The cytoskeleton essay sample

The cytoskeleton helps to maintain cell shape. But the primary importance of the cytoskeleton is in cell motility. The internal movement of cell organelles, as well as cell locomotion and muscle fiber contraction could not take place without the cytoskeleton.

The cytoskeleton is one of a few biological areas with broad potential for drug discovery and development and has been scientifically validated in a wide variety of human diseases. The concept of the cytoskeleton was first introduced by French embryologist Paul Wintrebert in 1931. The cytoskeleton is a complex of insoluble components of the cytoplasm playing critical roles in cell motility, shape generation, and mechanical properties of a cell. Fibrillar polymer filaments, microtubules, and intermediate filaments are major constituents of the cytoskeleton, which constantly change their organization during cellular activities. The actin cytoskeleton is especially polymorphic, as actin filaments can form multiple higher order assemblies performing different functions. Structural information about cytoskeleton organization is critical for understanding its functions and mechanisms underlying various forms of cellular activity. Because of the nanometer-scale thickness of cytoskeletal fibers, electron microscopy is a key tool to determine the structure of the cytoskeleton. Microtubules are conveyer belts inside the cells.

They move vesicles, granules, organelles like mitochondria, and chromosomes attachment proteins. They also serve a cytoskeletal role. Structurally, they are linear polymers of tubulin which is a globular protein. Microtubules may also work alone, or join with other proteins to form more complex structures called cilia, flagella. Microfilaments main function is in

cell motility, along with microtubules, and is Important in cell division, and also in anchoring centrosomes and in cytokinesis which forms a band just beneath the plasma membrane, giving cell mechanical strength which links transmembrane proteins.

Malfunctions lead to Cancer. Structural and functions of the cytoskeleton sometimes causes uncontrolled movement; we can use this as a therapeutic target. Uncontrolled celled migration is sign of cancerous cell. Intermediate filaments are one of three types of cytoskeletal elements. The other two are thin filaments and microtubules. Frequently the three components work together to enhance both structural integrity, cell shape, and cell and organelle motility. Intermediate filaments are stable, durable. They are prominent in cells that withstand mechanical stress and are the most insoluble part of the cell. Located within the cytoplasm is the cytoskeleton, a network of fibers that help the cell maintain its shape and give it support. The cytoplasm is clear in color and has a gel like appearance. It is composed mainly of water and also contains enzymes, salts, organelles, and various organic molecules. The cytoplasm helps to move materials around the cell and also dissolves cellular waste.

Cytoskeleton

The Cytoskeleton has many parts and is one of the areas with broad potential for drug discovery and development and even though if some parts in the cytoskeleton have malfunctions that lead to Cancer it is still and important part of cells in our bodies.

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