Unit 3: Bacterial Pathogenesis

In this unit we are going to take up bacterial pathogenesis. Anything the bacterium does to aid in the requirements needed to cause infectious disease mentioned above will influence its ability to cause disease. Bacteria are able to carry out many of these requirements as a result of their virulence factors. We must keep in mind, however, that whether or not a person actually contracts an infectious disease after exposure to a particular potentially pathogenic bacterium depends not only on the microorganism, but also on the number of bacteria that enter the body and the quality of the person's innate and adaptive immune defenses.

For example, if relatively few bacteria enter the body then the body's natural defenses against infection have a much better chance of removing them before they can colonize, multiply, and cause harm. On the other hand, if a large number of bacteria enter then the body's defenses may not be as successful. Likewise, a person with good innate and adaptive immune defenses will be much more successful in removing potentially harmful bacteria than a person that is immunocompromised. In fact a person highly immunosuppressed, such as a person taking immunosuppressive drugs to suppress transplant rejection, or a person with advancing HIV infection, or a person with other immunosuppressive disorders, becomes very susceptible to infections by microorganisms generally considered not very harmful to a healthy person with normal defenses.

However, in this unit we are going to look at bacterial virulence factors that can influence its ability to cause infectious disease. Virulence factors are molecules expressed and secreted by microorganisms that enable them to colonize the host, evade or inhibit the immune responses of the host, enter into or out of a host cell, and/or obtain nutrition from the host.

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Overview of Microbial Pathogenesis

• 5: Virulence Factors that Promote Colonization

• 6: Virulence Factors that Damage the Host

Thumbnail: The biohazard symbol was developed by the Dow Chemical Company in 1966 for their containment products. It is used in the labeling of biological materials that carry a significant health risk. Image used with permission (Public Domain; Silsor).

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