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JIGYAASA - SHP

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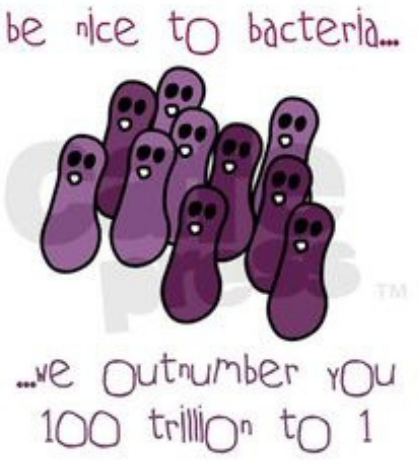
MICROCOSM

“We cannot fathom the marvelous complexity of an organic being; but on the hypothesis here advanced this complexity is much increased. Each living creature must be looked at as a microcosm--a little universe, formed of a host of self-propagating organisms, inconceivably minute and as numerous as the stars in heaven.”
— Charles Darwin

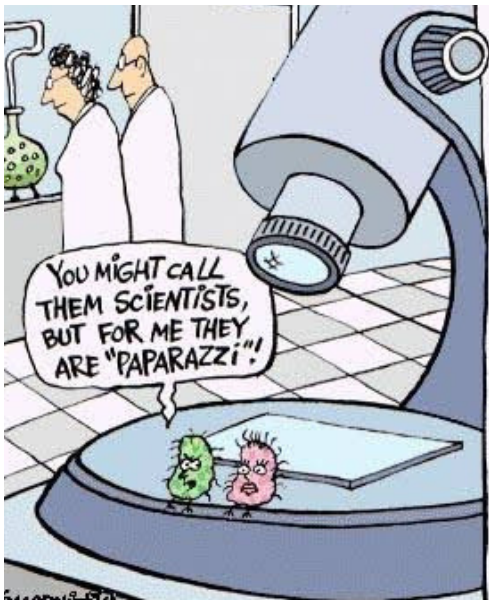


That's deep!

Life found 10 km below sea level in deepest known point on the surface of the Earth

Scientists have discovered potential evidence of life ten kilometres below the sea floor in the Mariana Trench - the deepest part of the world's oceans.

Researchers, including those from Utrecht University in the Netherlands, ventured to Mariana Trench located in the western Pacific Ocean. They used Remotely Operated Vehicles (ROV) to extract about 46 samples of serpentine from the ocean floor near the South Chamorro mud volcano, which they brought back to their lab for study.



Serpentine is a mineral that forms when olivine in the upper mantle meets water pushed up from a subduction zone, researchers said. Such reactions produce methane gas and hydrogen, which could be used as a food source by microbes. Serpentine is pushed to the surface of the sea floor by hydrothermal vents, where the researchers found it. They found trace amounts of organic material that was very similar to that produced by microbes living in more accessible places, the 'Phys.org' reported. It is possible that the serpentine samples are evidence of life living far below the surface. The team used data from prior studies to calculate how far below the sea floor the serpentine was formed, which allowed them to estimate that the possible microbes might live - about ten kilometres below the sea floor.

MICROBIAL ICE MAKERS

Pseudomonas syringae **uses a special cell-wall protein as a mold for arranging water molecules into ice, even at temperatures above water's normal freezing point, according to a study published last week (April 22) in Science Advances. Specifically, the protein, called inaZ, has alternating water-repelling and water-attracting regions, which push and pull on water molecules into an ice-like crystal. In the lab, *P. syringae* was able to crystallize water at 4° C; in nature, the bacteria are able to freeze water at around –2° C. But even that is still several degrees higher than the normal freezing point of pure water (around –40° C).**

Understanding this ice-making ability of *P. syringae*, which live on crops and other plants, could help researchers protect these organisms from frost damage resulting from the formation of ice crystals insides the plant's tissues. They nucleate ice to attack plant cells. They're also used in artificial snowmaking.

Cocoa bean husk extract rinse is highly effective in reducing mutants streptococci counts and plaque accumulation when used as mouth rinse by children.

Did you know??

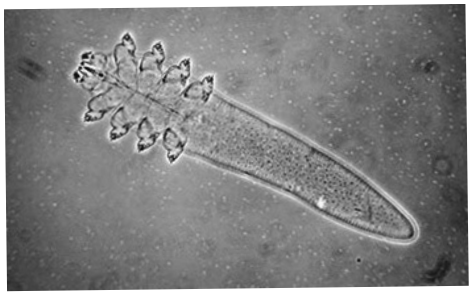
You can earn cash with your microbiome.

Many people have heard of selling blood to make cash, but now it is also possible to sell stool. Some people endure suffering from the overgrowth of *Clostridium difficile*, and faecal transplants are a valid treament. OpenBiome, the world's first faecal transplant bank collects and distribute samples to hospitals. OpenBiome rewards regular donors. If one donated weekly, all year long, it would be worth $13,000 a year.

Ants select better microbes

Researchers at the University of East Anglia in the United Kingdom have found that leaf-cutter ants have a simple system to build up healthful microbes on their exoskeleton.Leaf-cutter ants—which get their name from cutting and collecting leaves on which they grow their fungus diet—rely on microbes to produce the antibiotics that protect the farmed fungus fro harmful pathogens. "We argue that the ant host has evolved living conditions under which antibiotic-producing bacteria have a competitive advantage for the ant niche," biologist at East Anglia and senior author of the study Douglas Yu told Phys.Org.In the study, published online last month (August 22) in Ecology Letters, Yu and his colleagues generated a model in which leaf-cutter ants select for helpful microbes by passing on the beneficial bugs to the next generation,and providing a lot of food for the bacteria to eat on their bodies , which in turn generates competition that favors antibioti producing bacteria to kill off the competition.Our model shows that if the h produces a lot of food for bacteria, it fuels fighting via antibiotics," Yu told Phys.Org. "It's the reason bacteria produce antibiotic in the first place—to kill competitors." The resulting antibiotic-producing bacteria, he adds, "kill pathogenic molds on the fungus that [the ants] farm for food."

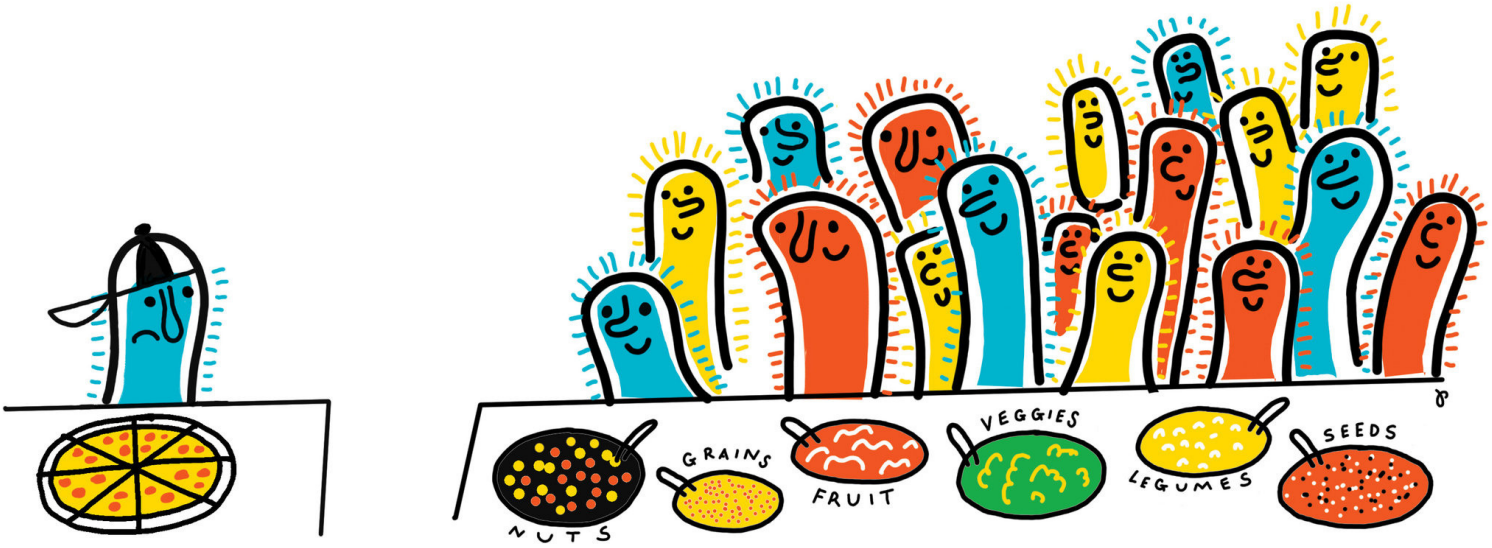
Eight legged *Demodex* mites head down inside the folllicles of our eye lashes.



What did one bacteria say to the other bacteria?

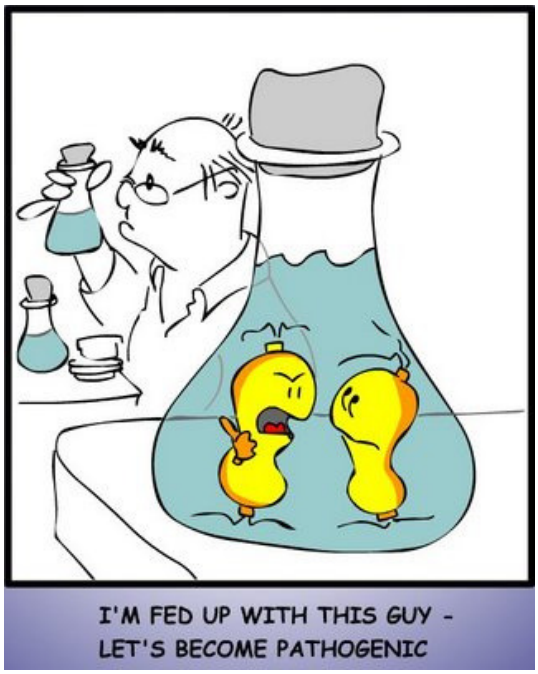
Your gene pool could use a little chlorine.

A GUT MAKEOVER FOR THE YEAR

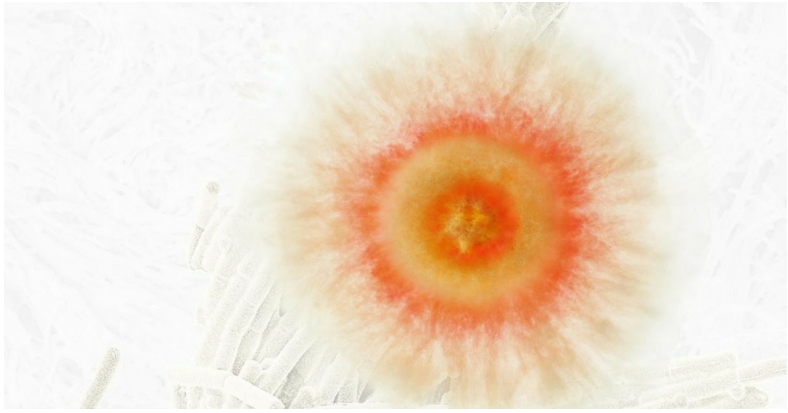


If you're making resolutions for a healthier new year, consider a gut makeover. Refashioning the community of bacteria living in your intestinal tract could be a good long-term investment in your health. Rich array of intestinal microbiota helps us process nutrients in the foods we eat, bolsters the immune system. A diminished microbial ecosystem, on the other hand, is believed to have consequences that extend far beyond the intestinal tract, affecting everything from allergies and inflammation, metabolic diseases like diabetes and obesity, even mental health conditions like depression. But a new study in mice and people adds to evidence that suggests you can take steps to enrich your gut microbiota. Changing your diet to one containing a variety of plant-based foods the new research suggests, may be crucial to achieve a healthier microbiome.

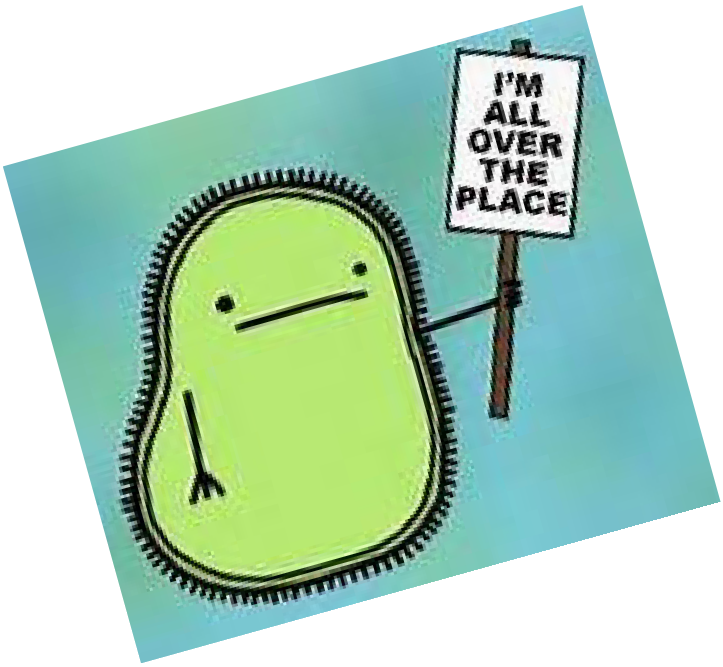
Bacteria trade genes as easily as human trade gifts.

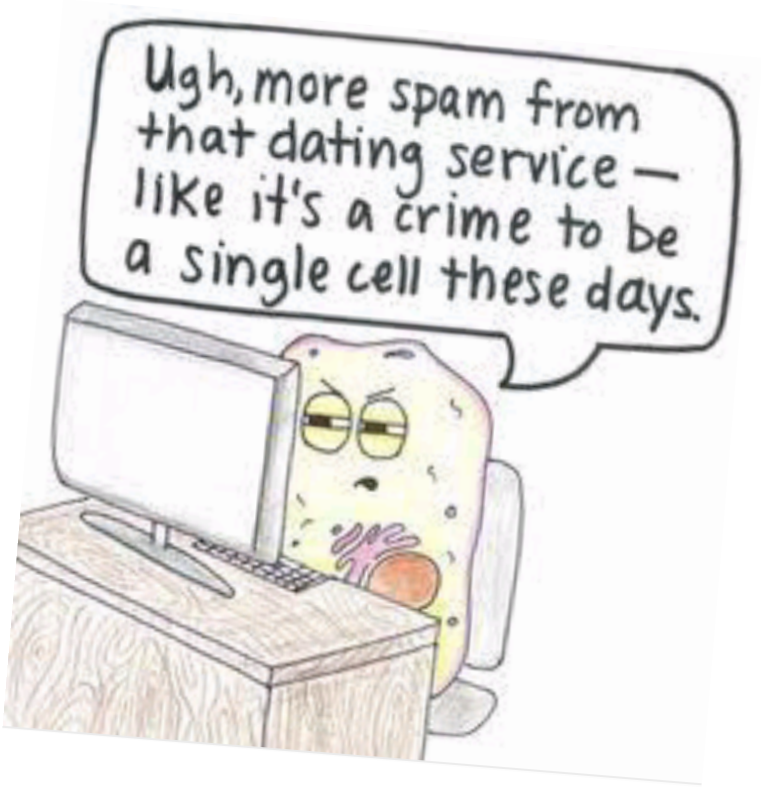


THE WORLD'S MOST SPOKEN LANGUAGE - TERPENE



Microorganisms communicate with each other, and the rest of the world through smells.If you're small, smells are a good way to stand out. A team of researches led by Netherlands Institute of Ecology (NIIO-KNAW) has demonstrated for the first time that two different types of micro-organisms -- bacteria and fungi -- use fragrances known as 'terpenes', to hold conversations. And they also believe that terpenes are the most popular chemical medium on our planet to communicate through.
In only one gram of soil billions of micro-organisms are thriving, so that makes many speakers. On top of that, this chemical communication will probably work for a whole bunch of other life forms as well.





Gonorrhea manipulates an anti-infection mechanism in the female reproductive tract

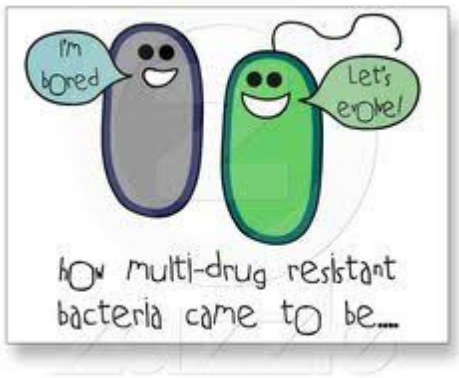
Gonorrhea is a widespread sexually transmitted disease caused when *Neisseria gonorrhoeae* bacteria infect the normally protective inner lining of human genital tissues. In women, the opening of the uterus, known as the endocervix, serves as a primary infection site for *N. gonorrhoeae*. However, the strategy used by *N. gonorrhoeae* to penetrate the lining of the endocervix has been unclear.

To investigate this mechanism, Liang-Chun Wang of the University of Maryland, College Park, and colleagues needed to develop an alternative to the mouse models normally used to study gonorrhea, since they have been inadequate for this purpose. The team developed a new model using tissue samples obtained from the human endocervix.

The researchers infected the endocervix tissue, as well as lab-grown cells of the same type as those that line the endocervix, with *N. gonorrhoeae*. They then employed a variety of molecular and imaging techniques to examine the infection mechanism.

The results demonstrate that *N. gonorrhoeae* penetrates the endocervix lining by interfering with a normally protective process. Usually, infected cells in the lining can be shed and disposed of without breaking the tight connections between cells that keep the lining uncompromised. *N. gonorrhoeae* appears to be able to break these connections and induce cell shedding, opening paths for penetration without reducing its ability to adhere to and invade the cells of the lining.

The scientists showed that *N. gonorrhoeae* causes disruption of cellular connections and cell shedding by promoting activation and accumulation of a human protein known as non-muscle myosin II. Depending on the particular genes being expressed by *N. gonorrhoeae* at any given time, the team found, it can either promote or inhibit this penetration mechanism.



An actual fingerprint is rarely left in a body, but a microbial fingerprint certainly is!

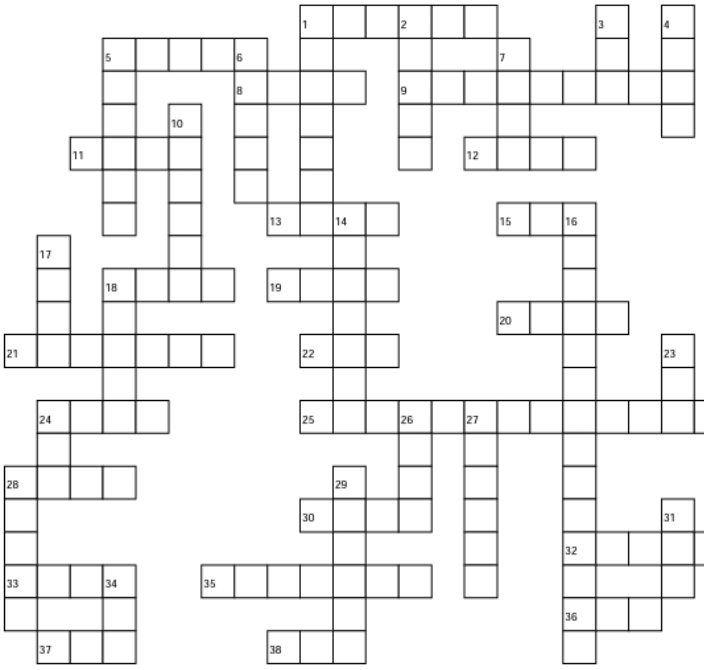
ACADEMIA

'MICROFIESTA- MEET THE MICROBES' event was organised on 19th December 2016 by teachers and 2nd year students of microbiology dept. under star DBT scheme. Our programme incharge was Mrs. Prabha Padmanabha. We had an exhibition on different sections in microbiology in form of charts, working models, carrier guidance and games. The event was a success with the great response by students across various schools, colleges and teachers.

For the first half of geological time our ancestors were bacteria. Most creatures still are bacteria, and each one of our trillions of cells is a colony of bacteria.

- RICHARD DAWKINS

LET'S PLAY



ACROSS

1 Building block of life (#6 on periodic table)
5 Helps some bacteria move
8 Coliform: Escherichia _____
9 Bacteria which dislike oxygen
11 Nucleus/center of apple
12 Insect that transmits bubonic plague
13 Laboratory worker
15 Dermatophyte Medium
18 Her cooking made folks ill: Typhoid _____
19 Tool used to transfer colonies new medium
20 Type of tube
21 Composed of amino acids
22 1.0E+01
24 Petri _____
25 Bacteria found in yogurt
28 Opposite of acid
30 _____ eye: conjunctivitis
32 Color of some Pseudomonas colonies
33 Egg
35 Staphylococcus plus hydrogen peroxide
36 Center for Disease Control (abbr.)
37 "A _____ on your house": Shakespeare
38 Thermophiles and Marilyn Monroe like it _____

DOWN

1 Bacterial growth/ arts and literature
2 Color of some Aspergillus colonies
3 Acid fast bacillus (abbr.)
4 Dormant Giardia lamblia
5 Mass of microorganisms or ants
6 Bacteria that's scourge of teens: Propionibacterium _____
7 Prison room
10 Invented small pox vaccine
14 "Love in the Time of _____" by Gabriel Garcia Marquez
16 Company which supplies microorganisms
17 Saccharomyces cerevisiae is used to make this beverage
18 Bacteria which harm teeth: Streptococcus _____
23 Colony forming unit (abbr.)
24 Stuff of genes
26 Insect that transmits Lyme Disease
27 Disinfectant which kills bacteria
28 Toxin/ wrinkle eraser
29 Crystal _____ stain
31 Name of sea colored by bacteria
34 Vortex

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