

Case Study Analysis

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1. Describe the pathophysiologic process of chlamydia, including the two forms, intracellular development, and immune evasion.

The pathophysiology of chlamydia involves a complex and unique intracellular lifecycle that allow the causative organism (*Chlamydia trachomatis*) to not only invade but also to survive and replicate within the host cells while at the same time escaping immune detection (Darville, 2025). *Chlamydia trachomatis* exists into two forms (elementary body and reticulate body) (Darville, 2025). The elementary body is the infectious form of the bacteria and it metabolically inactive but at the same time, well-suited or adapted for survival outside the cells of the host. It is also capable of attaching to the epithelial cells lining the urogenital tract. Upon contact, the elementary body form of the bacteria enters the host cell through a process known as endocytosis and once inside the host cells, it morphs into the reticulate body form which is metabolically active but non-infectious (Darville, 2025). The reticulate body starts to replicate through binary fission inside an inclusion and over the next 48-72 hours, this reticulate body continues to multiply; eventually reorganizing into new elementary body forms. The newly formed elementary bodies are released from the host cell through lysis or extrusion (Darville, 2025). The released elementary bodies continue to infect the neighboring cells, therefore, perpetuating this cycle.

For the sake of ensuring survival and replication, *Chlamydia trachomatis* utilizes different strategies. One of these ways is the evasion of the host's degradation by lysosomes by avoiding fusion. On the other hand, the intracellular inclusion provides an additional physical protection from being detected by the immune system. In addition, it down regulates the expression of MHC class I on the surfaces of infected cells to reduce recognition by cytotoxic T