Física do Corpo Humano

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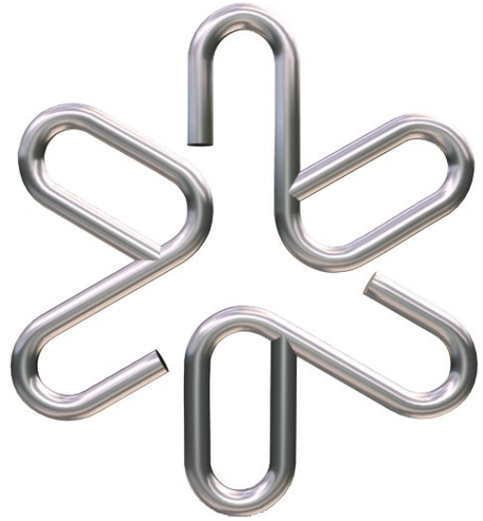
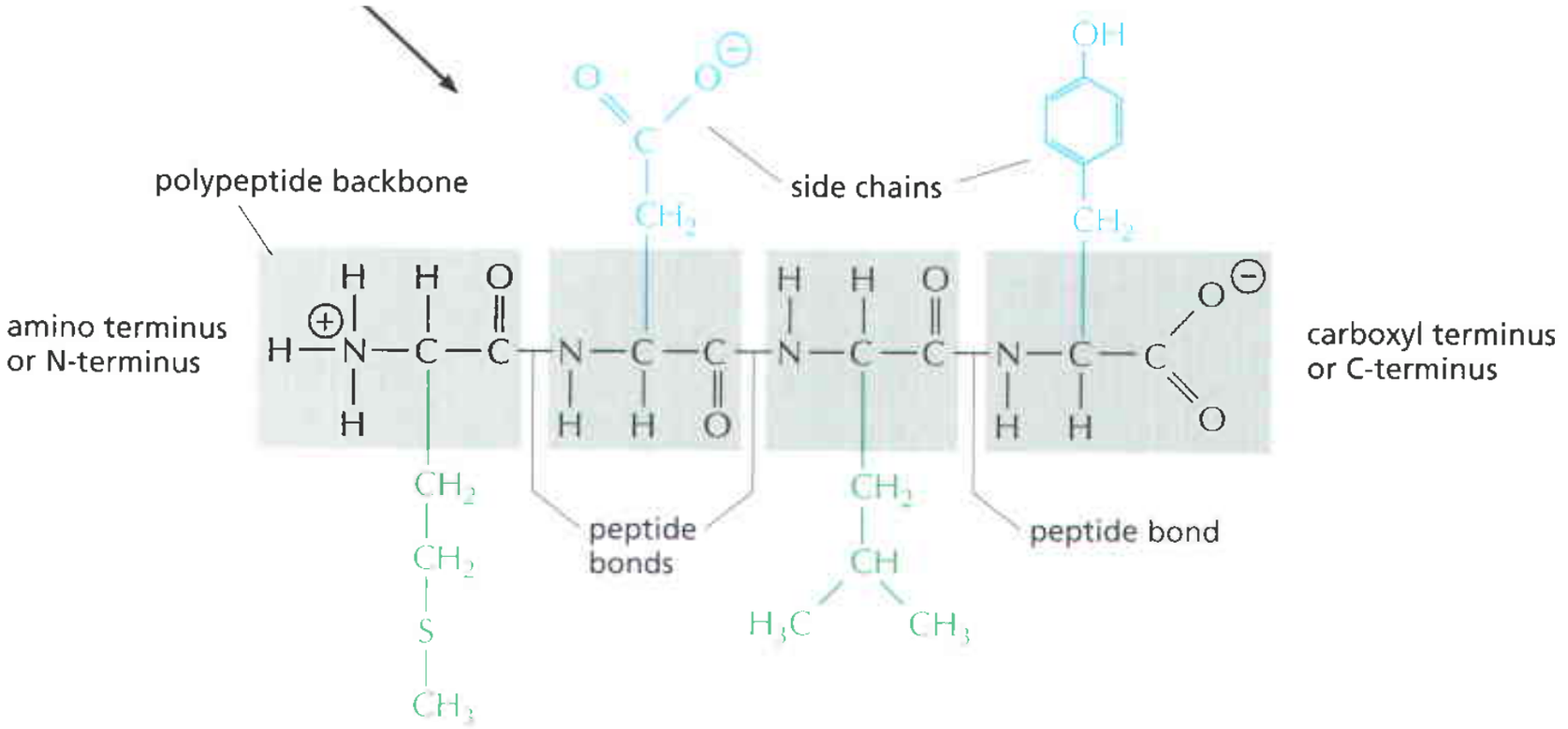
Dep. Física Geral
Instituto de Física da USP



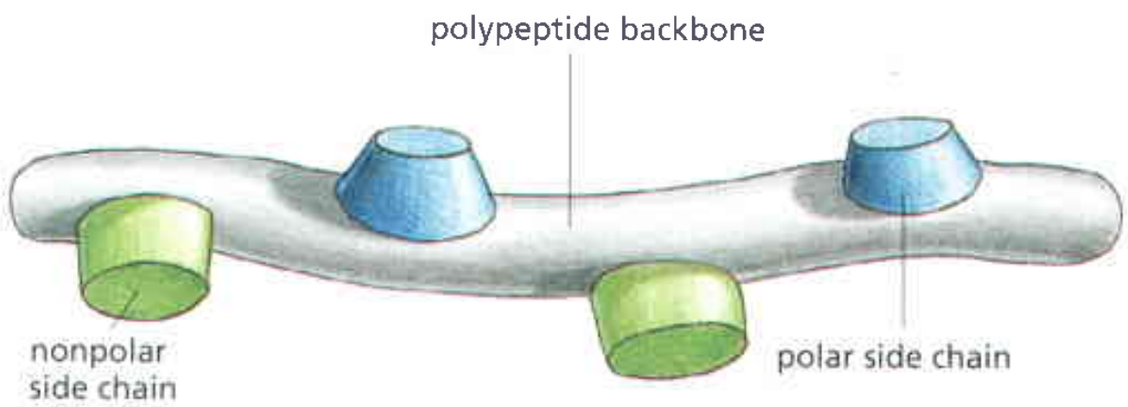
Ribbon, Transporte Ativo, Enzimas e geradores de energia

B02

Diagrama de Ribbon



SCHEMATIC



SEQUENCE

Diagrama de Ribbon

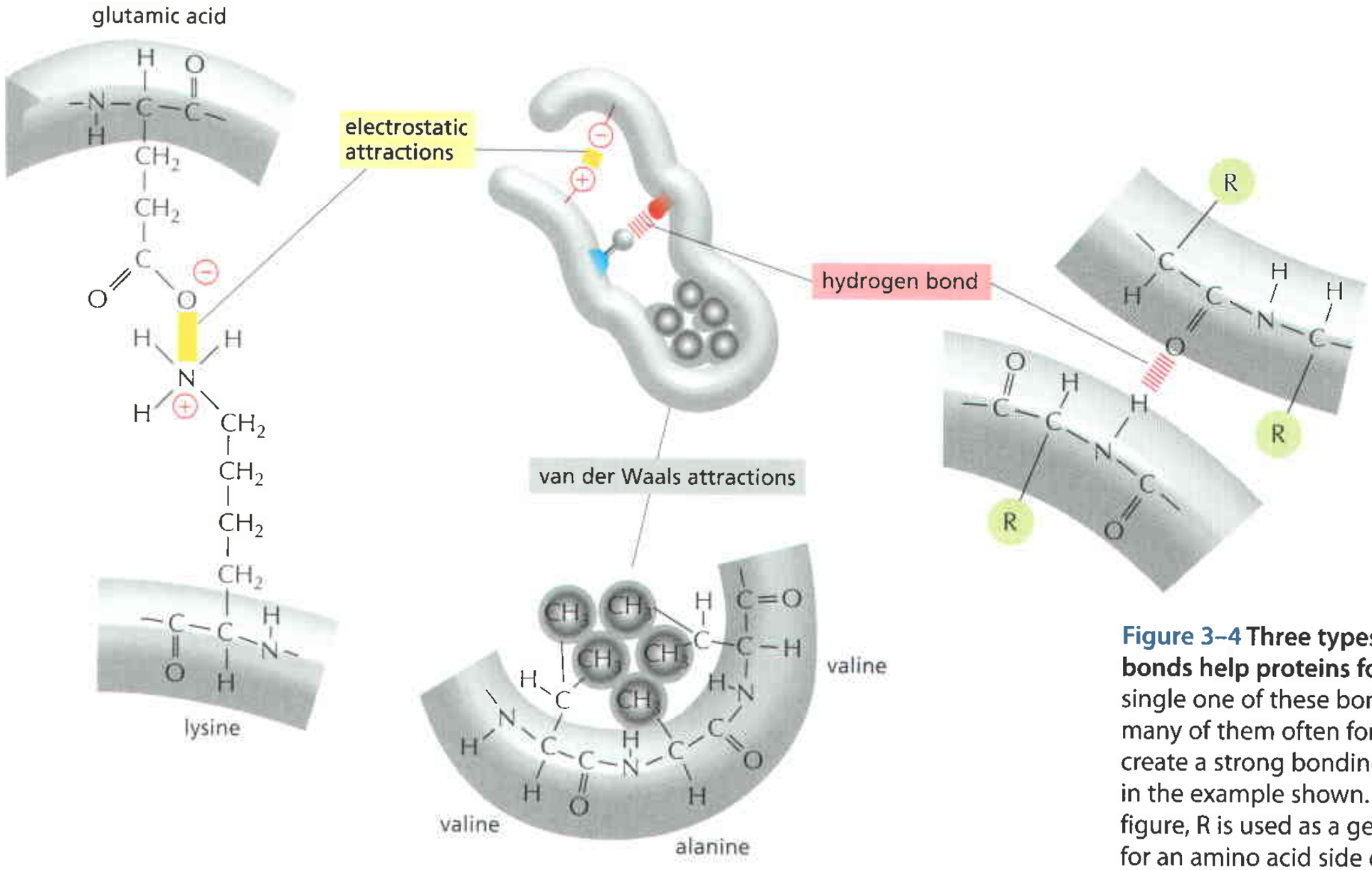
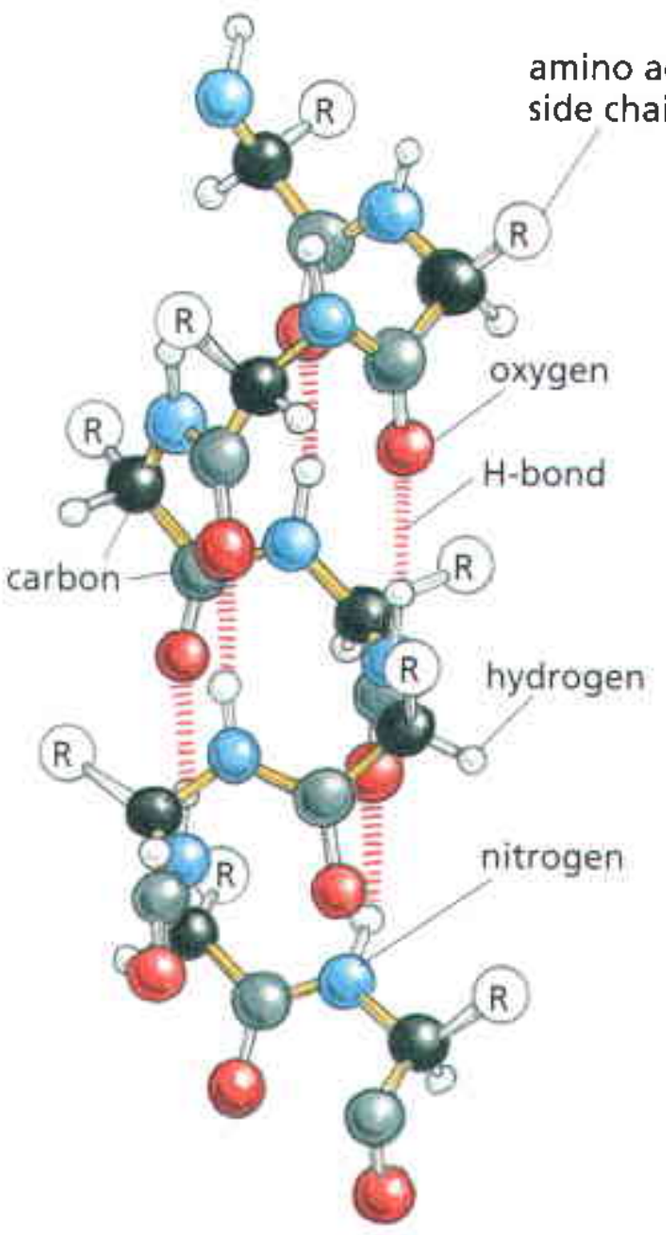
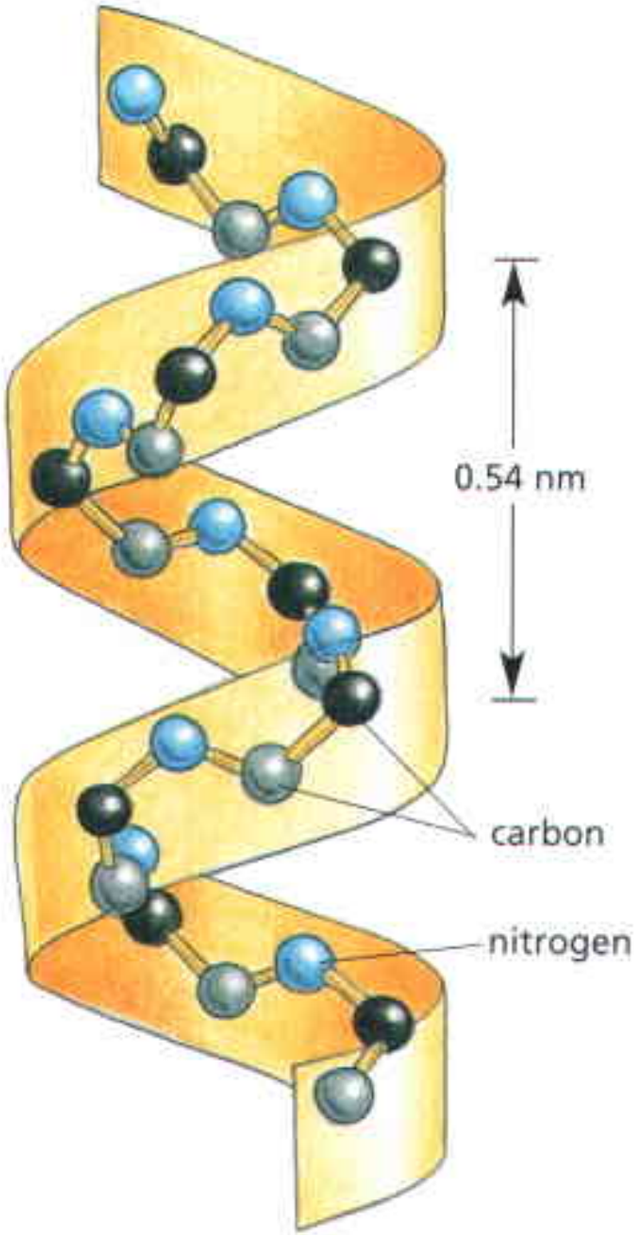


Figure 3–4 Three types of noncovalent bonds help proteins fold. Although a single one of these bonds is quite weak, many of them often form together to create a strong bonding arrangement, as in the example shown. As in the previous figure, R is used as a general designation for an amino acid side chain.

Diagrama de Ribbon





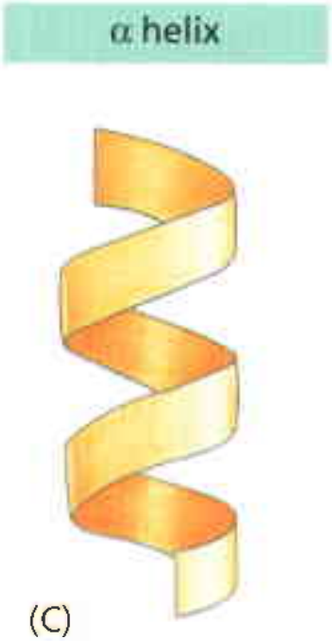


Diagrama de Ribbon

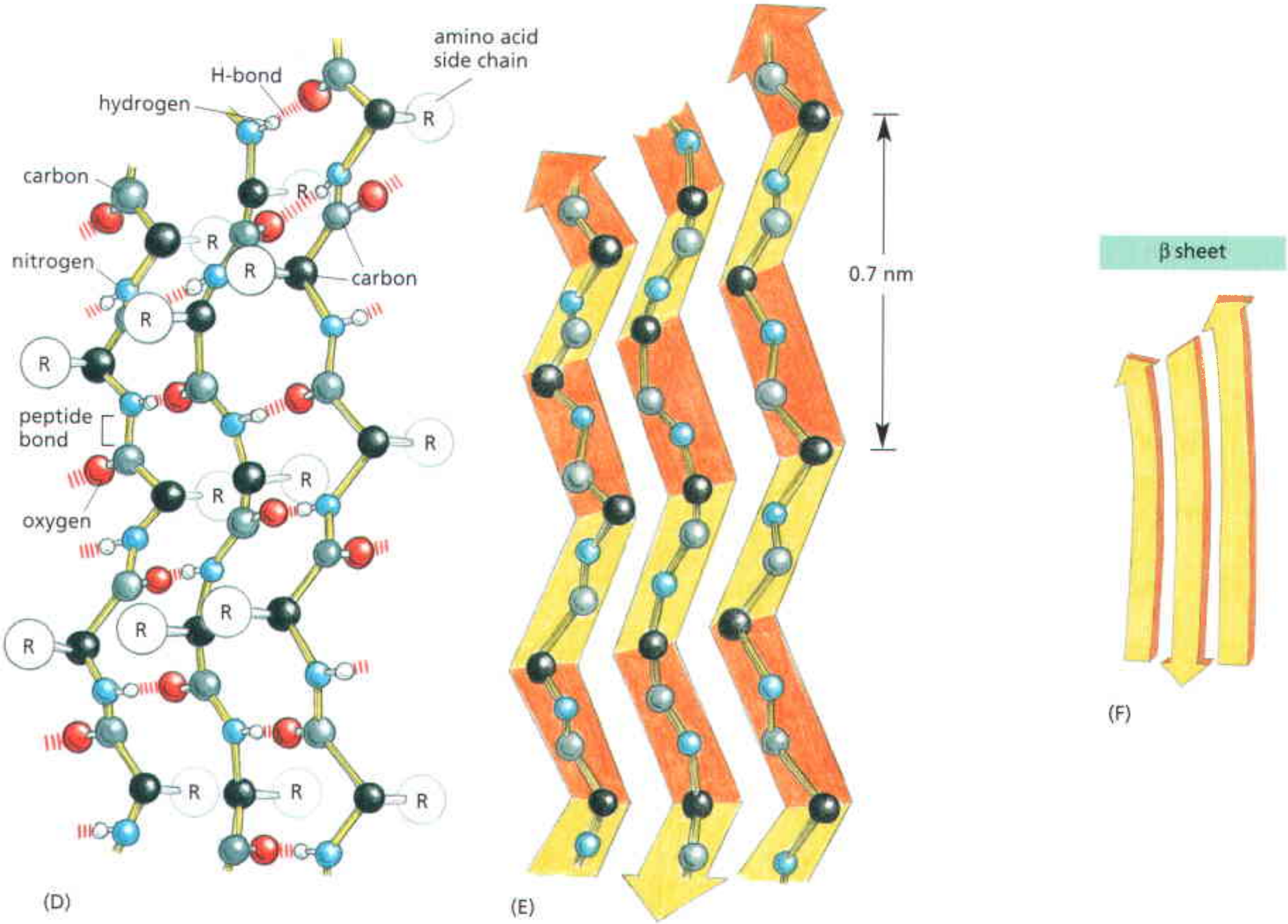
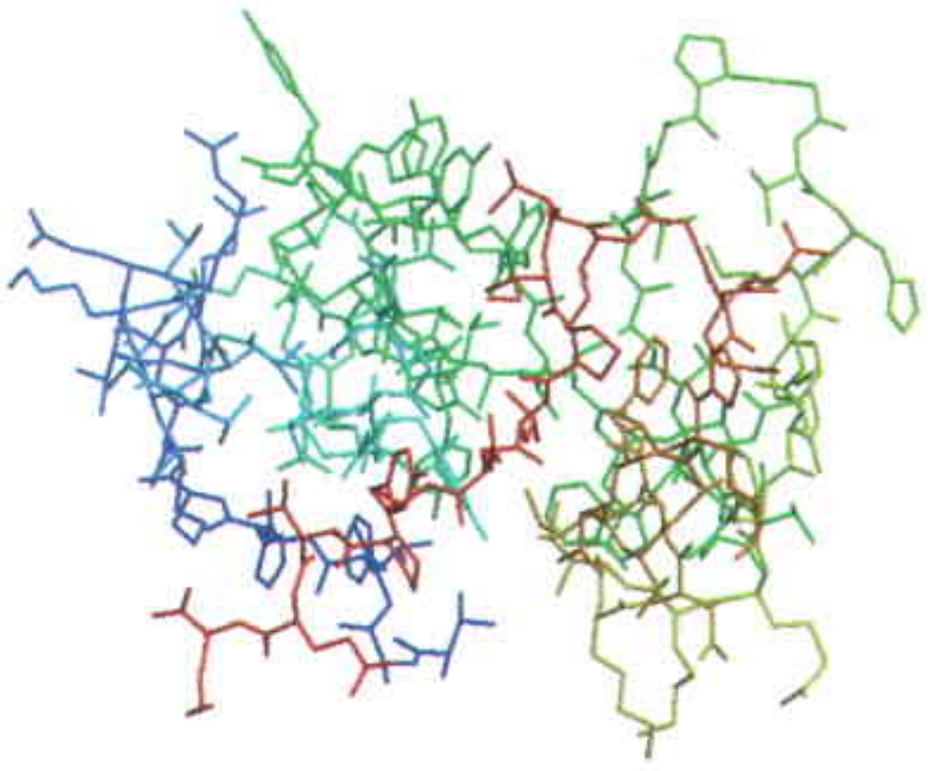


Diagrama de Ribbon



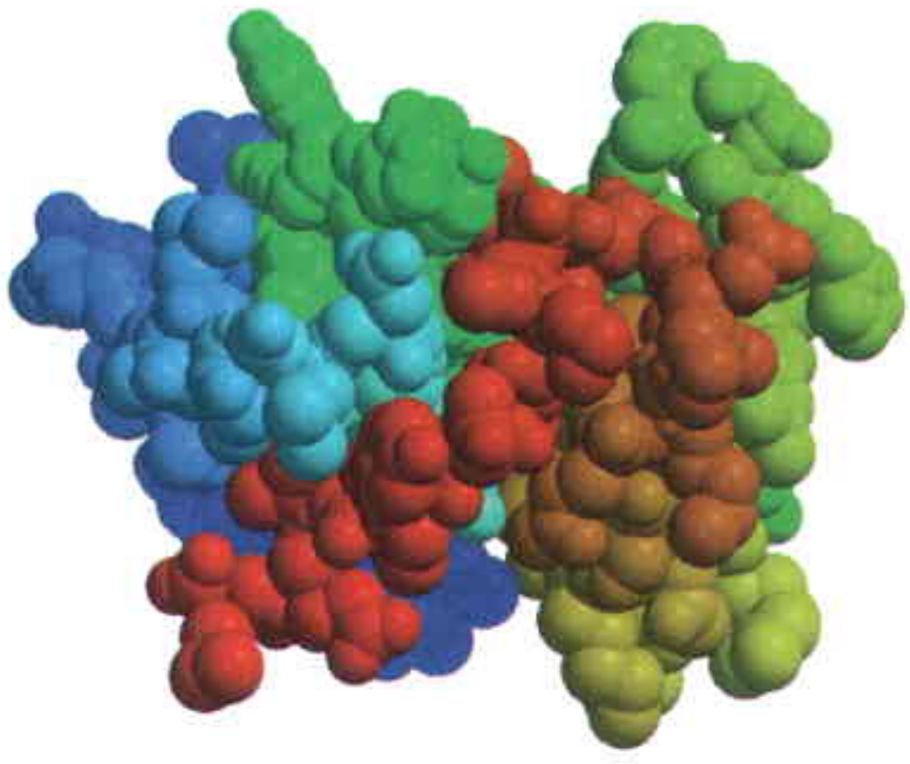


Diagrama de Ribbon

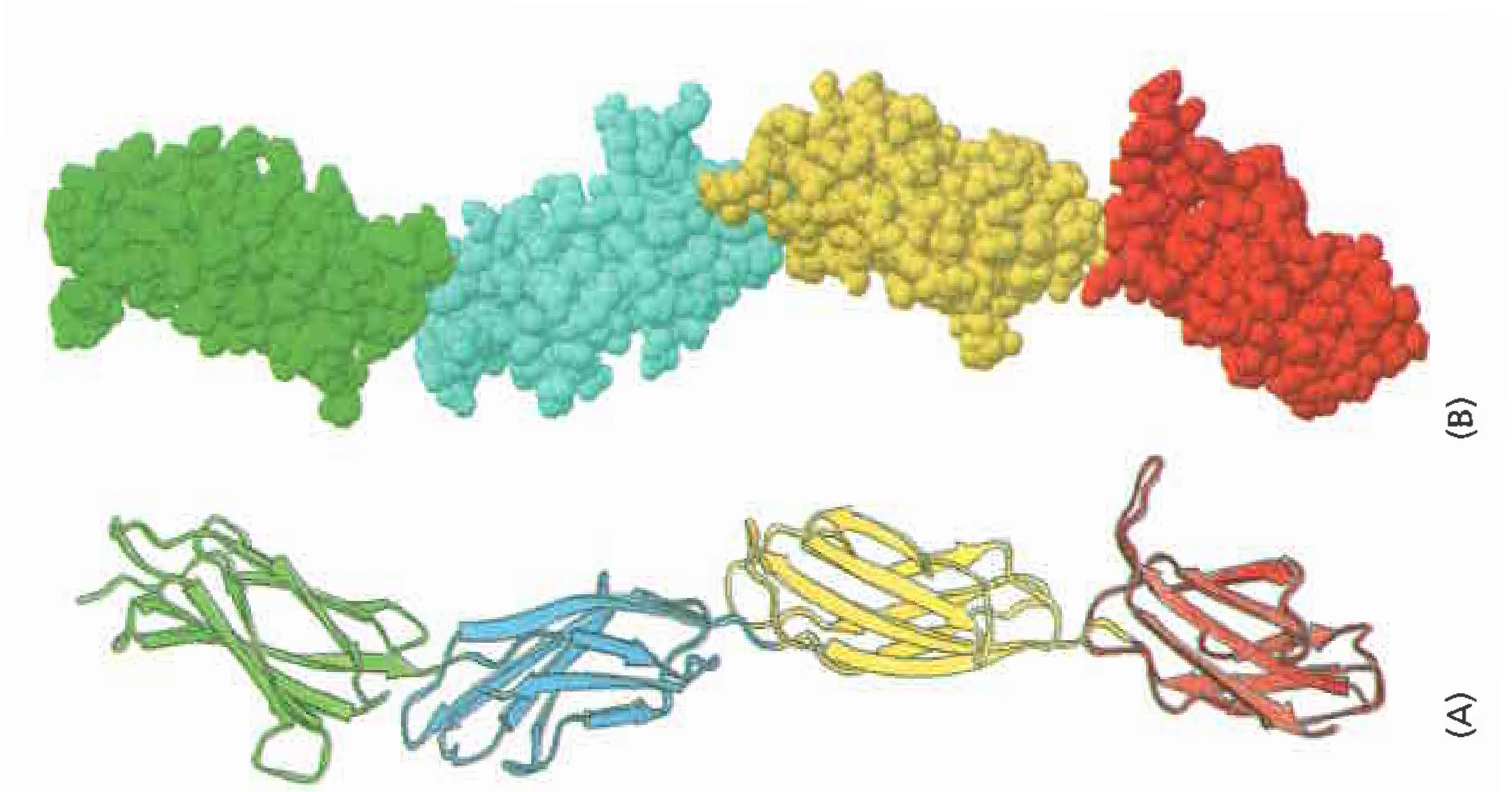
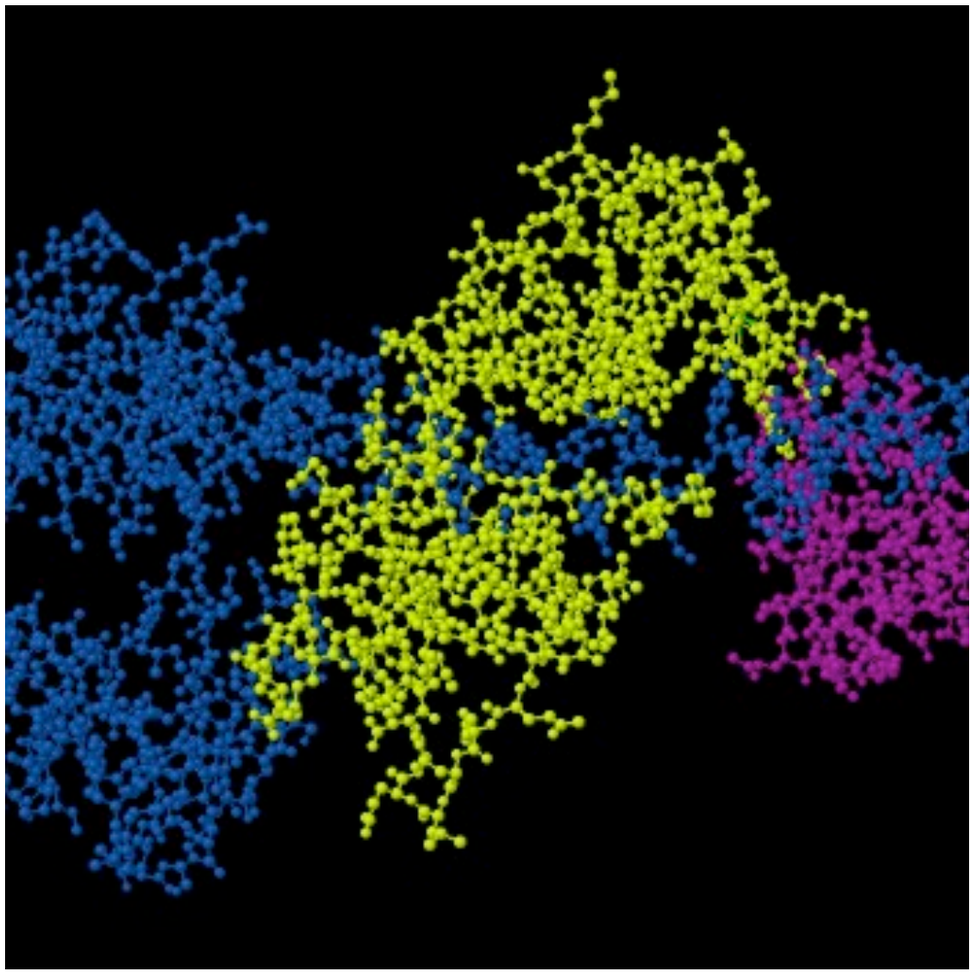


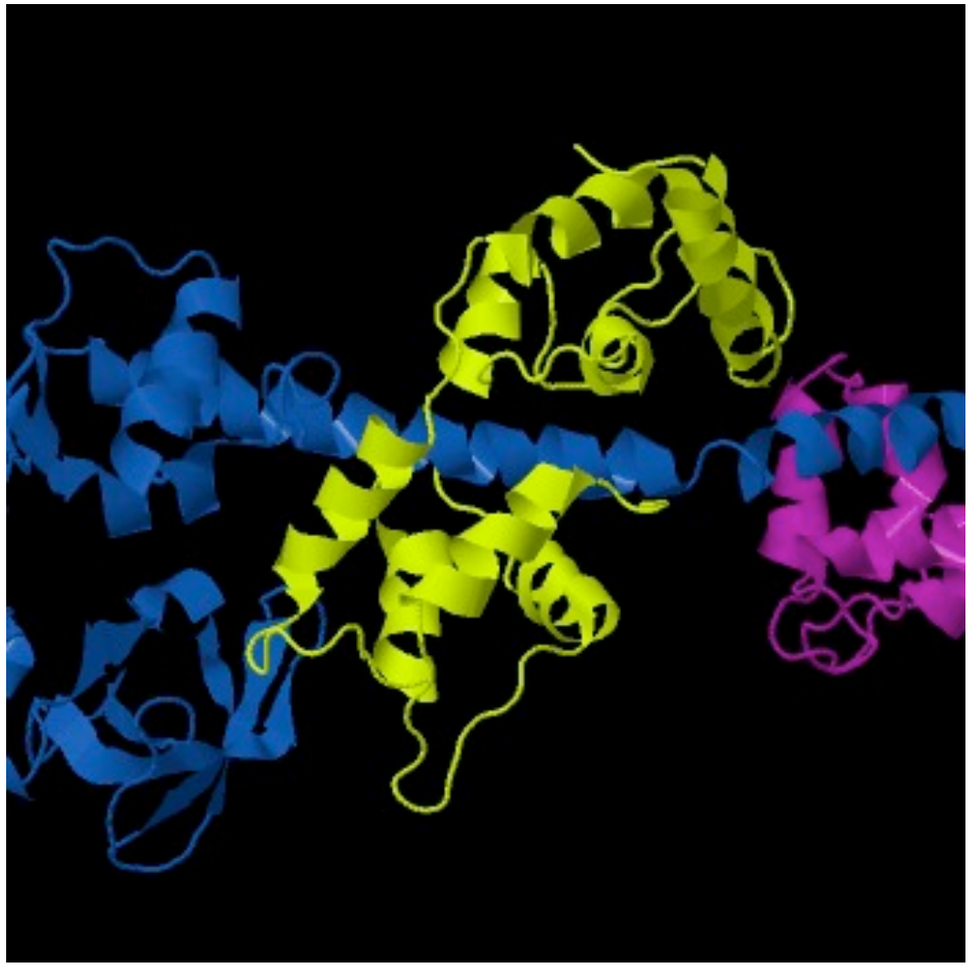
Diagrama de Ribbon

Representação de Proteínas em em 3D

- representação mais comum
- organização do caminho

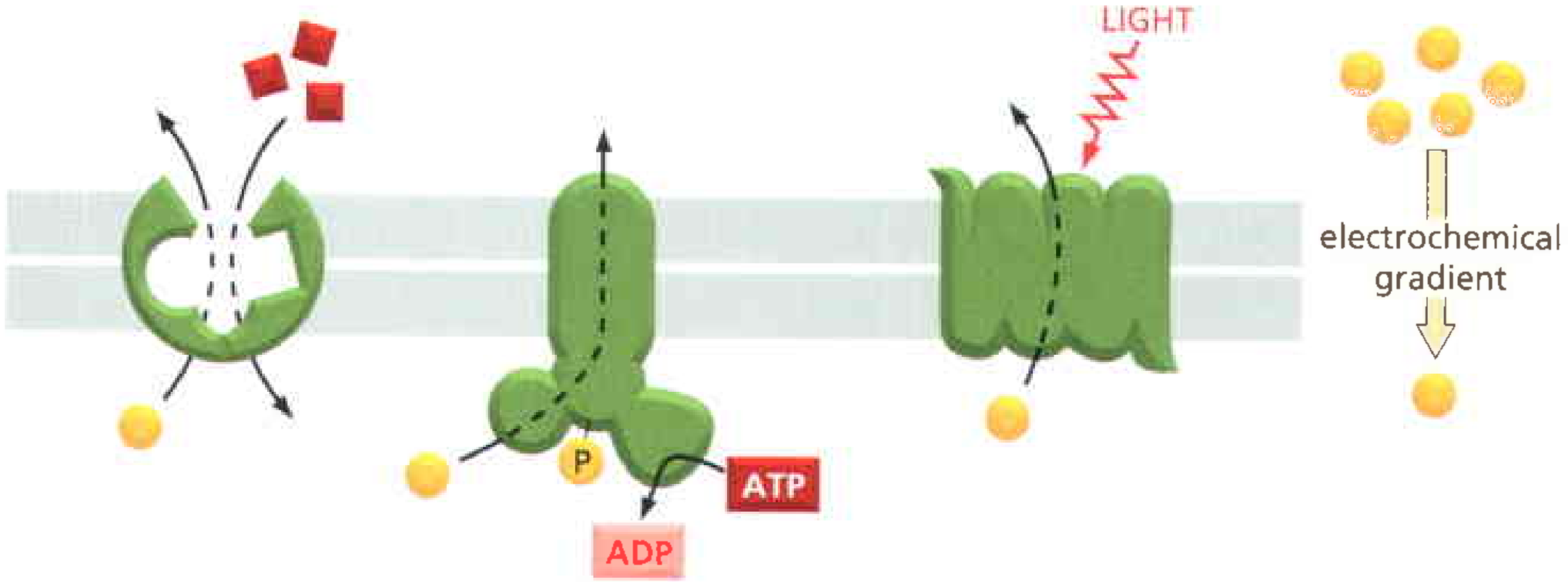
- espinha dorsal da proteína
- α-helices (ribbons mola)
- β-strands (setas)
- metais (esferas)



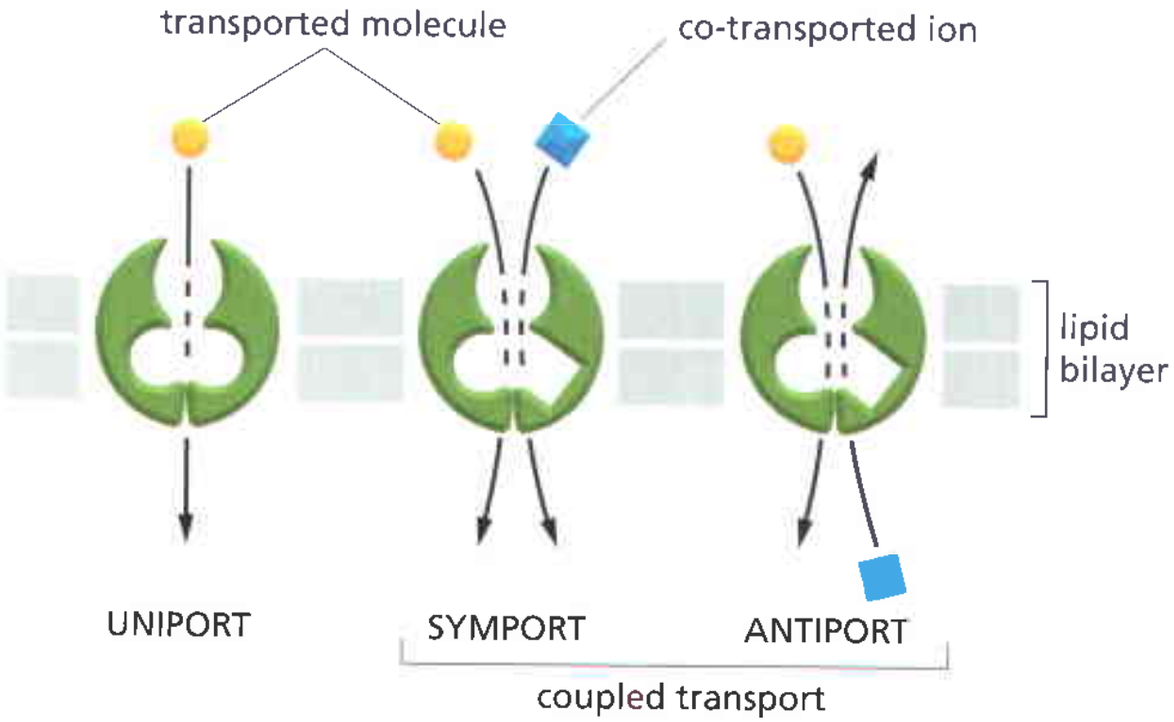


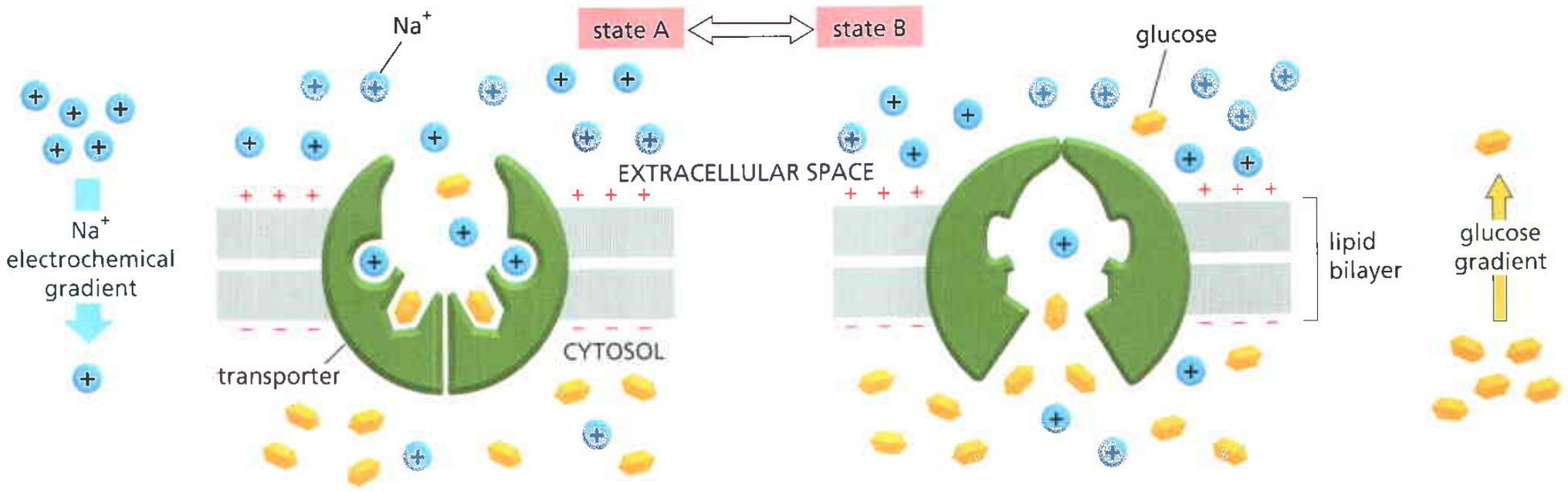
http://www.rcsb.org/pdb/home/home.do

Meios de Transporte



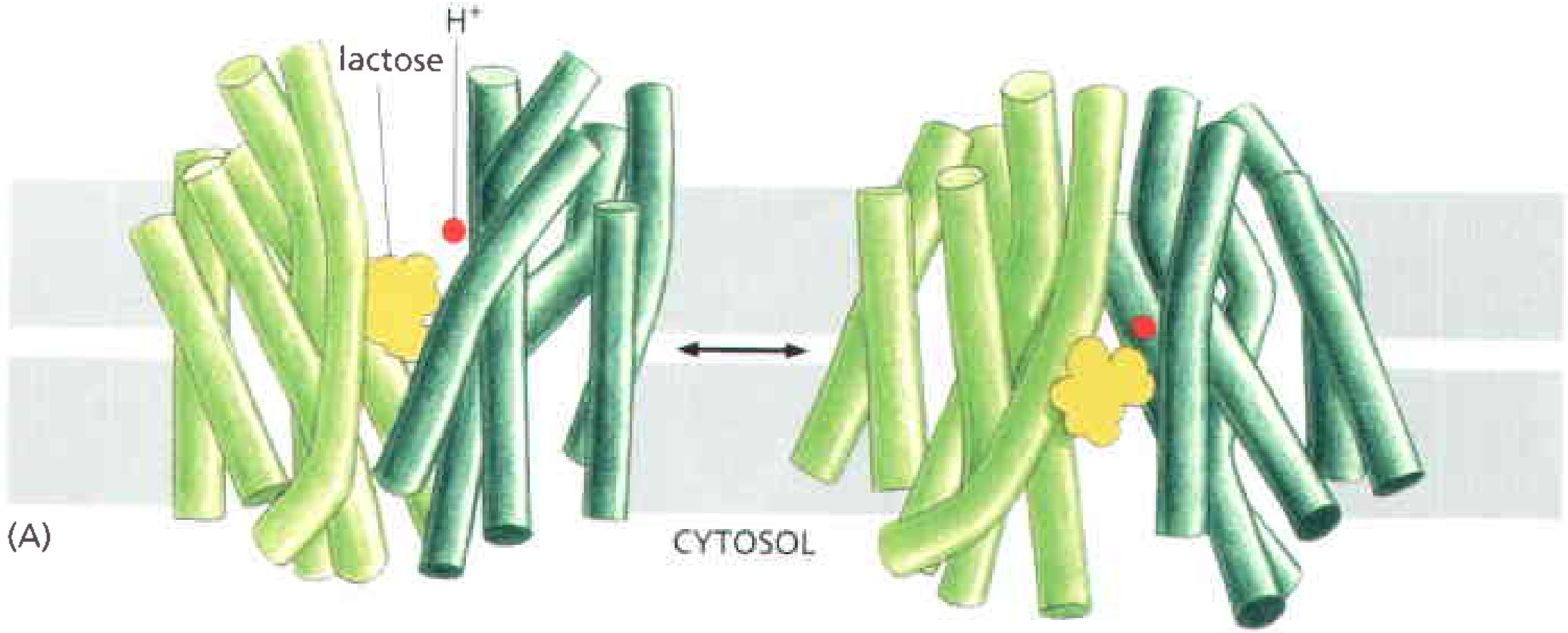
Transporte Ativo





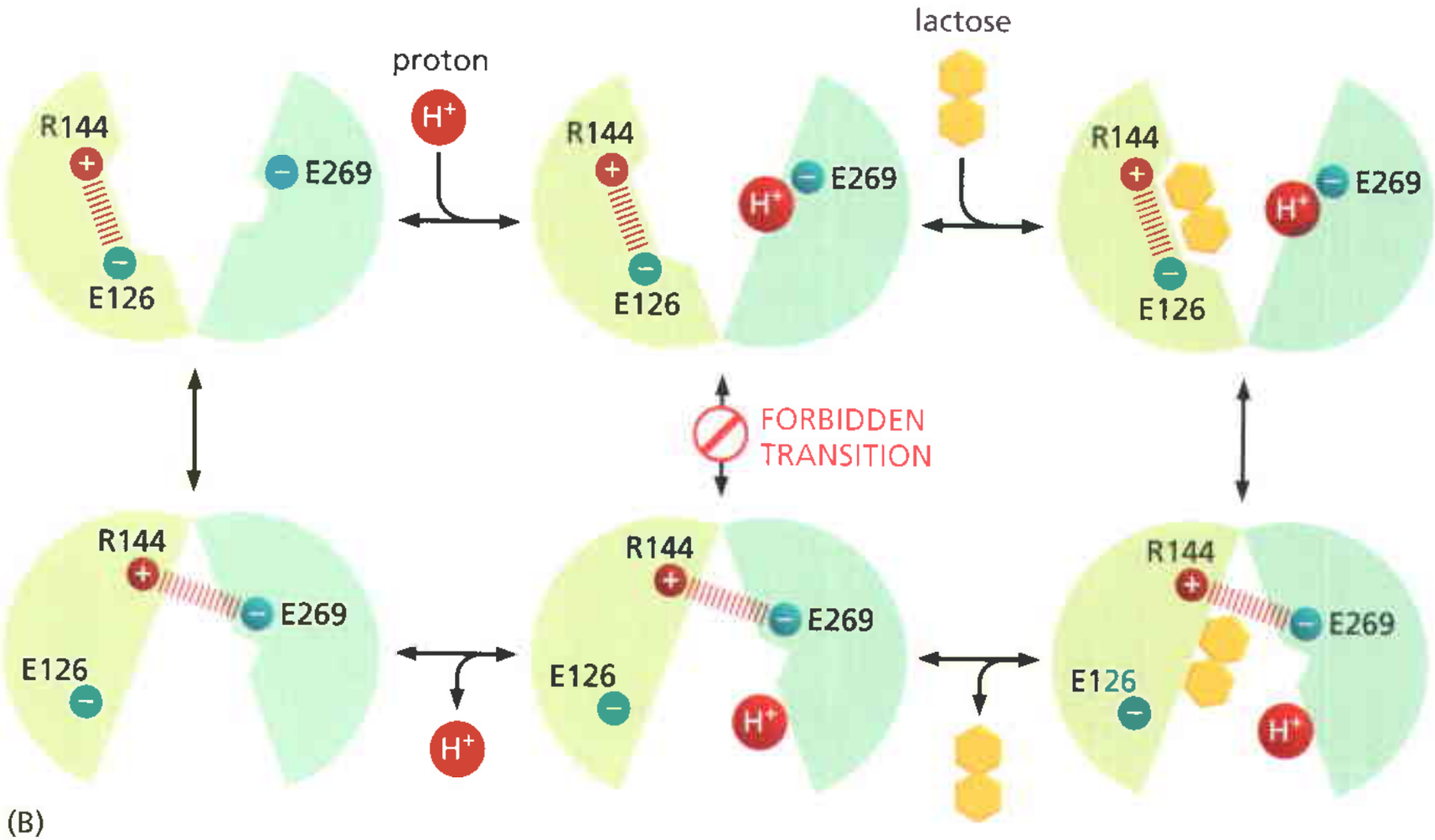
Transporte Ativo

Difusão pela membrana (*permease*)
de Lactose



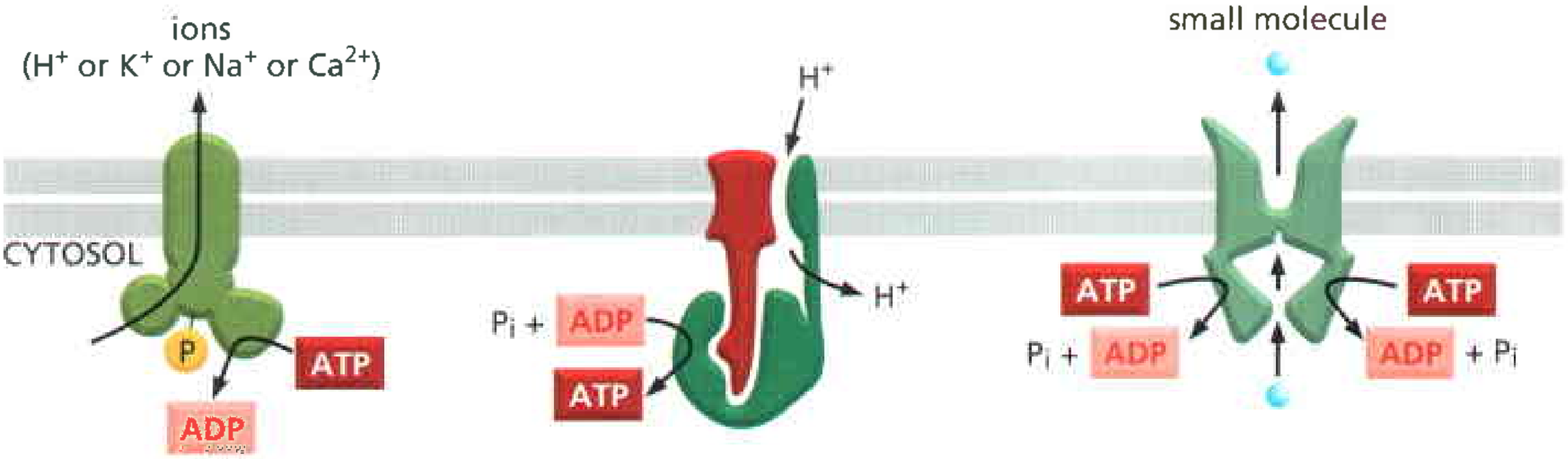
Transporte Ativo

Difusão pela membrana (*permease*) de Lactose



Bombas de ATP

Existem 3 tipos de bombas



P-type pump

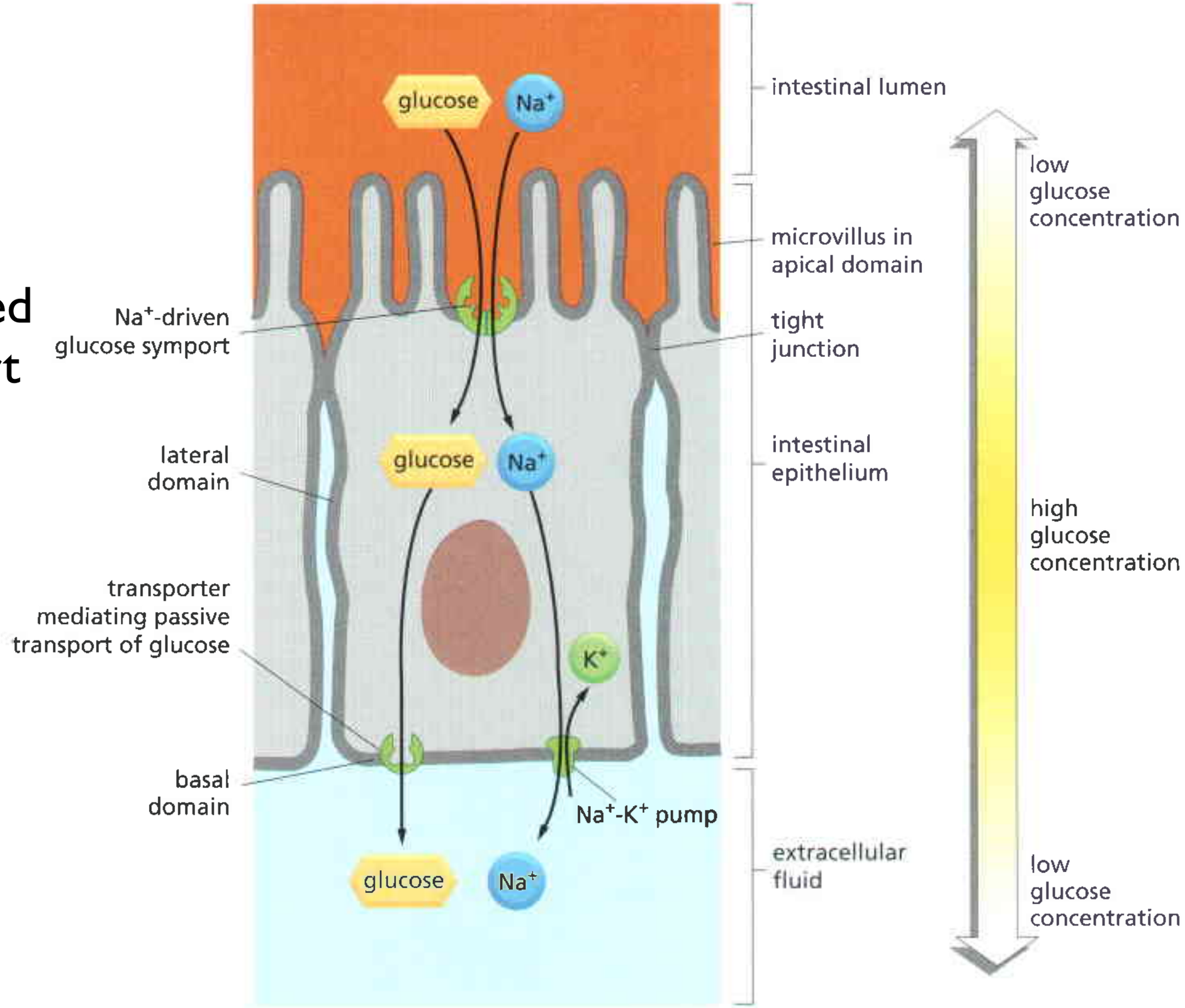
F-type (and V-type) proton pump

ABC transporter

Produção de ATP

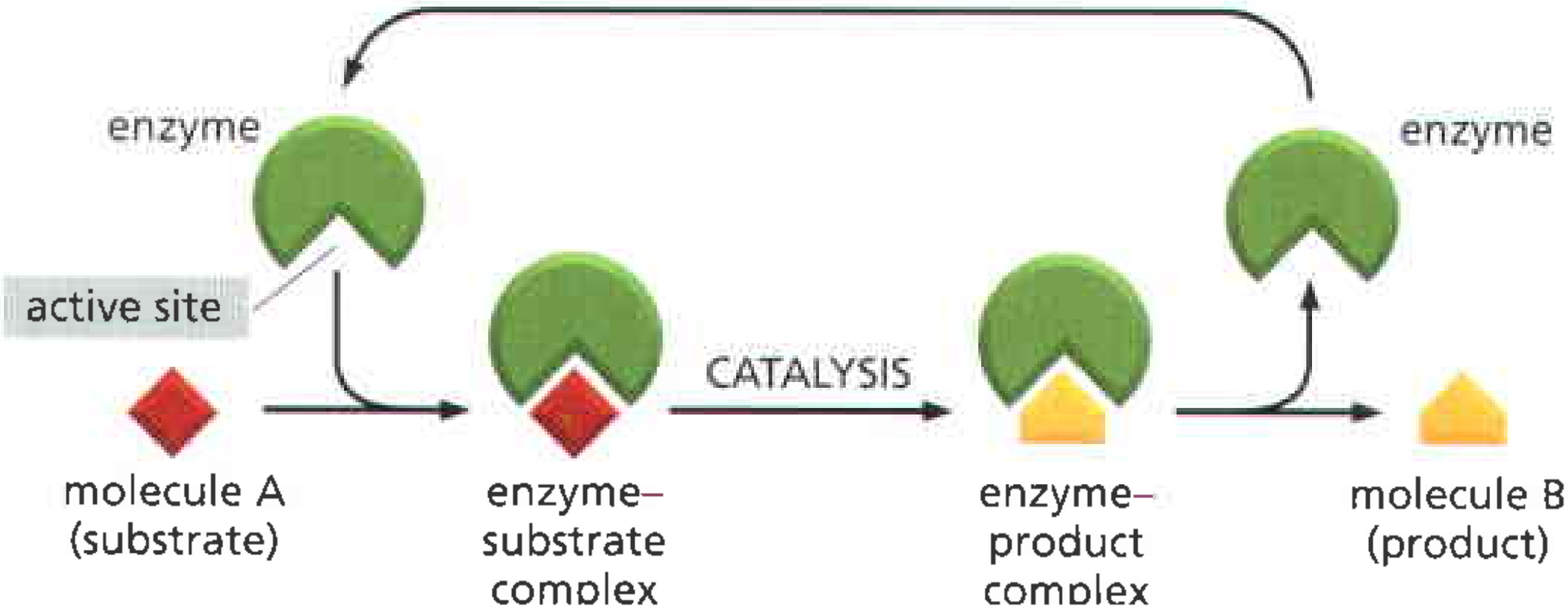
Transporte através de células

- Na+ powered glucose symport
- Na+ pumps mantêm baixas concentrações

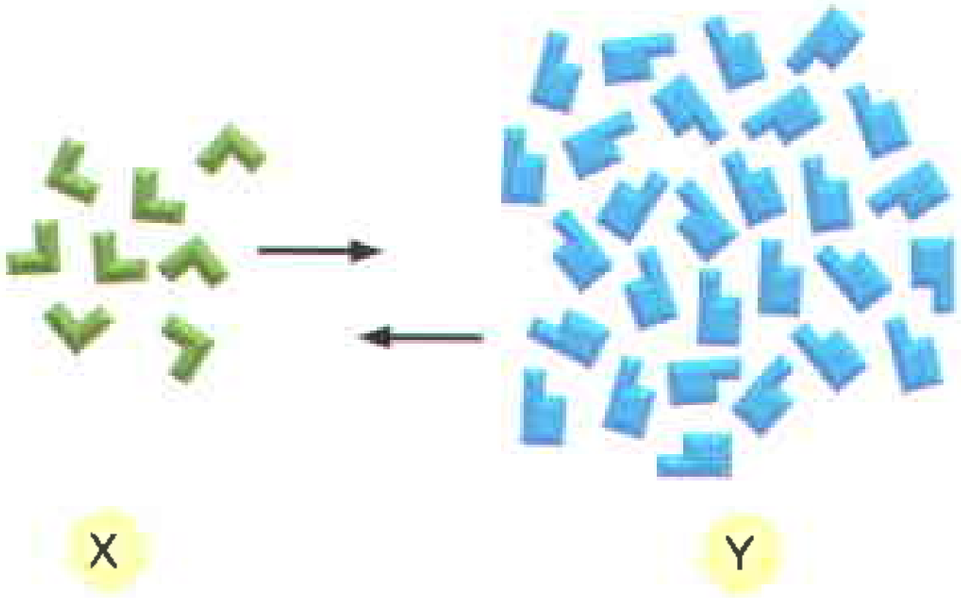


Metabolismo

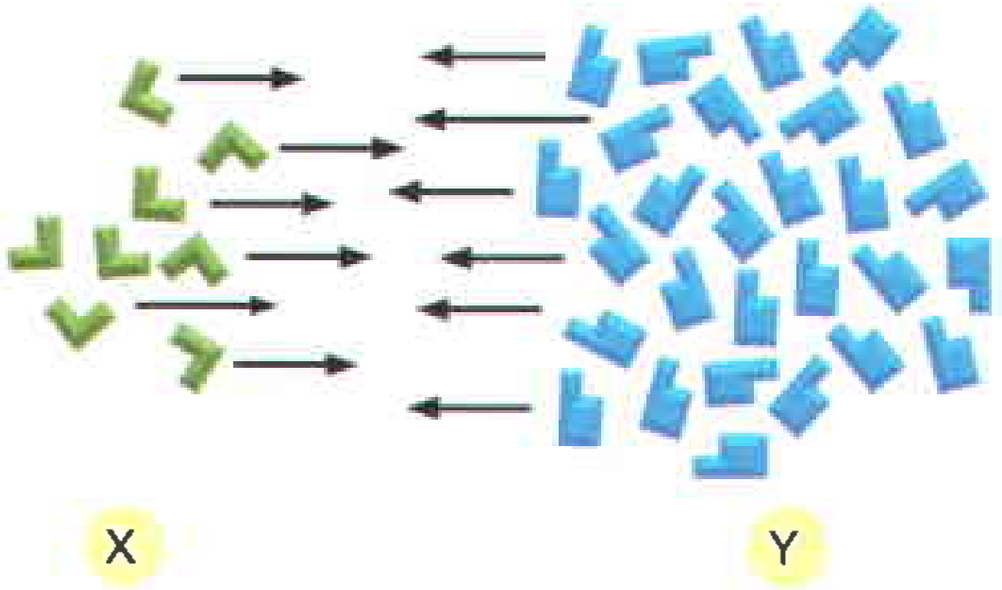
Enzimas



Enzimas

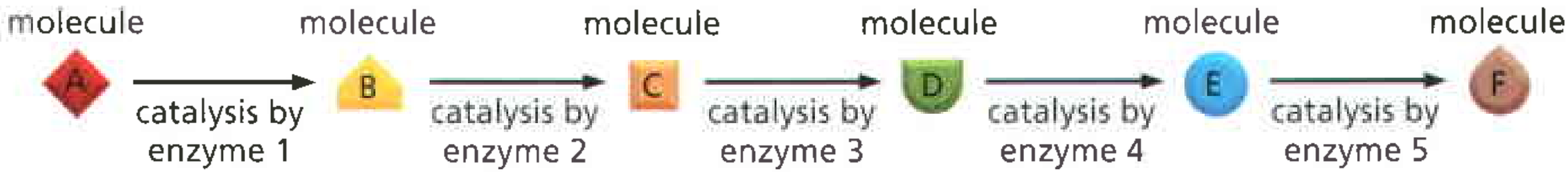


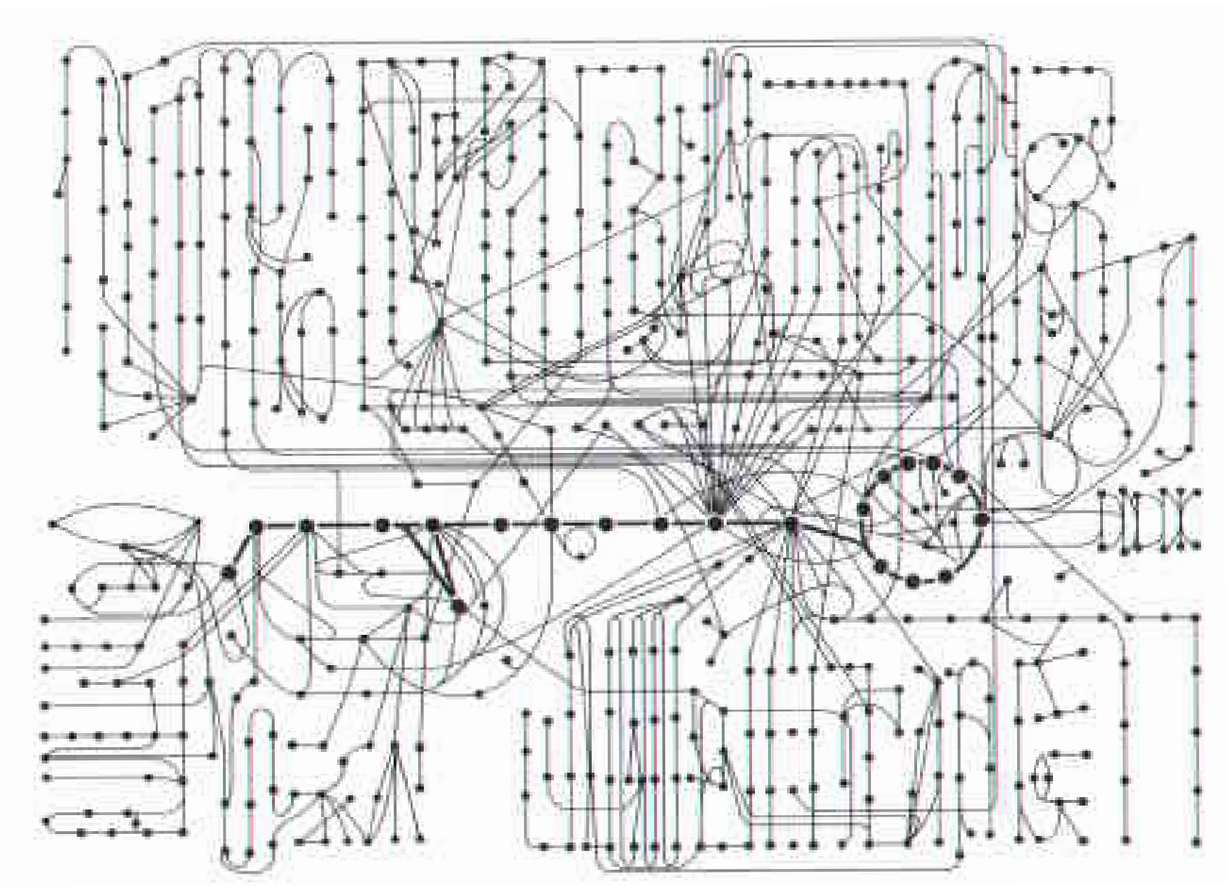
UNCATALYZED REACTION

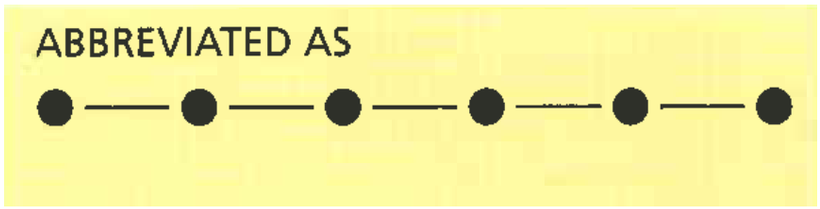


ENZYME-CATALYZED REACTION

Enzimas

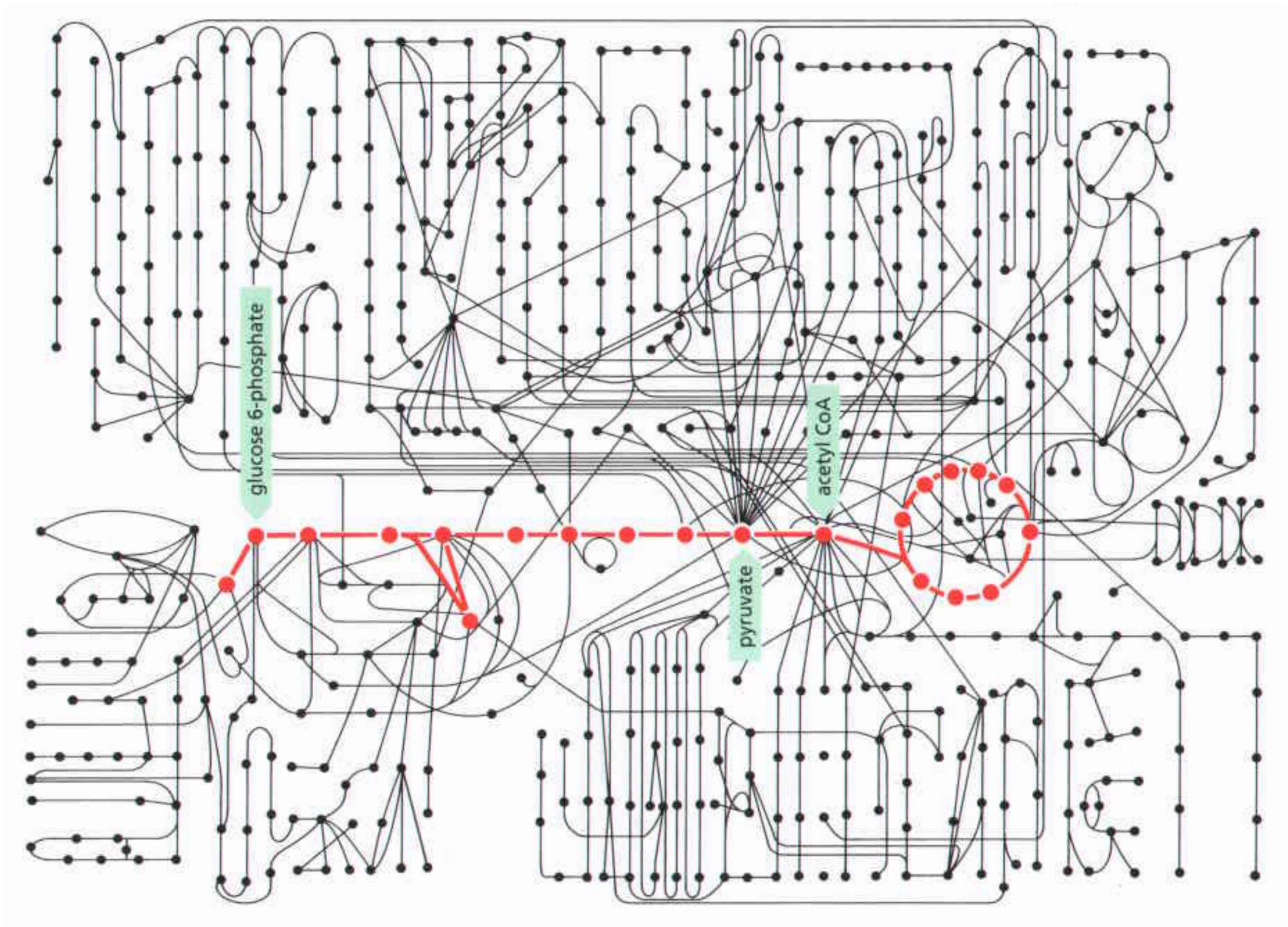




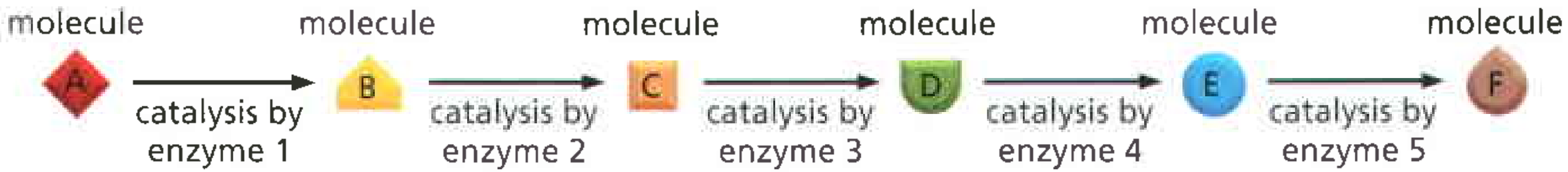


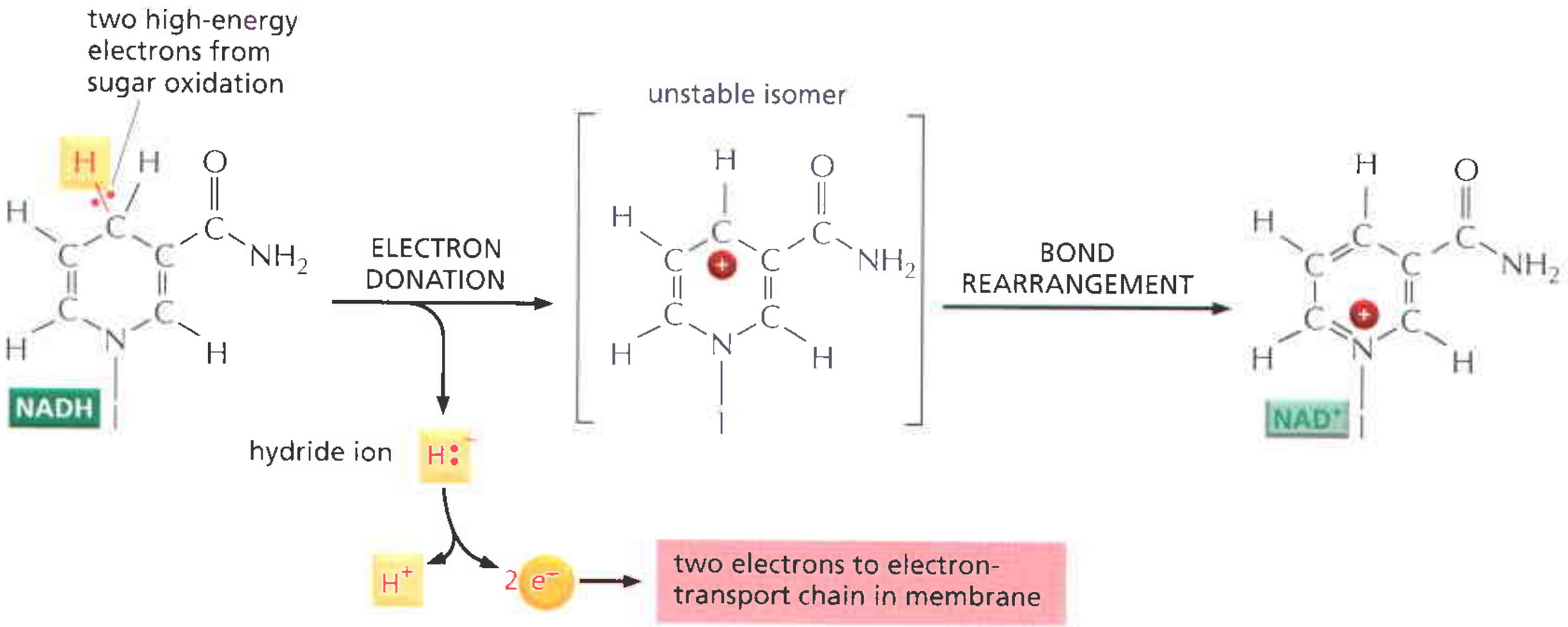
Alguns caminhos metabólicos de uma célula típica

Enzimas

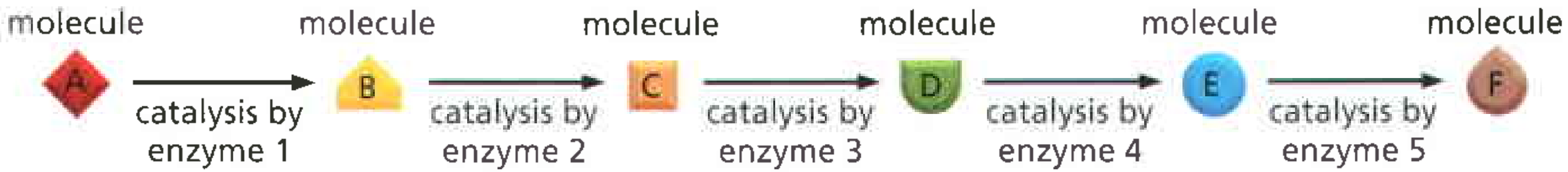


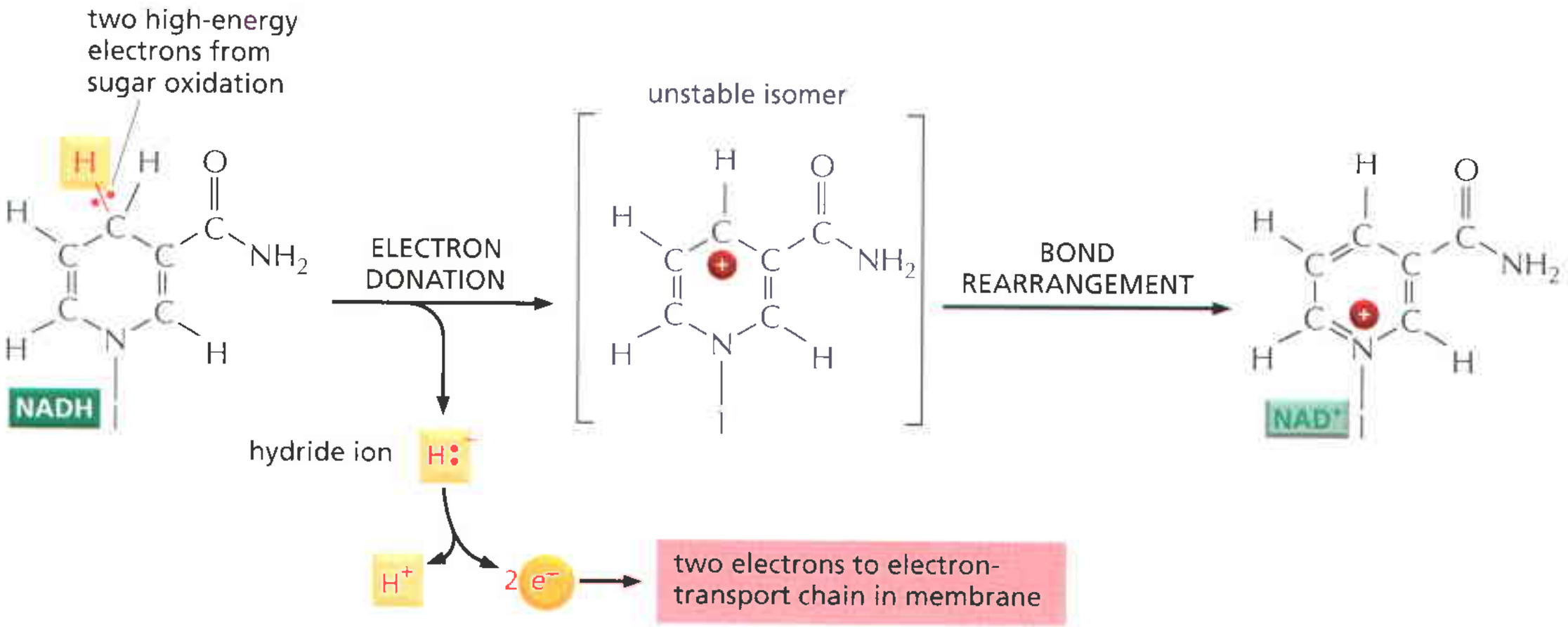
Mitocondria - Geradores de energia





Mitocondria - Geradores de energia





Mitocondria - Geradores de energia

1. Mitocondria são organelas atípicas
2. São nosso gerador de energia
3. Elas se duplicam independentemente das células que residem (seres unicelulares procarionte)
4. Acredita-se que houve uma simbiose em um passado remoto. Nesse caso, a célula invasora se protege dentro da hospedeira que passa a contar com uma fonte de energia

http://www.nature.com/scitable/topicpage/mitochondria-14053590

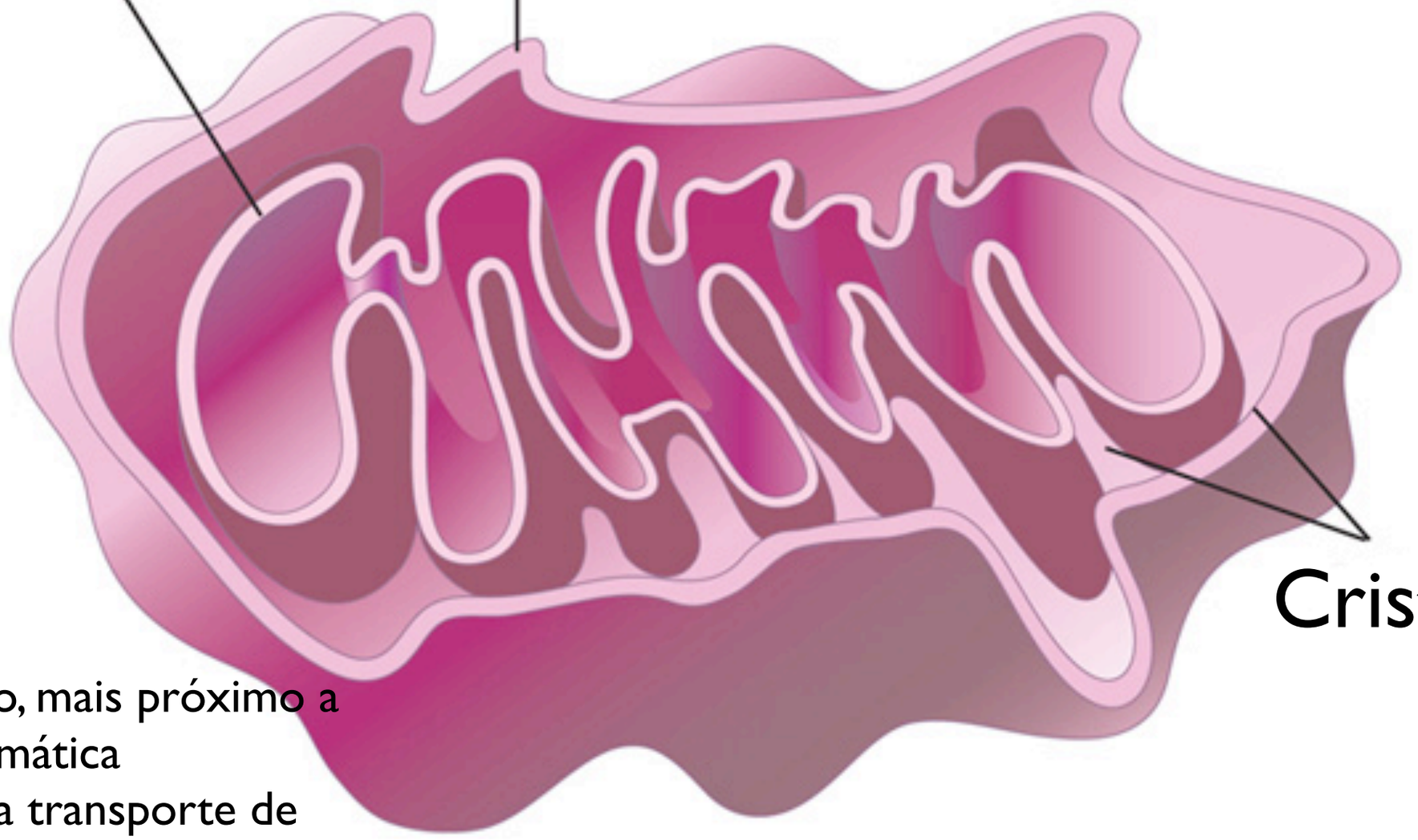
Capitulo 14 do Livro de Molecular Biology, Alberts

Mitocondria - Geradores de energia

Membrana externa

grandes poros de proteínas (permite a passagem de íons e moléculas grandes)

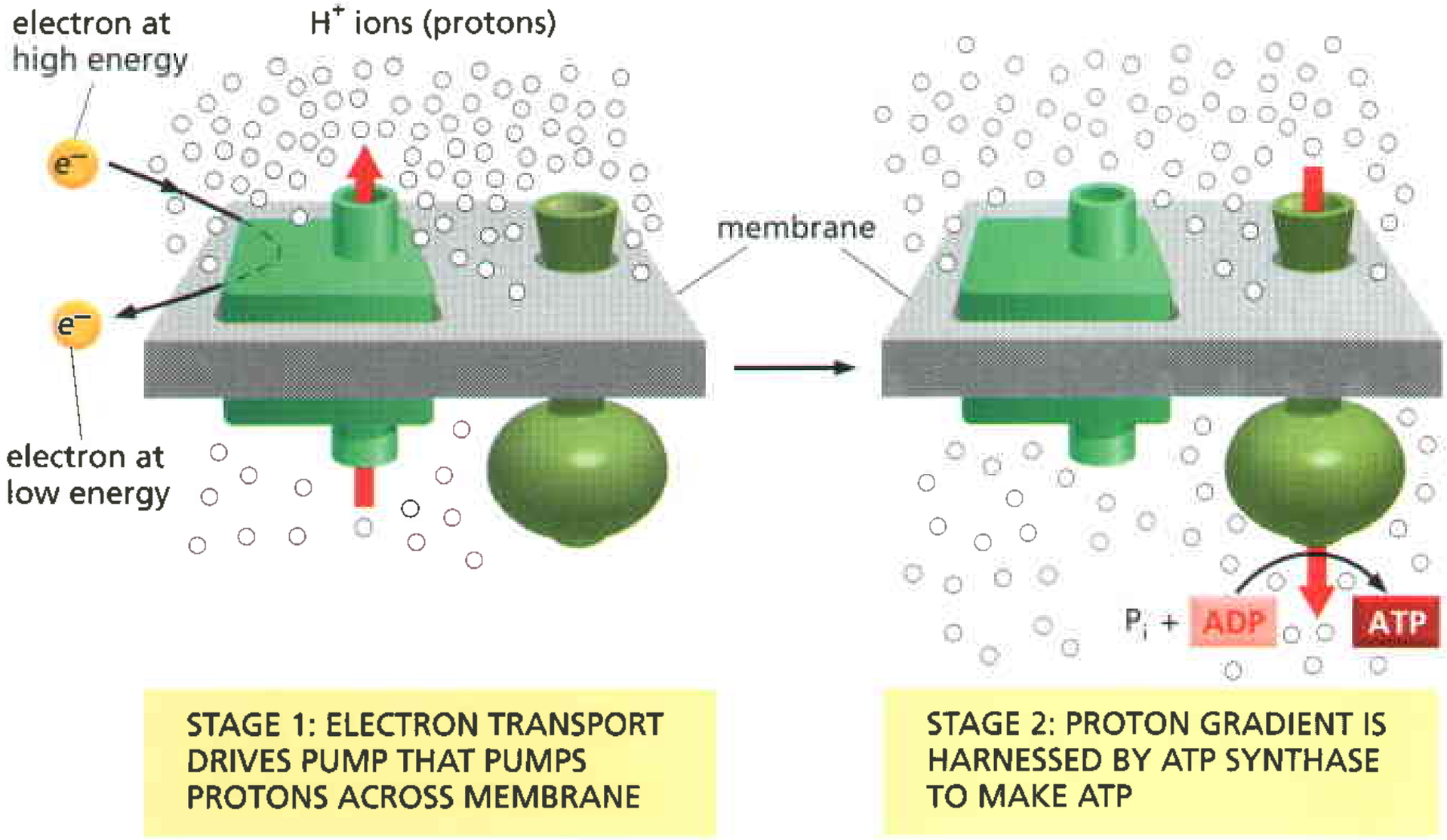
Membrana interna



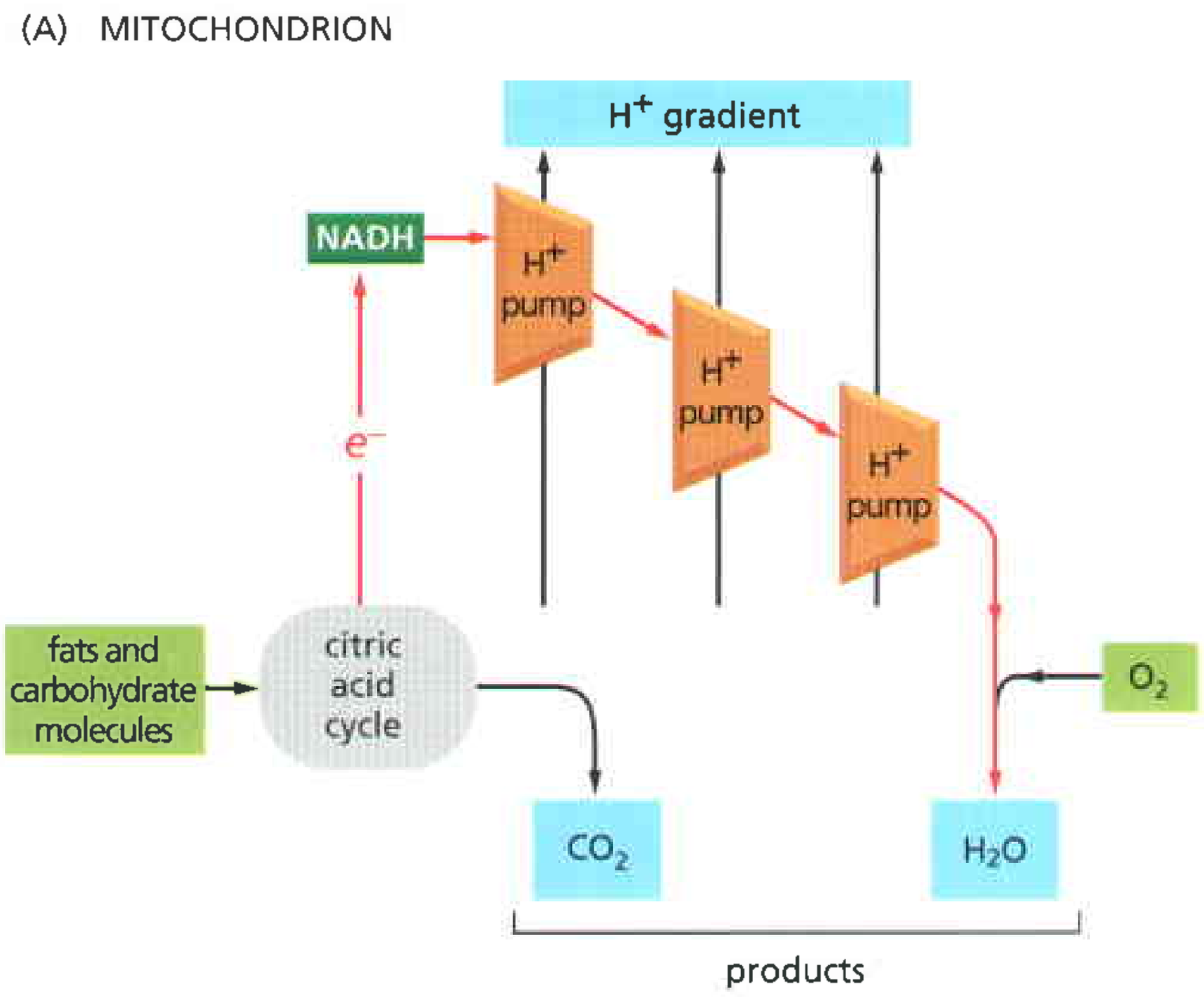
Cristas

* menos poroso, mais próximo a membrana plasmática
* proteínas para transporte de elétrons e síntese de ATP

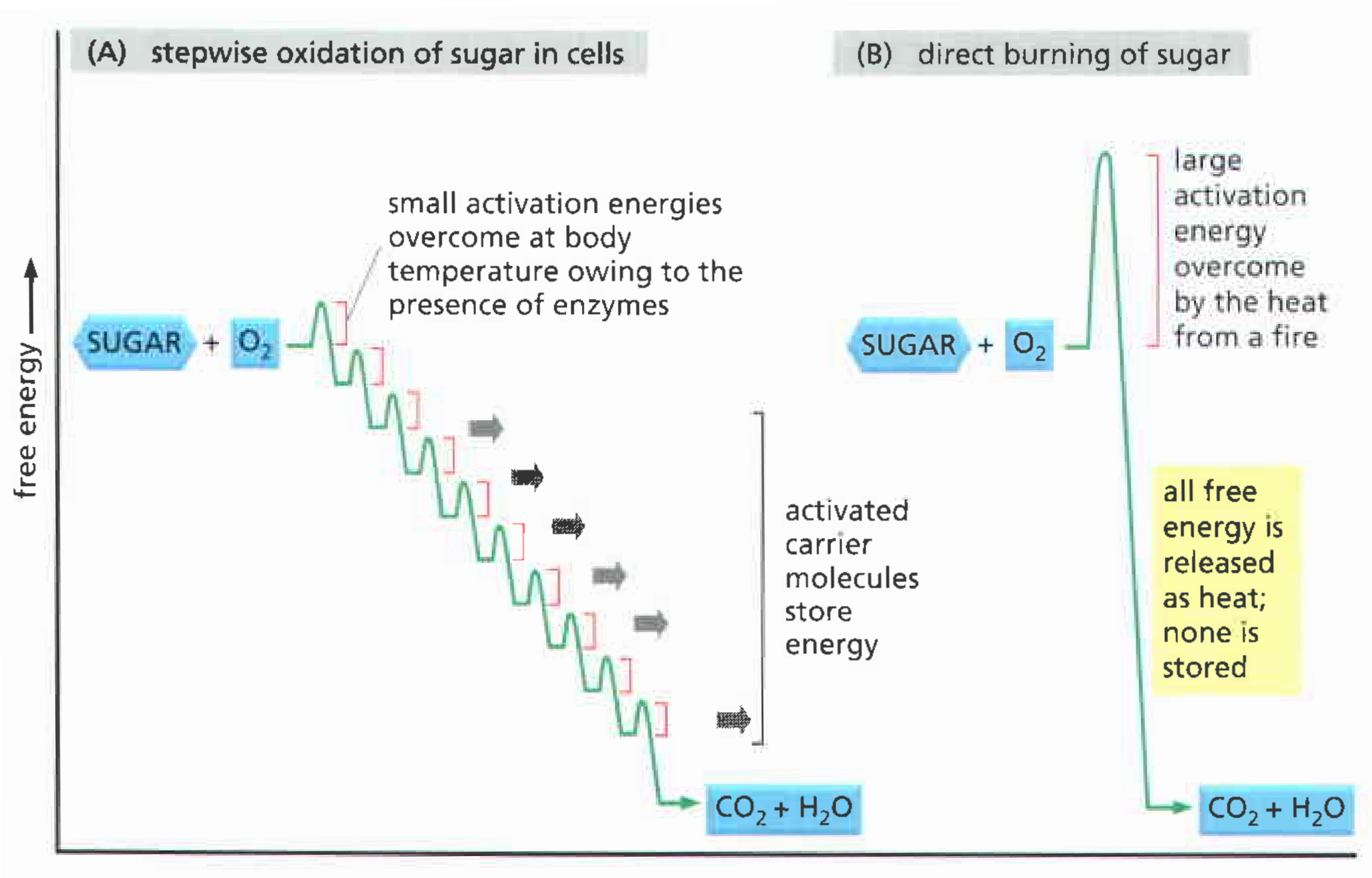
Mitocondria - Geradores de energia



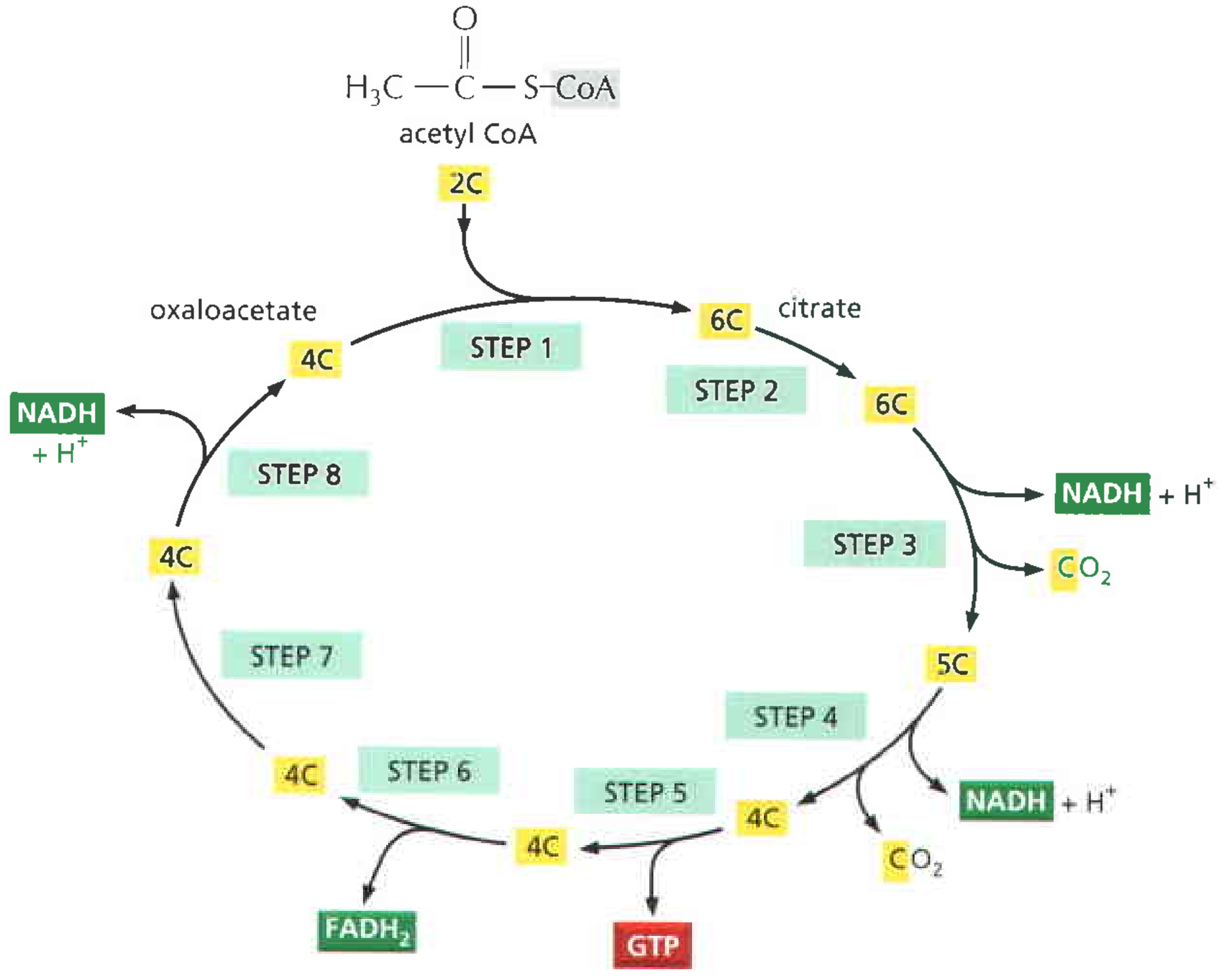
Mitocondria - Geradores de energia



Mitocondria - Geradores de energia

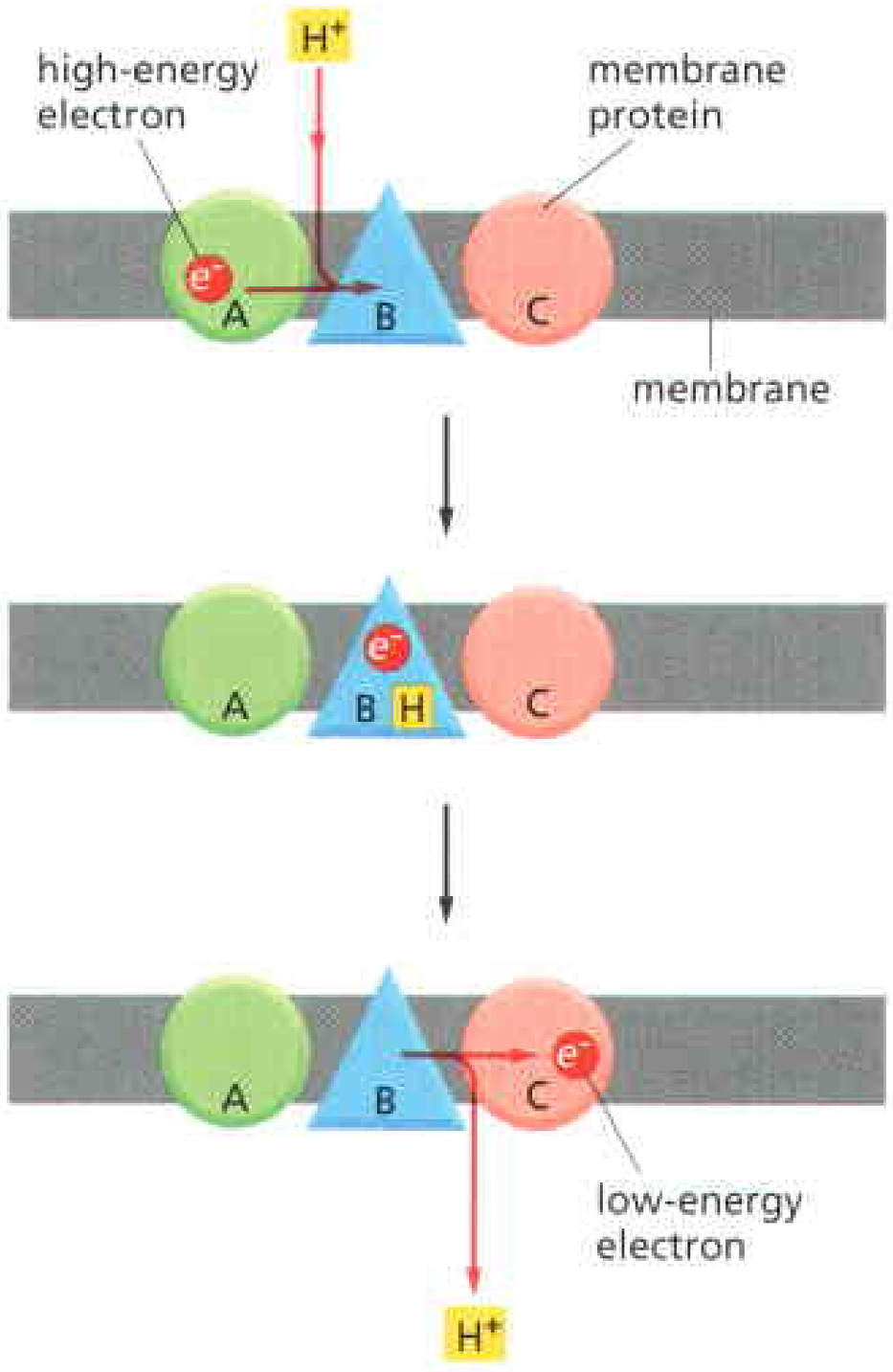


Mitocondria - Geradores de energia

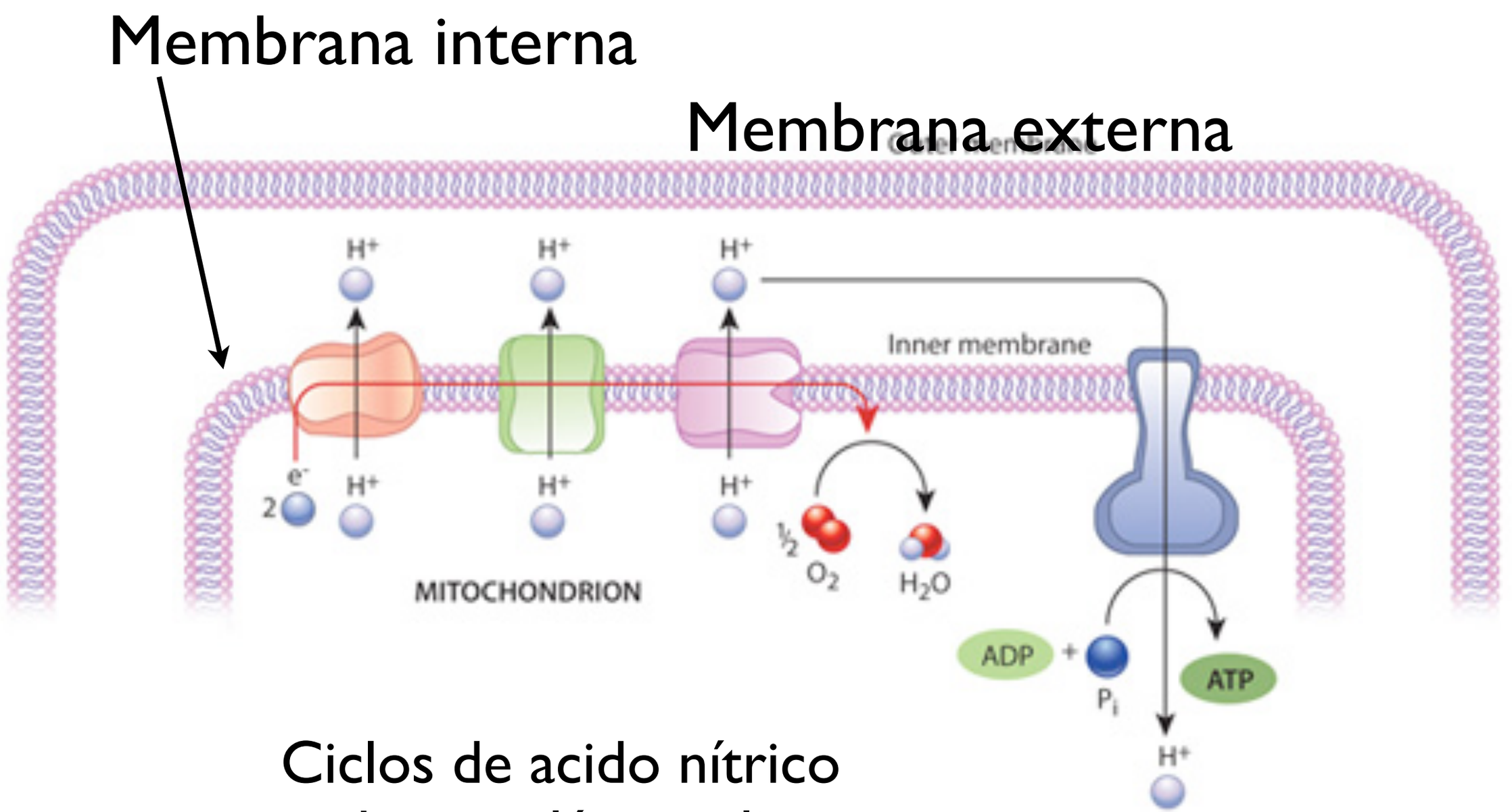


NET RESULT: ONE TURN OF THE CYCLE PRODUCES THREE NADH, ONE GTP, AND ONE $FADH_2$, AND RELEASES TWO MOLECULES OF CO_2

Mitocondria - Geradores de energia



Mitocondria - Geradores de energia

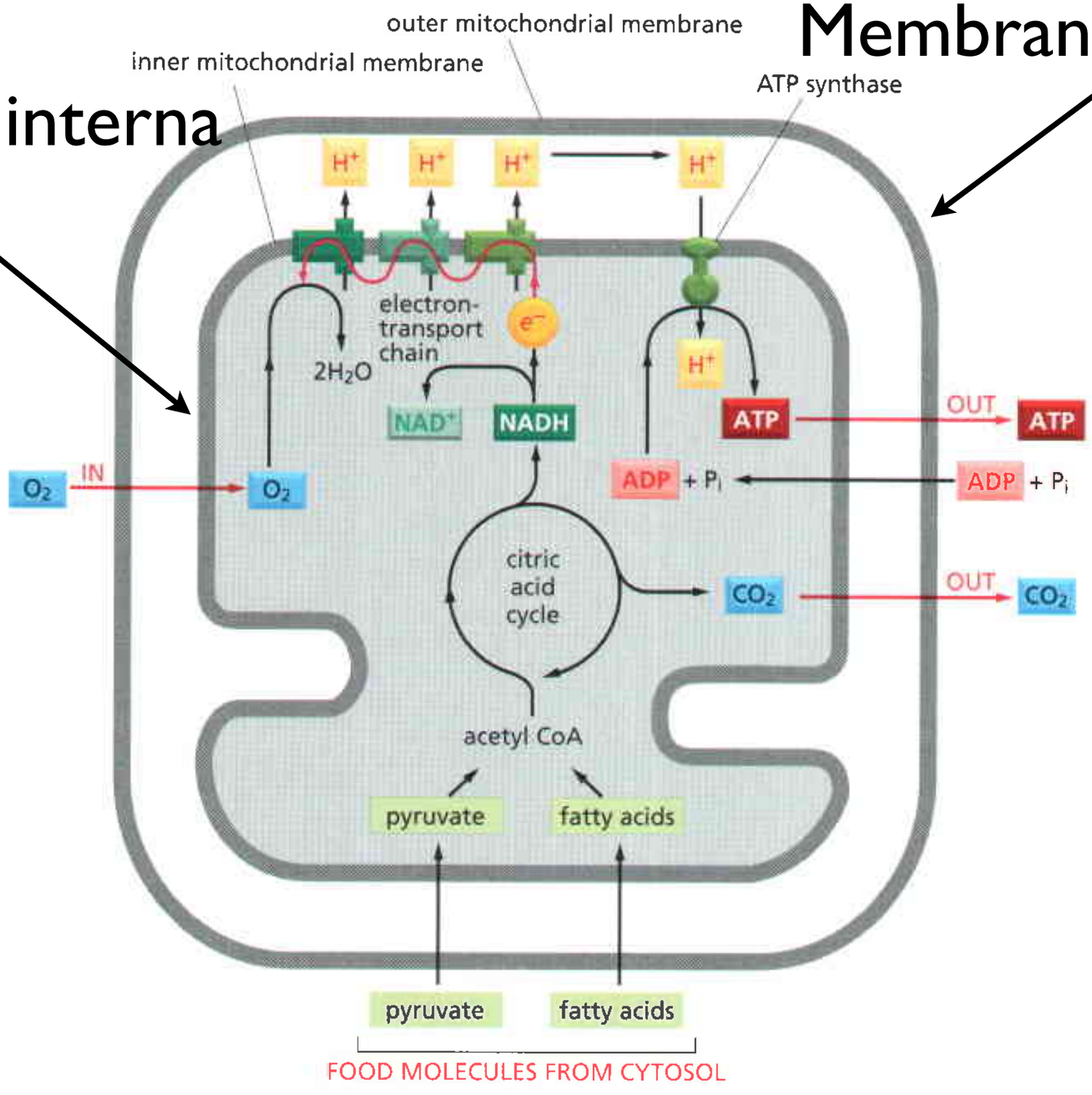


Ciclos de acido nítrico
produzem elétrons livres

Mitocondria - Geradores de energia

Membrana externa

Membrana interna



Mitocondria - Geradores de energia

1. Mitocondrias precisam de produtos manipulados pelo gene da célula (a maioria de suas proteínas)
2. Duplicação similar a duplicação assexuada de bactérias
3. Células que necessitam mais energia tem mais mitocondrias, e elas se multiplicam dependendo da necessidade da célula
4. Glicolise anaeróbia (nosso recurso do nosso DNA) produz aproveita 1/15 da energia do açúcar, obtido pela mitocondria.