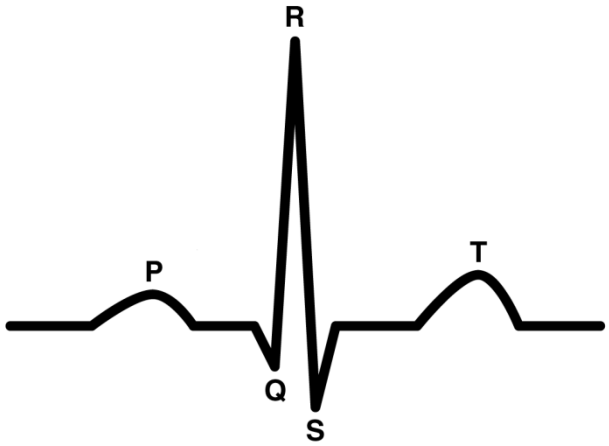
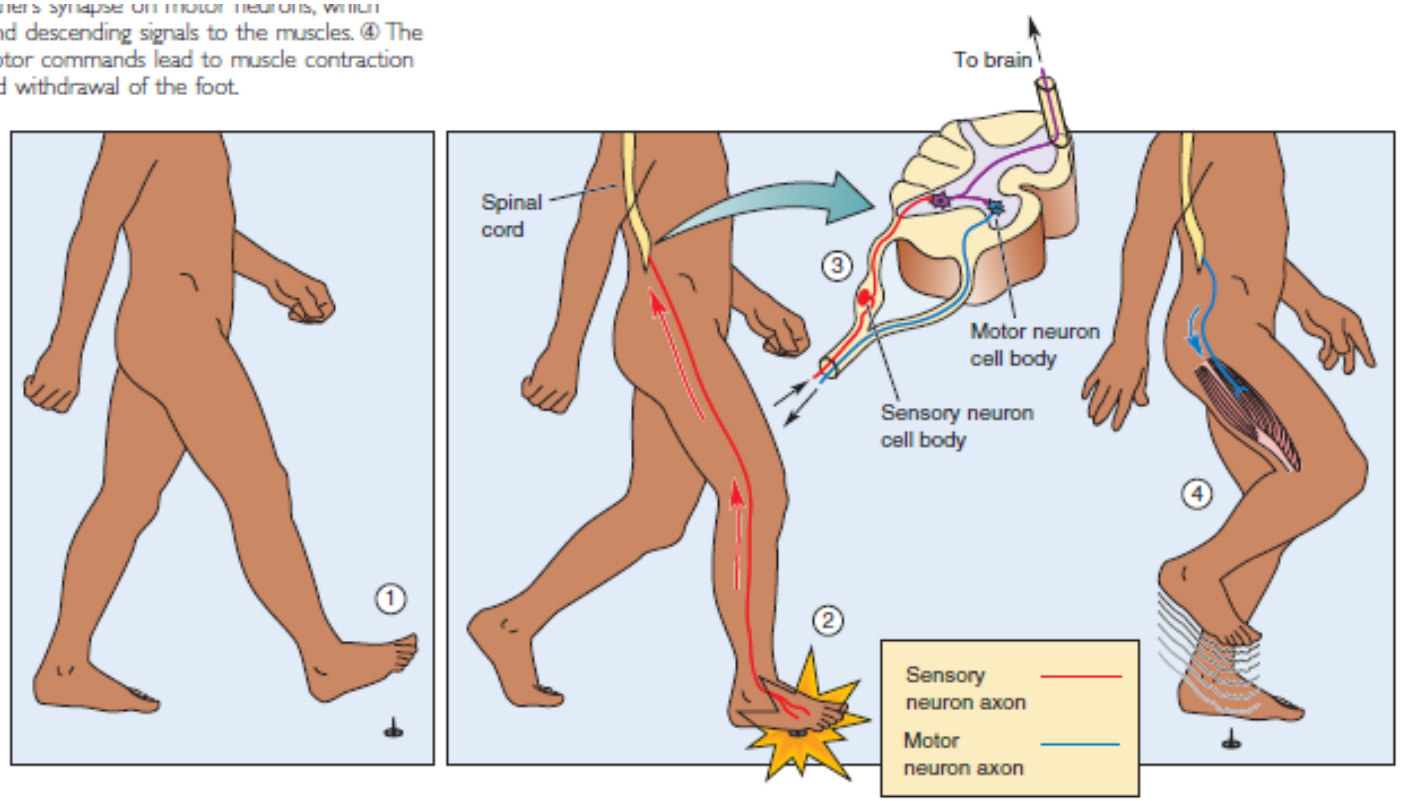
A ORIGEM DOS BIOPOTENCIAIS



Agateller for Wikipedia
Public Domain

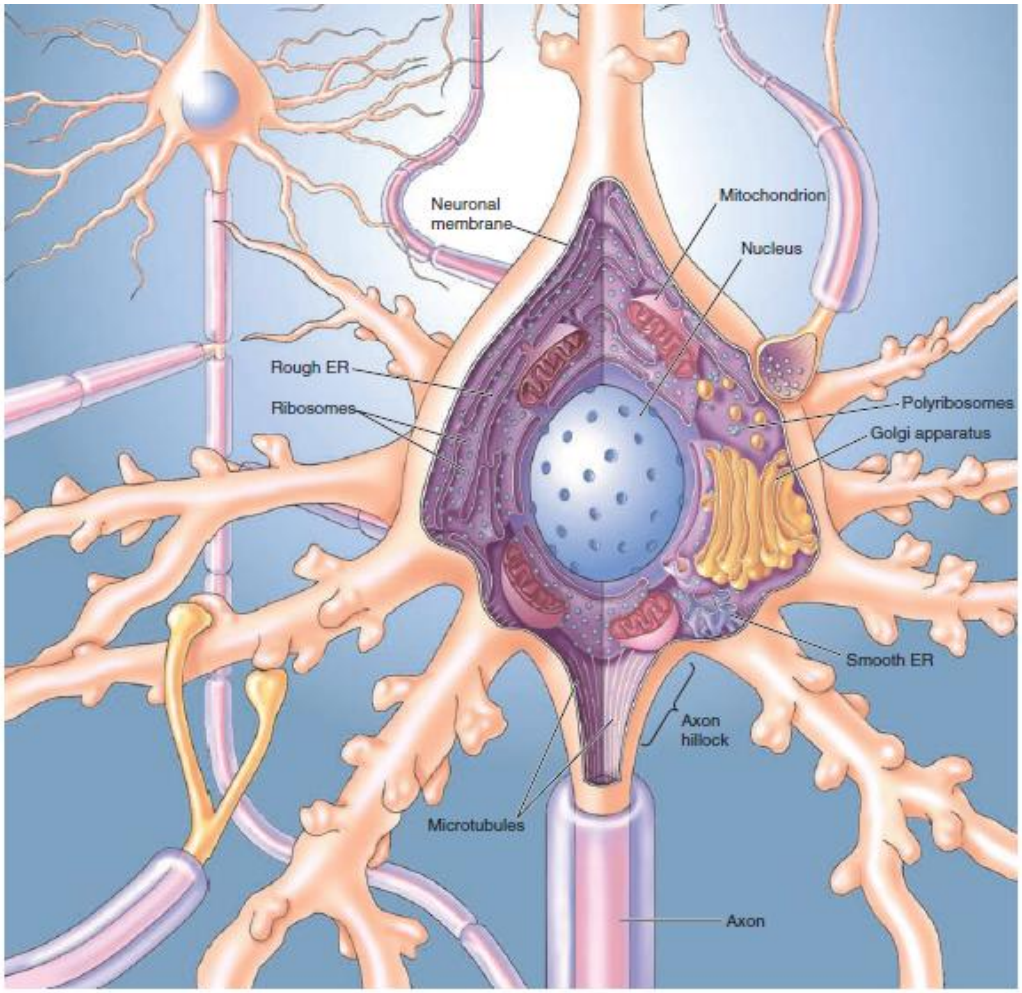
INTRODUÇÃO

-**Sistema nervoso**



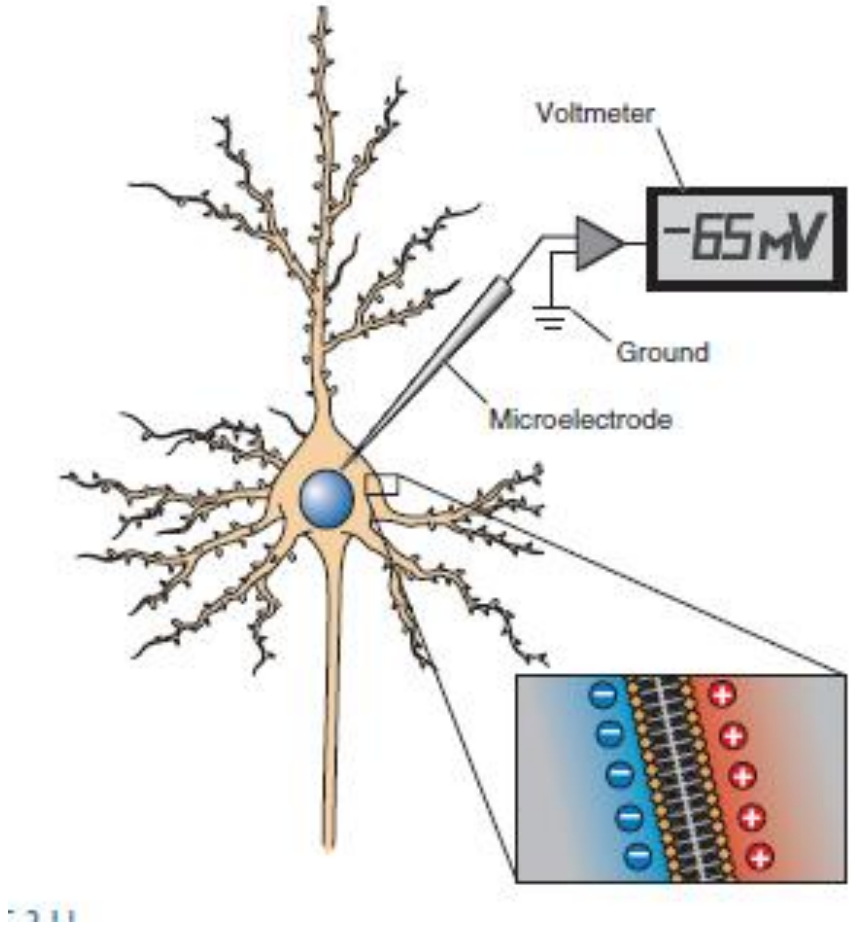
INTRODUÇÃO

-**Neurônio**



INTRODUÇÃO

-**Potencial de repouso**



INTRODUÇÃO

-**Potencial de ação**

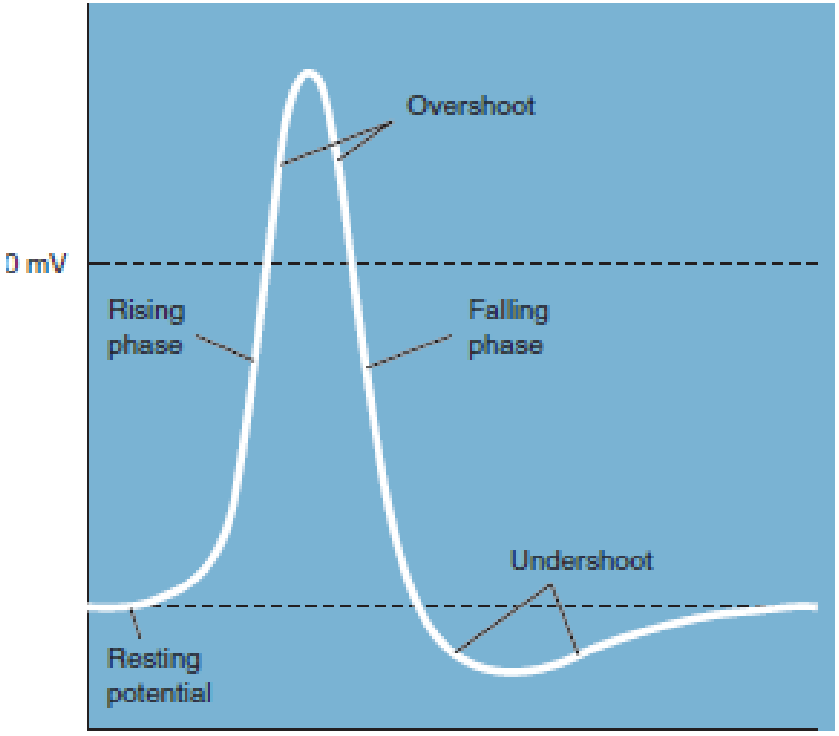
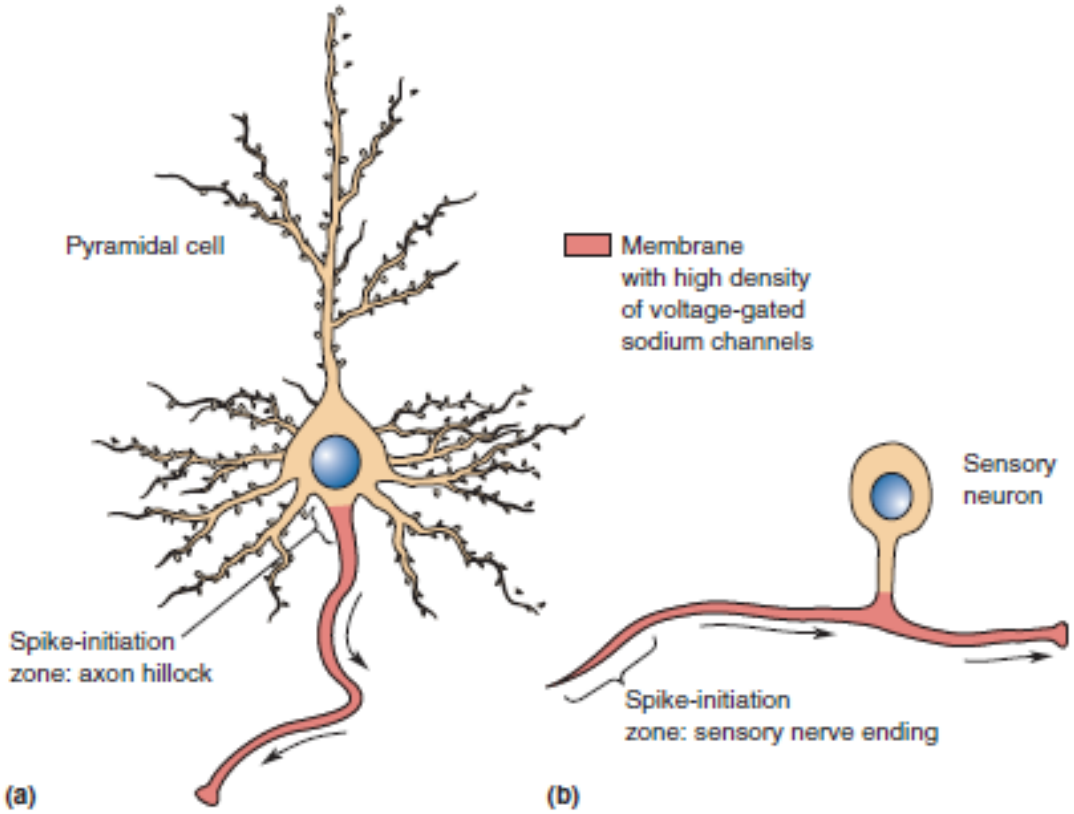


FIGURE 4.1
An action potential. (a) An action potential displayed by an oscilloscope. **(b)** The parts of an action potential.

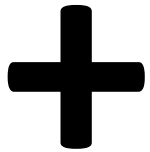
INTRODUÇÃO

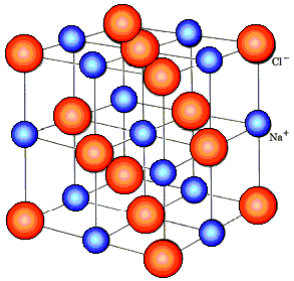
-**Condução do potencial de ação**



1 - ÍONS

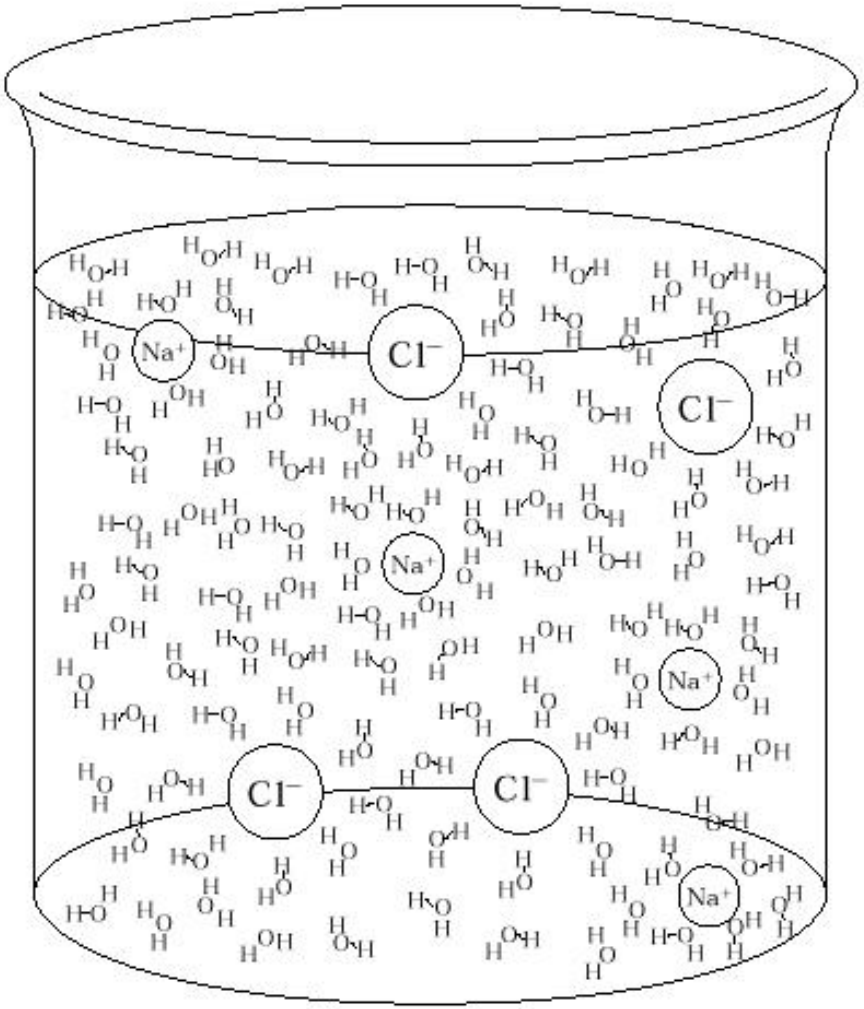
- **Íons (NaCl) na água:**





1 - ÍONS

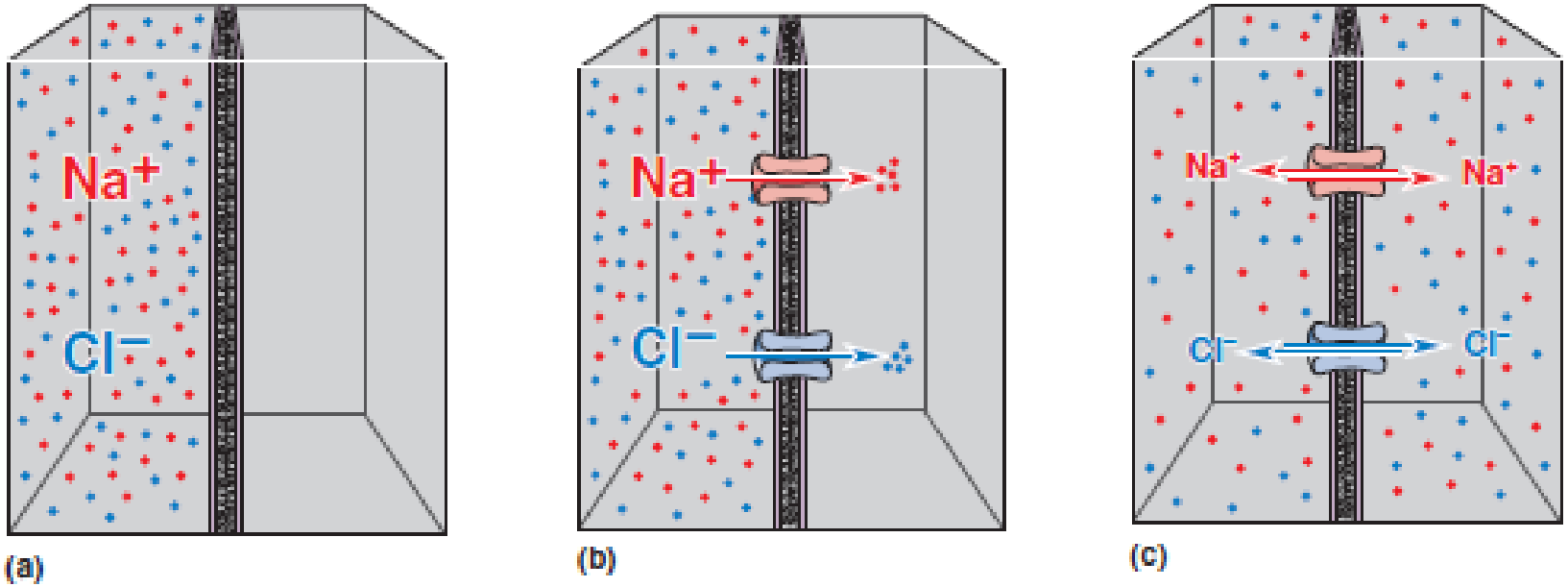
- **Íons (NaCl) na água:**



1 - ÍONS

- **Movimento dos íons dissolvidos em água :**

1 - Difusão



1 - ÍONS

-**O movimento dos íons dissolvidos em água :**

2 – Campo elétrico

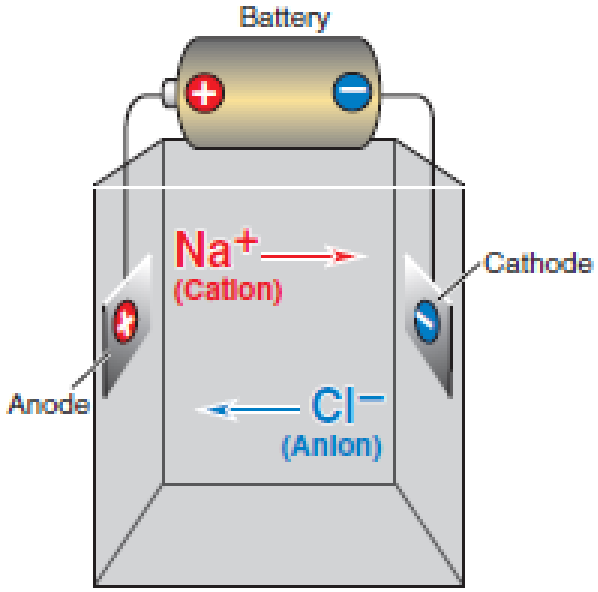
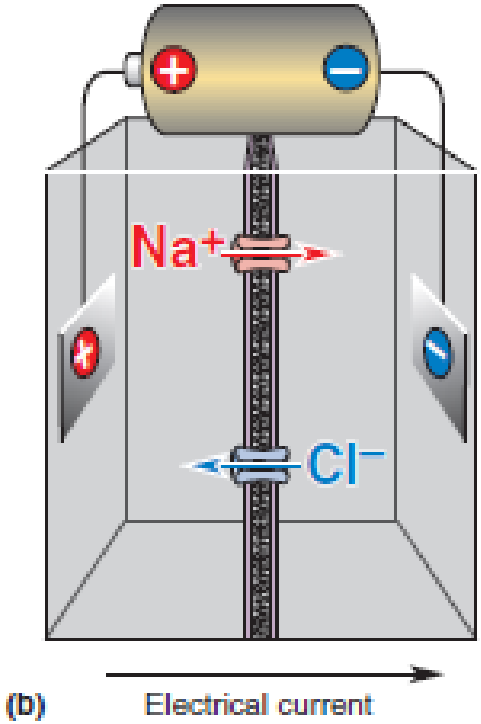


FIGURE 3.9
The movement of ions influenced by an electrical field.

1 - ÍONS

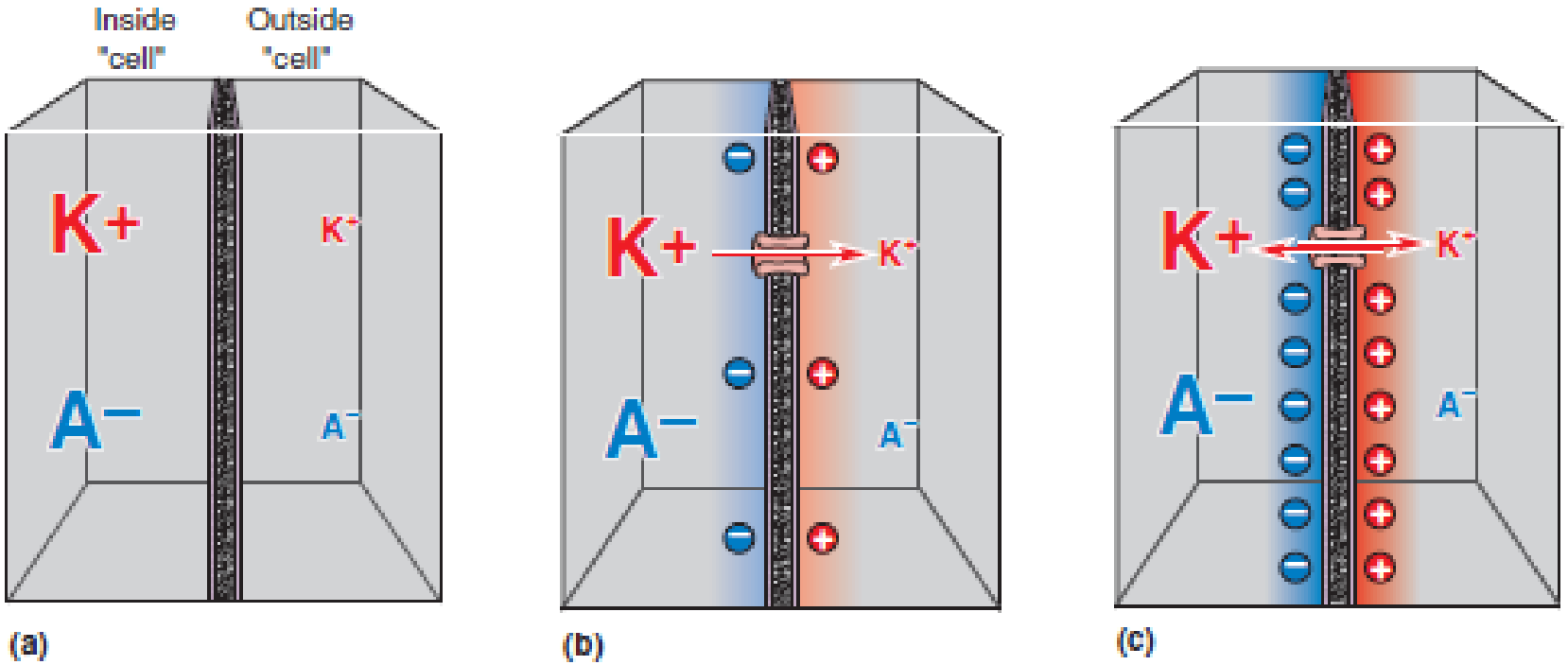
-**O movimento dos íons dissolvidos em água :**

2 – Campo elétrico



1 - ÍONS

-**O movimento dos íons em uma membrana semipermeável:**



1 - ÍONS

-**A equação de Nernst:**

$$E_{ion} = 2.303 \frac{RT}{zF} \log \frac{[ion]_o}{[ion]_i}$$

Ion	Concentration outside (in mM)	Concentration inside (in mM)	Ratio Out : In	E_{ion} (at 37°C)
K^+	5	100	1 : 20	−80 mV
Na^+	150	15	10 : 1	62 mV
Ca^{2+}	2	0.0002	10,000 : 1	123 mV
Cl^-	150	13	11.5 : 1	−65 mV

$$E_K = 61.54 \text{ mV} \log \frac{[K^+]_o}{[K^+]_i}$$

$$E_{Na} = 61.54 \text{ mV} \log \frac{[Na^+]_o}{[Na^+]_i}$$

$$E_{Cl} = -61.54 \text{ mV} \log \frac{[Cl^-]_o}{[Cl^-]_i}$$

$$E_{Ca} = 30.77 \text{ mV} \log \frac{[Ca^{2+}]_o}{[Ca^{2+}]_i}$$

1 - ÍONS

-**A equação de Goldman:**

$$Vm = 61.54\ mV \log \frac{P_K[K^+]_o + P_{Na}[Na^+]_o}{P_K[K^+]_I + P_{Na}[Na^+]_I}$$

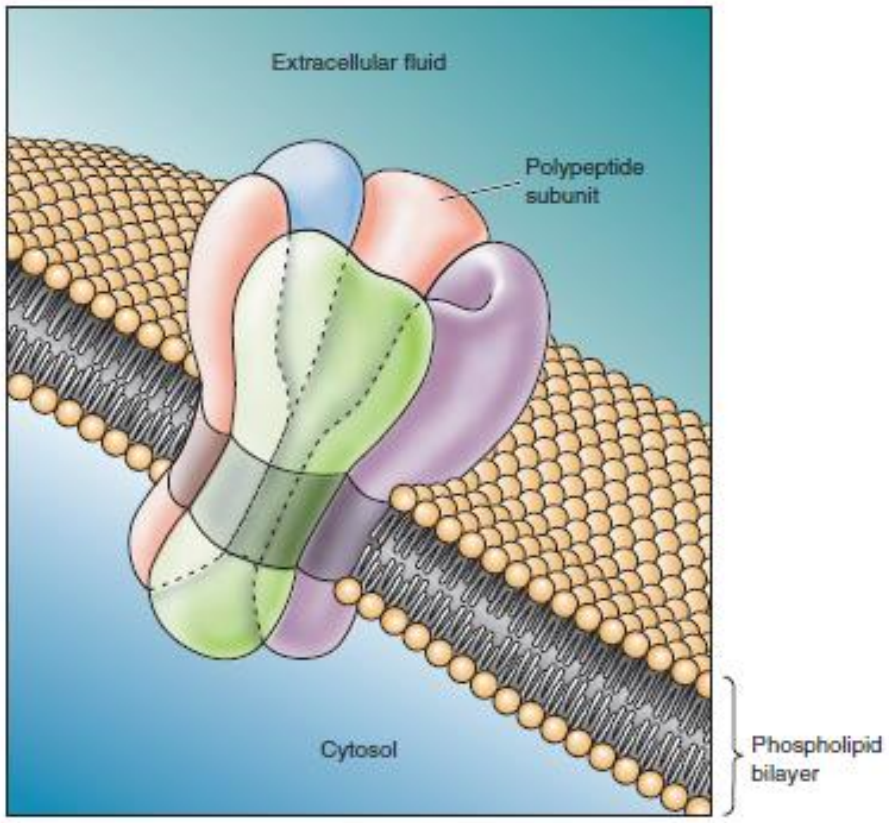
$$V_m = 61.54\ mV \log \frac{40\ (5) + 1\ (150)}{40\ (100) + 1\ (15)}$$

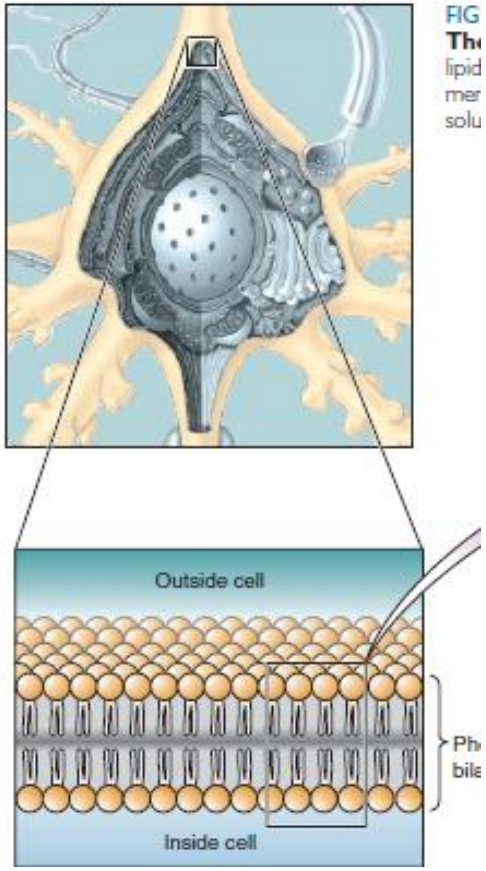
$$= 61.54\ mV \log \frac{350}{4015}$$

$$= -65\ mV$$

2 – A membrana celular

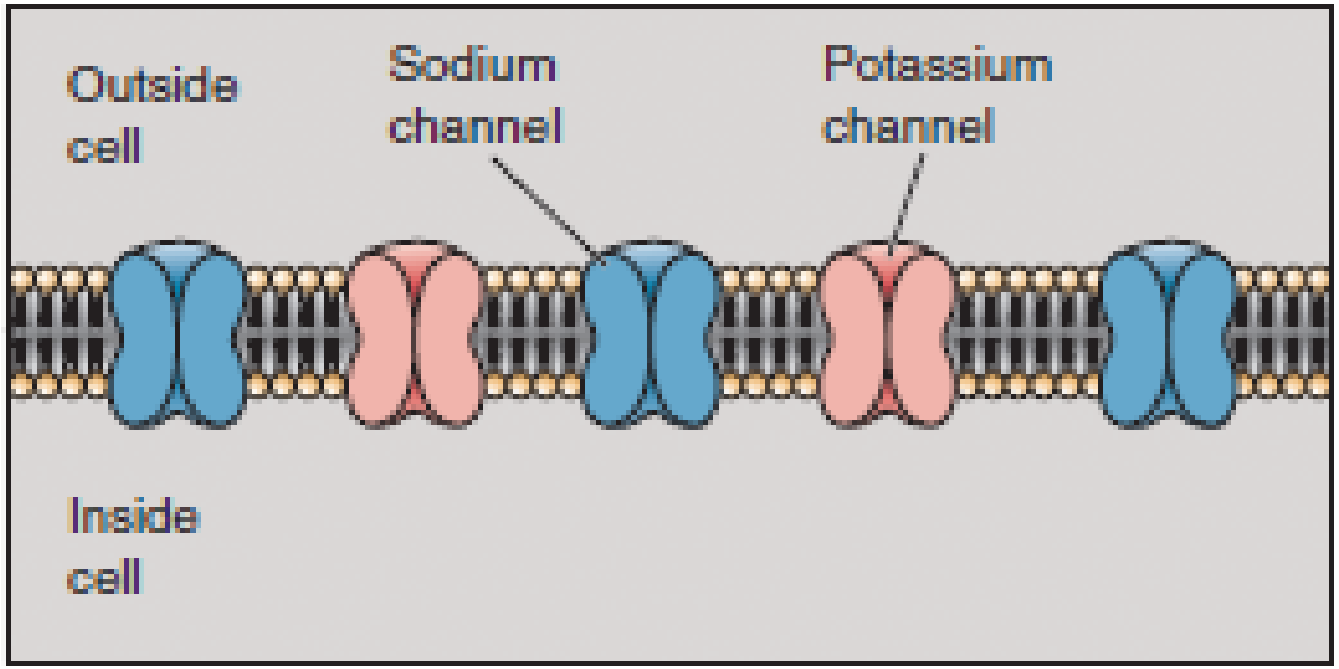
-**Membrana e canais iônicos**





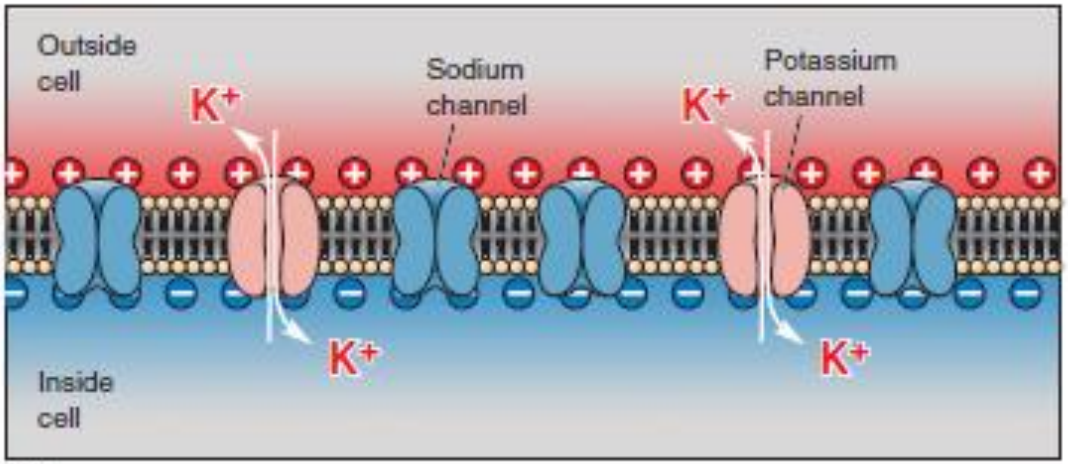
2 – A membrana celular

-**Canais de sódio e potássio**

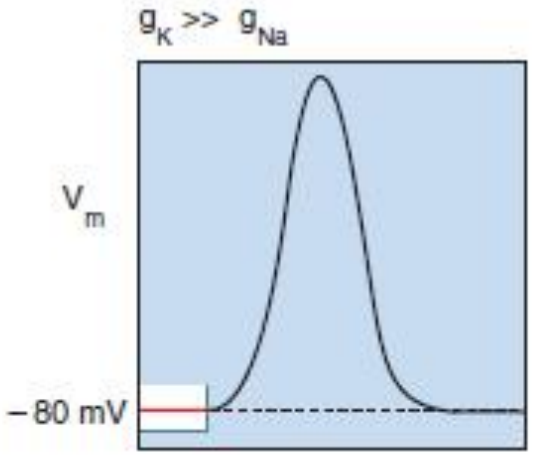


2 – A membrana celular

-**Repouso**

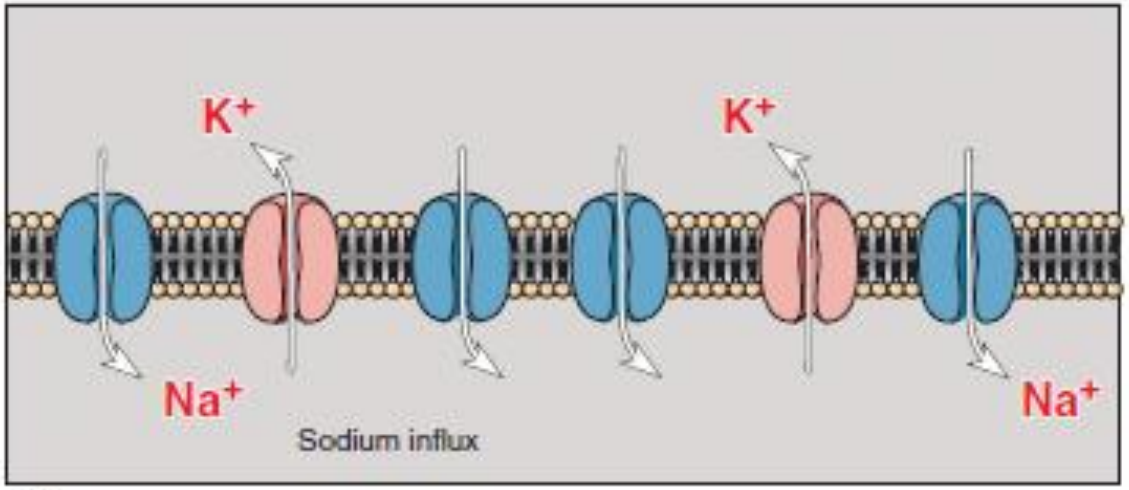


(a)

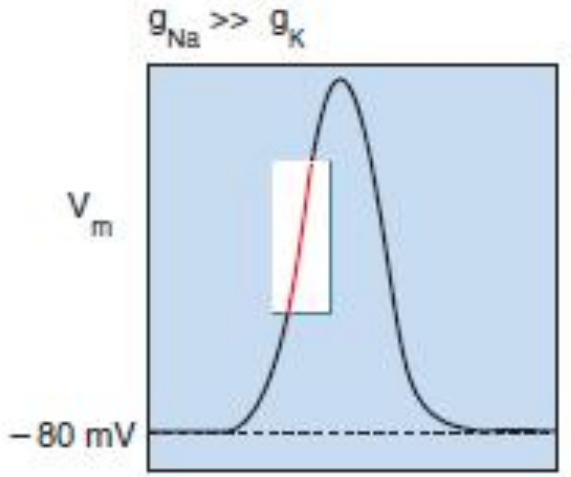


2 – A membrana celular

-**Despolarização**

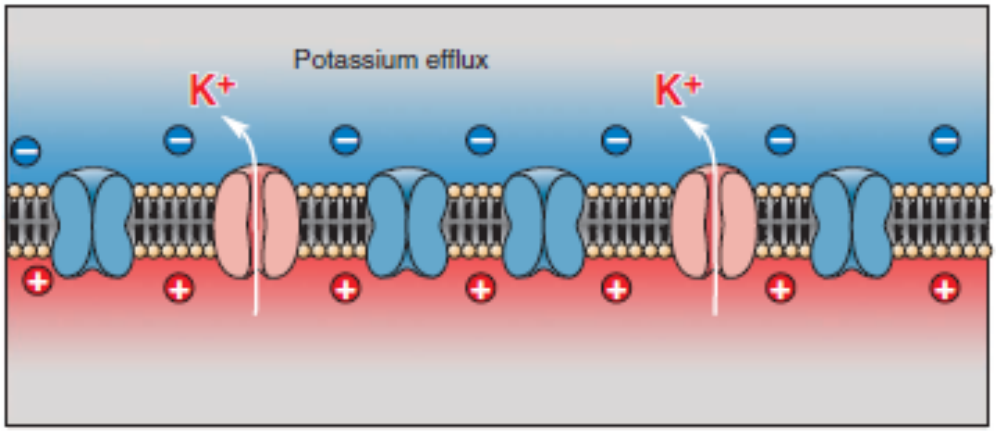


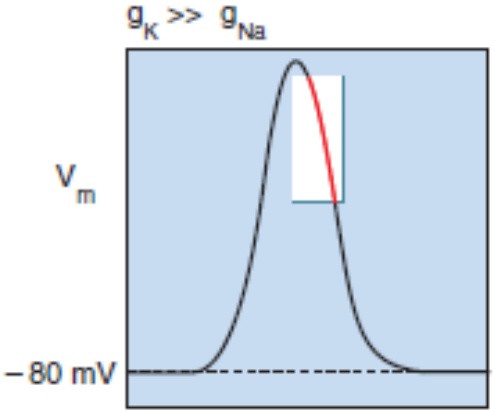
(b)



2 – A membrana celular

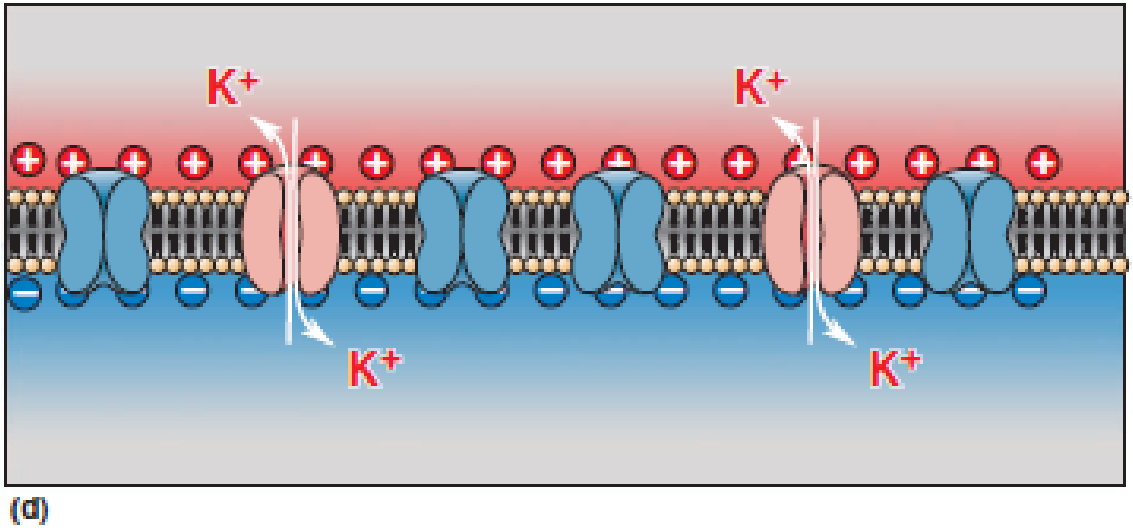
-**Polarização**



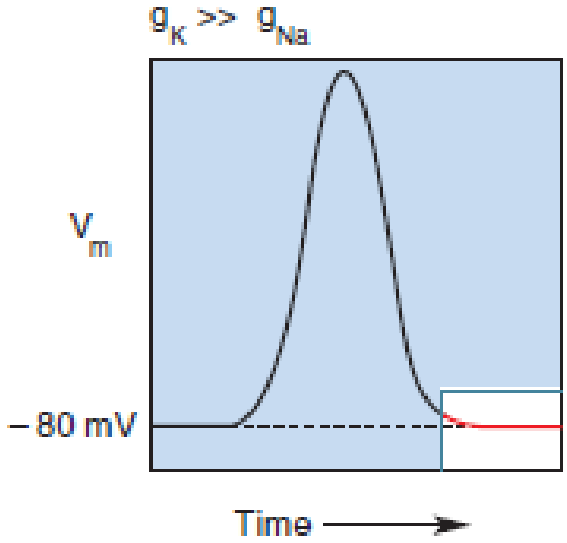


2 – A membrana celular

-**Repouso**

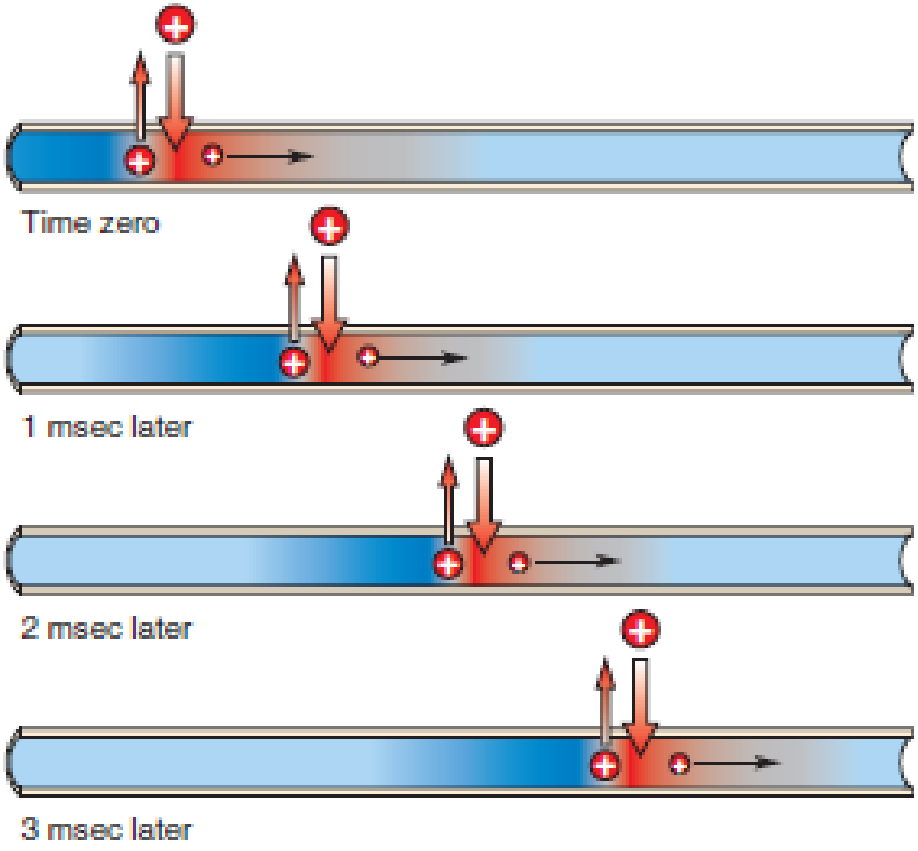


(d)



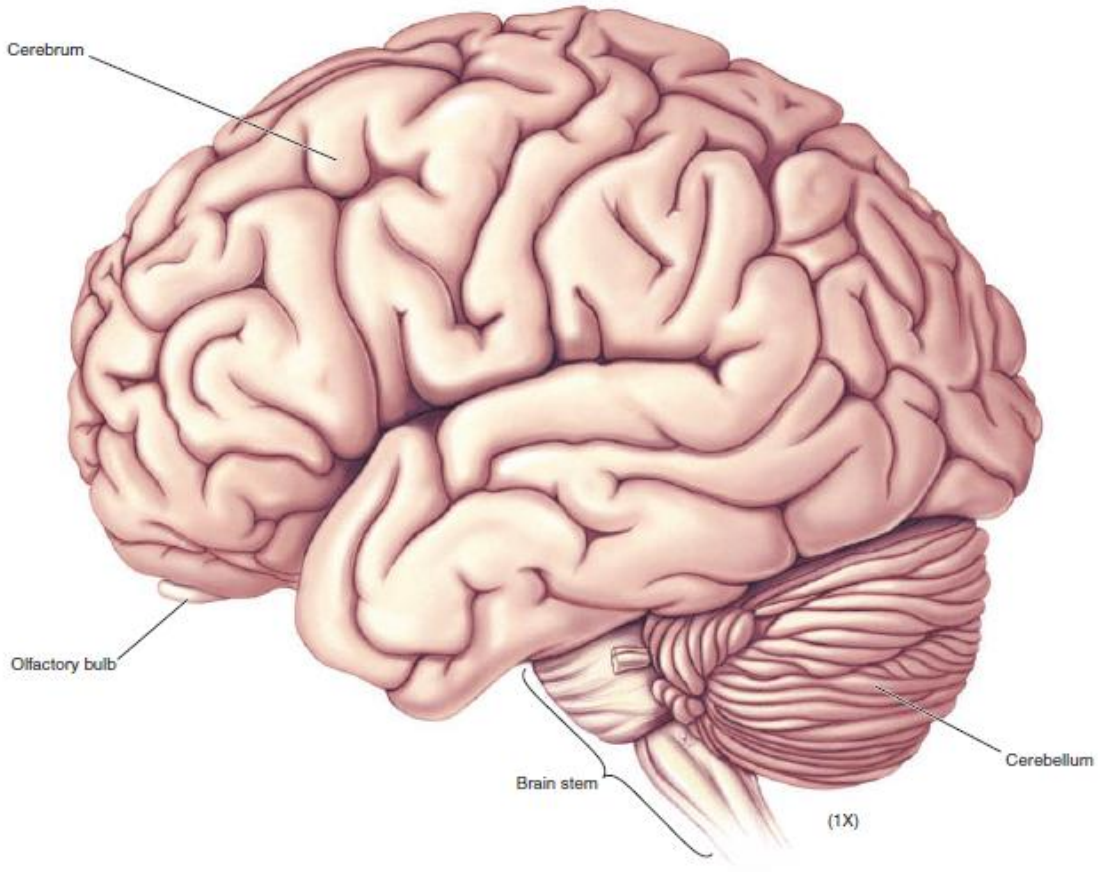
2 – A membrana celular

-**Condução**



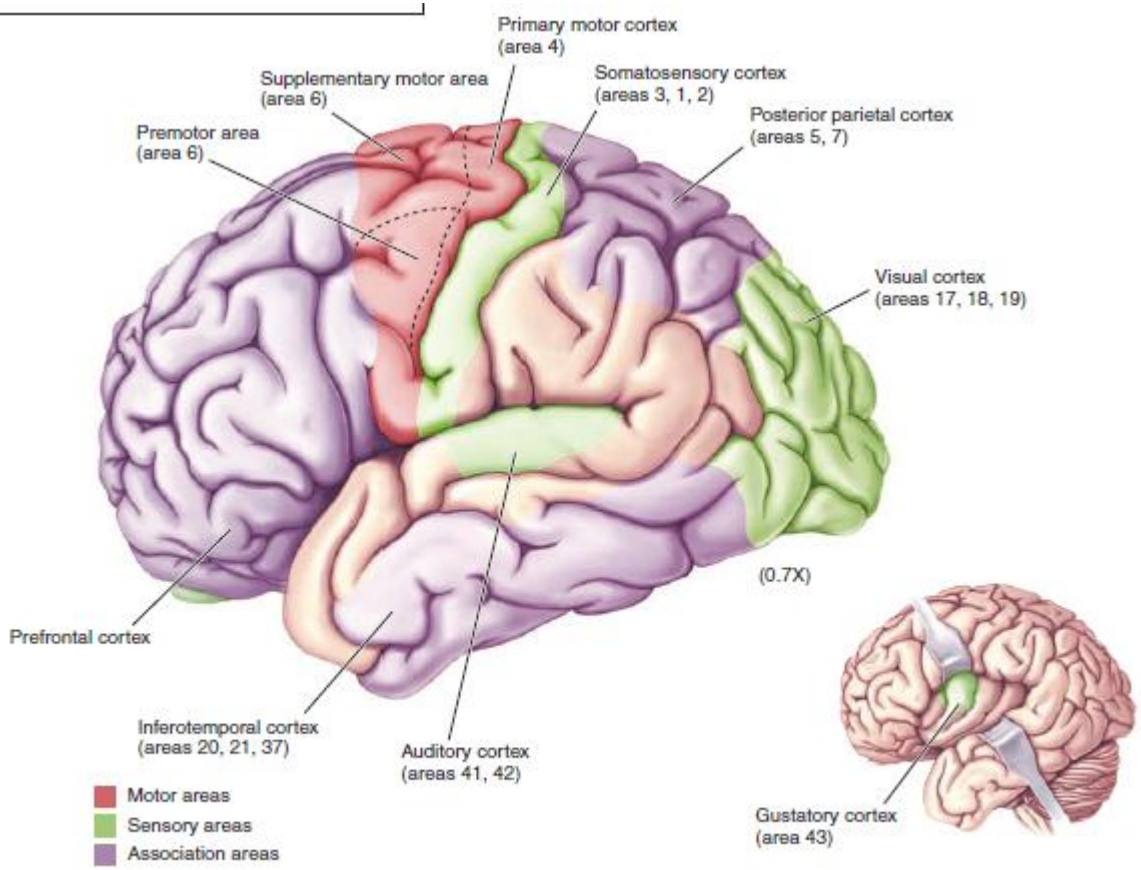
3 - Encéfalo

-**Encéfalo**

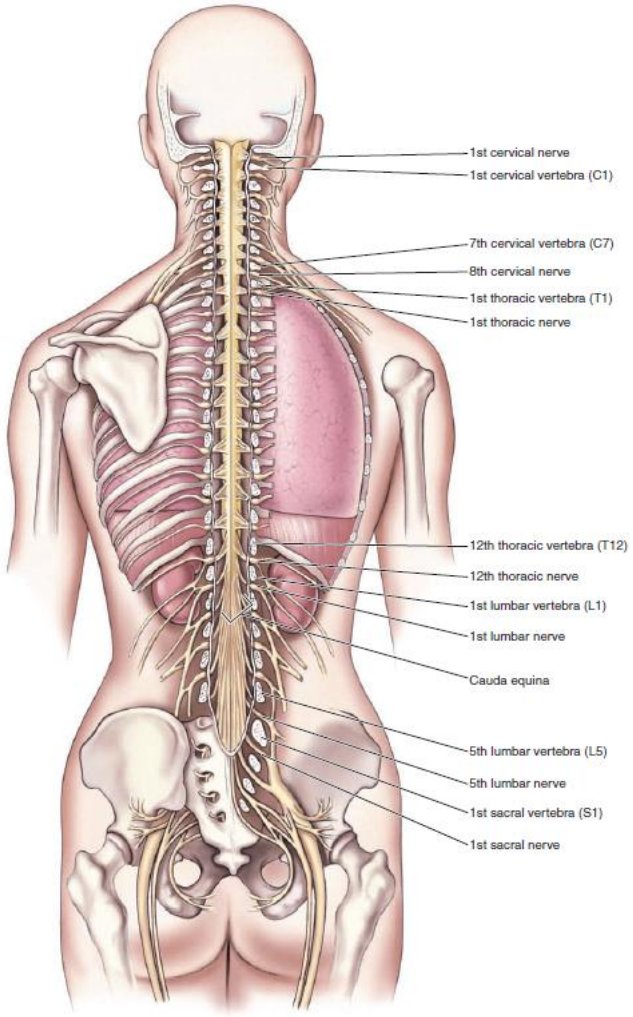


3 - Encéfalo

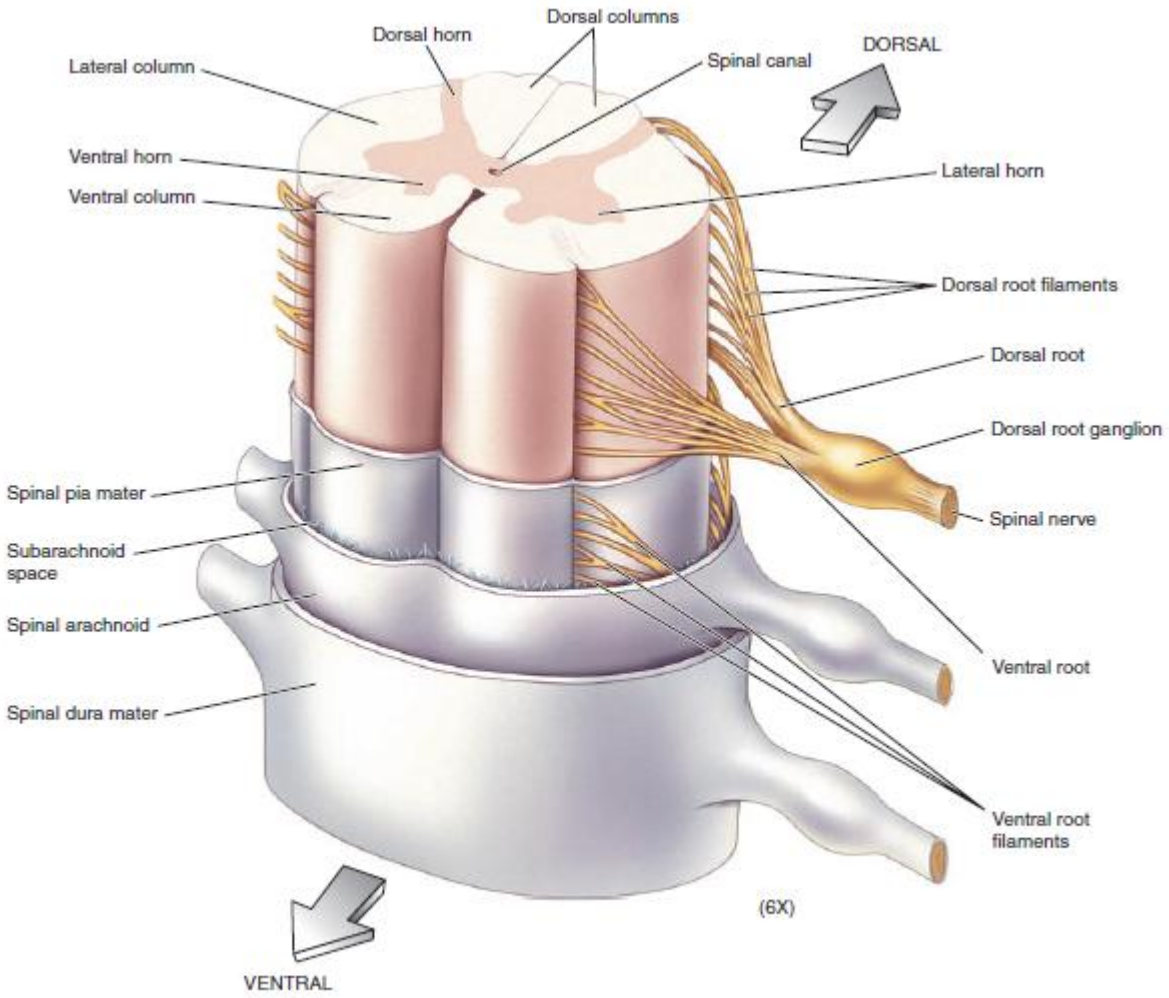
-**Encéfalo**



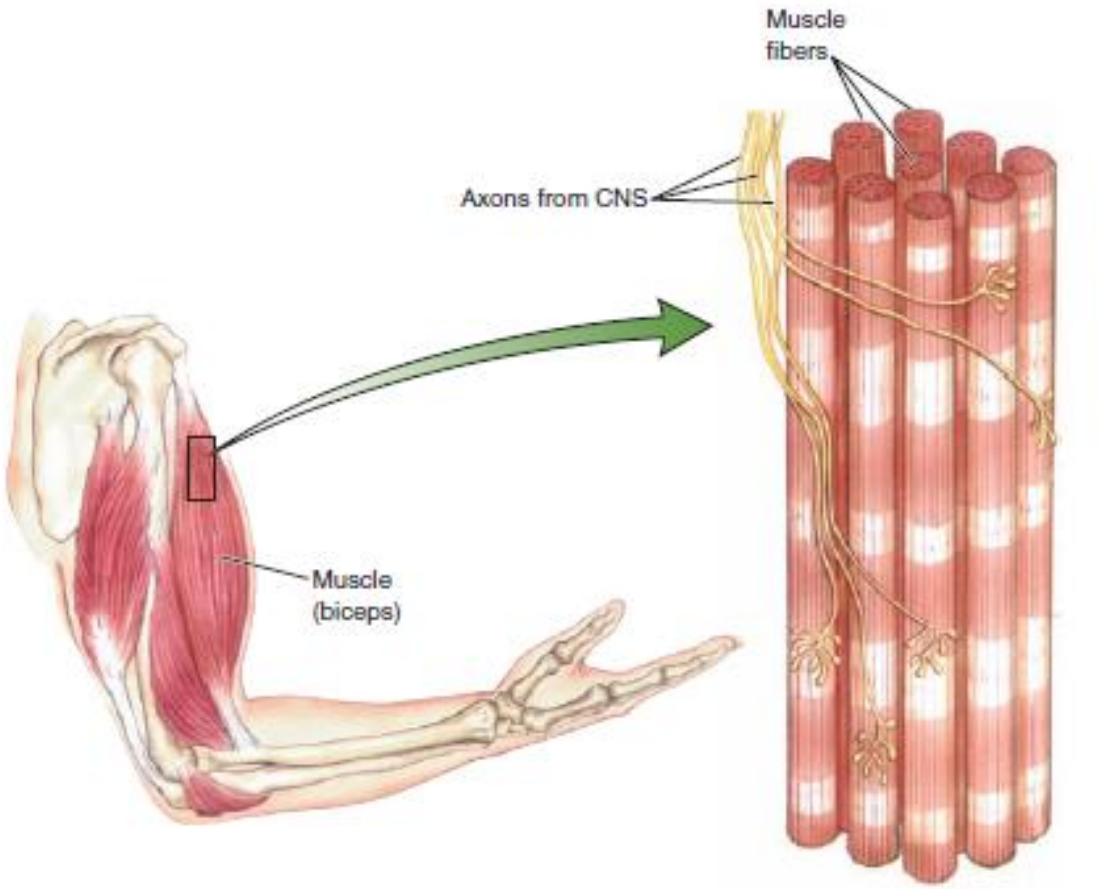
4 – Medula espinhal



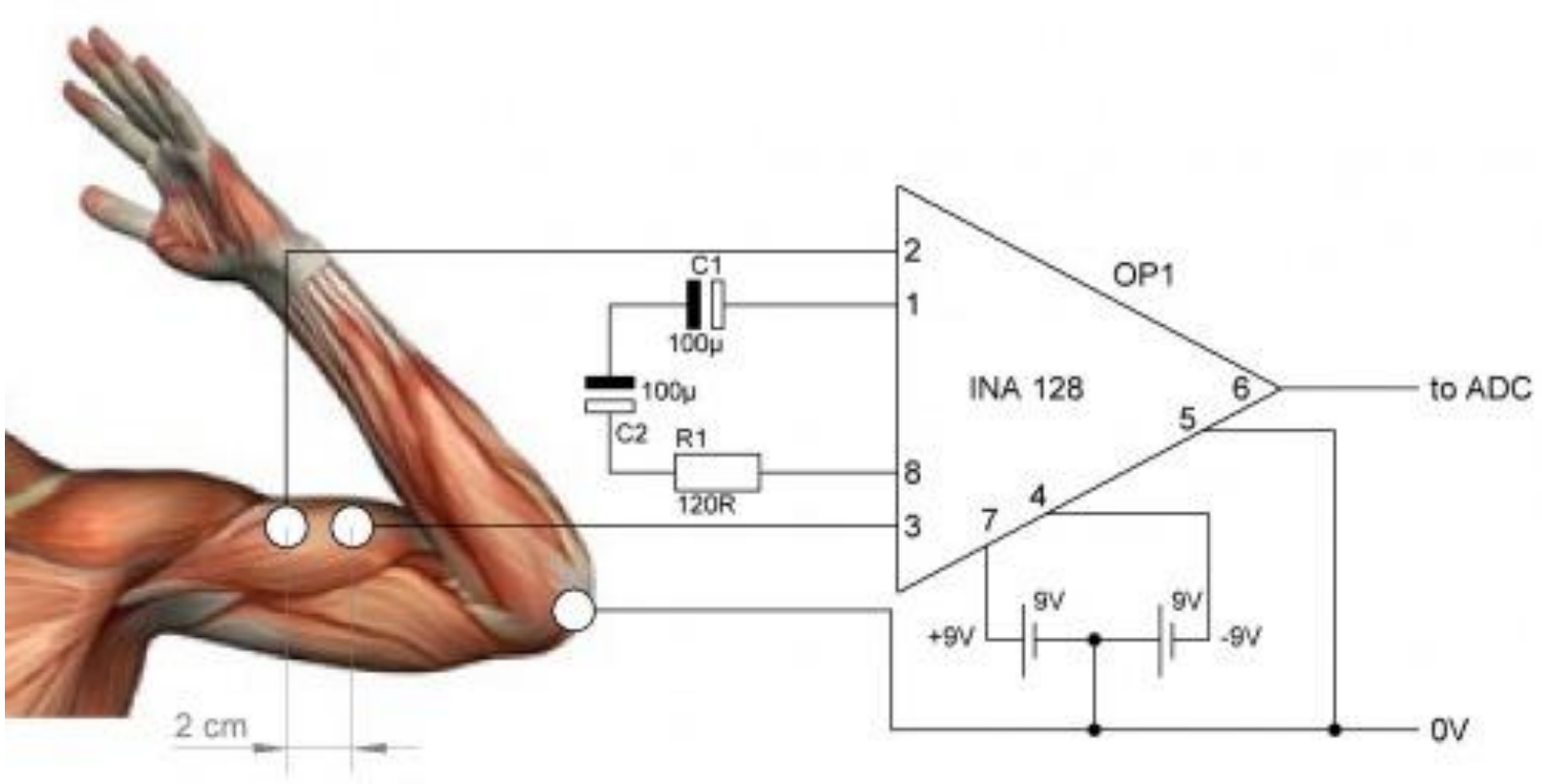
4 – Medula espinhal



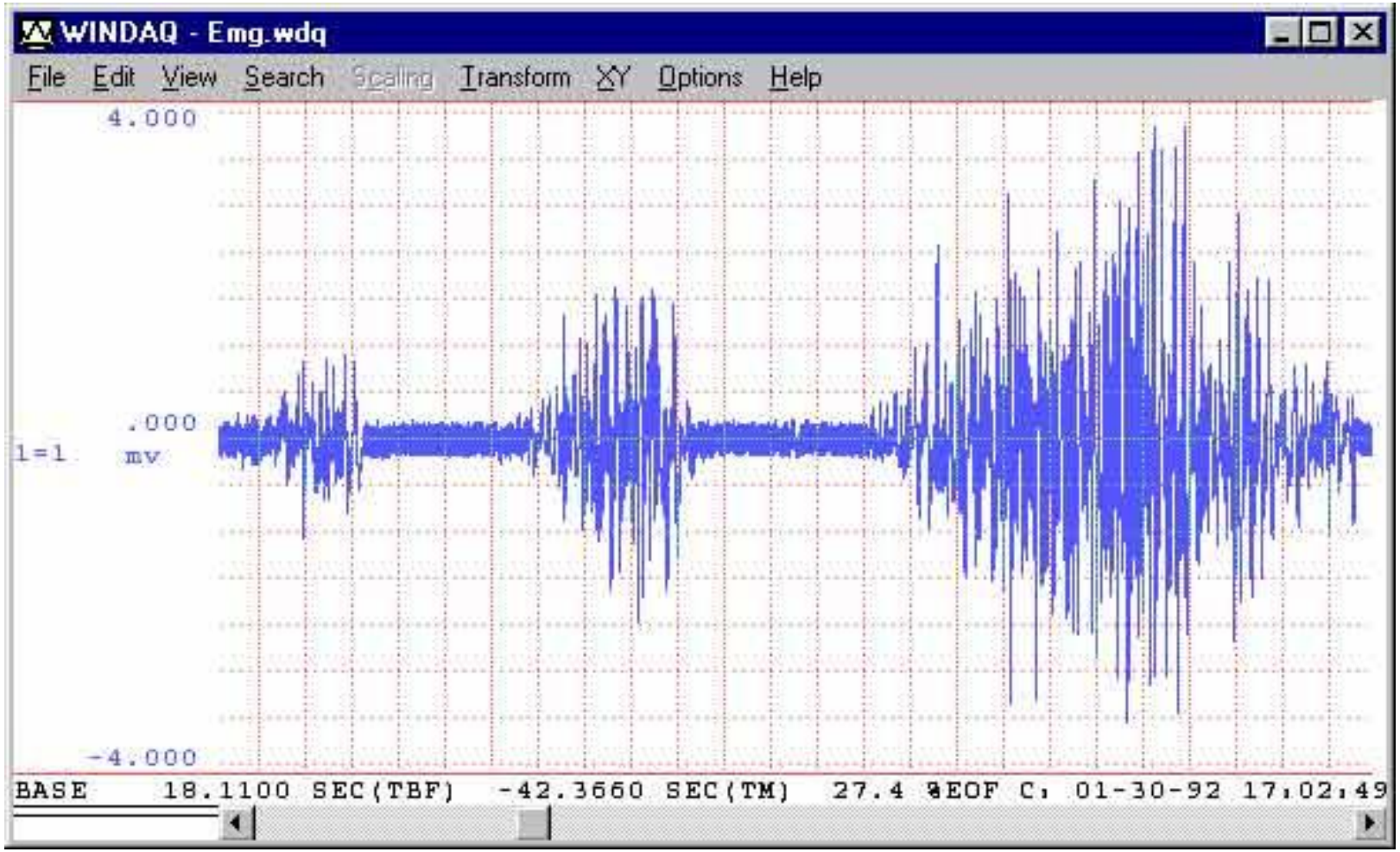
5 – SISTEMA MOTOR



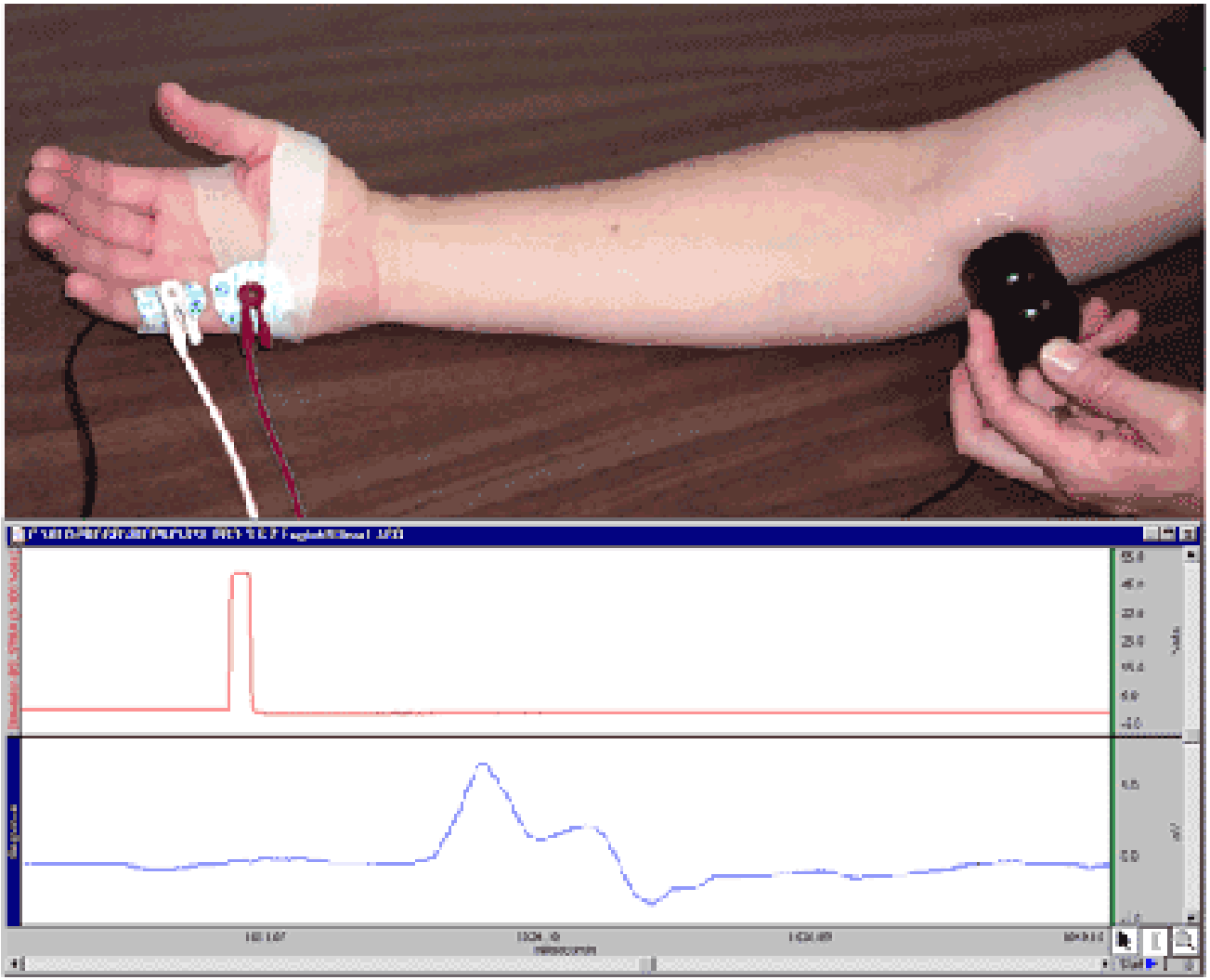
6 - EMG


C1
100µ
100µ
C2
R1
120R
2
1
8
3
OP1
INA 128
6
5
4
7
to ADC
9V
9V
+9V
-9V
0V
2 cm

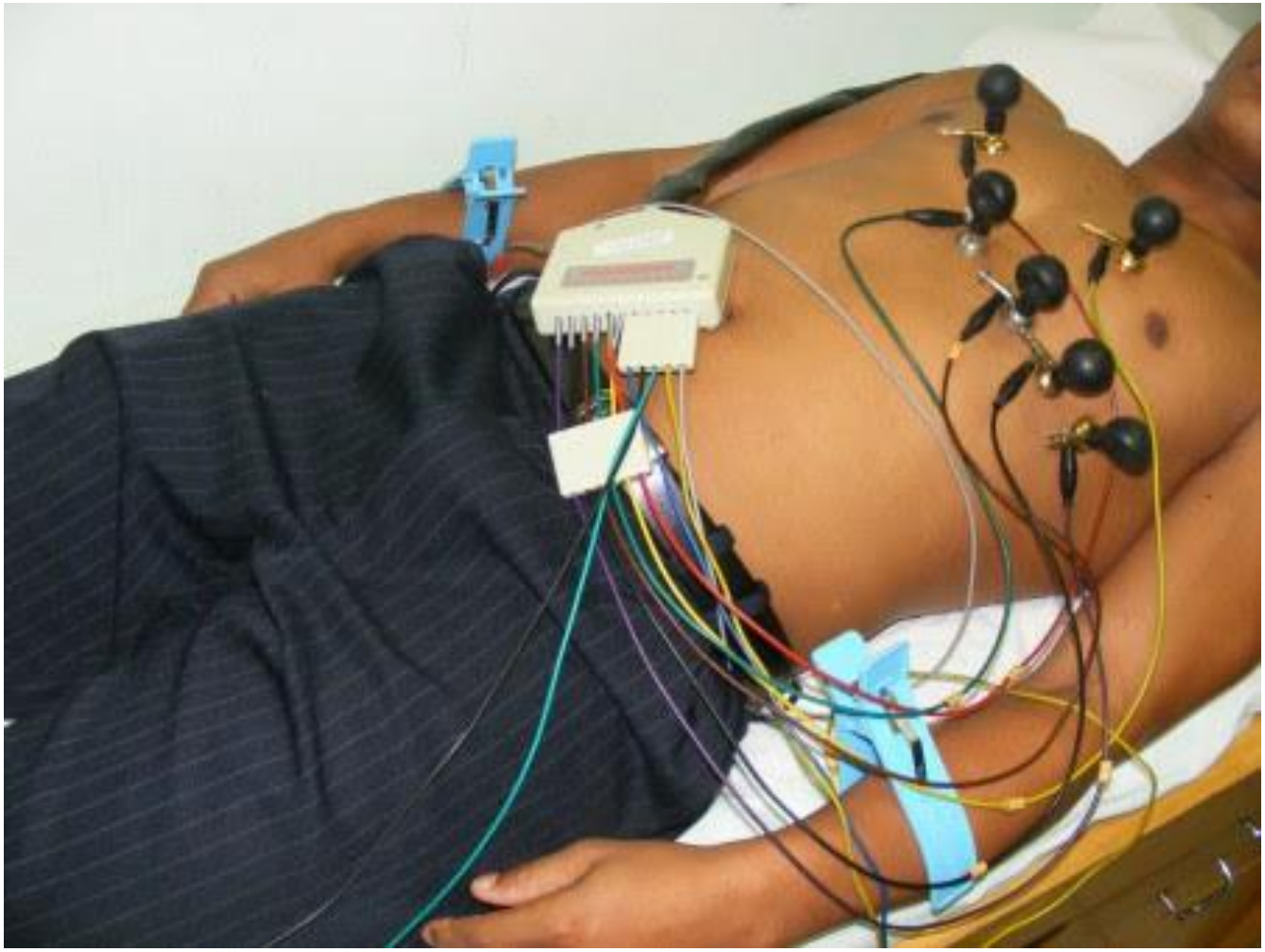
6 - EMG


WINDAQ - Emg.wdq
File Edit View Search Scaling Transform XY Options Help
4.000
.000
1=1 mv
-4.000
BASE 18.1100 SEC(TBF) -42.3660 SEC(TM) 27.4 %EOF C: 01-30-92 17:02:49

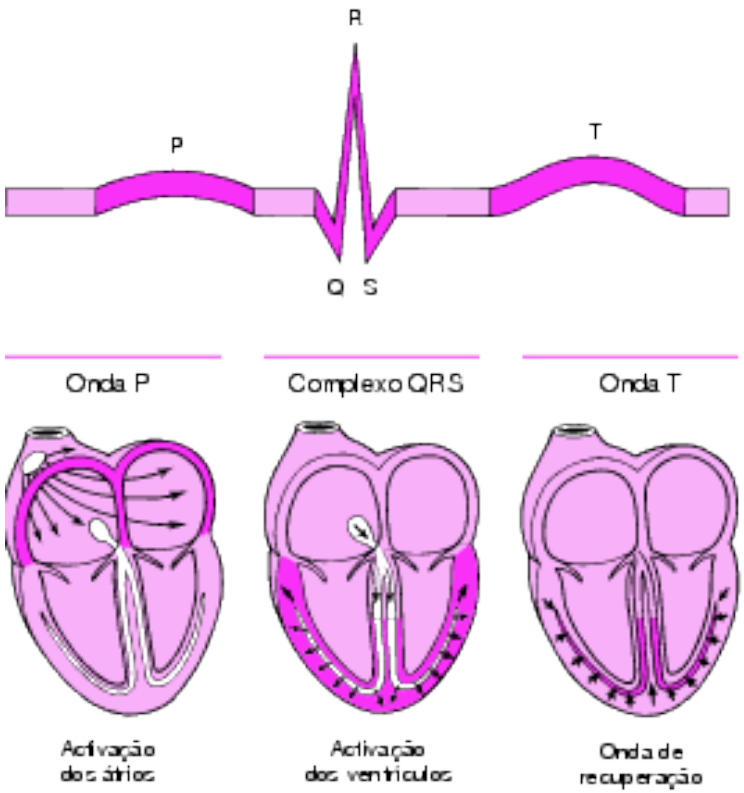
6 - EMG

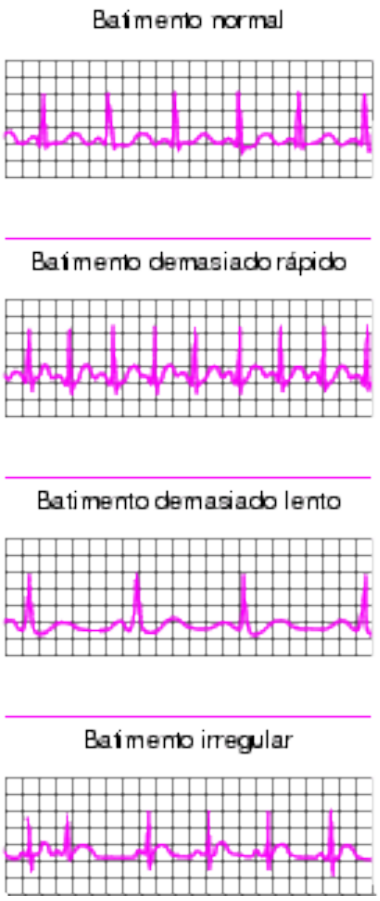


7 - ECG

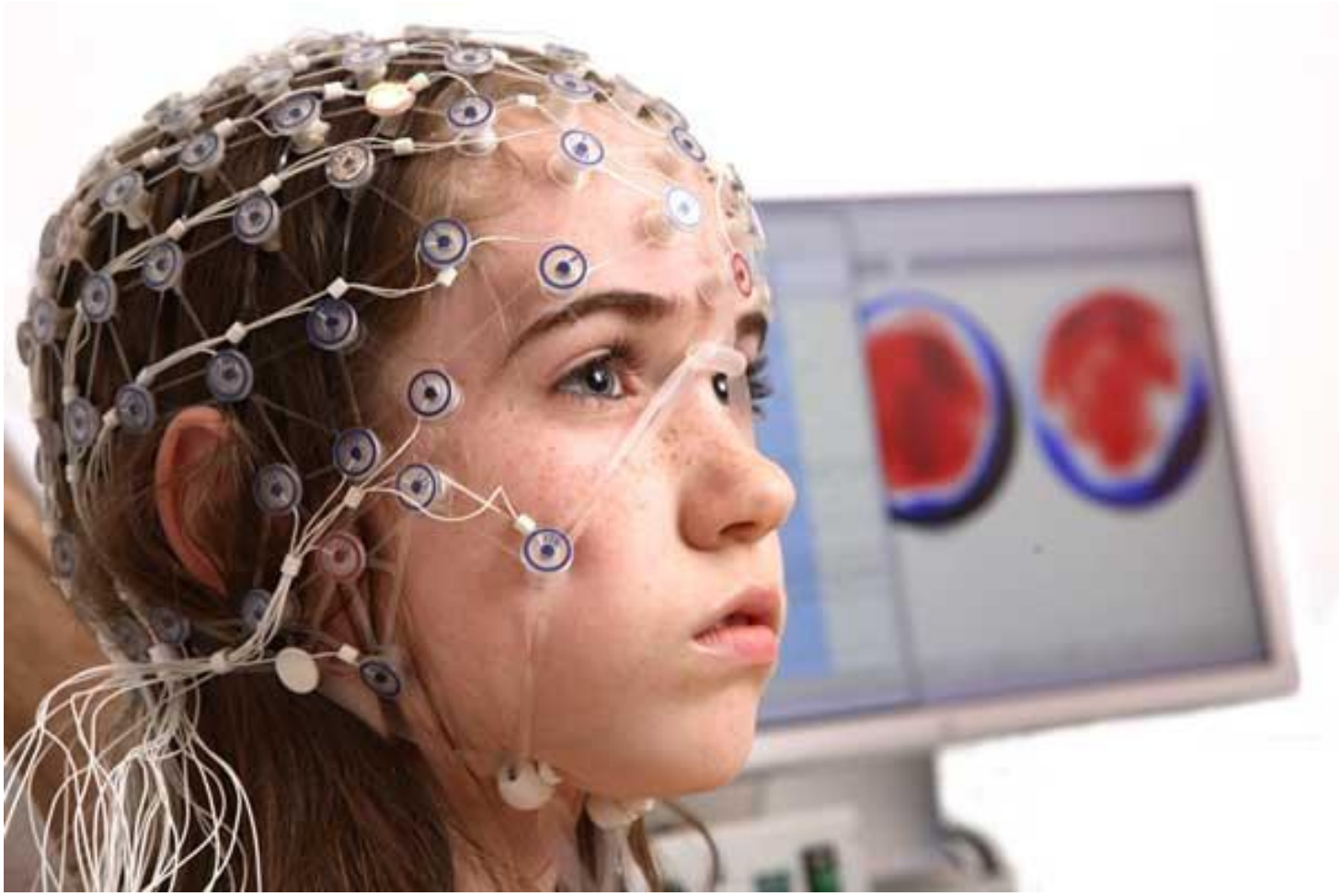


7 - ECG


R
P
T
Q
S
Onda P
Complexo QRS
Onda T
Activação dos átrios
Activação dos ventrículos
Onda de recuperação


Batimento normal
Batimento demasiado rápido
Batimento demasiado lento
Batimento irregular

8 - EEG



9 – ESTUDANDO O SISTEMA NERVOSO

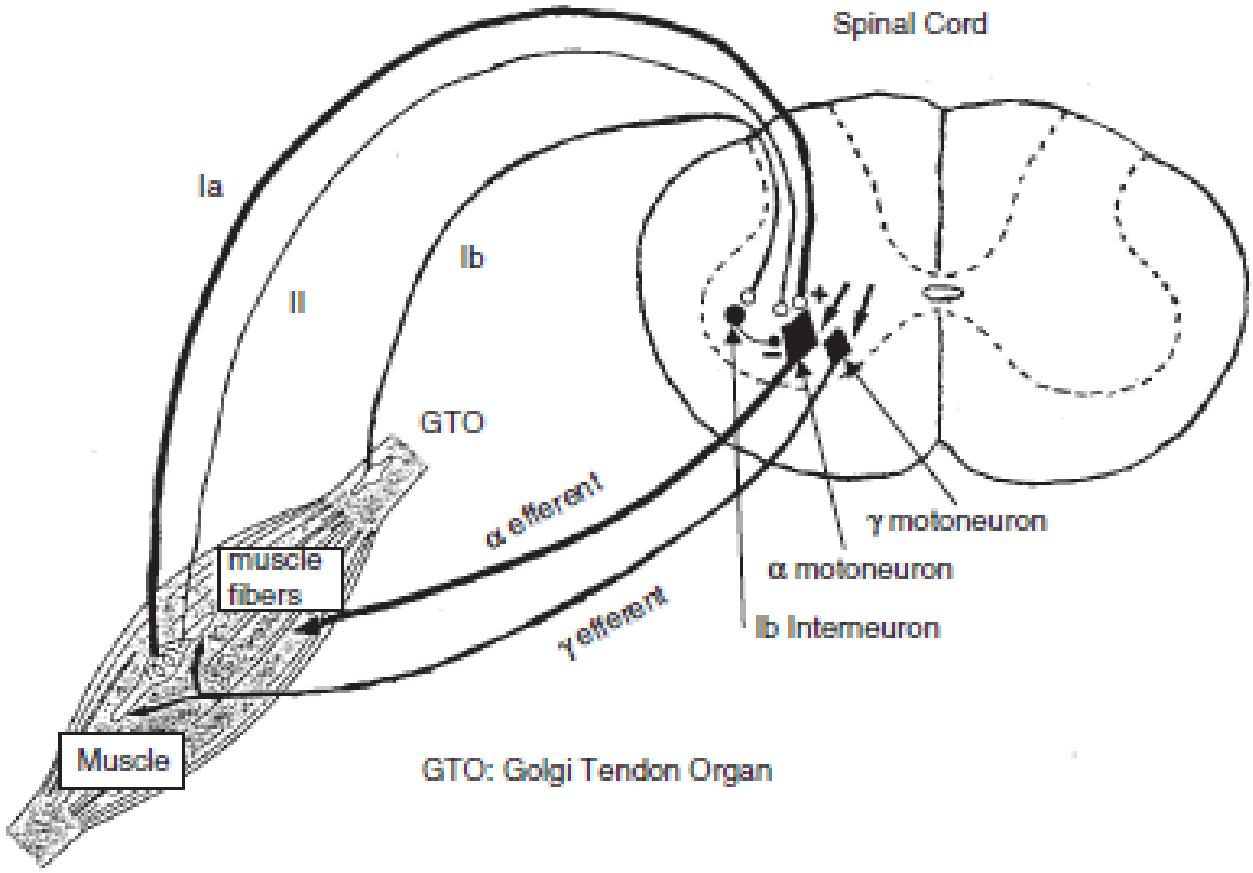
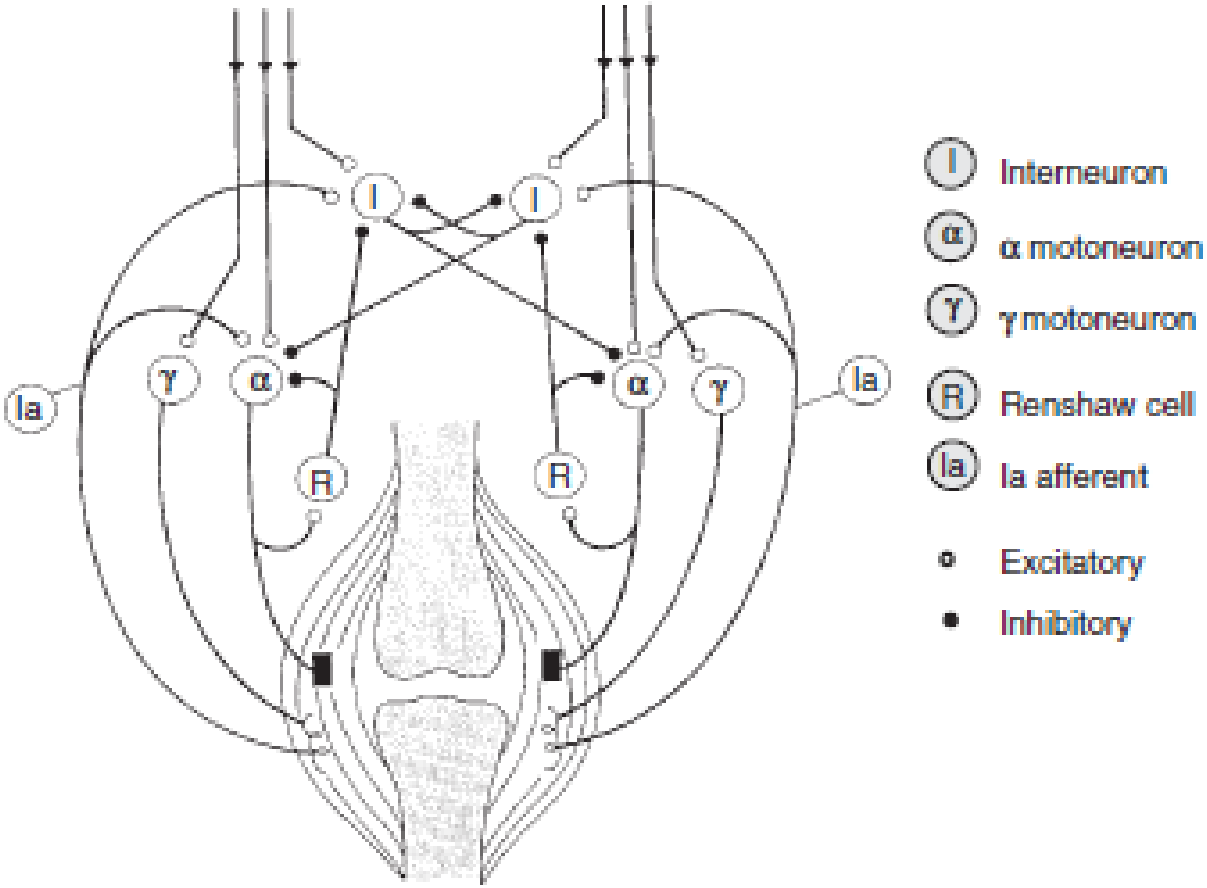


Figure 1.7. Schematic representation of the reflex components.

9 – ESTUDANDO O SISTEMA NERVOSO



10 – REFERÊNCIAS

-**1 – Neuroscience – Exploring the Brain – Bear, Connors, Paradiso**
-**2 - Electromyography – Merletti, Parker**
-**3 – Principles of Neural Science - Kandel**

Felipe Fava de Lima 05/2015
felipefavadelima@gmail.com