

# Difference Between Colonization and Infection

[www.differencebetween.com](http://www.differencebetween.com)

## Key Difference - Colonization vs Infection

The [pathogenicity](#) of microbes is a complete biochemical and structural process which is defined by the complete mechanism in which the microorganism causes the disease. For example, the pathogenicity of [bacteria](#) may be associated with different components of the bacterial cell such as capsule, [fimbriae](#), lipopolysaccharides (LPS) and other [cell wall](#) components. It can also be associated with active secretion of substances that damage the host tissues or protect the bacteria from host defenses. The colonization and infection are two terms that are discussed relating to microbial pathogenicity. The first stage of the microbial pathogenicity is colonization. It is known as the correct establishment of the pathogen in the host tissues. On the contrary, infection is the invasion of body [tissues](#) by the [pathogen](#) to cause the disease. The **key difference** between colonization and infection is that **colonization is the process of establishment of the microbe in the body tissues while the [infection](#) is the process of invading body tissues by the microbe to cause the symptoms of the disease.**

## What is Colonization?

This is the first step of the microbial and pathogen colonization. It is the correct establishment of the pathogen at the right portal of entry of the host. The pathogen is normally colonized with the host tissues that are in contact with the external environment. The portal of entries in humans are urogenital tract, digestive tract, respiratory tract, skin, and conjunctiva. The usual organisms that colonize these regions have tissue adherence mechanisms. These adherence mechanisms have the ability to overcome and withstand the constant pressure that is expressed by the host defenses. It can be simply explained by the adherence mechanism that is shown by the bacteria when attaching to the mucosal surfaces in humans.

## Pathogenic Infection

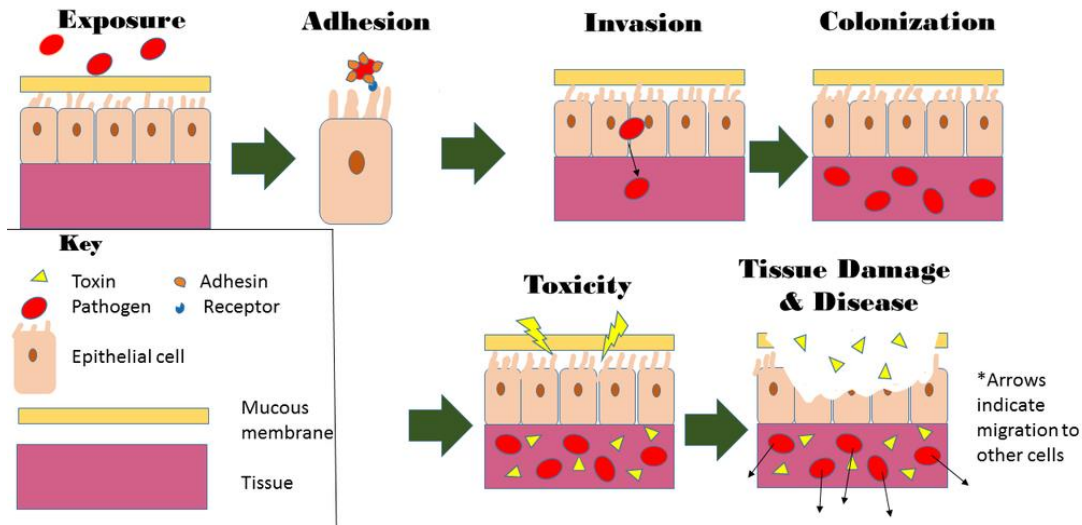


Figure 01: Colonization of a Pathogen

The bacterial attachment to the [eukaryotic](#) surfaces needs two factors, namely receptor and a ligand. The receptors are usually [carbohydrates](#) or peptides residues that reside on the eukaryotic cell surface. The bacterial ligands are called as adhesions. It is typically a macro molecular component of the bacterial cell surface. The adhesions are interacting with the host cell receptors. The adhesions and the host cell receptors normally interact in specific complementary fashion. This specificity is comparable to the type of relationship between [enzyme](#) and substrate or [antibody and antigen](#). The some of the ligands in bacteria are described as, Type 1 frimbriae, Type 4 pili, S-layer, Glycocalyx, capsule, lipopolysaccharide (LPS), teichoic acid and lipoteichoic acid (LTA).

## What is Infection?

Infection is the process of the invasion of body tissues by the infectious agents such as [bacteria](#), [viruses](#), their multiplication and altogether the collective responses by the hosts to particular infectious factors or [toxins](#). The infectious diseases are also called as communicable diseases and transmissible diseases. The hosts like humans can overcome the infections by using their [innate and adaptive immune systems](#). The innate immune system consists of cells like [dendritic cells](#), [neutrophils](#), [mast cells](#) and [macrophages](#) that can fight infections. The receptors like TLR'S (Toll-like receptors) in the innate immune system easily recognize the infectious agents. The bactericides like [lysosomes](#) enzymes are highly important in the innate immune system.



**Figure 02: Infection**

In case of the adaptive immune system the antigen presenting cells (APS), [B cells](#) and [T lymphocytes](#) are collectively inducing antigen-antibody reactions to eliminate the infectious agents from the human body completely. However, the pathogen has varied mechanisms in order to overcome the innate and adaptive immune system of a human. The pathogens have evading mechanisms like preventing from attaching to human macrophages and lysosomes. And also the pathogens produce [toxins](#) like [endotoxins](#), [enterotoxins](#), Shiga toxins, cytotoxins, heat-stable toxins, and heat-labile toxins. Some of the well-known bacteria like *Salmonella*, *E-coli* produce toxins in the successful infection process. A successful infection can only be raised by overcoming the complete molecular immune mechanisms of the hosts.

## **What are the Similarities Between Colonization and Infection?**

- Both are main steps of the microbial pathogenicity.
- Both are working together to cause the disease.
- Both of these steps are extremely important for the occurrence of the disease or symptoms.
- Both these steps are equally important for pathogen multiplication.

## **What is the Difference Between Colonization and Infection?**

**Colonization vs Infection**

Colonization is the process of establishment of the microbe in the body tissues.	Infection is the process of the invasion of body tissues, multiplication of pathogen and altogether, the collective responses by the hosts to particular infectious factors or toxins of the pathogen.
<b>Adhesins (Ligands)</b>	
Adhesins like pilli, frimbriae and LPS are extremely important for colonization.	Adhesins are not needed for infection.
<b>Cell Receptors</b>	
The cell receptors are important in attaching to the pathogen for successful colonization process.	The cell receptors are not important for infection.
<b>Toxin Production</b>	
Toxins are not produced during the colonization process.	Toxins are produced during the infection process.
<b>Disease or Symptoms</b>	
Symptoms or disease is not caused by colonization.	Symptoms or disease is caused by the infection.
<b>Acute Inflammations</b>	
Colonization does not cause acute inflammations or harming the host.	Infection causes acute inflammations and harms the host tissues.

## Summary - Colonization vs Infection

The pathogenicity in cases of bacteria is associated with different components of the bacterial cell such as capsule, frimbriae, lipopolysaccharides (LPS), pilli and other cell wall components like teichoic acid, glycocalyx, etc. It can also be due to the active secretion of substances that damage the host tissues or protect the bacteria from host defenses. The colonization and infection are two main steps that discussed relating to microbial pathogenicity. The first stage of the microbial pathogenicity is colonization. It is defined as the correct establishment of the pathogen in the host tissues or right portal of entry of the host. On the contrary, infection is the invasion of body tissues by the pathogen to cause the disease. This is the difference between colonization and infection.

**Reference:**

WI, Kenneth Todar Madison. Colonization and Invasion by Bacterial Pathogens, [www.textbookofbacteriology.net/colonization.html](http://www.textbookofbacteriology.net/colonization.html).

“Infection.” Wikipedia, Wikimedia Foundation, 18 Nov. 2017, [en.wikipedia.org/wiki/Infection](http://en.wikipedia.org/wiki/Infection).

**Image Courtesy:**

- 1.'Pathogenic Infection'By Uhelskie - Own work, [\(CC BY-SA 4.0\)](https://creativecommons.org/licenses/by-sa/4.0/) via [Commons Wikimedia](https://commons.wikimedia.org/)
- 2.'HHD R Axilla'By Julesmcn - Own work, [\(CC BY-SA 3.0\)](https://creativecommons.org/licenses/by-sa/3.0/) via [Commons Wikimedia](https://commons.wikimedia.org/)

**How to Cite this Article?**

APA: Difference Between Colonization and Infection.(2017 November 28). Retrieved (date), from <http://differencebetween.com/difference-between-colonization-and-vs-infection/>

MLA: "Difference Between Colonization and Infection" Difference Between.Com. 28 November 2017. Web.

Chicago: “Difference Between Colonization and Infection.” Difference Between.Com. <http://differencebetween.com/difference-between-colonization-and-vs-infection/> accessed (accessed [date]).



Copyright © 2010-2017 Difference Between. All rights reserved