## Cytoskeletal proteins:

<table>
<thead>
<tr>
<th></th>
<th>Size</th>
<th>Polar? Structure</th>
<th>Function</th>
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| **Microtubules** | 25 nm                 | Yes, has a plus and minus end. Polar tube consisting of 13 protofilaments. Each monomer consists of an alpha and a beta unit. | 1. Transport  
2. Mitotic spindle  
3. Mobility (ie cilia, flagellum, sperm) |
| **Intermediate filaments** | 10 nm                 | No. 8 tetramers twisted into a rope  
| | | | 1. Provides mechanical structure to nucleus. Forms nuclear lamina.  
2. Anchored to plasma membrane in various places. Giving cells mechanical strength and carrying mechanical strength in an epithelial cell by spanning the cytoplasm from cell-cell junction to another. |
| **Actin**      | 7 nm, “microfilament” | Yes, has a plus and minus end. Each filament is a twisted chain of identical globular actin molecules, all of which “point” in the same direction along the axis of the chain. | 1. Microvilli.  
2. Contractile bundles in cytoplasm.  
3. Sheet-like and finger-like protrusions.  
4. Contractile ring during cell division. |