
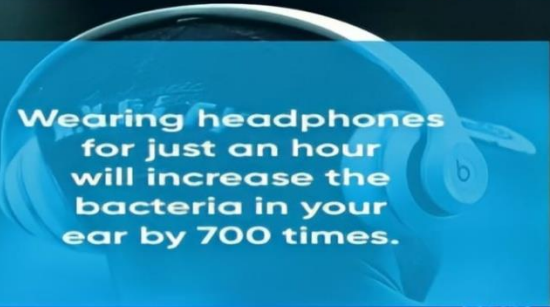


# Microbial facts



02. During the American Civil War some soldier's wounds **glowed blue**. Soldiers whose wounds **glowed** had better chance of surviving, and so the glow was called "Angel's Glow". Now it is known that the luminescence comes from bacteria that produce antibiotics and that live in nematodes.



Wearing headphones for just an hour will increase the bacteria in your ear by 700 times.

Sharks have the best immunity to diseases that are known to man and deadly diseases like cancer do not affect them at all.



P. Mahasree MBC final year  
Kasturba Gandhi Degree and  
PG college for women



# BIG facts about TINY microbes in the gut

Human's  
gastrointestinal  
tract is home to  
**100 trillion of  
microorganisms<sup>1</sup>**

Gut microbiota  
weighs up to



The gut contains  
more than  
**3 million  
microbial genes**  
(150 times more than  
human genes)<sup>1</sup>



Host-microbe  
interactions can occur on  
a surface area of about  
**30-40m<sup>2</sup>**  
(20 times of the  
skin surface area)<sup>4</sup>



Skin surface  
area = 1.5-2.0m<sup>2</sup>

**N.Roja**  
11119458021  
(MBC)final year

Just like our fingerprints, the composition of gut microbiota is unique to each individual (although we share some similar features). It is influenced by genetics, age, lifestyle, environmental microbial exposure, diet and health factors<sup>1,2,3</sup>



## MICROBIAL FACTS

- *In the womb, babies are in a sterile with no microbiome at all. Even the bacteria babies need to digest breast milk- lactobacillus- is usually picked up in the mother's birth canal, before their first drink.*




- *More than 1000 kinds of bacteria live in human mouth and around 100-200 species. Different bacteria dominate our mouth during night and day- Tongue produce the stinky "sulfurous" chemicals at night when food is scarce and mouth dries out.*

**G. AKSHAYA**  
**1111-19-458-016**  
BSC Final year  
Kasturba Gandhi  
degree and PG  
college for women.

- *Helicobacter pylori-the bacteria responsible for causing stomach ulcers. Today about half of the world's population has it. Most of them do not have symptoms, but a small number develop painful ulcers in an acidic part of the digestive tract. Helicobacter infections are treatable with antibiotics*



## BIG facts about TINY microbes in the gut



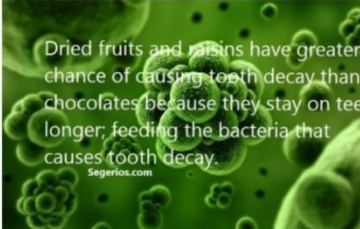
Human's gastrointestinal tract is home to **100 trillion of microorganisms!**

The gut contains more than **3 million microbial genes** (150 times more than human genes!)

Gut microbiota weighs up to **2 kg!**

Dried fruits and raisins have greater chance of causing tooth decay than chocolates because they stay on teeth longer, feeding the bacteria that causes tooth decay.

Segeiros.com



our mouth is inhabited by over 600 known species of micro-organisms



### THE "SMELL OF RAIN" IS CAUSED BY A BACTERIA CALLED ACTINOMYCETES.

G. chandrakala  
MBC final year  
kasturba Gandhi Degree and pg college for women

### DID YOU KNOW?

There are microorganisms living on the seafloor that reproduce only once every 10,000 years and have been alive for millions. These are likely the oldest living things on Earth.




## MICROBIALFACTS


Bacteria also have internal clocks that align with the 24-hour cycle of life on earth.


**DO YOU KNOW?**

**HUMAN BODY CONTAINS 2 TO 9 POUNDS OF BACTERIA IN HIS OR HER BODY**




Human breast milk contains sugars called oligosaccharides that are intended to feed beneficial bacteria, rather than the infant itself.





**BACTERIA IN GUT PRODUCES VITAMINS SUCH AS VITAMIN B12, VITAMIN K AND FOLATE.**

VIRUSES AND BACTERIA CAN BE REPROGRAMMED TO HELP ELIMINATE CANCER.



D. Bhanusree  
Mbc final year  
Kasturba Gandhi degree and pg college

# MICROBIAL FACTS

**DID YOU KNOW?**  
BLOWING BIRTHDAY  
CANDLE INCREASES  
BACTERIA UPTO  
1,400% ON THE CAKE



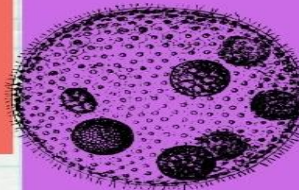
**DO YOU KNOW?**  
WEARING HEADPHONES  
FOR JUST AN HOUR WILL  
INCREASE THE BACTERIA  
IN YOUR EAR BY 700  
TIMES

**DO YOU KNOW?**

THERE ISN'T ENOUGH  
WATER IN HONEY  
FOR  
MICROORGANISMS TO  
LIVE ON, WHICH IS  
WHY HONEY NEVER  
GOES BAD



**VOLVOXES**

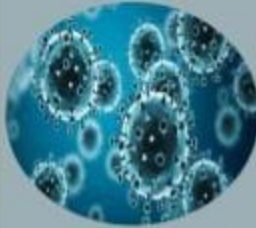


VOLVOXES GROW IN  
DEEPER PONDS,  
LAGOONS, AND DITCHES  
THAT RECEIVE AN  
ABUNDANCE OF RAIN  
WATER

**D. HANNAH ESTHER**  
**MBC FINAL YEAR**  
**KASTURBA GANDHI DEGREE**  
**AND PG COLLEGE**

## MICROBIAL FACTS

Do you know ?



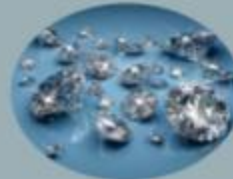
In 1918 more people died from the influenza virus than died in the first world war .Aprox (30 million people).



The smell of rain is caused by a bacteria called actinomyce'ts.



There's a breed of bacteria that lives in hair spray called as microbacterium hatanonis



Diamonds are thought to be made from carbon and dead bacteria. There are an estimation that 75 to 100 trillion cells present in the human body.



The average office desk has 400 times more bacteria than a toilet.

D . Alaritha MBC 3<sup>rd</sup> year

## Microbes

### On mobile phones....

Our mobile phones are covered with Bacteria and viruses.....and we never wash them.....

Cell phones carry 10 times more Bacteria than most toilet seats.....

Microbes on phones automatically makes sick and cause influenza and cough.

DISINFECTING THEM WITH WATER AND ALOCHOL COULD HELP TO STOP DISEASES SPREADING..



# MICROBIOME FACT



Food we eat effects gut microbiota  
Gut microbiota inturn effects  
inflammatory complex

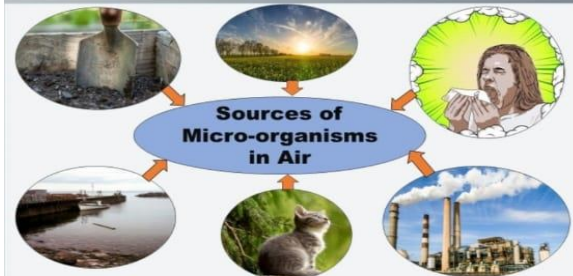
This sends signals to brain causing  
depression

Transplanting gut microbiota from  
healthy humans to depressed  
ones, reduces depression....



# MICROBES IN AIR

**INTRODUCTION:** Airborne microbes are biological airborne contaminants (also known as bioaerosols) like bacteria, viruses or fungi



The air you breathe is teeming with more than 1,800 kinds of bacteria, including harmless relatives of microbes associated with bioterrorist attacks.

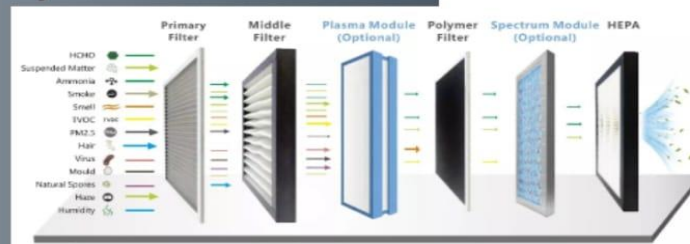


Launching, transport and deposition are all points at which the airborne spread of pathogens can be controlled.



Most microbes are around 1 micrometer in size. Viruses are typically 1/10th that size.

They play an important role in the global climate system, biogeochemical cycling, and health.



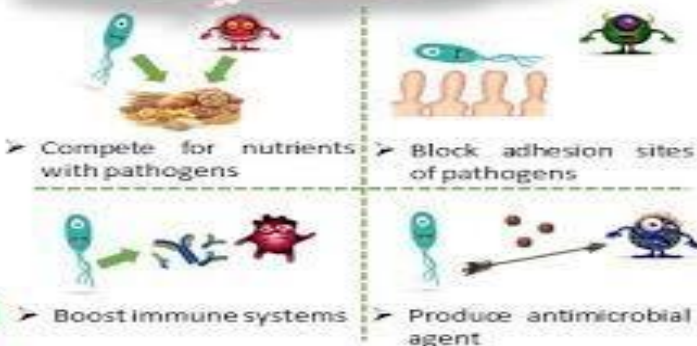
# Probiotics—beneficial bacteria

## What are probiotics?

The World Health Organization's (WHO) 2001 defines probiotics as live micro-organisms that, "...when administered in adequate amounts, confer a health benefit on the host."



## How do probiotics work?



## Types of probiotics?

### *Lactobacillus*

- ✓ Rod-shaped
- ✓ Facultative anaerobic
- ✓ Functions: suppress pathogenic growth, relieve irritable bowel syndrome and diarrhea



### *Bifidobacterium*

- ✓ Y-shaped
- ✓ Anaerobic
- ✓ Functions: relieve ulcerative colitis, modulate immune responses, help digest lactose



## Probiotics products?

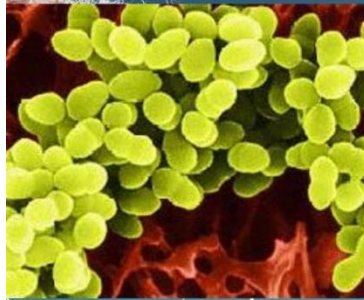


**Yogurt**, is produced by bacterial fermentation of milk. Bacteria used include *Lactobacillus*, *Streptococcus* and *Bifidobacterium*



Certain soft fermented **cheeses** like Cheddar, Swiss, Parmesan and particularly Gouda contain lactic acid bacteria including *Lactobacillus*

## # FACTS #

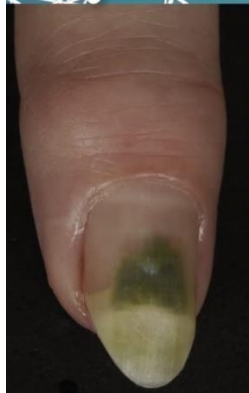


☆ Paronychia commonly known as bacterial nail infection.



☆ Bacterial infections of the nails are caused by, gram -ve bacteria eg: pseudomonas & gram +ve bacteria like staphylococcus aureus.

☆ Fingertips are a cesspool of germs, & various types of bacteria, fungus & yeast can live under nails, including fecal matter.



☆ Leukonychia is a condition where white lines or dots appear on finger.



B.TULASI  
BSC.MBC  
FINAL YEAR



## MICROBIAL FACT

- 99% of the bacteria Are helpful: Help with digestion, Uses to make Food Breakdown oil spills, purify water at Sewage Treatment Plants
- 90% of the cells in or on your body bacteria
- Scientists estimate Bacteria Produce nearly ½ Of the oxygen found in atmosphere
- One square inch of Skin Contains more than a Half a million bacteria



Ch mounia  
Group mbc  
Final year



MICROBIAL FUN FACTS



There are around 1458 bacteria in your belly button



Damp hands have more bacteria than dry hands..



There are more bacteria in person's mouth than the entire population of the world .



It is known that fungal species of aspergillus and bacteria species of pseudomonas can degrade plastic.

D.Dhanasri MBC Final year

## Microbes as bio controlling agents

- Four groups of Microorganisms are known as Biocontrol agents include bacteria, fungi, protozoan's and viruses.
- *Bacillus thuringiensis* controls the Larvae of moths, butterflies, wax moths, black flies, some adult beetles.
- *Bacillus sphaericus* controls the Larvae of Culex.
- *Bacillus papillae* controls the Larvae of Japanese beetle.
- *Pseudomonas fluorescens* controls the Black cutworms.



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for women



# Oral Bacteria:

Types, Roles and Health Effects

Oral bacteria are a threat not only for your mouth but also for your general health.

Some of them are harmless while others can bring serious damage if not controlled regularly.



There are 700 various strains of oral bacteria detected in the human mouth while most people are only host to its 34 to 72 kinds.

Based on clinical studies, the mouth holds 20 billion bacteria, which reproduce every five hours.



Thus, if you forget to brush your teeth within 24 hours, your mouth can produce 100 billion of oral bacteria.

Moreover, the mouth is home to good and bad bacteria.

## Good Bacteria

This bacteria is beneficial as it can inhibit the harmful bacteria, Protect your mouth from diseases, and reduce bad breath odour.



The two most known destructive bacteria are:



### Streptococcus mutans

The one that lives in the mouth and causes tooth decay.



### Porphyromonas gingivalis

This rarely exist in a healthy mouth. When present, it can cause gum disease, toothache or tooth loss.

## Bad Bacteria

Bad bacteria can be associated with preterm birth, stroke, pneumonia, diabetes and heart disease.

SHARON PRIYANKA

1111-19-458-032

# MICROBIAL FACTS

## Mind control

When the spores of a certain fungus, called *Ophiocordyceps unilateralis*, land on an ant, they spread through the ant's body. Before long, the fungus will completely take over the ant's mind and behaviour.



1

### Spores land

Spores fall from a fungus and land on an ant. They use special chemicals called enzymes to break into the ant's body.



2

### Fungus infects

The fungus cells multiply and spread through the ant. They release more chemicals that change the ant's behaviour.

3

### Ant climbs

The fungus forces the ant to climb up to the top of a plant and bite down hard.



4

### Fungus sprouts

Now anchored to the plant by its strong jaws, the ant dies. The fungus growing inside the ant bursts out in long stalks.

5

### Cycle continues

The fungus releases more spores, which fall onto other unsuspecting ants below, making new zombie ants.



The balls of fungus at the end of the stalks, called sporangia, will burst, releasing lots and lots of spores.

Fungus stalks sprout from the ant's head.

SHAISTA SULTANA  
MBC 3RD YEAR  
1111-19-458-031

The ant stays anchored to the plant even after it dies.

## Zombie ants!

We normally think of fungi growing on dead plants and animals. However, some can grow inside **living creatures**, and even **change their behaviour**. One freaky fungus even turns ants into zombies.

### FUNGUS FARMERS

Not all fungi are bad for ants. In fact, leafcutter ants grow fungi like crops. They take pieces of leaves to their underground nests. When fungus grows on the leaves, the ants farm it and eat it.





**SANA BHANU**  
**1111-19-458-030**  
**MBC III YEAR**

## **TREPONEMA PALLIDUM MICROBIAL FACTS**



- TREPONEMA PALLIDUM IS A SPIROCHAETE BACTERIUM WITH VARIOUS SUBSPECIES THAT CAUSE THE DISEASES SYPHILIS, BEJEL (ALSO KNOWN AS ENDEMIC SYPHILIS), AND YAWS. IT IS TRANSMITTED ONLY AMONGST HUMANS. IT IS A HELICALLY COILED MICROORGANISM USUALLY 6–15 MM LONG AND 0.1–0.2 MM.
- TREPONEMA PRODUCES HIGHLY DESTRUCTIVE LESIONS IN ALMOST ANY TISSUE OF THE BODY, INCLUDING THE CENTRAL NERVOUS SYSTEM.
- IT IS RAPIDLY INACTIVATED BY MILD HEAT, COLD, DESICCATION, AND MOST DISINFECTANTS.
- TREPONEMA PALLIDUM CAN SURVIVE 120 HOURS OR MORE IN BLOOD AT 4°C
- MOTHER-TO-CHILD TRANSMISSION MIGHT RESULT IN FOETAL DEATH, PERINATAL DEATH OR CONGENITAL SYPHILIS.

# Microbial Facts

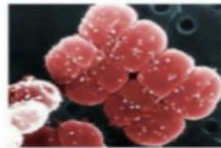
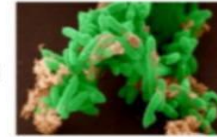


## Power of Mushrooms

Mushrooms contain chemical compounds psilocybin and psilocin. psilocybin gets broken down to psilocin which is an active hallucinogenic drug - Send signal to the brain cells to regulate things like mood, memory and sleep

## Geobacter Metallireducens

They produce energy using cellular respiration process which also makes excess electrons

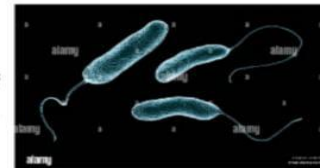


## Deinococcus radiodurans

Its power has landed it in the Guinness book of world records, where it's listed as the world's most radiation resistant life form

## Ideonella sakaiensis

It is a bacterium from the genus ideonella and capable of breaking down consuming the plastic polyethylene terephthalate (PET) using it as both a carbon and energy source



Inside our mother's womb, humans start out sterile when we are born and travelling through the birth canal, billions of our mother's bacteria cover every single part of our bodies. This is an essential part of human health

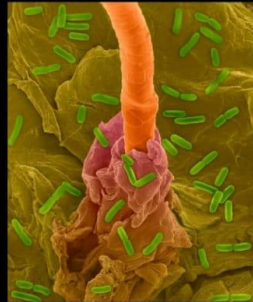
Rathod SriVani (MBC Third year)

# MICROBIAL FACTS

## Microorganisms in Hair



- *The two species of bacteria that dominate your scalp: Propionibacterium and Staphylococcus.*
- *But their abundance differ drastically between the healthy and dandruff groups.*
- *In the healthy group, Propionibacterium made up the majority of the scalp bacteria, and Staphylococcus made of much less.*
- *The bacterial community of hair consists of Gram-positive and Gram-negative Bacteria. S.aureus and S.epidermis have been identified on human scalp.*



Pooja Rathod  
MBC Final Year  
Kasturba Gandhi Degree College.

# MICROBIAL FACTS

- The *Lactobacillus gasseri*, a species common in the vagina, to make a novel antibiotic drug they called lactocillin.
- The bacteria called Christensenellaceae, which are more abundant in lean people than in obese people.
- Men's hands, on the flip side, generally have more corynebacterium bacteria, which play a role in synthesizing monosodium glutamate, or MSG.
- The birth canal also supplies newborns with the bacteria lactobacillus, which helps the baby digest milk and develop the immune system.



Poojari Madhavi  
MBC final year  
Kasturba Gandhi degree college

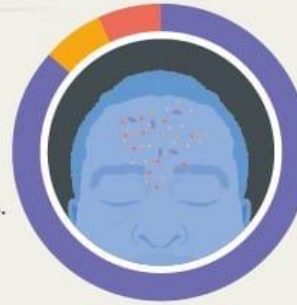
Relative abundance of bacteria, eukaryotes and viruses on the skin of healthy adults<sup>1</sup>

● Bacteria ● Eukaryotes ● Viruses

### OILY SKIN

(for example, ear folds and forehead)

This area is home to bacteria that consume lipids, such as *Staphylococcus* spp. and *Cutibacterium acnes*, particularly during puberty, when sebum production increases.



### MOIST SKIN

(for example, the groin and armpit)

Sweat attracts species of *Corynebacterium* and *Staphylococcus*, which contribute to body odour.

### DRY SKIN

(for example, the forearms and palms)

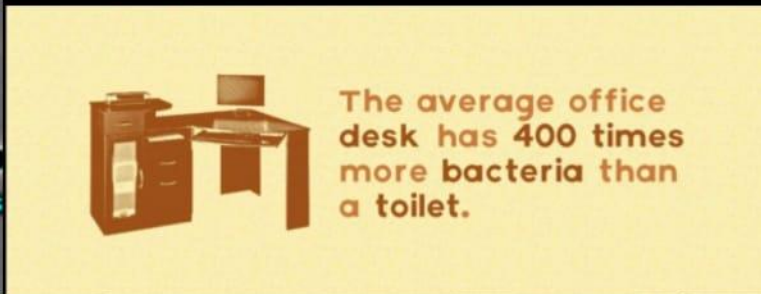
Dry skin has the most diverse microbiome, which is rich in species of Betaproteobacteria and Flavobacteriales.



### THE FEET

Feet have their own distinctive ecosystem. The community is made up mainly of bacteria, but the fungi present are much more diverse than in other areas of the body.

P.Sadhana  
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K.TANVI

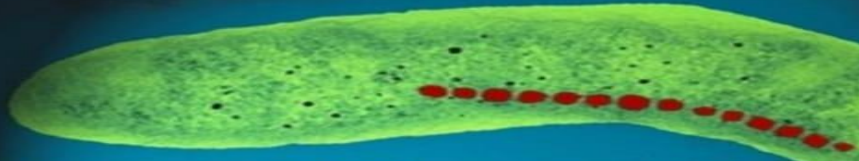
BSC MBC 3<sup>RD</sup> YEAR

KASTURBA GANDHI DEGREE AND PG COLLEGE FOR WOMEN

Luminous bacteria that live in the tip of the fishing rod of angular fish provide light that attracts prey



02. **Magnetospirillum magneticum** is a free-living bacteria which has the ability to actively take in iron, convert it to magnetic magnetite, align it like a backbone along its body, and travel through its environment using magnetic fields.



The flu virus can live on your skin for only five minutes, but can survive on paper currency for upto 17 days

Breakfast is the best time to take probiotics

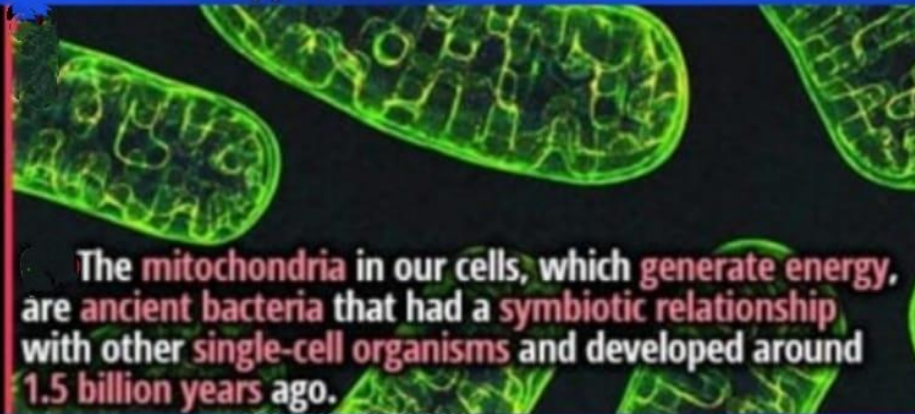


K. Shruthi  
Bsc MBC III Year  
1111-19-458-017  
Kasturba Gandhi Degree and PG College  
for Womens

## MICROBIAL FACTS

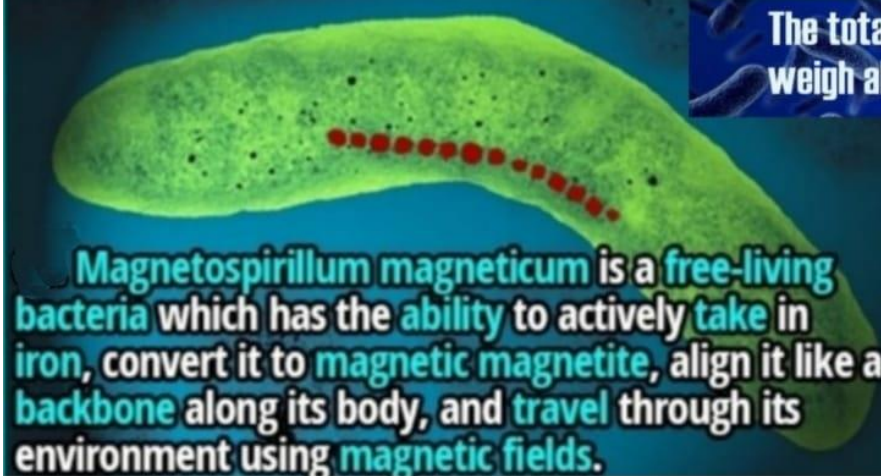


.Botox is a drug made from a toxin produced by the bacterium *Clostridium botulinum* used for Temporary smoothing of facial wrinkles and improving your appearance.



The **mitochondria** in our cells, which **generate energy**, are **ancient bacteria** that had a **symbiotic relationship** with other **single-cell organisms** and developed around **1.5 billion years ago**.

The total bacteria in our body weigh about 4 pounds



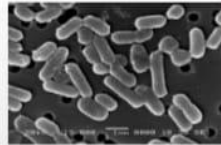
**Magnetospirillum magneticum** is a **free-living bacteria** which has the ability to actively take in iron, convert it to **magnetic magnetite**, align it like a **backbone** along its body, and travel through its environment using **magnetic fields**.

P.Sai Priyanka  
MBC final year  
Kasturba Gandhi  
degree and  
pg college



## MICROBIAL FACTS

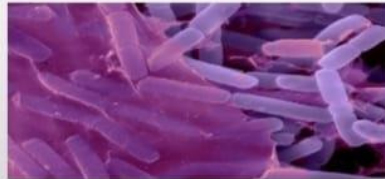
1. *Bacillus thuringiensis* is a species of bacteria that lives in soil.
2. It makes protein that are toxic to some insects.
3. *Bacillus thuringiensis* is not toxic to non target wildlife.



### *Lactiplantibacillus plantarum*

1. *Lactiplantibacillus plantarum* is a species of lactic acid bacteria.
2. Which is mainly found in the fermentation plant derived raw material.

### *Hay bacillus (Siena nujina)*



1. *Hay bacillus subtilis* known as the hay bacillus or grass bacillus is a gram positive.
2. Found in soil and the gastrointestinal tract of ruminants, humans and marine sponges.

### *Streptococcus Thermophilus*



1. *Streptococcus Thermophilus* is a type of probiotic bacteria.
2. These are friendly bacteria that live in our digestive system.
3. It is commonly used to produce fermented dairy foods such as yogurt. It is also used in dietary supplements.

M.JHANSI  
Final year  
Kasturba Gandhi degree  
and college

## MICROBIAL FACTS

The fungi known as dermatophytes which causes the infection to the scalp of the head which also leads to hair loss



*Do u know...?*

*Shope papilloma virus is a virus that infects the rabbit by growing the keratinous carcinomas horns*



*A species of baculovirus infects gypsy moth caterpillars and essentially turns them into zombies. The virus then forces these Zombie caterpillars to climb to the treetops to die, liquefy and rain on the foliage below to infect others.*



**The truth about your toothbrush**

Keeping your toothbrush wet encourages the bacteria on it to grow. Want a healthier toothbrush? Try keeping it dry!

D.Madhuri  
Mbc final year  
Kasturba Gandhi degree  
and pg college



# MICROBES IN SOIL

➔ Microbes in soil are extremely important for plant growth and for the functioning of ecosystem



➔ soil bacteria may cause

W

Wound , skin , and respiratory tract diseases

➔ The systemic fungi are largely acquired via inhalation from contaminated soil ; environment



BY MAINTAINING HYGEINE IN OUR SOURROUNDS AND CLEANING HANDS AND VEGETABLES CLEANLY...

CAN PREVENT CONTAMINATIONS AND CAUSING OF DISEASES...



# MICROBIAL FACTS

P.Pavani  
Mbc final year  
Kasturba Gandhi degree  
College

- ▶ *Naegleria fowleri* is a brain eating amoeba, under rare conditions they enter into human body and feed on brain causing death.
- ▶ *Bacillus sphaericus* is a bacteria found on soil. It is resistant endospore which is tolerant to high temperature, chemicals, uv light. WHO has stated due to larvicide effect, it's against to culex & anopheles mosquitoes.
- ▶ *Bdellovibrio*, the fastest living thing on planet, it got a flagellum, it swims fast probably 60 micrometers/sec
- ▶ Bioluminescence is a form of chemiluminescence, in some organisms, the light is bacteriogenic produce by symbiotic organisms such as vibriobacteria
- ▶ *Bacillus thuringiensis* is a soil bacteria, used for crops that are genetically engineered to carry (bt) gene

