

Virus - a friend or enemy?

Math

An interesting article about what the role of viruses in the evolution of mankind. For a separate person infected with any virus, this virus, of course, is great evil. But for humanity as a whole, everything is not so unequivocal.

We often have to deal with various diseases that are associated with viral infections. We hear that viruses can be biological weapons, and hundreds of thousands of people die from them. Yes, the AIDS virus caused a pandemic on the entire planet, and the Ebola virus can kill whole villages in Africa. But ... There are scientists who argue that viruses are one of the important factors of evolution. How could it happen that one of the enemies of mankind helped him to become at the head of nature? Let's start with how the viruses live in human cells and what they need from us.

Viruses affect not only animals, but also plants, mushrooms, bacteria and even other viruses. It is assumed that at some stage of evolution, these agents separated from cellular forms and continued to evolve in parallel. What purpose does the virus put in front of him an amazing cell? Let's start with the fact that no virus can multiply outside the host cell, it is a non-cell living form that has only DNA / RNA and some proteins that protect genetic information and are necessary for the first stages of cell infection. Once in a cage, the virus must be multiplier as efficiently as possible using cell enzymes, which is in most cases and breaks its work.

In addition, very often viral particles that were formed in a cell can kill it during the exit to the intercellular space. But it is not very profitable - kill your home. Therefore, most viruses have their own owner, as, for example, a human herpes virus who is striking a long time human genus. Such viruses adapted under their owners and do not bring significant harm to them. Therefore, approximately 95% of the world's population has a herpes virus of a man, but this is not threatened with extinction.

Moreover, some scientists say that if we got rid of our "ordinary" viruses, then, perhaps, their place would occupy new, more aggressive pathogens. Here is the first factor in the collaborative evolution of viruses and cellular forms (including humans), which is carried out by approximately such a scheme. The new virus amazes, for example, a population of people, those from the population members, which cannot cope with this virus die or sick. And those who can at least deal with this disease continue to live and give rise to the same persistent children, that is, they transmit their genetic information. In turn, the virus can also mutate. That is, those strains that were aggressive and killed their owners do not have the opportunity to multiply, and those that are less aggressive - allow their owners to live and in the end successfully multiply that those that others.

It is precisely because those viruses that are particularly dangerous for us, the owners of which we are not, for example, animal viruses (there are no cases of human damage to the plant or bacteria).

The same HIV "migrated" to us from monkeys, which are resistant to him and do not hurt any diseases associated with AIDS. Scientists suggest that by 2300 HIV for people will not carry mortal danger as well as herpes virus. But if we talk about evolution, then it's not just that.

Depending on which the virus in the virus is encoded by genetic information and life cycle, they can multiply by very different ways. One of the most interesting ways is the reproduction of retroviruses. These are RNA-containing viruses that, occasionally in a cell, are synthesized from this DNA RNA, this DNA is embedded in the host gene, and already from it, together with useful proteins, the cell synthesizes and viral. The cell does not know which DNA of it, and what a virus, since this DNA in my genome, it is worth doing what is written on it. And if such a virus was mounted in sex cells, it will be very easy to transmit to a vertical way, that is, from parents to the child. And the child picks up another couple of such viruses and give them to their children and so on.

Over time, on some viruses, the immune system will respond and learn to deal with them, and that viral DNA, which in the genome deactivates, but maybe there are some sequences in that DNA, and they have not been in the cell, and they can greatly alleviate her life , Then the "smart" cell will not deactivate them. It is assumed that 5-8% of the human genome contains retroviruses. Yes, perhaps this is a "bomb of slow motion", according to some scientists, and one day these retroviruses can "come around", but maybe it is the reason that we are. Nature is not stupid, it will not do anything to the detriment. So it is worth fighting with new epidemics, but you should not be too afraid of them, because there are two ways: or development, or degradation, the other is not given.