

Difference Between Cyst and Oocyst

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Key Difference - Cyst vs Oocyst

Microorganisms utilize different cellular structures present in their life cycle to maximize the survival and growth rate. Through these different structures, microorganisms such as bacteria and protozoa ensure the survival and reproduction of the species. Cysts and oocyst are examples of such cellular components that involve in the aspect mentioned above. **The cyst is a dormant stage of bacteria or protozoa that facilitates their survival during unfavourable environmental conditions while an oocyst is a thick-walled cell that is present in the life cycle of protozoa that contains a zygote within it.** This is the **key difference** between cyst and oocyst.

What are Cysts?

The dormant stage of a microorganism is known as a cyst. A cyst mainly facilitates the survival of a microorganism (bacterium or protists) under unfavourable environmental conditions such as insufficient nutrients and oxygen, high temperature, the presence of toxic chemicals and lack of moisture etc. The cyst is a thick-walled structure and is not considered as a reproductive cell. The sole intention of the cyst is to make sure the survival of the organism till the environmental conditions come back to normal and favourable levels.

Encystment is the process by which the internal parasites mostly in larval stages are enclosed within a cyst. Therefore the encystment process helps the microorganism to be easily dispersed to a favourable environment or to move from one host to another. When the microorganism reaches a favourable environment after encystment, the wall of the cyst ruptures by a process called excystation. The cell wall composition of cysts is variable according to different microorganisms. The cyst wall of bacteria is thick due to the presence of peptidoglycan layers while the protozoan cyst walls are composed of chitin.

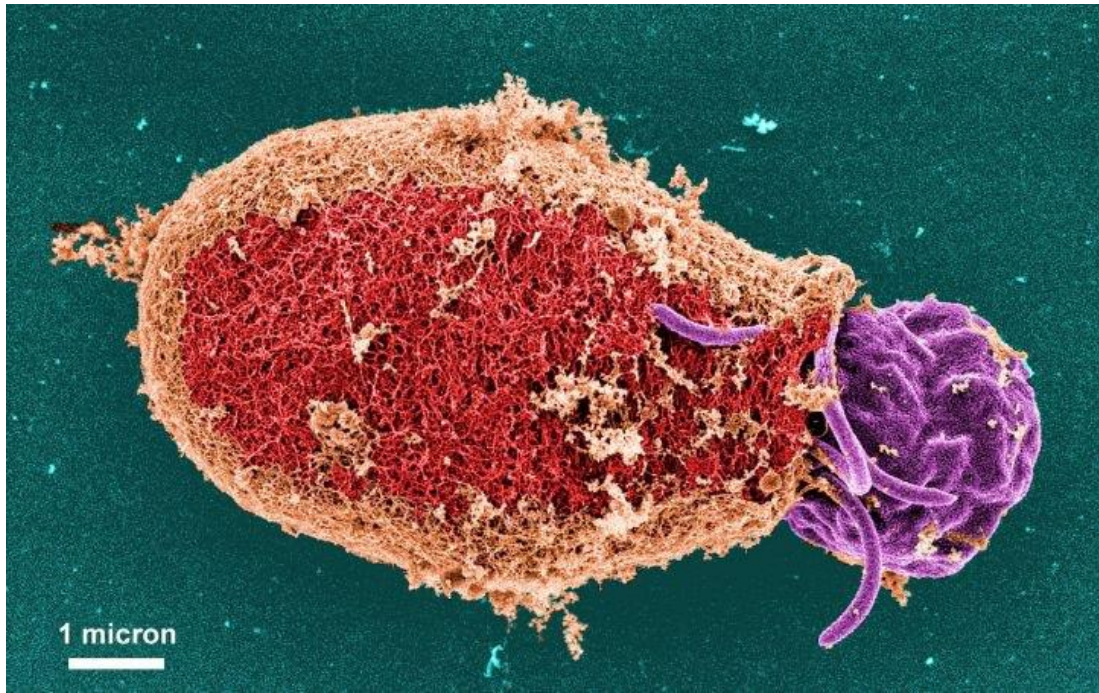


Figure 01: Cysts

The cyst formation of bacteria occurs when the encystment is taken place due to cytoplasmic contraction and thickening of the cell wall of the cyst. Usually, the bacterial cysts differ from endospores in the way they are formed. Endospores are also resistant to unfavourable environments than cysts.

What are Oocysts?

In the context of Apicomplexan phylum, it is composed of protozoa that are characterized by the presence of a special type of organelle known as the apical complex. Most of the protozoa species belong to this phylum are unicellular spore-forming intracellular parasites. With regards to its life cycle, it is composed of different stages where the cellular structure highly varies. But all members of the phylum do not possess the similar type of cell patterns during their life cycles. *Toxoplasma gondii* belonging to this group of protozoa possess different stages with the involvement of a variety of cell types in its life cycle. These include bradyzoites, tachyzoites and oocysts. Bradyzoites is a sessile cell type with a slow growth rate and give rise to either tachyzoites or gametocytes.

Gamete forming cells are known as gametocytes. The male gametocyte gives rise to a microgamete that is comparatively smaller and flagellated. The female gametocyte develops into a macrogamete which is larger and in non-flagellated. During fertilization the microgamete and macrogamete fuse to form a zygote. This zygote is present inside the oocyst. Therefore oocyst can be defined as a thick-walled cell type that is present in the life cycle of protozoa which contains a zygote.

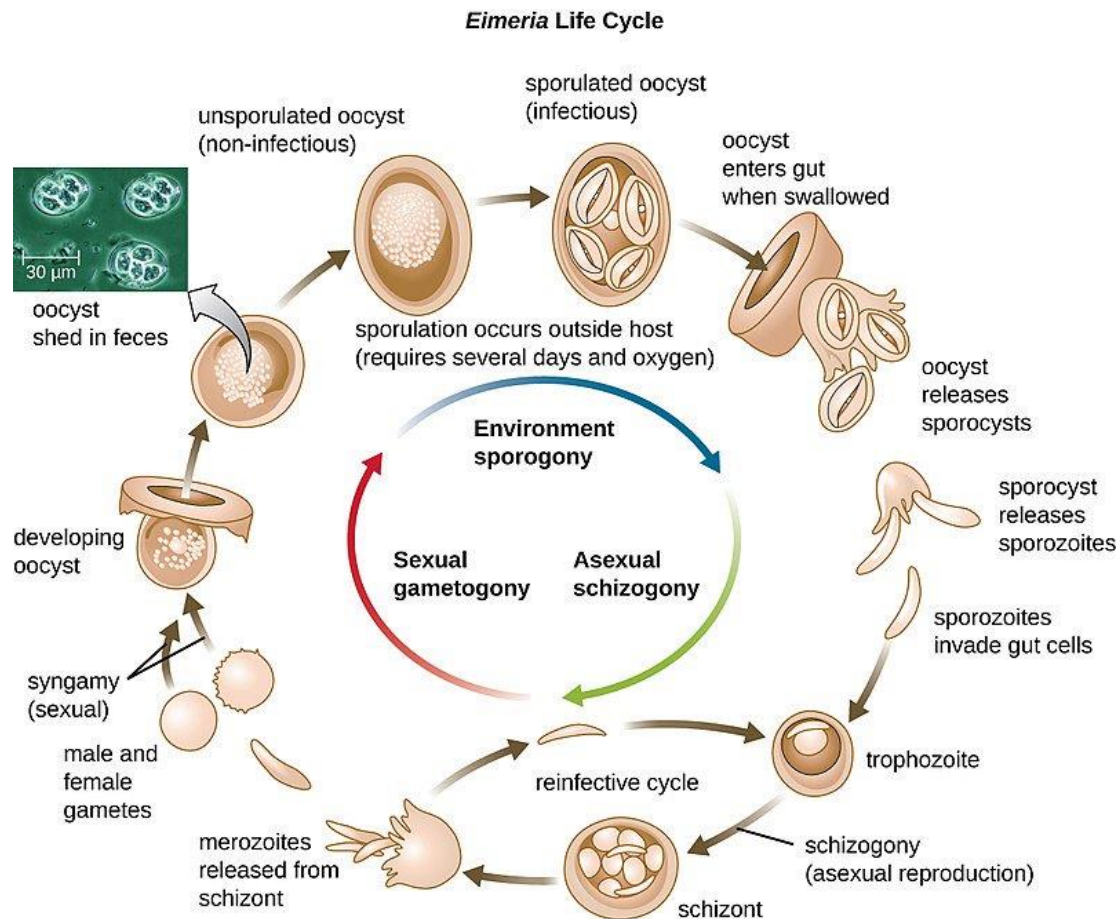


Figure 02: Oocysts

During favourable conditions, the zygote initiates its development within the oocyst. During zygote development, the oocyst becomes infective. The main reason for the development of toxoplasmosis in a host is due to the ingestion of an oocyst when it is in its infective stage. Once ingested, the oocysts will set free bradyzoites in the stomach and the intestinal region of the host which initiates the life cycle of *Toxoplasma gondii* again. Not only *Toxoplasma gondii*, but other organisms like *Eimeria*, *Isospora*, and *Cryptosporidium* also produce oocysts during their life cycles.

What are the Similarities Between Cyst and Oocyst?

- Both are cellular components of bacteria and protozoa.
- Both structures are involved in the survival of the organism.
- Both have thick cell wall

What is the Difference Between Cyst and Oocyst?

Cyst vs Oocyst	
The cyst is a dormant stage of bacteria or	Oocyst is a type of thick-walled cell

protozoa which facilitates the survival during unfavourable environmental conditions.	that is present in the life cycle of protozoa which contains a zygote within it.
Cell Type	
The cyst is not a reproductive cell.	Oocyst is a reproductive cell.

Summary - Cyst vs Oocyst

The dormant stage of a microorganism is known as a cyst. A cyst mainly facilitates the survival of a microorganism (bacteria or protists) under unfavourable environmental conditions. The cyst formation of bacteria occurs when the encystment is taken place due to cytoplasmic contraction and thickening of the cell wall of the cyst. Encystment is the process by which the internal parasites mostly in larval stages reside within a cyst. Oocyst can be defined as a thick-walled cell type that is present in the life cycle of protozoa which contains a zygote. During zygote development, the oocyst becomes infective. Not only *Toxoplasma gondii*, but other organisms like *Eimeria*, *Isospora*, and *Cryptosporidium* also produce oocysts during their life cycles. The main reason for the development of toxoplasmosis in a host is due to the ingestion of an infective oocyst. This is the difference between cyst and oocyst.

Reference:

1. "Difference Between Spore and Cyst in Bacteria | Definition, Features, Function." Pediaa.Com, 22 Aug. 2017. [Available here](#)
2. "Oocyst." Encyclopædia Britannica, Encyclopædia Britannica, inc. [Available here](#)

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