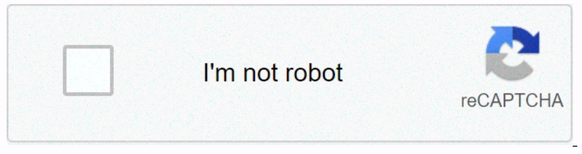

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Viruses definition microbiology

Viruses are microscopic parasites, usually much smaller than bacteria. They lack the ability to thrive and multiply outside the host institution. Mostly, viruses have a reputation for being the cause of infection. Widespread illness and death have undoubtedly supported such a reputation. The 2014 Ebola outbreak in West Africa and the 2009 H1N1/swine flu pandemic (a widespread global outbreak) are likely to come to mind. While such viruses are, of course, wily enemies of scientists and medical professionals, others do ilk as research tools; to raise awareness of basic cellular processes, such as protein synthesis mechanics, and of the viruses themselves. DiscoveryCid much smaller are the most viruses compared to bacteria? Much. With a diameter of 220 nanometers, the measles virus is about 8 times smaller than E.coli bacteria. At 45 nm the virus is about 40 times smaller than E.coli. For a sense of how small it is, David R. Wessner, a biology professor at Davidson College, provides an analogy to a 2010 article published in the journal Nature Education: The polio virus, 30 nm across, is about 10,000 times less than a grain of salt. Such differences in size between viruses and bacteria gave a critical first clue about the first existence. At the end of the 19th century, micro-organisms, especially bacteria, were well established to cause the disease. However, researchers who cared for the unpleasant disease of tobacco – tobacco mosaic disease – were somewhat stumped about its cause. In 1886 a research paper entitled For Mosaic Tobacco Disease by Adolf Mayer, a German chemist and agricultural researcher, published the results of his extensive experiment. In particular, Mayer found that when he crushed an infected leaf and injected harmful juice into the veins of healthy tobacco leaves it caused yellowish speckling and discoloration of the characteristic disease. Mayer correctly surmised that someone caused the tobacco mosaic disease was leaf juice. However, more specific results ridiculed him. Mayer felt confident that someone caused the disease had bacterial origin, but he could not isolate the cause of the disease or identify it under a microscope. Nor could he restore the disease by injecting healthy plants with a range of known bacteria. In 1892, Russian student Dmitry Ivanovskis basically repeated Mayer's juicing experiments, but with a little twist. According to a 1972 article published in the journal Bacteriological Reviews, Ivanovsky passed the juice from an infected leaf through a Chamberland filter, a filter fine enough to capture bacteria and other known microorganisms. Despite the sifting, the liquid filtrate remained infectious, which indicates a new piece of batter; someone caused the disease was small enough to go through the filter. However, Ivanovski also concluded that Tobacco mosaic disease was bacterial, suggesting the filtrate contains either bacteria or soluble toxins. It was only in 1898 when the presence of viruses was recognized. Dutch scientist Martinus Beijerinck, while confirming Ivanovsky's results, suggests that the cause of tobacco mosaic disease is not bacterial, but the life of the liquid virus, referring to it with the now outdated term, the filterable virus. Ivanovska, Beijerinck and other experiments that followed only pointed to the existence of viruses. It would take a few more decades before anyone actually saw the virus. According to a 2009 article published in the journal Clinical Microbiology Reviews, when an electron microscope was developed in 1931 by German scientists Ernst Ruska and Max Knoll, the first virus could be visualized with the new high-definition technology. These first images taken by Ruska and colleagues in 1939 were from the tobacco mosaic virus. Thus, the detection of viruses came full circle. This digitally coloured image shows the H1N1 influenza virus with a transmissing electron microscope. In 2009, the virus (then called swine flu) caused a pandemic and is believed to have killed 200 00 people worldwide. (Image credit: National Institute of Allergy and Infectious Diseases (NIAID)) The structureMans teeter on the border, which is considered to be life. On the one hand, they contain the main elements that make up all living organisms: nucleic acid, DNA or RNA (any virus indicated may contain only one or the other). On the other hand, viruses do not have the ability to independently read and act upon the information contained in these nucleic acids. A minimal virus is a parasite that requires replication (making copies of itself) in the host cell, said Jaquelin Dudley, professor of molecular biosciences at the University of Texas at Austin. The virus cannot reproduce itself outside the host because it lacks the complex machines that [host] cells possess. Host cell machines allow viruses to produce RNA from their DNA (process calledtranscription) and build proteins based on instructions that encoded their RNA (a process called translation). When the virus is completely assembled and able to become infected, it is known as virion. According to medical microbiology 4th Ed authors. (University of Texas Medical Branch at Galveston, 1996), the structure of a simple virion consists of an internal nucleic acid nucleus surrounded by an outer sheath of protein known as capsid. Capsids protect viral nucleic acid from chewing up and destroys specific host cell enzymes called nucleus. Some viruses have a second protective layer called an envelope. This layer is usually derived from the cell membrane host; few stolen bits that have been modified and repurposed for virus to use. DNA or RNA detected in the nucleus of the virus may be single ballast or double-suing. It forms a genome or total genetic information. Viral genomes are usually small in size, coding only essential proteins such as capsid proteins, enzymes, and proteins necessary for replication in the host cell. FunctionThe role of the virus or virion is to deliver your DNA or RNA genome to the host cell so that the genome can be expressed (transcripted and translated) by the host's cell, according to Medical Microbiology. First, viruses need to access the inside of the host body. Breathing passages and open wounds can act as a gateway to viruses. Sometimes insects provide a way of entering. Some viruses will snag a ride in insect saliva and enter the host body after insect bites. According to the authors of Molecular Biology of the Cell, 4th Ed (Garland Science, 2002), such viruses can replicate both insects and host cells, ensuring a smooth transition from one to another. Examples are viruses that cause yellow fever and dengue fever. The viruses will then join the surfaces of the host cells. They do this by recognizing and linking to cell surface receptors, such as two locking puzzle pieces. Many different viruses can bind to the same receptor, and one virus can bind different cell surface receptors. While viruses use them to their advantage, cell surface receptors are actually designed to serve the cell. After the virus binds to the surface of the host cell, it can begin to move around the external coating or membrane of the host cell. There are many different types of entry. HIV, virus with envelope, fuses with membrane and is pushed through. Another film-coated virus, the flu virus, is engulfed in a cell. Some non-foldable viruses, such as polio virus, create a porous channel entrance and cave through the membrane. Once inside, viruses release their genome, as well as interfere with or hijack various parts of the cell machine. Viral genomes direct host cells to eventually produce viral proteins (plenty of time to stop the synthesis of any RNA and proteins that the host cell can use). Eventually, viruses stack the deck in their favor, both inside the host cells and within the host itself, creating conditions that allow them to spread. For example, if you suffer from a cold, one sneeze emits 20,000 drops containing rhinovirus or coronavirus particles, according to Molecular Biology cells. Touching or breathing this droplet is all it takes for the common cold to spread. Microscopic view of the Ebola virus. (Image credit: CDC/Cynthia Goldsmith/Public Health Image Library) New findingsStasting virus relationships began with the fact that it was indicated the similarities in size and form, whether viruses contain DNA or RNA, and what form. With better methods to sequence and compare viral genomes, and with a constant influx of new scientific data, what we know about viruses and their history is constantly being clarified. Until 1992, the viruses are considered to be much smaller with tiny genomes was taken as a dece about. This year scientists discovered a bacteria-like structure in an edema in a water cooling tower, according to Wessner. As it turns out, what they discovered was not a bacterial species, but a very large virus, which they named Mimivirus. The virus is about 750 nm in size and may also have the same dyeing properties as Gram-positive bacteria. This was followed by the discovery of other major viruses, such as Mamavirus and Megavirus. It is not known how these large viruses evolved, Dudley said, referring to them as elephants from the virus world. They may degenerate cells that have become parasites in other cells (Mimiviruses infect amoeba), or they may be more typical viruses that continue to acquire additional host genes, she added. Mimiviruses require host cell machines to produce proteins, just like other smaller viruses. However, their genome still contains many remnants of genes associated with the process of translation. Mimiviruses may have been independent cells. Or they could have simply acquired and accumulated some host genes, Wessner wrote. Such discoveries raise new questions and open up new research opportunities. In the future, these studies may provide answers to fundamental questions about the origin of viruses, how they reached the current state of the parasites, and whether viruses should be included in the tree of life. Additional Resource Resources