Difference Between Binary Fission in Amoeba and Leishmania

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Key Difference - Binary Fission in Amoeba vs Leishmania

Binary fission is the most common asexual reproduction method exhibited by prokaryotic organisms and single cell eukaryotic organisms. Binary fission results in two genetically identical daughter cells from a single mature cell. Most bacteria and single cell eukaryotic organisms depend on binary fission for propagation since it's a simple and fast process. Amoeba and Leishmania are two single cell eukaryotic organisms. In amoeba, splitting into two cells can happen in any place. Leishmania has a whip-like structure called flagellum at one end of the body. Hence the binary fission occurs longitudinally (in a definite orientation) in relation to this flagellum. The key difference between binary fission of amoeba and leishmania is that **binary fission of amoeba is feasible from any place of the amoeba cell** while the **binary fission of leishmania is feasible in a definite orientation due to a flagellum located at one end.**

What is Binary Fission in Amoeba?

Amoeba is a single celled organism found in pond water and moist soils. Amoeba does not have a definite shape. It contains only a flowing cytoplasm surrounded by a very flexible membrane. Amoeba is a eukaryotic organism. It contains a nucleus, a contractile vacuole, and organelles. Amoeba locomotes using pseudopodia developed temporally during the movements.

Binary fission is the common method adopted by single cell amoeba for cell division and reproduction. It is a method of asexual reproduction which produces two genetically identical amoeba cells from a single mature amoeba cell. First, the nucleus of the amoeba cell undergoes division and duplicates into two nuclei. Then the two nuclei move in opposite directions in the parent cell. The cell synthesizes proteins and other necessary substances in preparation for binary fission. At the final stage of binary fission, the cytoplasm divides and forms two identical daughter cells.

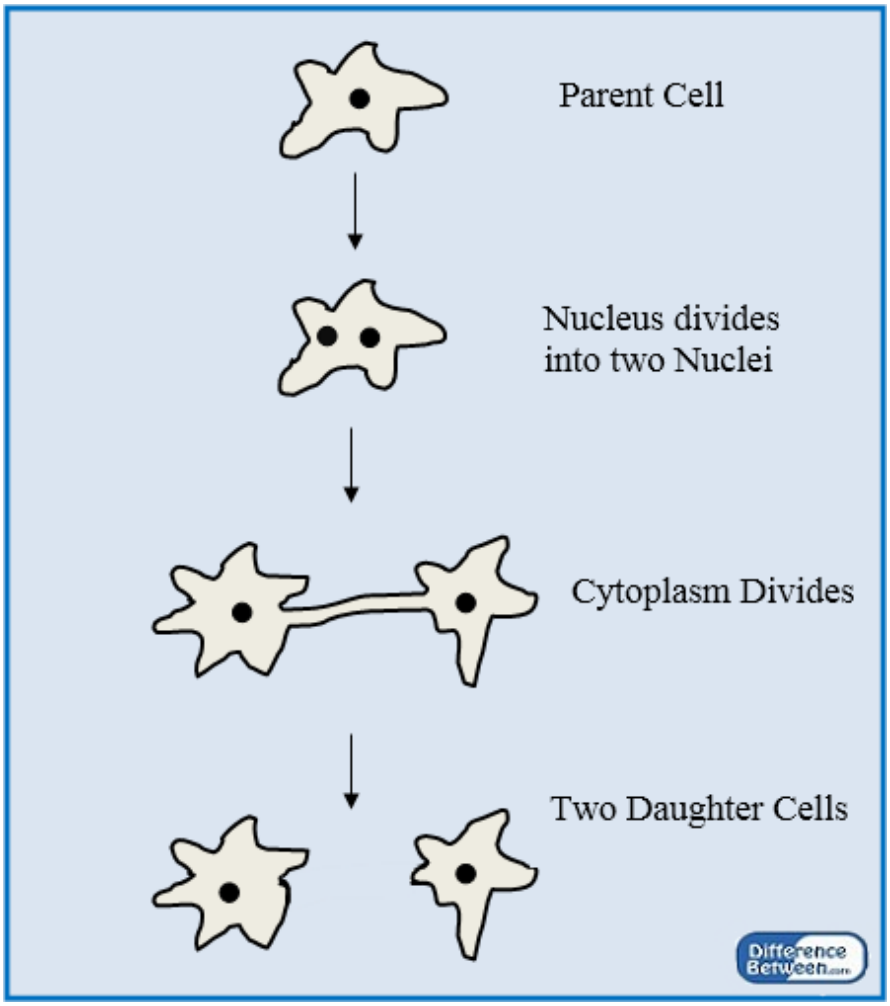

Figure 01: Binary fission of Amoeba

Since amoeba has no definite shape, binary fission can initiate and split into two cells from any place of the amoeba cell. This is different from Leishamania binary fission.

What is Binary Fission in Leishmania?

Leishmania is a flagellated protozoan. It is a unicellular eukaryote with a well-developed nucleus and other cell organelles. Leishmania belongs to the genus trypanosomes and causes the disease called leishmaniasis. It commonly infects host organisms such as hyraxes, canids, rodents, and humans. Leishmania is a very common human parasite.

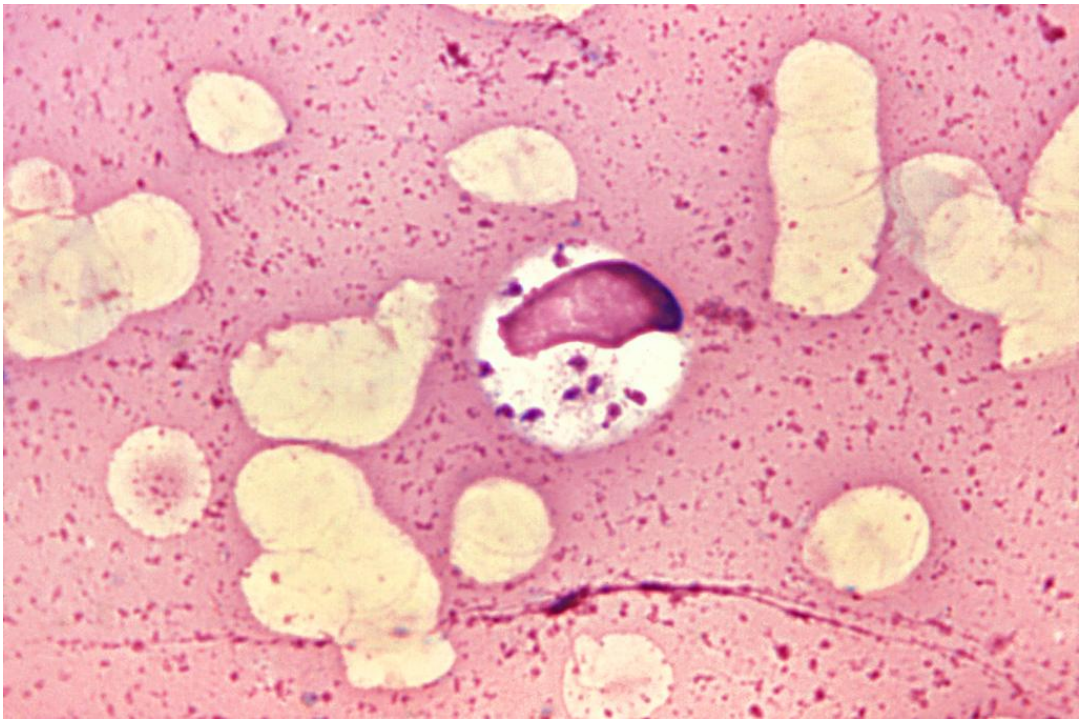

Figure 02: Leishmania structure

Leishmania divides by binary fission. It shows longitudinal binary fission because leishmania has a flagellum at one end of the cell. Due to this structure, it results in two daughter cells in the longitudinal plane.

What is the difference between Binary Fission in Amoeba and Leishmania?

Binary Fission in Amoeba vs Leishmania	
Binary Fission in Amoeba is a type of asexual reproduction shown by amoeba.	Binary Fission in Leishmania is a type of asexual reproduction shown by leishamnia.
Location	
Binary fission of Amoeba can happen in any place of the cell.	Binary fission of Leishmania happens in a longitudinal plane.

Summary - Binary Fission in Amoeba vs Leishmania

Binary fission is a common asexual reproduction method shown by single cell organisms including bacteria, amoeba and leishmania. Matured parent cell splits into two identical daughter cells in binary fission. The amoeba cell does not have a definite shape. It has a floating cytoplasm covered in a flexible cell membrane. Hence the shape can be changed at any time. Binary fission in amoeba can also happen from any place of the cell. Leishmania is a common human parasitic protozoan which also has a single cell structure. At one end of leishmania, there is a flagellum. Hence the binary fission of leishmania has a definite orientation. This is the main difference between binary fission of amoeba and leishmania.

Reference:

1. Wheeler, Richard J., Eva Gluenz, and Keith Gull. "The cell cycle of Leishmania: morphogenetic events and their implications for parasite biology." Molecular Microbiology. Blackwell Publishing Ltd, Feb. 2011. Web. Available here. 26 June 2017.
2. "Institutional links."Leishmania spp. - Pathogen Safety Data Sheets. N.p., 08 Sept. 2011. Web. Available here. 26 June 2017.

Image Courtesy:

1. "Leishmania donovani 01" By CDC/Dr. L.L. Moore, Jr. - from the Centers for Disease Control and Prevention's Public Health Image Library (PHIL) −(Public Domain) via Commons Wikimedia

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