Universidade de São Paulo
Escola de Engenharia de Lorena
Departamento de Biotecnologia

Curso: Engenharia Ambiental

Citoesqueleto

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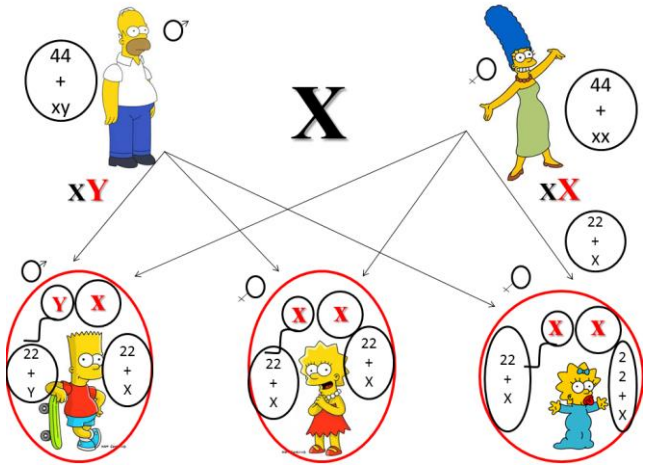
1

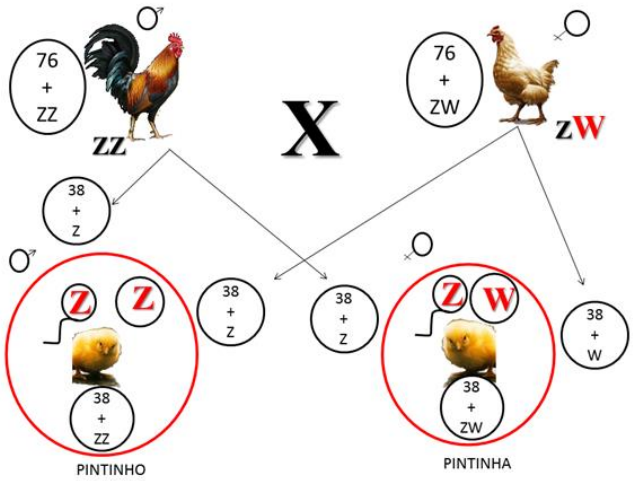
Herança ligada ao sexo: Cromossomos Sexuais

✓ Sistema XY: espécie humana e na maioria dos animais diploides e em algumas plantas



2

✓ Sistema ZW: as fêmeas constituem o sexo heterogamático



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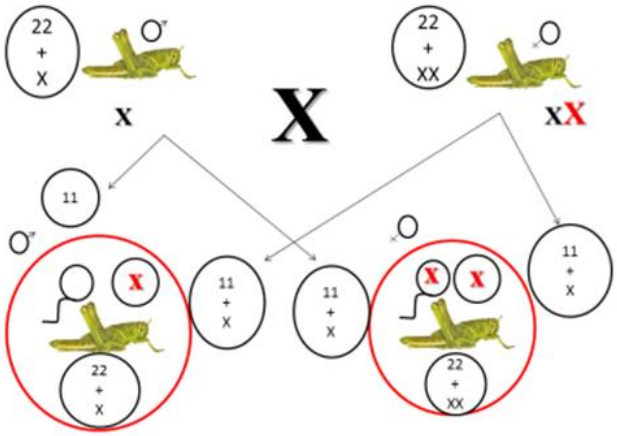
✓ Sistema X0: diversas espécie de insetos
Machos X0 e Fêmeas XX



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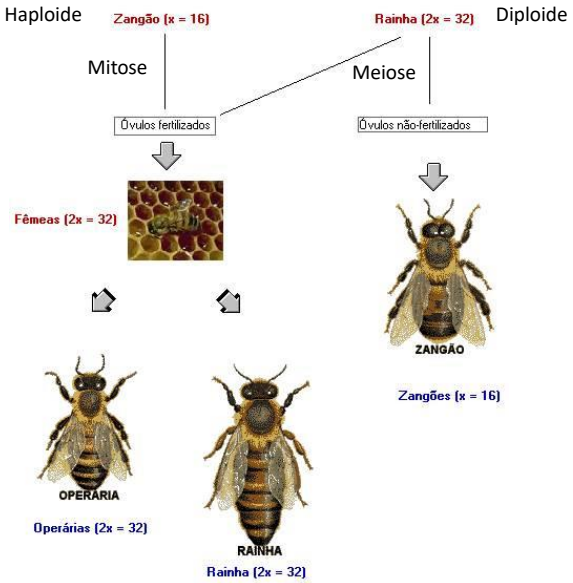
✓ Sistema halodiploide:



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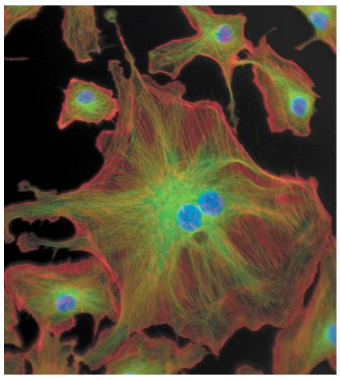
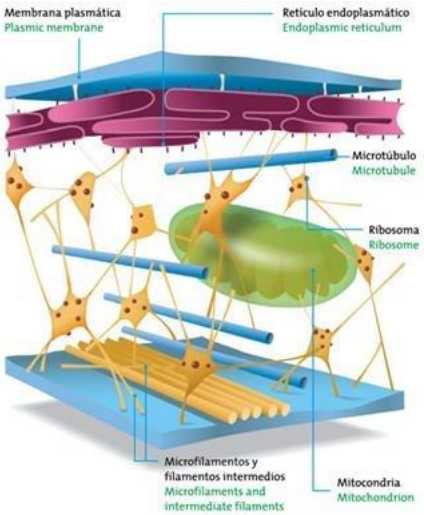
Citoesqueleto: esqueleto da Célula





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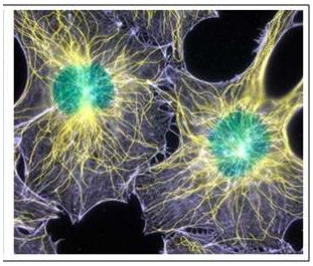
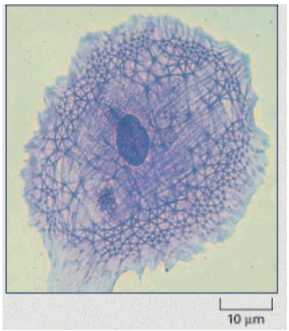
Citoesqueleto

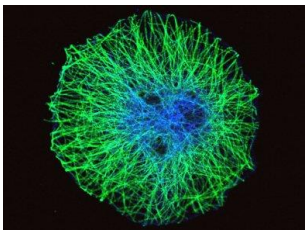
❖ **Funções:**

-Define a forma e organiza a estrutura interna da célula.



- Possibilita o deslocamento de material dentro da célula e da própria célula





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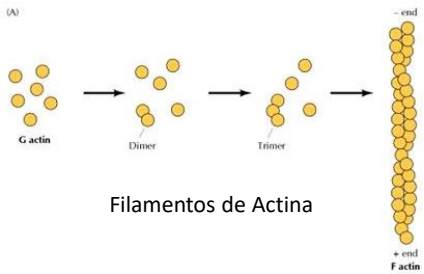
Natureza do Citoesqueleto

❖ Filamentos lineares

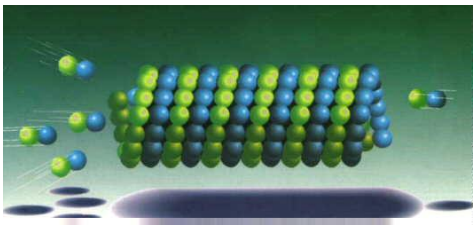
❖ Polimerização de **monômero proteicos**

❖ Ligações não covalentes



Filamentos de Actina

Alberts, B. et al. *Molecular Biology of The Cell.* 4 Ed.



Microtubulo

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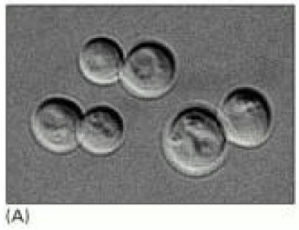
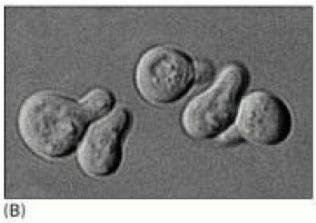
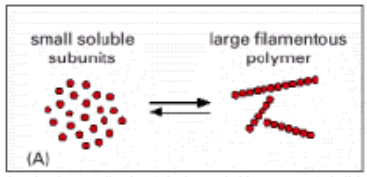
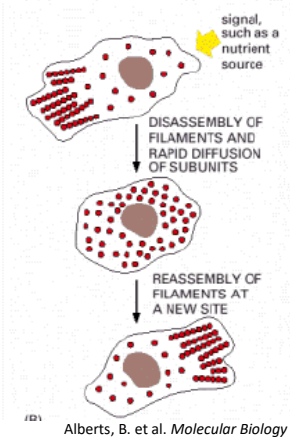
Citoesqueleto









Alberts, B. et al. *Molecular Biology of The Cell.* 4 Ed.

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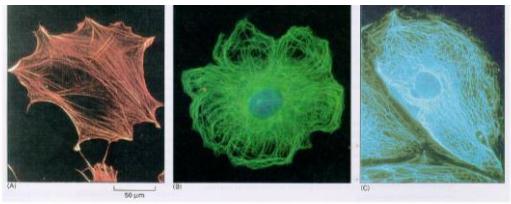
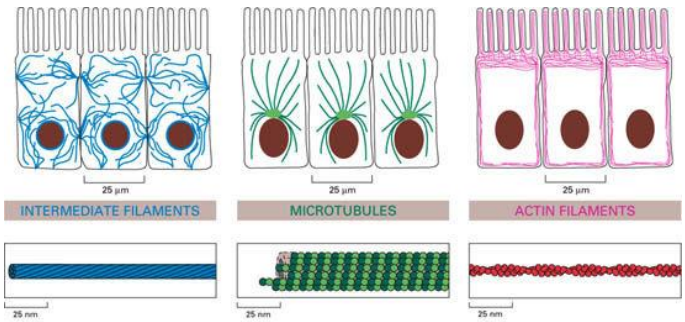
Citoesqueleto- Componentes

- ✓ **Filamentos de Actina**
- ✓ **Microtúbulos**
- ✓ **Filamentos Intermediários**



A – filamentos de actina; B – Microtúbulos; C – Filamentos intermediários



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Citoesqueleto- Componentes

Filamentos de Actina

-8nm

Filamentos de Intermediários

-8-12 nm

Microtúbulo

- 25 nm

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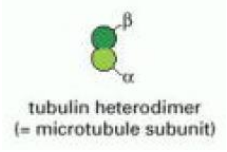
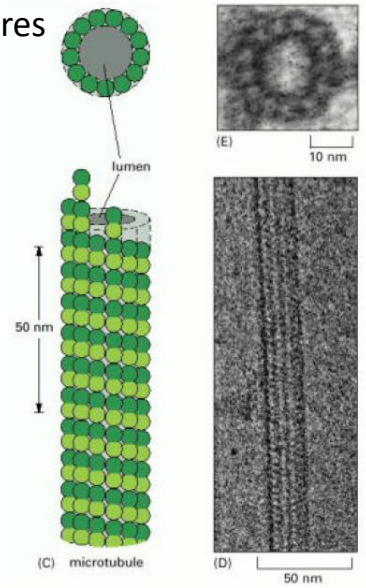
Microtúbulos

- Formado por proteínas globulares

Tubulinas: (α e β –tubulina)

- Estrutura dinâmica e polares





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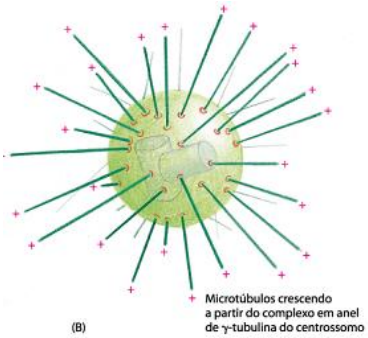
Dinamismo dos Microtúbulos

❖ Extremidade “**+**” cresce rapidamente

❖ Extremidade “ **-** ” , estabilizada nos centrossomos

❖ Emanam do **Centrossomo** em animais



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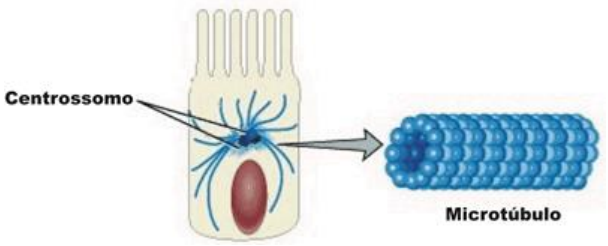

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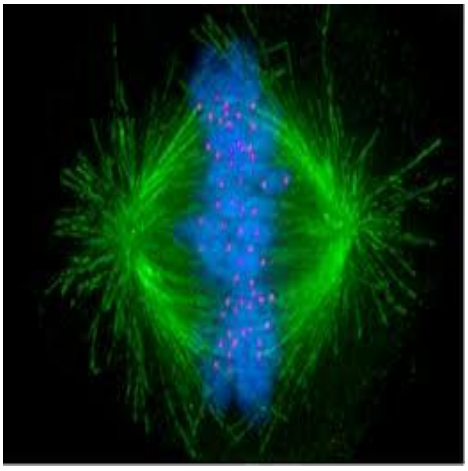

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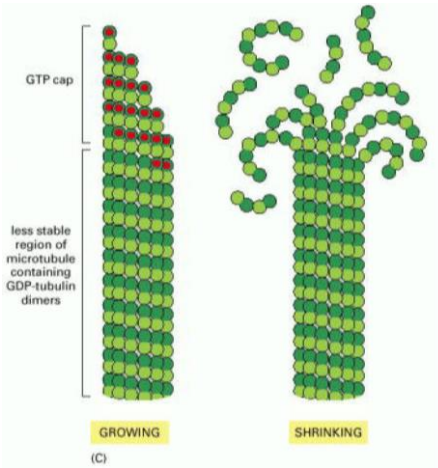
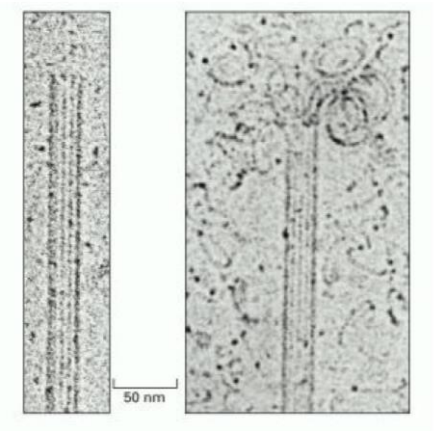
Dinamismo dos Microtúbulos

❖ Instabilidade dinâmica.

❖Extremidade " +" perder subunidades





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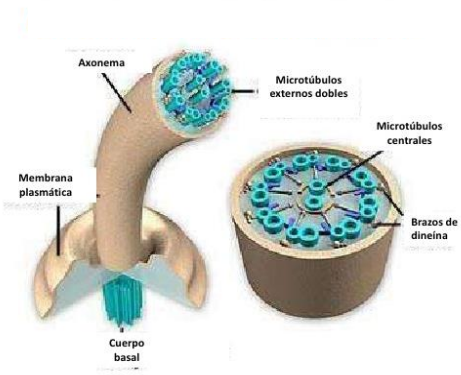
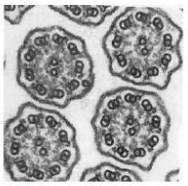
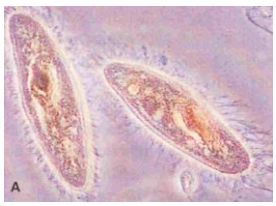
Exemplos de ação dos Microtúbulos: Cílios e Flagelos em Eucarioto

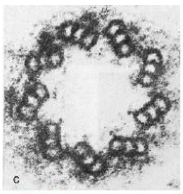
❖ Arranjos dos Microtúbulos







Cilio: 2 microtúbulos.



Centriolo: 3 microtúbulos.

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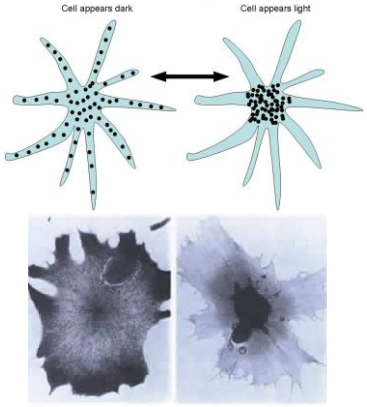
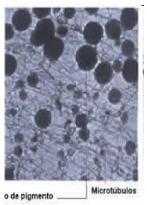
Exemplos de ação dos Microtúbulos Alteração da Pigmentação em animais

❖ Grânulos com pigmentos associados aos microtúbulos





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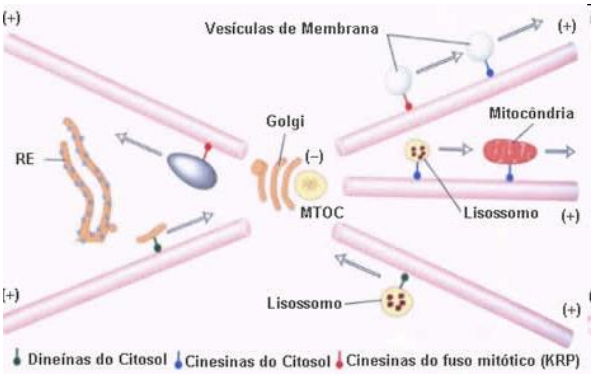
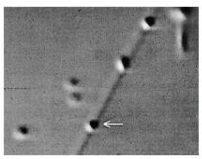
Movimento pelo Microtúbulos





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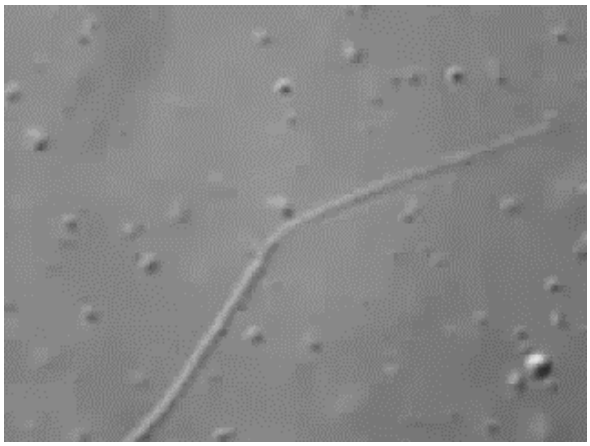

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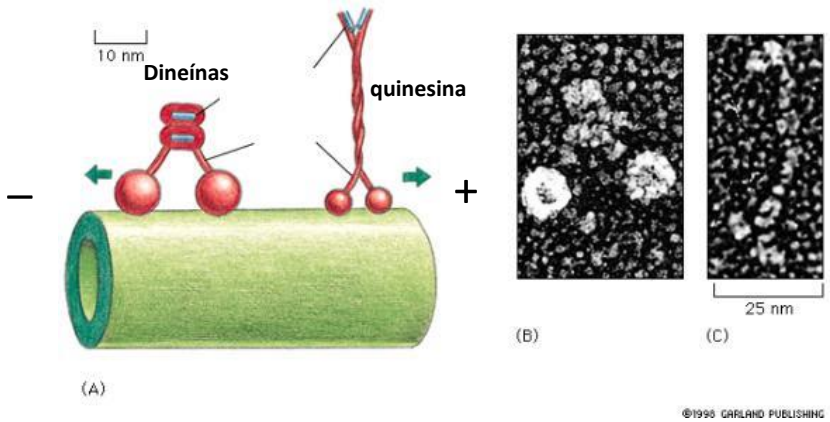
Proteínas motoras

- ❖Dineínas e quinesínas
- ❖ Movem-se em direções opostas nos microtúbulos
- ❖ Carregam organelas e vesículas



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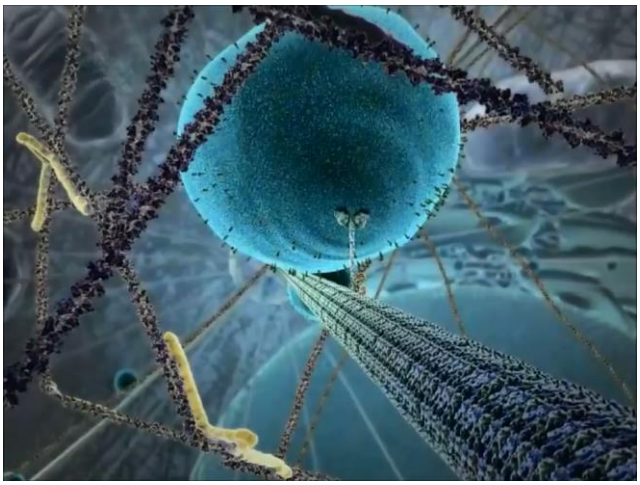

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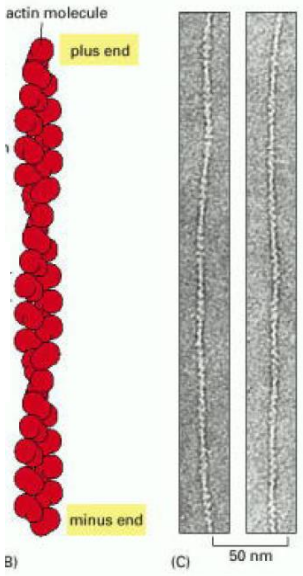
Filamentos de Actina ou Microfilamento

❖ Formado por proteínas globulares Actina ou Actina G

❖ Filamentos Polares: Extremidade "+" e "-"

❖ Responsáveis pela forma e mobilidade celular



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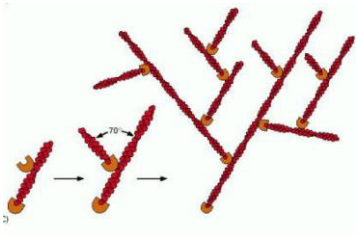
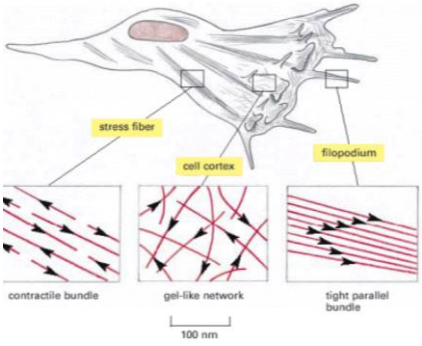
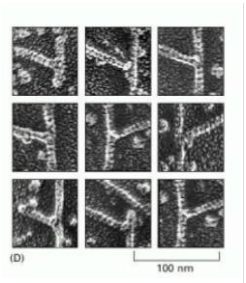
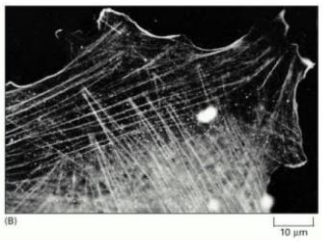
Filamentos de Actina

❖ Forman redes e feixes









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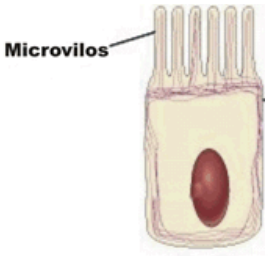
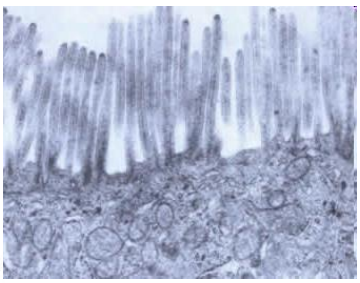
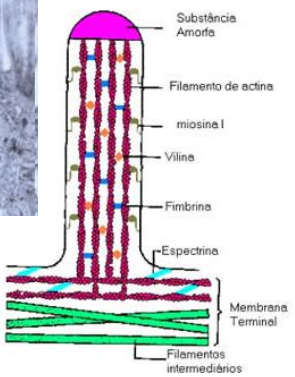
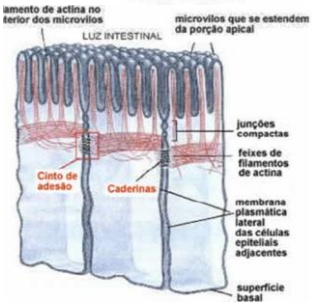
Filamentos de Actina: Funções

❖ Papel nas microvilosidades









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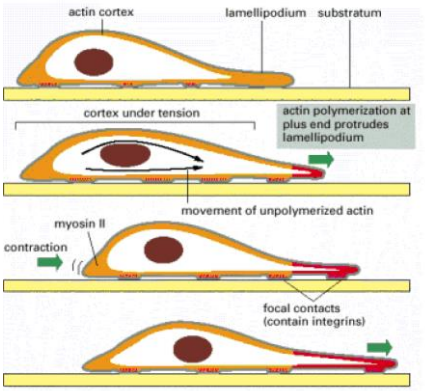
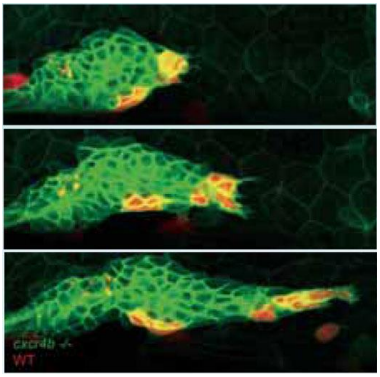
Filamentos de Actina: Funções

❖ Migrações de células: Polimerização dos filamentos de actina





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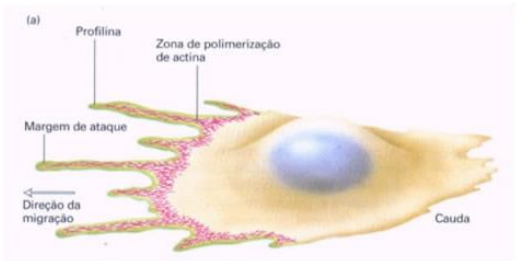
Filamentos de Actina: Funções

❖ Forma da célula: Exemplo processo de coagulação sanguínea



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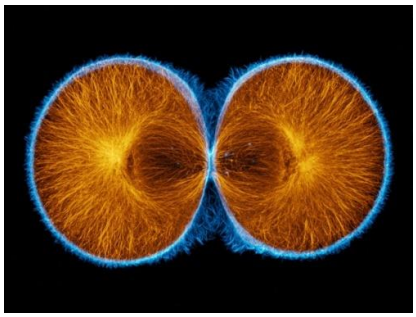
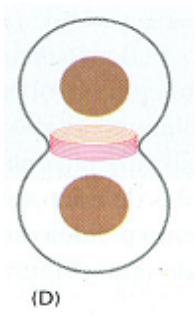
Filamentos de Actina: Funções

❖ Também participa do processo de divisão celular em células animais

❖ Anel contrátil





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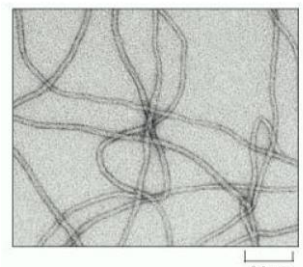
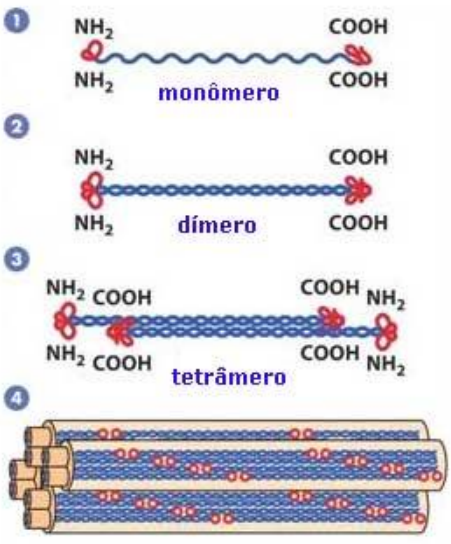
Filamentos Intermediários

❖ Somente em células animais!

✓Proteínas fibrosas de cadeia longa. Ex. Queratina

✓Estável





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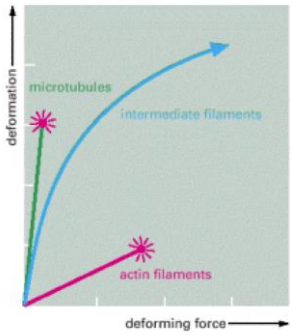
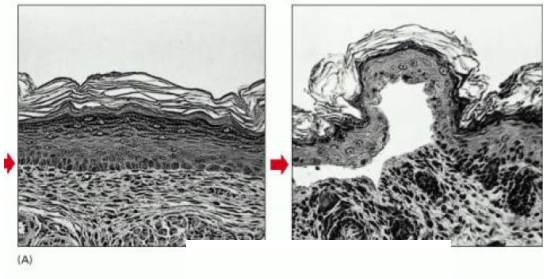
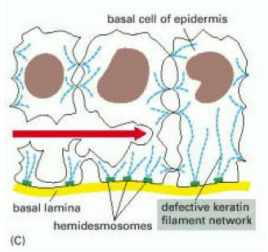
Filamentos Intermediários: Funções

- Relacionado a sustentação e não ao movimento







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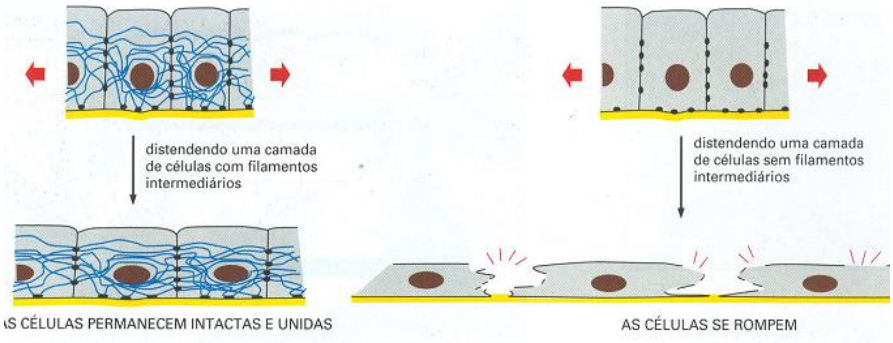
Filamentos Intermediários: Funções

- Formação de camada de células



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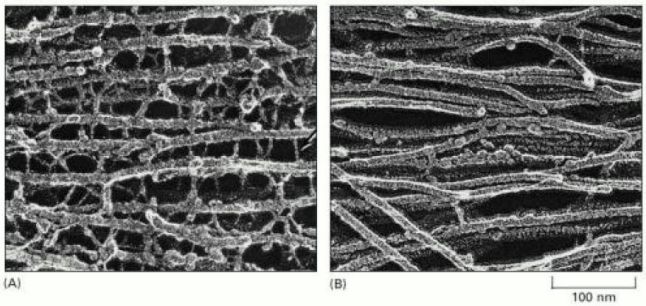
Filamentos Intermediários

❖ Diferentes tipos de filamentos intermediários



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Citoesqueleto

	Filamentos Intermediários	Microtúbulos/Microfilamentos
Constituição protéica	Família de proteínas	Tubulinas e actina
Tipos de sub-unidades	Filamentosa	Globulares
Dinâmica de pol/despol	Inexistente (estáveis)	Existente (instáveis)
Função geral	Apenas sustentação	Movimentação e sustentação
Nucleotídios fosfatados	Ausentes	Presentes (GTP e ATP)
Polaridade	Inexistente	Extremidades "+" e "-"
Adição de sub-unidades	Pelas extremidades e laterais	Apenas pelas extremidades
Resistência x Flexibilidade	Alta resistência e flexibilidade	Baixa resistência e alta flexibilidade

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