

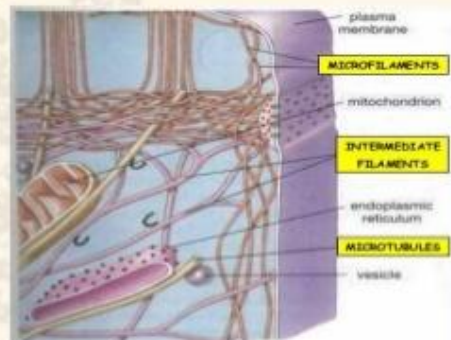
CYTOSKELETON

STRUCTURE

- Network of filamentous proteins
 - filaments formed from a few proteins
 - monomer protein forms polymer filaments
- located in nucleus and cytoplasmic compartments
 - not within organelles
- location based upon cellular function
- named on basis of physical size

The Cytoskeleton

- The eukaryotic cell is a 3D structure. It has a cytoskeleton anchored to proteins in the plasma membrane
- These proteins both maintain shape and allow movement
- The cytoskeleton is a dynamic structure, as the microfilaments and microtubules can depolymerise and repolymerise very easily



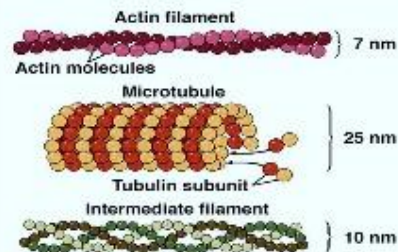
FUNCTIONS:

- functions based upon the filaments physical properties
- integral strength
- cell shape
- motility
 1. inside the cell
 2. whole cell
 3. motor proteins associated with 2 filament systems

Cytoskeletal filaments:

1. Microfilaments
2. Microtubules
3. Intermediate filaments

Three Kinds of Cytoskeletal Filaments



INTERMEDIATE FILAMENTS

- different cell types, different intermediate filaments
- all eukaryotes nuclear cytoskeleton the same
- resist stresses applied externally to the cell cytoplasm
- 10-nanometer diameter
- cross-linking proteins allow interactions with other cytoskeletal networks

- intermediate filament associated proteins (IFAPs)
 - coordinate interactions between intermediate filaments and other cytoskeletal elements and organelles,
- human disorders
 - mutations weaken structural framework
 - increase the risk of cell rupture

Some functions of Intermediate Filaments :

- Intermediate filaments provide mechanical strength and resistance to shear stress.
- There are several types of intermediate filaments, each constructed from one or more proteins characteristic of it.