

## ESTRUTURA CELULAR



Prof. José Roberto Cardoso Meireles

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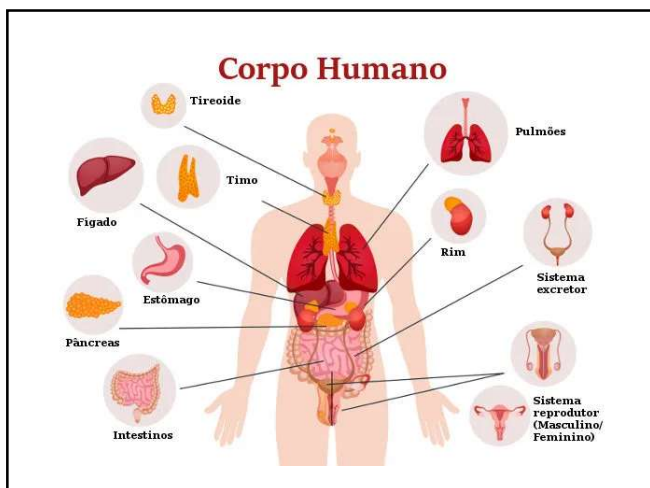
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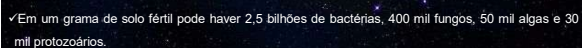
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✓ São os organismos mais numerosos do planeta, ocupando uma grande variedade de habitats



Procariontes

✓ Utilizam as mais diversas fontes de energia

NUTRIÇÃO	FONTE DE ENERGIA	FONTE DE CARBONO	EXEMPLOS
Foto autotrófica	Luz	Gás carbônico	Bactérias fotossintetizantes
Foto heterotrófica	Luz	Compostos orgânicos ambientais	Bactérias não sulfurosas púrpuras e não sulfurosas verdes
Químio autotróficas	Reações de compostos inorgânicos ou orgânicos	Gás carbônico	Bactérias do enxofre, do ferro, do hidrogênio e nitrificantes
Químio heterotrófica	Reações de compostos inorgânicos ou orgânicos	Compostos orgânicos ambientais	Maioria das espécies de bactérias

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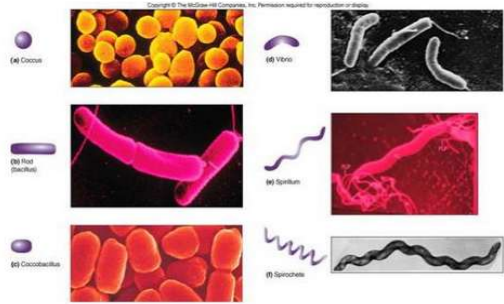
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Procariontes

✓ A maioria são unicelulares, anatomicamente variadas e podem viver isoladas ou em colônias



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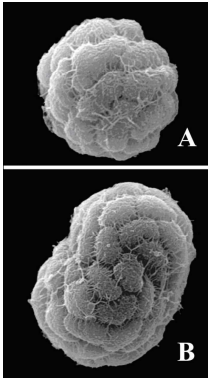
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Procariontes

✓ Multicelulares

- Forma de uma esfera oca composta por várias células (entre 10 e 40) organizadas em espiral;
- As células são cobertas de flagelos que movimentam sincronicamente;
- Diferente de outras bactérias multicelulares a *Magnetoglobus multicellularis* não tem uma etapa unicelular no seu ciclo de vida.



Magnetoglobus multicellularis

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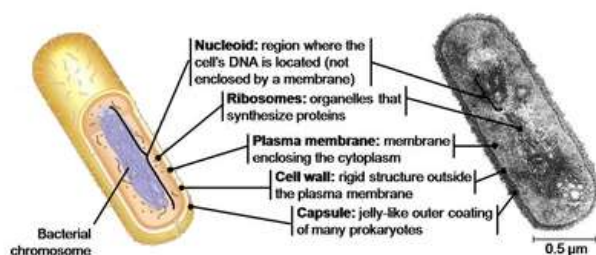
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## Procariontes

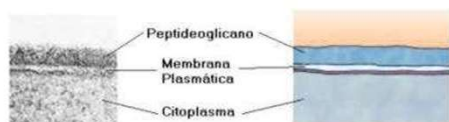
- ✓ Reprodução por fissão binária (assexuada), mas são capazes de trocar informação genética



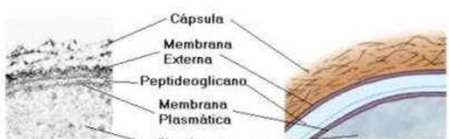
## Estrutura da célula procariótica



## Estrutura da célula procariótica



Parede de bactérias gram-positivas

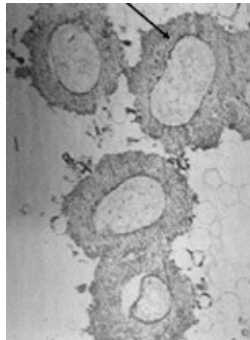
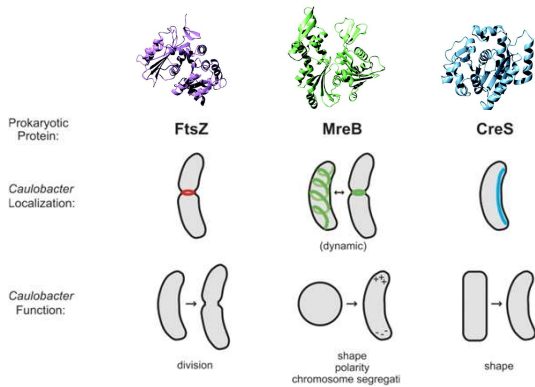


Parede de bactérias gram-negativas

**Procariontes: Bactérias**

## ✓ Cápsula externa

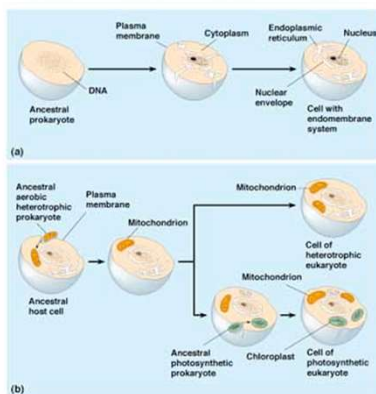
- Camada viscosa de natureza polissacarídea ou polipeptídicas;
- Confere proteção contra as condições externas desfavoráveis;
- Relacionada com a virulência pois confere resistência à fagocitose

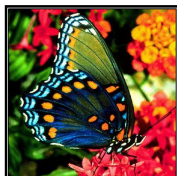
**Citoesqueleto bacteriano****Células eucarióticas**

## ❖ Perda da parede celular

## ❖ Invaginações da membrana

## ❖ Endossimbiose



**Eucariontes**


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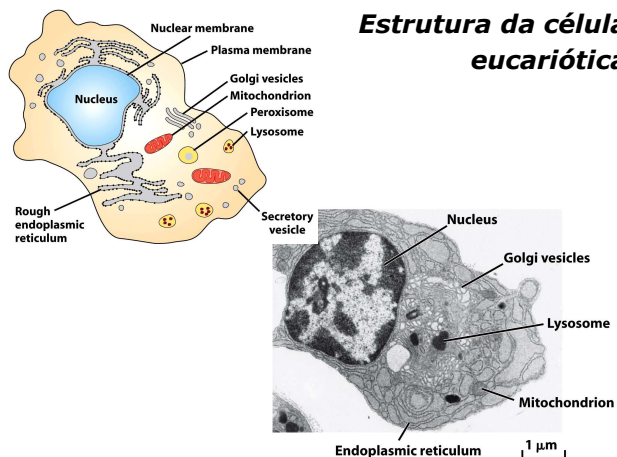
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**Estrutura da célula eucariótica**


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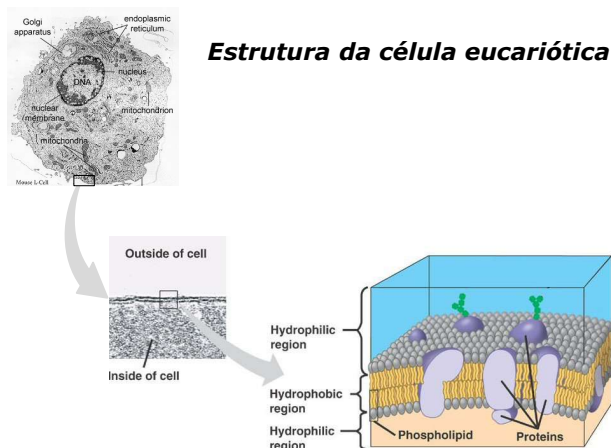
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**Estrutura da célula eucariótica**


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### Estrutura da célula eucariótica

✓ **Organelas que processam informação**

✓ **Organelas que processam energia**

✓ **Sistema de endomembranas**

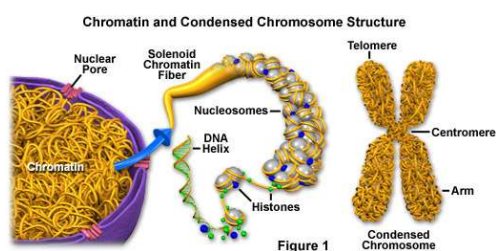
✓ **Centríolos**

✓ **Citoesqueleto**

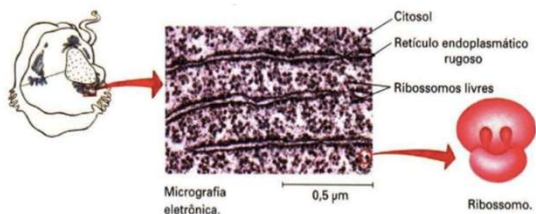
✓ **Matriz extracelular**

### Organelas que processam informação

- Armazena a informação genética, na forma de DNA.
- Formado basicamente de Cromatina (DNA, RNA e Proteína)



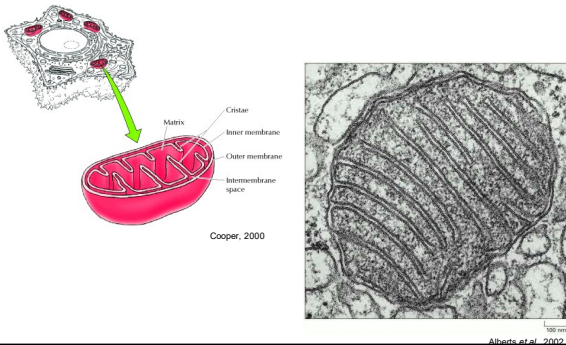
### Organelas que processam informação



- São as principais organelas da síntese de proteínas;
- São organelas não envolvidas por membrana, formadas por RNA (RNAr) e proteínas que ocorrem em todos os tipos celulares;
- Podem ser encontrados livres no citoplasma ou associados ao RER.

### Organelas que processam energia

- Contém DNA e ribossomos: Síntese de proteínas




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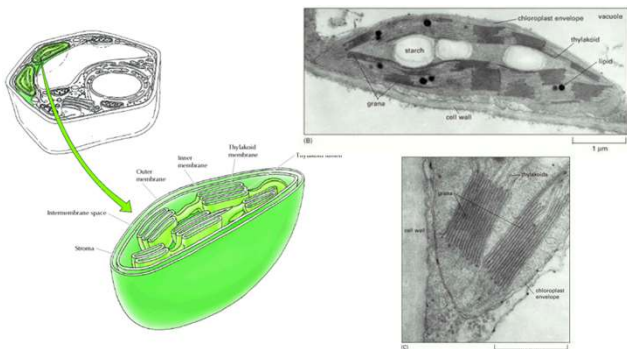
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### Organelas que processam energia

- Contém DNA e ribossomos: Síntese de proteínas




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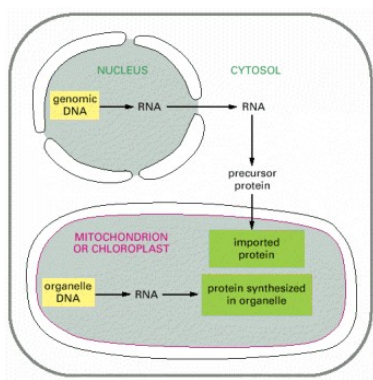
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### Genomas eucarióticos



Alberts et al., 2002

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### *Sistema de endomembranas*

➤ Uma série de membranas inter-relacionadas, formando compartimentos especializados

✓ Retículo endoplasmático (Liso e Rugoso)

✓ Complexo de Golgi

✓ Lisossomos

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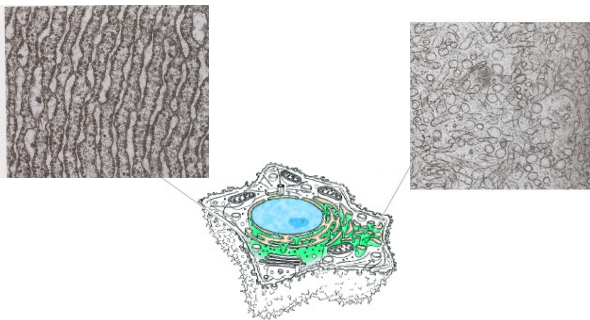
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### *Sistema de endomembranas*



Cooper, 2000

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Retículo endoplasmático rugoso (RER): Síntese proteica

(A) Rough endoplasmic reticulum



Cooper, 2000

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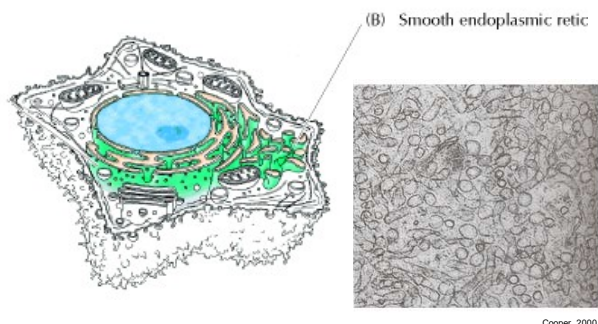
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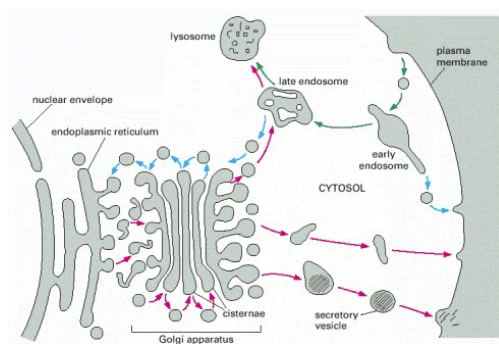
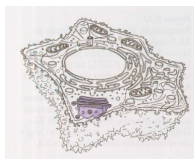
### Retículo endoplasmático liso (REL) Síntese lipídica



Cooper, 2000

### Sistema de endomembranas

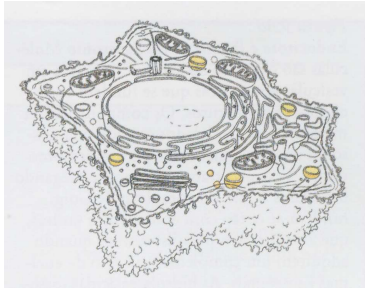
Modificações pós traducionais e endereçamento de proteínas



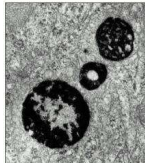
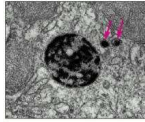
Alberts et al., 2002

### Sistema de endomembranas

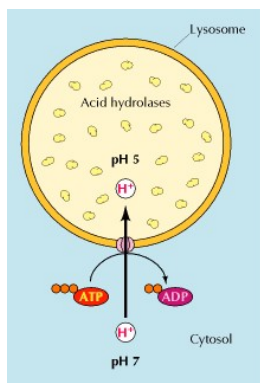
Digestão intracelular de lipídios, proteínas, carboidratos, etc.



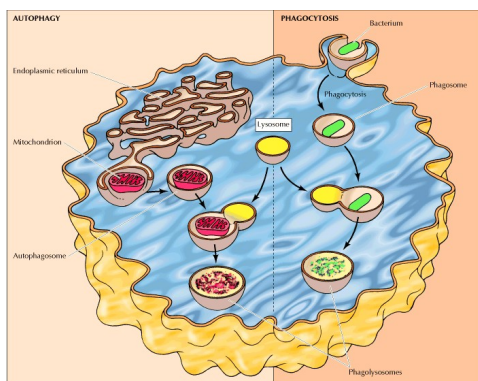
Cooper, 2000



Alberts et al., 2002



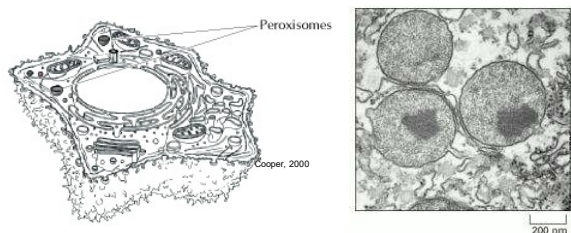
Cooper, 2000



Cooper, 2000

### Sistema de endomembranas

Detoxificação dos radicais livres produzidos pelo metabolismo celular

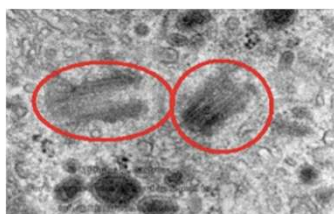
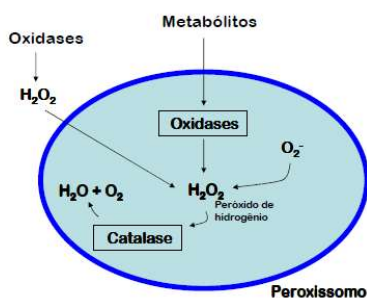


- organela esférica (0,5 a 1  $\mu\text{m}$  de diâmetro) contendo enzimas que oxidam substratos em presença de  $\text{O}_2$  produzindo  $\text{H}_2\text{O}_2$  que é degradado pela catalase

- A neutralização de  $\text{H}_2\text{O}_2$  é uma das funções dos peroxissomos mais conservadas na escala filogenética

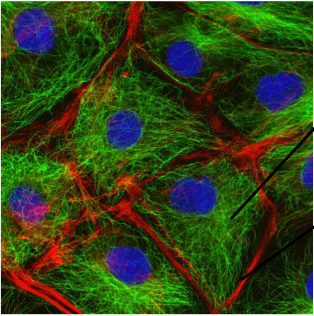
#### Neutralização de $\text{H}_2\text{O}_2$

- formada pela oxidação de substratos no peroxissomo;
- formada em outras organelas celulares;



- São organelas não envolvidas por membrana que ocorrem aos pares em células animais e em anterozóides das criptógamas (briófitas e pteridófitas);
- Envolvidos na formação das fibras do fuso durante a divisão celular e na origem dos cílios e flagelos.

*Citoesqueleto*



Microtúbulos

Filamentos de actina

✓ Forma e Sustentação

✓ Transporte intra-celular

✓ Movimento

✓ Processos de divisão celular

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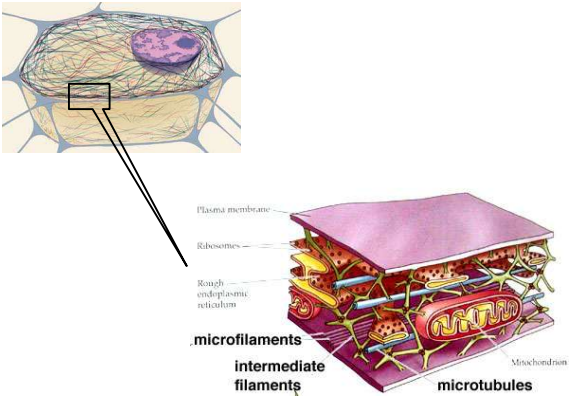
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Plasma membrane

Ribosomes

Rough endoplasmic reticulum

microfilaments

intermediate filaments

microtubules

Mitochondrion

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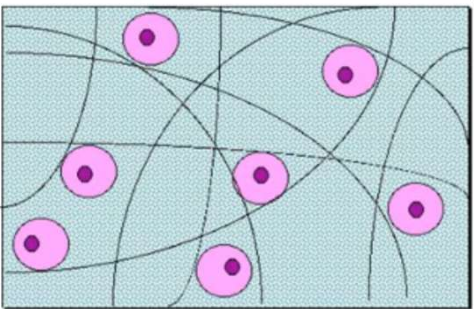
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*Matriz extracelular*

Moléculas diversas que constituem o ambiente celular



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### Matriz extracelular

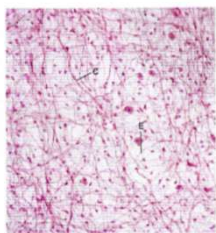
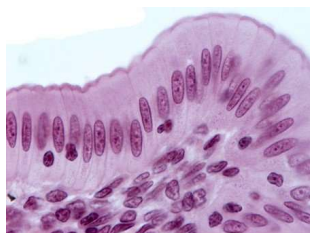
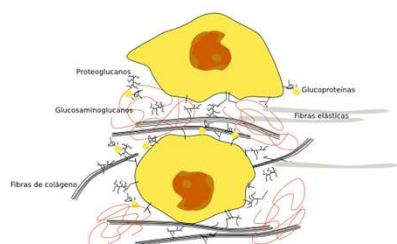


Fig. 6.8 Micrograph (left) of connective tissue (cartilage) showing collagen fibers (C) and elastic fibers (E) and some of the cells (right) of connective tissue (300x).



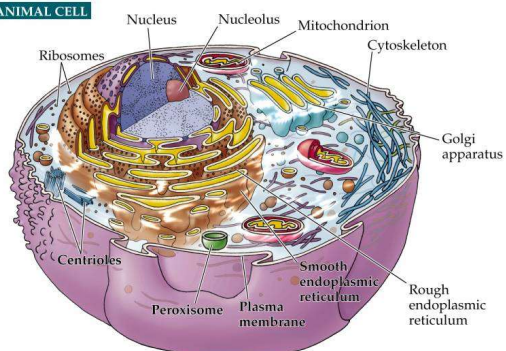
### Matriz extracelular



- ✓ Preenchimento
- ✓ Resistência e Elasticidade
- ✓ Transporte de nutrientes e resíduos celulares
- ✓ Diferenciação celular
- ✓ Sinalização celular

### Célula Animal

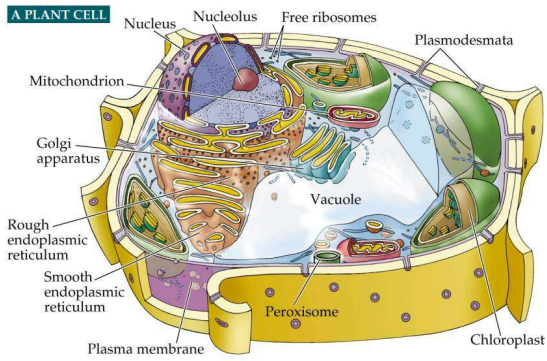
#### AN ANIMAL CELL



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## Célula Vegetal



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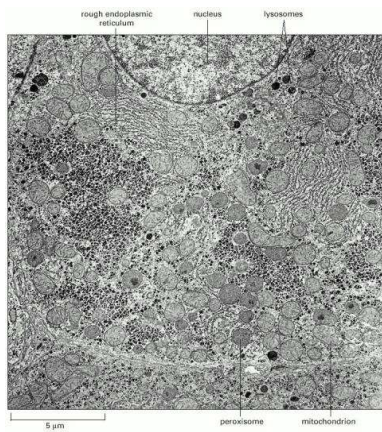
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