

Bacteria, viruses and fungi

It is nice to think that this planet belongs to us but, the fact is, we have to share it with many other living forms, including microorganisms: *bacteria*, *viruses* and *fungi*. At this very moment, where ever you have happened to be, there are billions of invisible microorganisms right next to you: in the ground you're standing on, in the water you drink, the food you eat and in the air you're inhaling.

If you think there must be a few of them inside your body as well, you're right: micro-organisms in your intestine, on the skin, in your mouth, nose and scattered throughout the body, outnumber your body cells by a wide margin. Most of them are bacteria and the rest are viruses and fungi.

Normally, these bugs don't cause health problems, because your [immune system](#) keeps them in check. We coexisted for millions of years, simply because humans, through natural selection, have come out with the adequate defending mechanisms.

However, the merciless law of natural selection can turn very different face to you. As long as you are healthy, those tiny bugs have little chance of harming you. But if your health is for any reason compromised ([nutrient](#) deficiency caused by poor [diet](#), stress, trauma, unhealthy lifestyle, genetics, age, etc.), they can overwhelm weakened body defenses, over-multiply, and cause a disease. The statistics are telling: infectious diseases are

#1 cause of death in children and the elderly.

That makes these tiny bugs worth a closer look. Any of the three main form of microorganisms - bacteria, viruses, and fungi - can and does cause a human disease.

Bacterial infections

Bacteria are single-cell plant organisms, most of them only a few microns (micron=0.001mm) in size. What separates bacteria from all other cellular

forms is that they lack the nucleus. Most bacteria are doing great job at recycling, transforming and composting organic matter; our life, as we know it, just wouldn't be possible without them.

They also inhabit our skin, mouth, intestine - pretty much the entire body. Healthy adult intestine has roughly

50 trillion generally friendly bacteria in it,

helping digestion and keeping bad bugs from over-multiplying.

Most of the intestinal bacteria are numerous species of **bacteroides**. While normally friendly, or at least harmless, some of them - notably *B. fragilis* - are opportunistic pathogens and can cause infections - commonly associated with abscess formation - when spread out of the intestines to any other part of the body. Internal infections they cause can be very serious, more so due to high antibiotic resistance of these bacteria. The chances for this kind of infection to occur are particularly high with inflamed, leaky intestines, commonly associated with weakened immune system.

Some intestinal bacteria - like **lactobacillus** and **bifidum** - are always friendly and health supporting. That earned them the name **probiotic bacteria**, which could be translated as pro (your) life. You want them to be there at all times, and in good numbers: 10 to 20 trillion of them. Their numbers can be suppressed by poor diet choices - excess of sugary and processed foods - and compromised digestion, both promoting other, unfriendly bacterial forms, as well as by frequent or prolonged use of antibiotics, which indiscriminately kill them. Thus periodic supplementation with probiotic bacteria is the right thing to do.

Out of some 100 trillion bacteria living in your body, only a small fraction is potentially harmful (**pathogenic**). They don't cause infection until given the opportunity to multiply extensively. In general, this occurs due to weakened immune system. Pathogenic bacteria can also infect the body from the outside - through air, food, or by physical contact.

Less than 1% of all bacteria can cause bacterial infection. Their metabolism produces toxins that damages body cells and disrupts body functions. In other words, produces symptoms of infectious (bacterial) disease. Bacterial diseases affect most often skin, respiratory tract, gastro-intestinal and urinary tract, but also other areas of the body.

Viral infections

Unlike bacteria, no virus serves useful purpose (the exception might become those used to carry genes needed to correct erroneous [DNA](#)). They are entities reduced to mobile genetic material enclosed in a protein/fatty shell. Smaller than bacteria, most viruses are between 0.0001mm and 0.0003mm (0.1 to 0.3 micron) in size. They hurt the body by entering body cells and using them to produce new viruses, instead of serving their normal body functions. As a result, the cell gets damaged, and finally dies.

If the immune system doesn't step in and destroys the virus, viral infections like flu, chicken pox, polio or AIDS, can be life threatening.

Fungal infections

Fungi are, similarly to bacteria, single-cell plant organisms. Fungi include **mold** and **yeast**, and can be found - just like other microorganisms - pretty much everywhere. That includes our bodies: they are most often on the skin and in the intestine. As long as the body and its immune system function properly, fungi are kept in check and there is no adverse health effects caused by their presence. But given the chance, they'll over-multiply to the extent that, similarly to bacteria, toxic products of their metabolism burden and disrupt body functions.

The most frequent form of fungal infection is intestinal over-growth of **Candida albicans** yeast. It can cause intestinal inflammation, drain your energy, poison your blood with aldehydes (acetaldehyde), suppress your immune system, cause host of symptoms and, in short, make your life miserable. If untreated,

it can cause leaky gut, and that is a definite step toward developing some form of a serious degenerative disease.

In conclusion...

What is in common to all three forms of infection - bacterial, viral and fungal, is that they are caused by invading **parasitic microorganisms**. In other words, microorganisms that use the host - human body - to feed and multiply, without giving anything back. In fact, their over-proliferation damages the host.

Aside from parasitic microorganisms, there are larger forms of parasitic organisms either inhabiting the body - like intestinal parasites, from *protozoa* (animal-like microorganisms that hunt and swallow their food) to *intestinal worms* - or external blood suckers, like mosquitoes, lice, ticks or leeches. Not seldom these relatively large parasitic organisms are carriers of pathogenic microorganisms causing serious and life-threatening infections (lime disease, malaria, West Nile encephalitis/meningitis, etc.).

Most infectious diseases are easy to diagnose, and are usually treated successfully with antibiotics. However, the emerging problem is increasing number of **antibiotic-resistant strains** of microorganisms, mainly resulting from the overuse of antibiotics in both, human health care and in animals commercially grown for food. The more extensive use of antibiotics, the wider breeding ground for new, antibiotic-resistant bacterial strains.

This wasn't hard to predict. As far back as early 1960's Rachel Carson (*Silent Spring*) was warning that one of negative results of the overuse of [pesticides](#) will be creating resistant insect strains. Somehow, the simple parallel escaped organized medicine when it came to the use of antibiotics.

This war we can't win - at best we can stay one step ahead. New antibiotics containing more than a single bacterial toxin are being developed as we speak. These will be more efficient initially but, after a while - just as it's happened with the first generation of antibiotics -

**new superbugs will emerge, more resistant
and more dangerous than ever!**

Luckily, other options are open. One is the use of selective viruses which would only attack harmful bacteria. The other is to target bacterial DNA directly; either way, it will likely be up to molecular/genetic medicine to spare the humanity from devastating epidemics in the near future.

As always - and especially considering increasingly inefficient antibiotic treatments - your best bet is still to take good care of your health in general, and health of your immune system in particular. Thus good digestion, [quality nutrition](#) and lowering your [toxic exposure](#) become even more important. Also, avoiding foods of animal origin where the animals are routinely given antibiotics - and that is almost always the case with animals grown in confined spaces - significantly reduces your chances of being infected with antibiotic-resistant strains.

**Healthy digestive tract is a must for efficient immune and
[detox system](#), as well as for your health in general.**

To assess its state of health - as well as possible hidden bacterial and fungal infections - you need to use appropriate lab tests.

Poor [diet](#) and compromised [gut health](#) is most often what causes your body defenses to weaken, and become prey to infectious microorganisms. You may have them temporarily suppressed with antibiotic treatments, but they will keep coming back as long as you don't address and correct this core problem.