CYTOSKELETON

INTRODUCTION :-

Cytoskeleton is intracellular framework of cells. It is unique to Eukaryotic cell. cytoskeleton composed of Microtubules, Microfilaments and intermediate filaments. All three components are composed of Protein Sub units that can assemble or disassemble rapidly. cytoskeleton helps to define and Control the shape of the cell and involved in cell movement and important in cell division. The network of Protein fibre is known as the Sytoskeleton.

1. MICROTUBULES :—

- Microtubules are present in eukaryotic cells.
- form the cytoplasmic matrix of all eukaryotic cells.
- Tube like, 25 nm. in diameter occurs singly or aggregate
- Microtubules are hallow, devoid of ribosomes, made of 13 Sub-units. (Beta-Filament)
- The protein sub unit of microtubule is called tubulin.
- The two monomers of tubulin are -α- tubulin and β- tubulin
- They are non-contractile
- They have no role in Cyclosis.
- They do not cause, Sol-gel changes
- They run parallel forming bundle
- They do not helps in endocytosis.
- It maintain cell shape
- Involved in cell differentiation.

— Facilitates sperm cell nucleus elongation during spermatogenesis.
— Determine cell Polarity and motility.
— Helps in intracellular transport of macromolecules through the formation of temporary channels.
— Microtubules are seen in cilia and flagella.
— They are involved in sliding motion of chromosome during cell division.

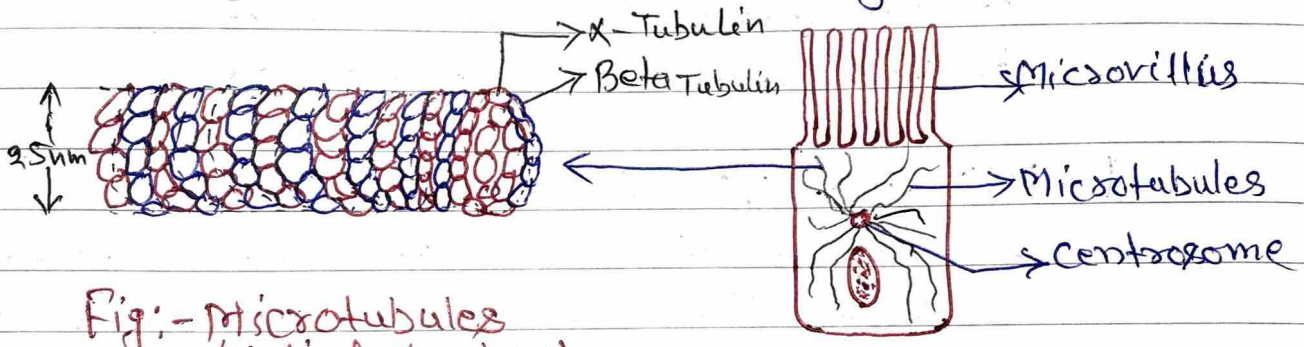

Fig:- Microtubules (Helical structure)

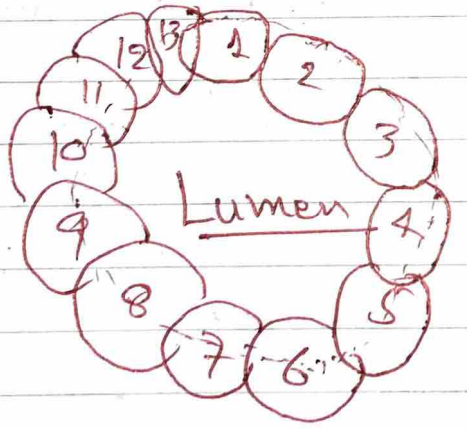

Fig:- Microtubule in C.S. showing 13 tubules.

2. Microfilament :—

— They are narrower with a diameter of 6 nm.
— They are Solid
— They composed of two strands of subunit

- of the Protein Actin.
- Protein Actin is of one type.
- Microfilament are the smallest filament of the cytoskeleton and also A called Actin filaments.
- they are Polymer of Protein actin.
- It is equal to a single Proto-filament though it often appears double helix due to spiralisation of actin molecules.
- Microfilament bring about cyclosis
- They are contractile.
- They cause Sol-gel changes
- They form a network
- They helps in endocytosis.
- One of the most importan roles of microfilaments is to contract muscles.
- In muscle cells actin works together with the Protein myosin to allow the muscles to contract and relax.
- Neither actin nor myosin can work properly without the other and they form a complex called actomyosin.
- Groups of actomyosin are found in sarcomeres the basic unit of muscle tissue.

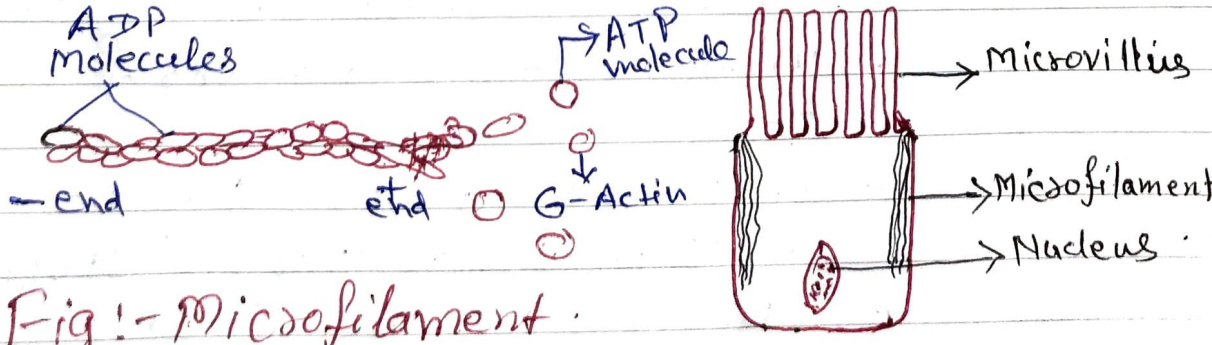

Fig:- Microfilament.