, a person who has suffered from dengue once can get dengue again, which is called a secondary infection. Severe dengue, characterised by haemorrhage and sometimes shock, is associated more with secondary infections," Shah said.

The immune response recognises the second infection, but instead of inhibiting the virus it enhances its growth and causes an enhanced inflammatory response, he added.

As far as virulence of different serotypes is considered, it is believed that DENV-2 is associated more often with dengue haemorrhagic fever that occurs in secondary infections.

patients and DENV-2 was the causative agent in five. Therefore, DENV-4 is currently the predominant dengue strain in the city. DENV-3 was predominant during July and August last year but now it is DENV-4," said senior scientist Devendra Mourya, director of NIV.

When asked what the detection of DENV-4 in 10 samples meant after a gap of four years, scientist Paresh Shah, who is attached to the dengue research group at NIV, said, "The DENV-4 serotype could be in circulation but may

have remained undetected. Early sample collection has made it possible to detect the DENV-4 serotype."

About its severity, Shah said, "We cannot comment on the severity of the virus. It has to be correlated with the clinical findings in a large group of

June records max malaria, dengue cases

Siddharth Gaikwad | TNN

Pune: Pimpri Chinchwad recorded as many as 20 malaria cases and 37 dengue cases from January to June this year.

"A total of 32,812 suspected malaria cases were detected in the city in the past six months. Out of these, 20 patients were confirmed to have malaria. There were as many as 296 suspected dengue patients in the same period, of which 37 were confirmed to have contracted the virus," Anil Roy, medical officer of health (MOH), Pimpri Chinchwad Municipal Corporation (PCMC), said.



33 dengue cases in city in just 5 days

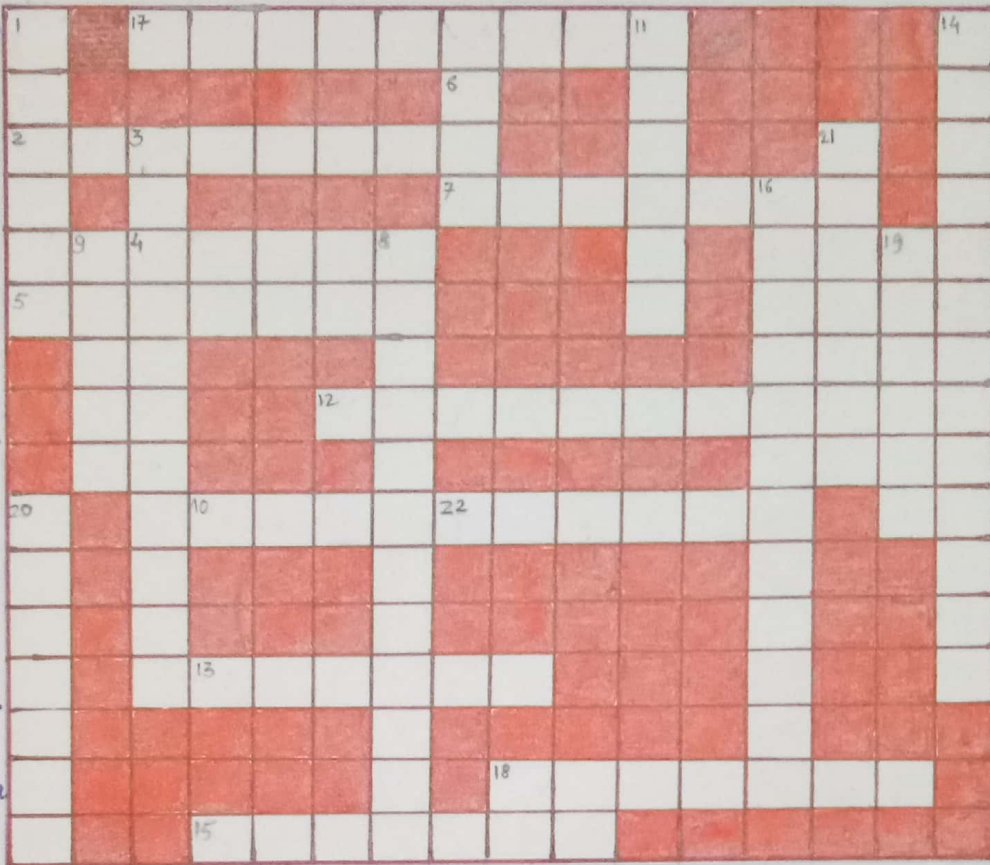
Newest, 4th strain of Dengue virus reappears. after a gap of 4 years. It is causative agent for Dengue Haemorrhagic fever. vector is the *Aedes aegypti* mosquito.



- Puzzle -

Down

1. Negative stain used to stain Eosinophils
3. Production of new strand of DNA from original
6. continuous cell culture
8. Sterilizer of 850-900°C temp.
9. Sequence of 3 nucleotide on mRNA is called
11. Structurally complete, mature & infectious virus particle is called
14. Polysaccharide of Gram +ve bacterial cell.
17. Agar/media used to grow fungi
19. mordant used in Gram staining
20. Disease caused by Bacillus anthracis
21. Disease caused by Salmonella typhi



Across

2. cuboidal pattern of cell arrangement
4. Small hair like appendages
5. metachromatic granules are also called as
7. 4th amino acid of tetrapeptide chain of murin in Gram +ve cell
10. Another name of peptidoglycan
12. A Neutral stain
13. Polysaccharide present in fungal cell wall.
15. Extra chromosomal, circular DNA of bacteria
16. Genus of bacteria used in RDNA technology & extensively studied
18. capsule can be stained by this method.
22. Disease caused by poliomyelitis virus.

“

Take out your pencils & solve the above puzzle. Test your memory!

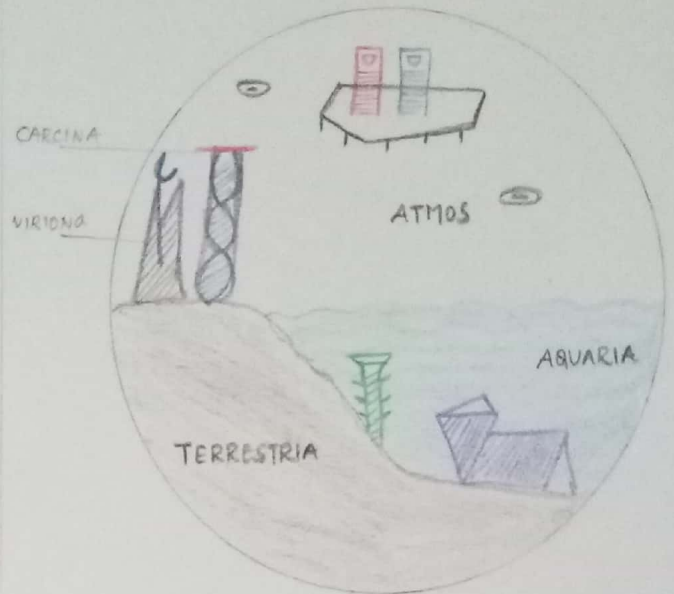
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Did you Know ?

- All of Bacteria in our body collectively weighs 4 pounds.
- Smell of rain is caused by Bacteria Actinomyces.
- Chocolate has Anti-Bacterial effect on mouth & protect against tooth decay.
- Strongest creature on the Earth are gonorrhoea bacteria - They can pull 100,000 times their own weight.
- Magnetospirillum magneticum is a free living bacteria, which takes iron & convert it into magnetic 'magnetite' and align it as its backbone & travel creating magnetic fields.
- One teaspoon of Clostridium botulinum, if equally distributed, can kill every single human on this planet.
- when you hear music with headphones for 1 hour, it can increase Bacterial population upto 7000 times.



Once there was a planet named
"Microbia"



It was divided into 3 provinces

- 1) ATMOS (AIR)
 - 2) TERRESTRIA (LAND)
 - 3) AQUARIA (WATER)
- Two major cities
1) VIRIONA
2) CARCINA

01

02



ATMOS' President was Klebsiella Pneumoniae
and 2 council-o-minister - mycobacterium tuberculosis
& Salmonella typhi

ATMOS Regulated Air traffic & protected
microbia from foreign attacks

- TERRESTRIA's president was Escherichia coli It was the highly developed province of
microbia with 2 cities VIRIONA & CARCINA
It was tech-centre of microbia.

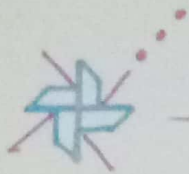
- Paramecium & Euglena were the
caudatum viridis

joint presidents of Aquaria. That was
Agricultural province of microbia. They
provided food to microbia.

- Apart from these microbia had a 'Prisona'
below CARCINA in which 2 Bioterrorists
were imprisoned.

03

18



Overview of Bacterial infections

Bacterial meningitis

- *Streptococcus pneumoniae*
- *Neisseria meningitidis*
- *Haemophilus influenzae*
- *Streptococcus agalactiae*
- *Listeria monocytogenes*

Otitis media

- *Streptococcus pneumoniae*

Pneumonia

Community-acquired:

- *Streptococcus pneumoniae*
- *Haemophilus influenzae*
- *Staphylococcus aureus*

Atypical:

- *Mycoplasma pneumoniae*
- *Chlamydia pneumoniae*
- *Legionella pneumophila*

Tuberculosis

- *Mycobacterium tuberculosis*

Skin infections

- *Staphylococcus aureus*
- *Streptococcus pyogenes*
- *Pseudomonas aeruginosa*

Sexually transmitted diseases

- *Chlamydia trachomatis*
- *Neisseria gonorrhoeae*
- *Treponema pallidum*
- *Ureaplasma urealyticum*
- *Haemophilus ducreyi*

Eye infections

- *Staphylococcus aureus*
- *Neisseria gonorrhoeae*
- *Chlamydia trachomatis*

Sinusitis

- *Streptococcus pneumoniae*
- *Haemophilus influenzae*

Upper respiratory tract infection

- *Streptococcus pyogenes*
- *Haemophilus influenzae*

Gastritis

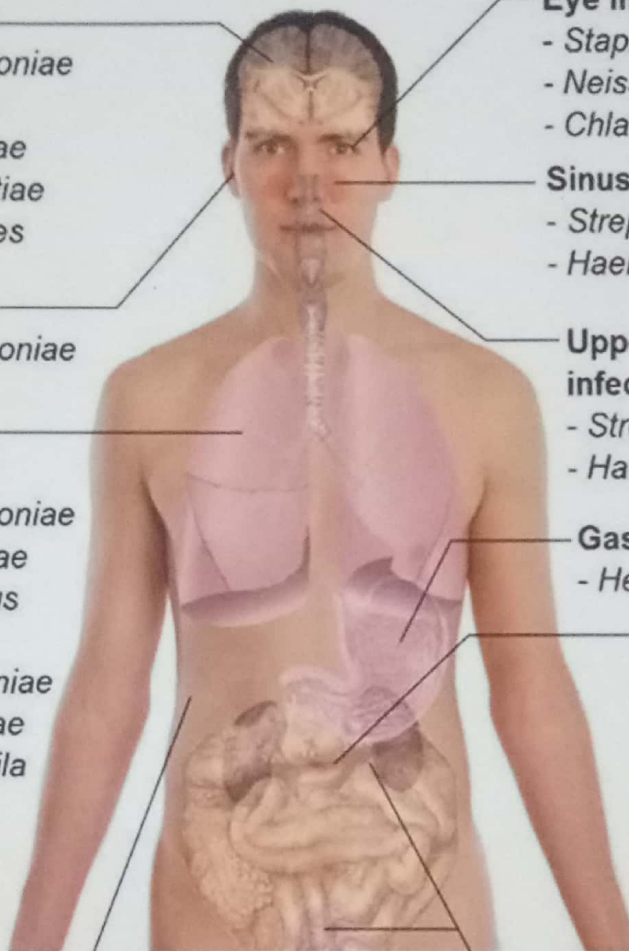
- *Helicobacter pylori*

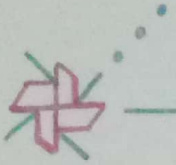
Food poisoning

- *Campylobacter jejuni*
- *Salmonella*
- *Shigella*
- *Clostridium*
- *Staphylococcus aureus*
- *Escherichia coli*

Urinary tract infections

- *Escherichia coli*
- Other Enterobacteriaceae
- *Staphylococcus saprophyticus*
- *Pseudomonas aeruginosa*





Overview of Viral infections

Encephalitis/ meningitis

- JC virus
- Measles
- LCM virus
- Arbovirus
- Rabies

Common cold

- Rhinoviruses
- Parainfluenza virus
- Respiratory syncytial virus

Eye infections

- Herpes simplex virus
- Adenovirus
- Cytomegalovirus

Pharyngitis

- Adenovirus
- Epstein-Barr virus
- Cytomegalovirus

Gingivostomatitis

- Herpes simplex type 1

Parotitis

- Mumps virus

Pneumonia

- Influenza virus, Types A and B
- Parainfluenza virus
- Respiratory syncytial virus
- Adenovirus
- SARS coronavirus

Cardiovascular

- Coxsackie B virus

Hepatitis

- Hepatitis virus types A, B, C, D, E

Myelitis

- Poliovirus
- HTLV-I

Skin infections

- Varicella zoster virus
- Human herpesvirus 6
- Smallpox
- Molluscum contagiosum
- Human papillomavirus
- Parvovirus B19
- Rubella
- Measles
- Coxsackie A virus

Gastroenteritis

- Adenovirus
- Rotavirus
- Norovirus
- Astrovirus
- Coronavirus

Sexually transmitted diseases

- Herpes simplex type 2
- Human papillomavirus
- HIV

Pancreatitis

- Coxsackie B virus

