

## A General Perspective on Pathogen Hosts

Mustafa Gulum\*

Department of Microbiology, Kahramanmaraş Sutcu Imam University, Kahramanmaraş, Turkey

### DESCRIPTION

Any organism that has the ability to cause disease is referred to as a Pathogen. A pathogen is also known as an infectious agent or a germ. Pathogens can infiltrate a host through a variety of routes. Although the main routes have varying episodic time frames, soil has the longest or most persistent capacity for pathogen harboring. Pathogenic diseases are diseases that are caused by infectious pathogens in humans. Pathogens are not the only cause of disease; other factors include toxins, genetic abnormalities, and the host's own immune system.

Bacteria, plants, animals and humans acts as pathogen hosts. On a molecular, cellular, organismal, or population level, the host pathogen interaction is described as how bacteria or viruses maintain themselves within host organisms. Although they may not cause illness in all hosts, this word is most generally used to refer to disease-causing bacteria. As a result, the concept has been broadened to include how known pathogens persist within their hosts, regardless of whether or not they cause disease.

Despite the fact that bacteria can be pathogens, they can also be infected by pathogens. Bacteriophages are viruses, sometimes known as phages, which infect bacteria, typically resulting in death of the infected bacteria. T7 and Lamda phage are two common bacteriophages. Bacteriophages infect many types of bacteria, including both gram-negative and gram-positive bacteria. A phage can even infect pathogenic bacteria that infect other species, including humans. Plants can contain a variety of pathogens such as viruses, bacteria, fungus, nematodes, and even other plants. Bacterial plant infections are also a severe concern in many plant species, causing leaf spots, blights, and rots.

*Pseudomonas syringae* and *Ralstonia solanacearum* are the most common bacterial diseases in plants, causing leaf browning and other problems in potatoes, tomatoes, and bananas. Fungi are another common form of plant pathogen. Shorter plant height, growths or pits on tree trunks, root or seed rot, and leaf spots are just a few of the problems they might create. Rice blast fungus, Dutch elm disease, chestnut blight, and the black knot and brown rot diseases of cherries, plums, and peaches are all common and deadly plant fungi. Pathogenic fungi are thought to be responsible for up to a 65% loss in crop production.

The pathogen can be involved in one of three host-pathogen interactions, depending on how it interacts with the host. When the pathogen benefits but the host receives no advantage from the contact, this is known as commensalism. *Bacteroides thetaiotaomicron*, for example, is found in the human digestive system but has no known benefits. As demonstrated in the human stomach, mutualism occurs when both the pathogen and the host benefit from the contact. Many bacteria assist in the breakdown of nutrients for the host, and our bodies serve as their habitat in return. When a pathogen gains from a relationship while the host suffers, this is known as parasitism. The unicellular *Plasmodium falciparum* parasite, which causes malaria in humans, demonstrates this.

Prions, viruses, bacteria, and fungi are only few of the pathogens that can infect humans. Human-infecting viruses and bacteria can produce symptoms such as sneezing, coughing, fever, vomiting, and even death. Some of these symptoms are brought on by the virus, while others are brought on by the infected person's immune system.

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**Correspondence to:** Mustafa Gulum, Department of Microbiology, Kahramanmaraş Sutcu Imam University, Kahramanmaraş, Turkey, E-mail: mgam12@gmail.com

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