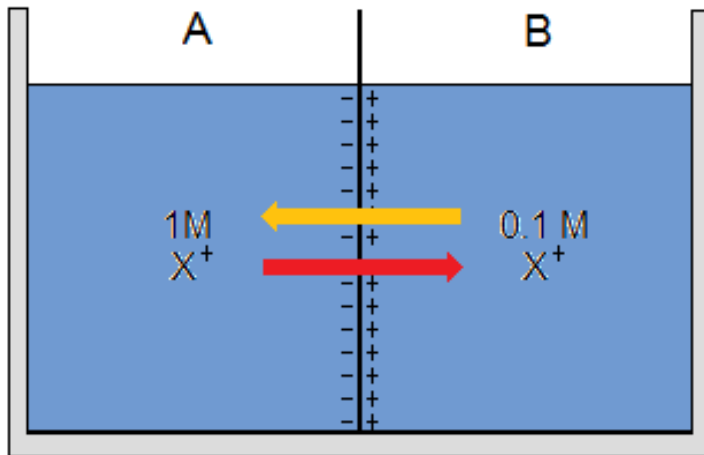


Potencial de Membrana

Potencial de membrana



$$\Delta\mu(X) = \mu_A(X) - \mu_B(X) = RT \ln \frac{[X]_A}{[X]_B} + zF(E)$$

$$\Delta\mu = RT \ln \frac{[X]_A}{[X]_B} + zF(E_A - E_B) = 0$$

$$E_A - E_B = -\frac{RT}{zF} \ln \frac{[X]_A}{[X]_B}$$

$$E_A - E_B = -61.5 \text{ mV} \log \frac{[X]_A}{[X]_B} = 61.5 \text{ mV} \log \frac{[X]_B}{[X]_A}$$

$$E = 61.5 \text{ mV} \log \frac{P_K [K_e] + P_{Na} [Na_e] + P_{Cl} [Cl_i]}{P_K [K_i] + P_{Na} [Na_i] + P_{Cl} [Cl_e]}$$

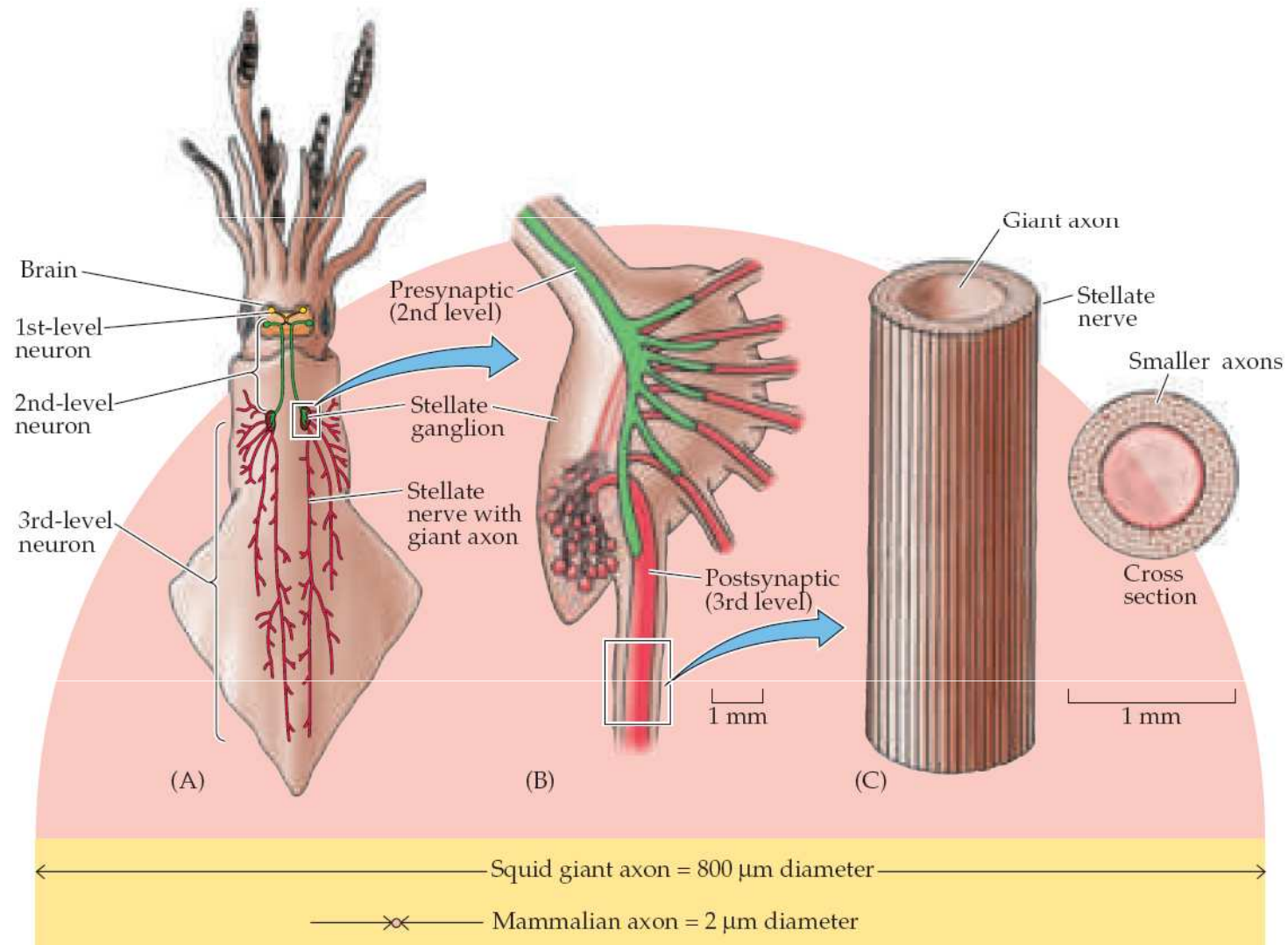
Potencial de membrana

- Todas las células del organismo mantienen una diferencia de potencial eléctrico a través de la membrana.
- Este “potencial de membrana” se debe a una pequeña diferencia de distribución de cargas a un lado y otro de la membrana. Esto debido a:
 - La difusión pasiva de iones
 - La actividad de las bombas iónicas

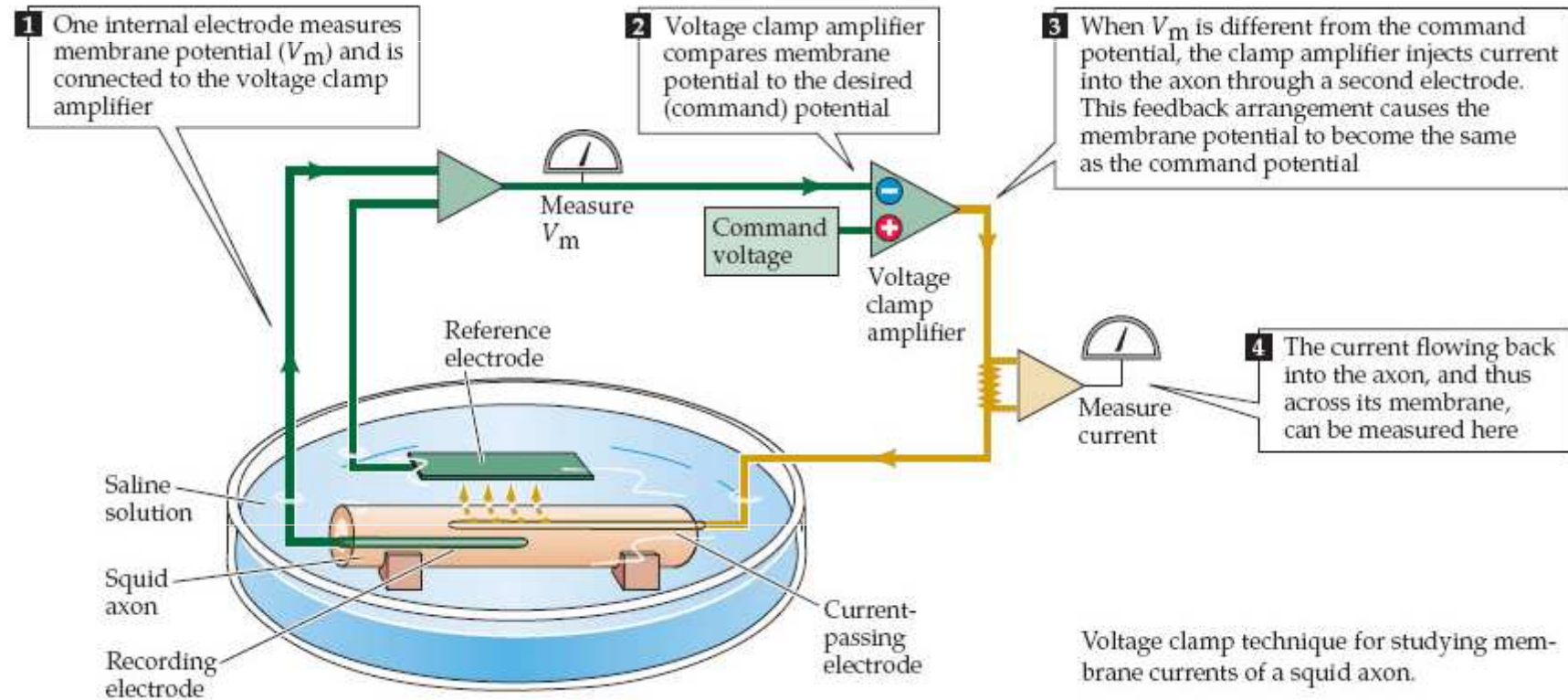
Membrana Celular

| | Líquido Extracelular | Líquido Intracelular |
|-------------------------------|----------------------|----------------------|
| Na ⁺ | 142 mEq/l | 10 mEq/l |
| K ⁺ | 4 mEq/l | 140 mEq/l |
| Ca ⁺⁺ | 2.4mEq/l | 0.0001 mEq/l |
| Mg ⁺⁺ | 1.2 mEq/l | 58 mEq/l |
| Cl ⁻ | 103 mEq/l | 4 mEq/l |
| HCO ₃ ⁻ | 28mEq/l | 10 mEq/l |
| Fosfatos | 4mEq/l | 75 mEq/l |
| SO ₄ ⁻ | 1 mEq/l | 2 mEq/l |
| Glucosa | 90 mEq/l | 0 a 20 mEq/l |
| Aminoácidos | 30 mEq/l | 200 mEq/l |
| Colesterol | 0.5 g/dl | 2 a 95 g/dl |
| PO ₂ | 35 mmHg | 20 mmHg |
| PCO ₂ | 46 mm Hg | 50 mm Hg |
| pH | 7.4 | 7.0 |
| Proteínas | 2g/dl | 16 g/dl |

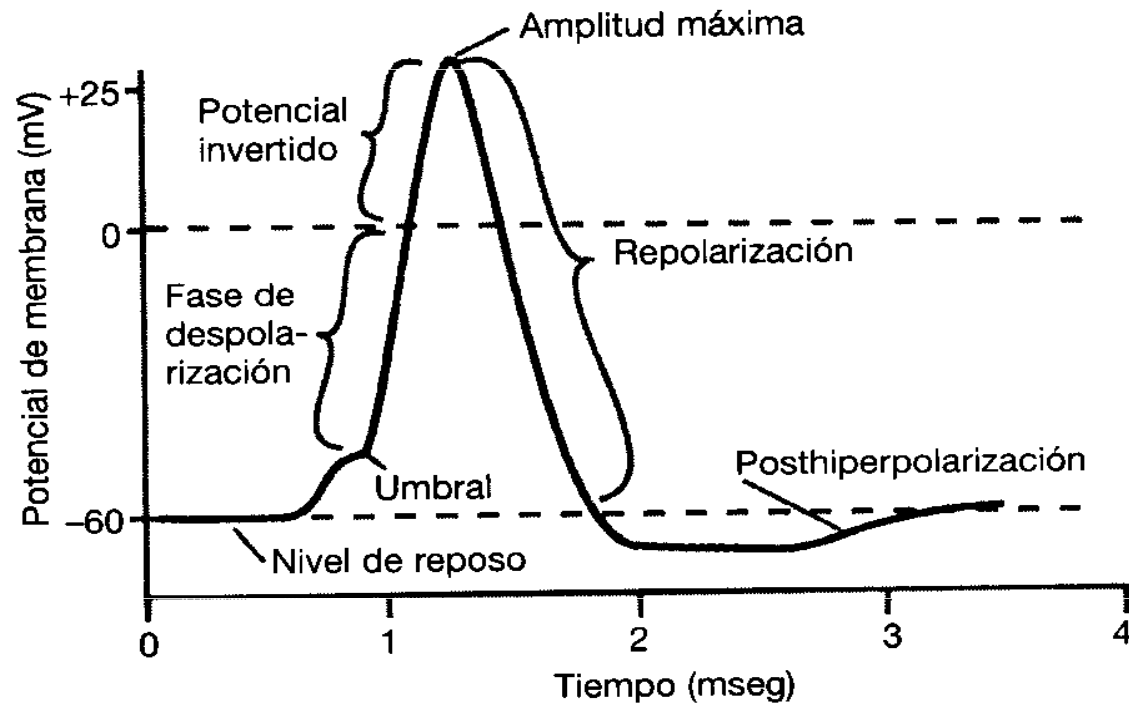
Medición de potenciales de membrana



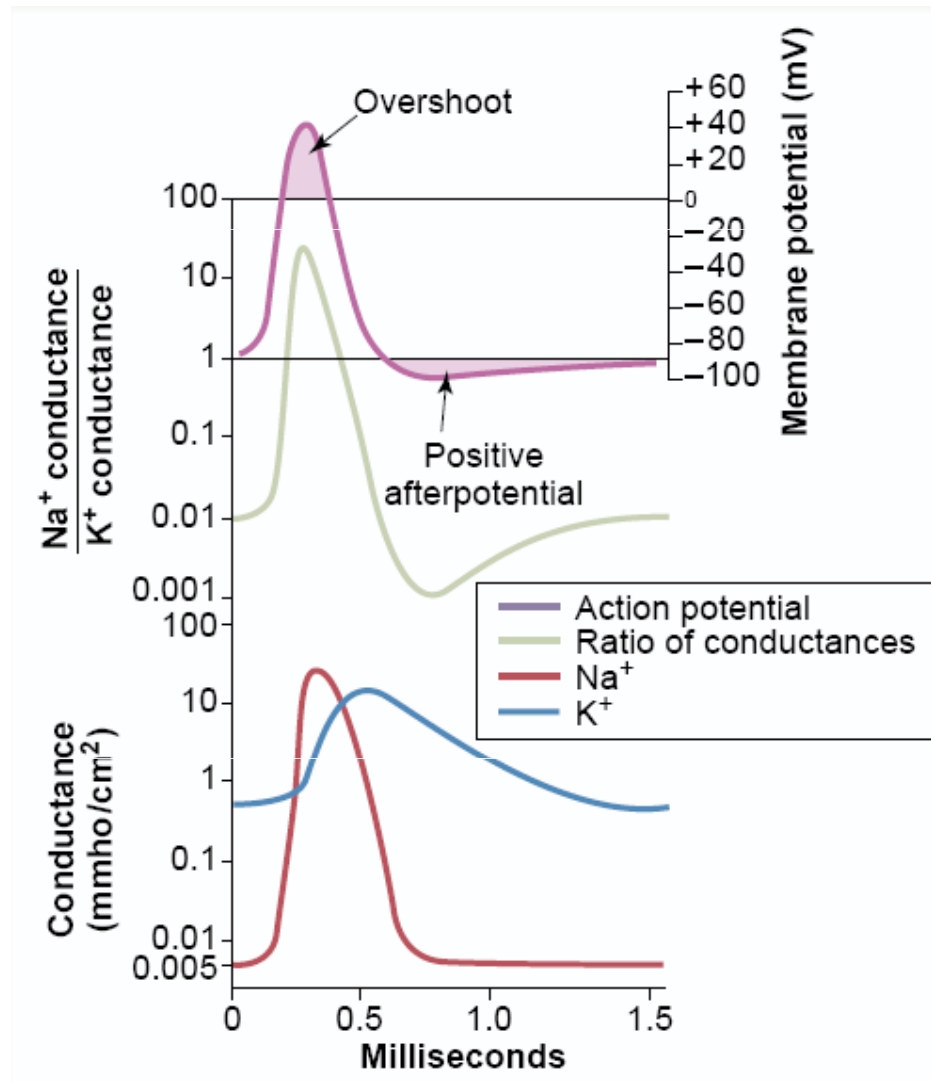
Medición de potenciales de membrana



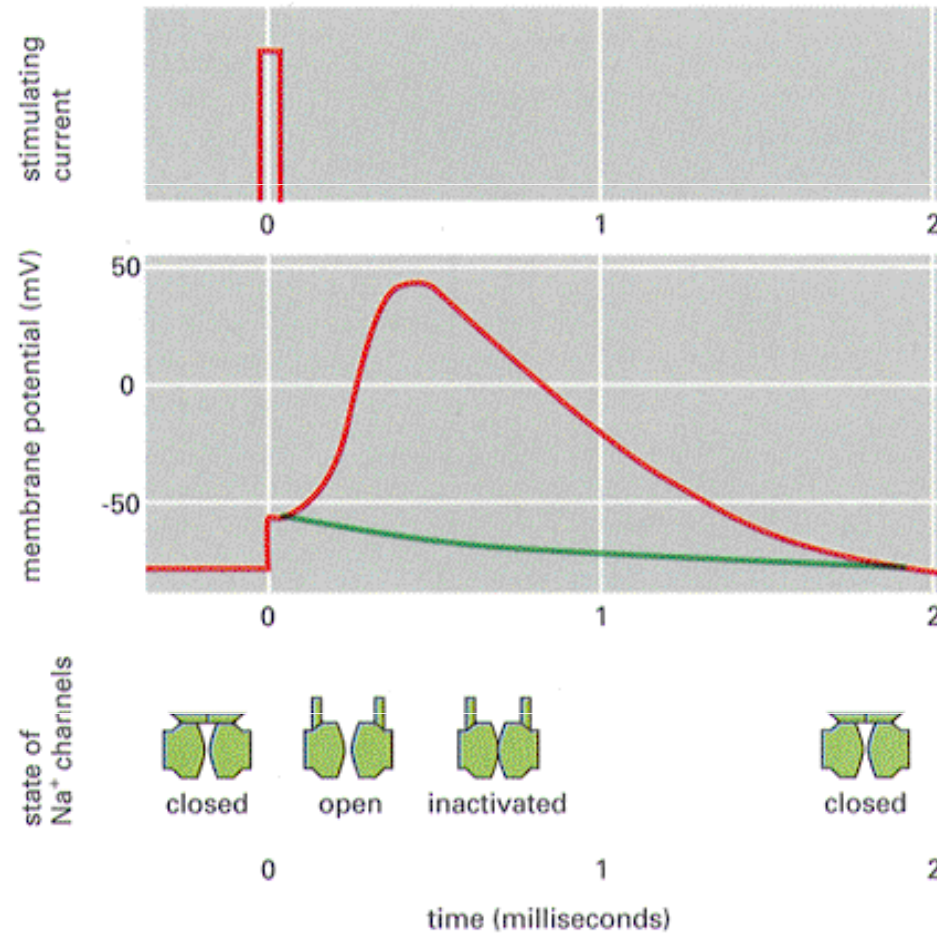
Potencial de Acción



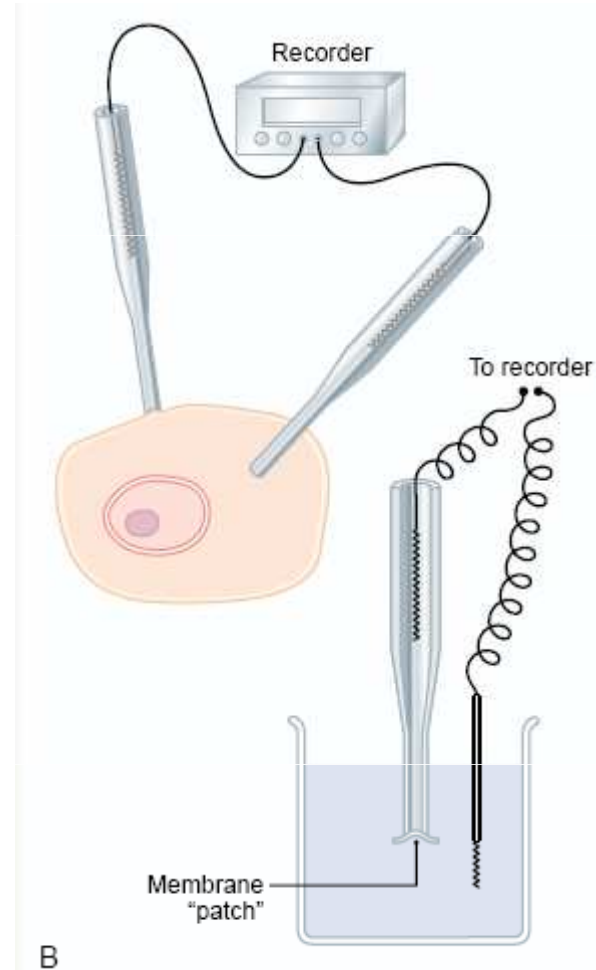
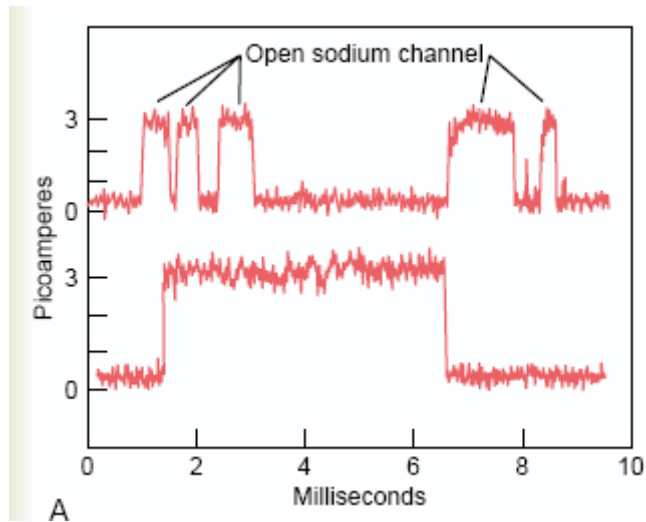
Potencial de Acción



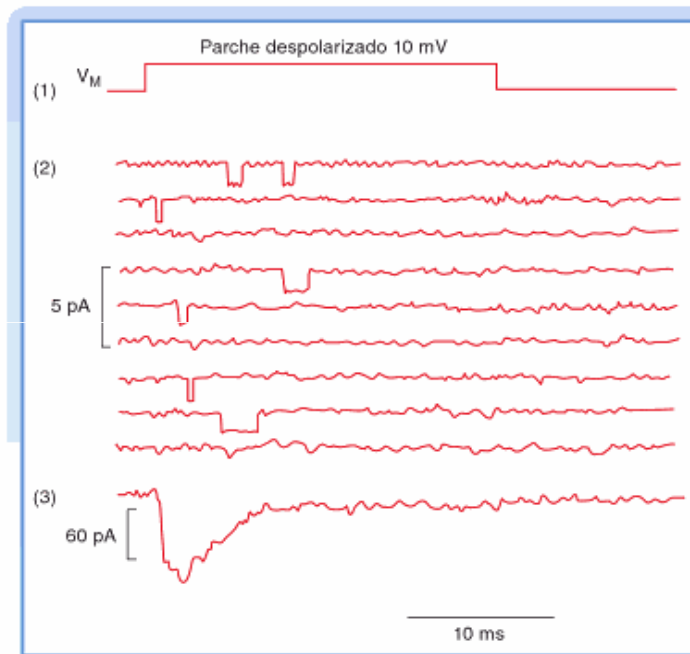
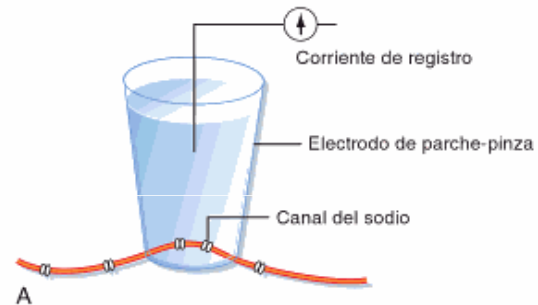
Potencial de Acción



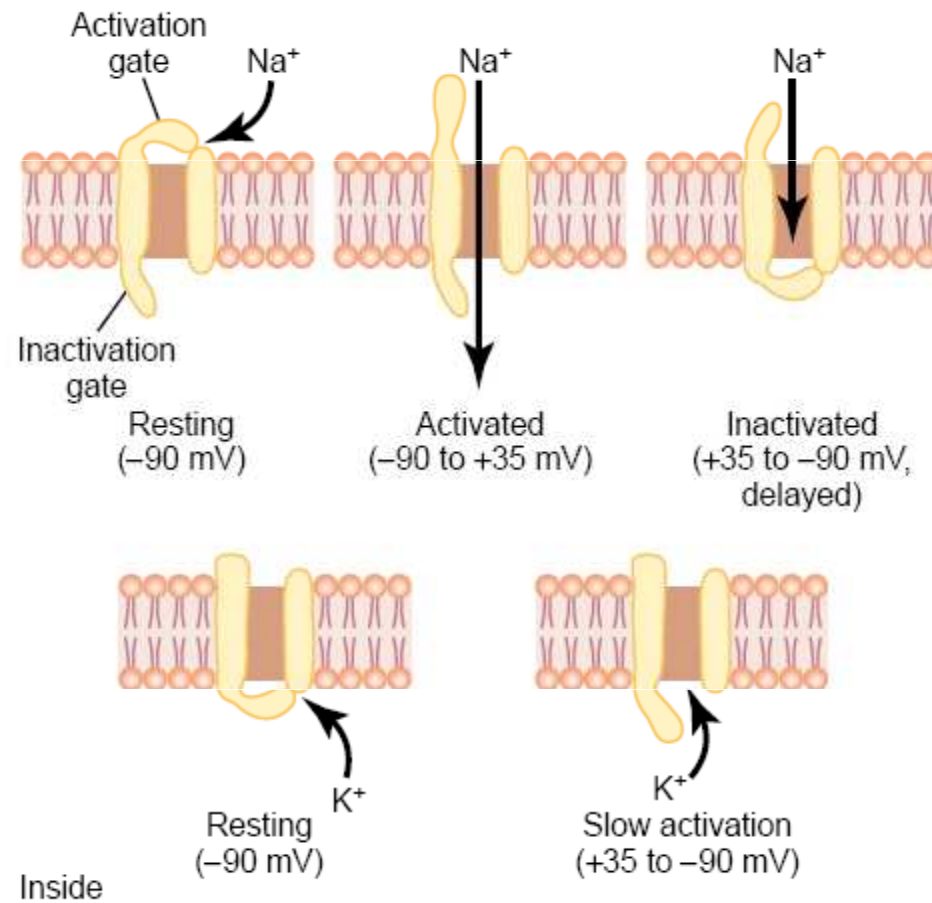
Medición de canales individuales



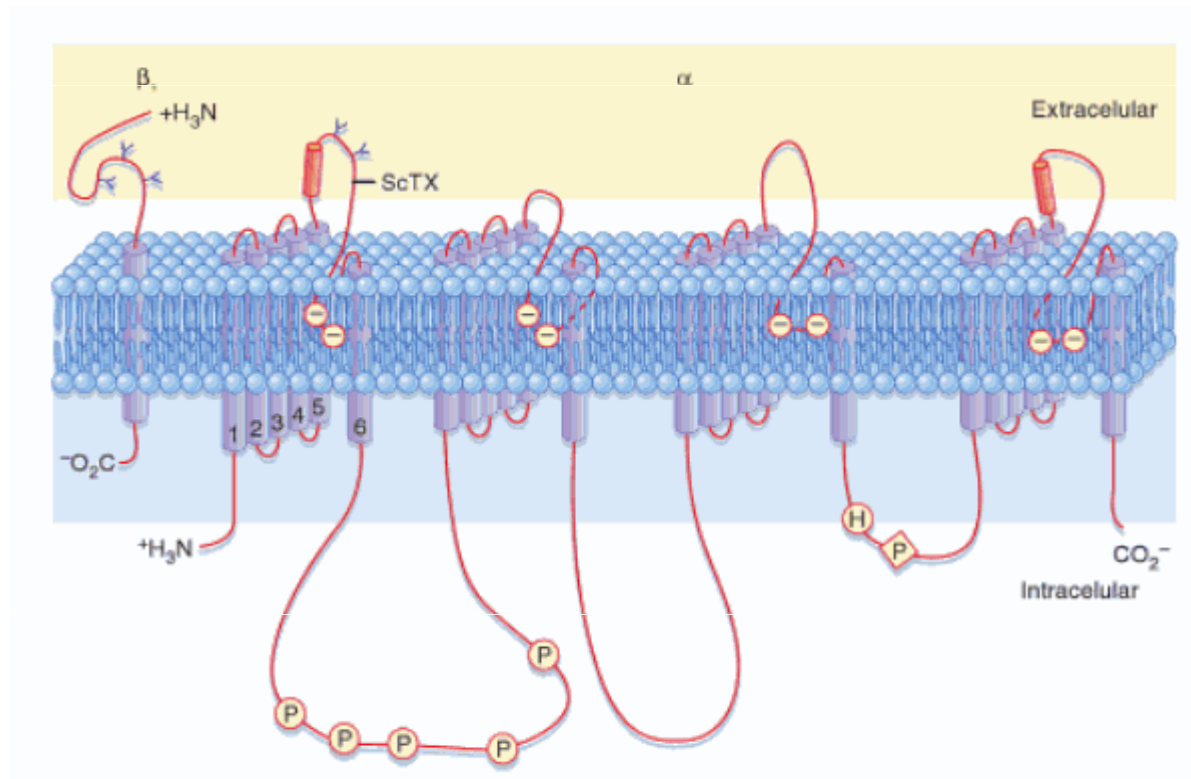
Medición de canales individuales



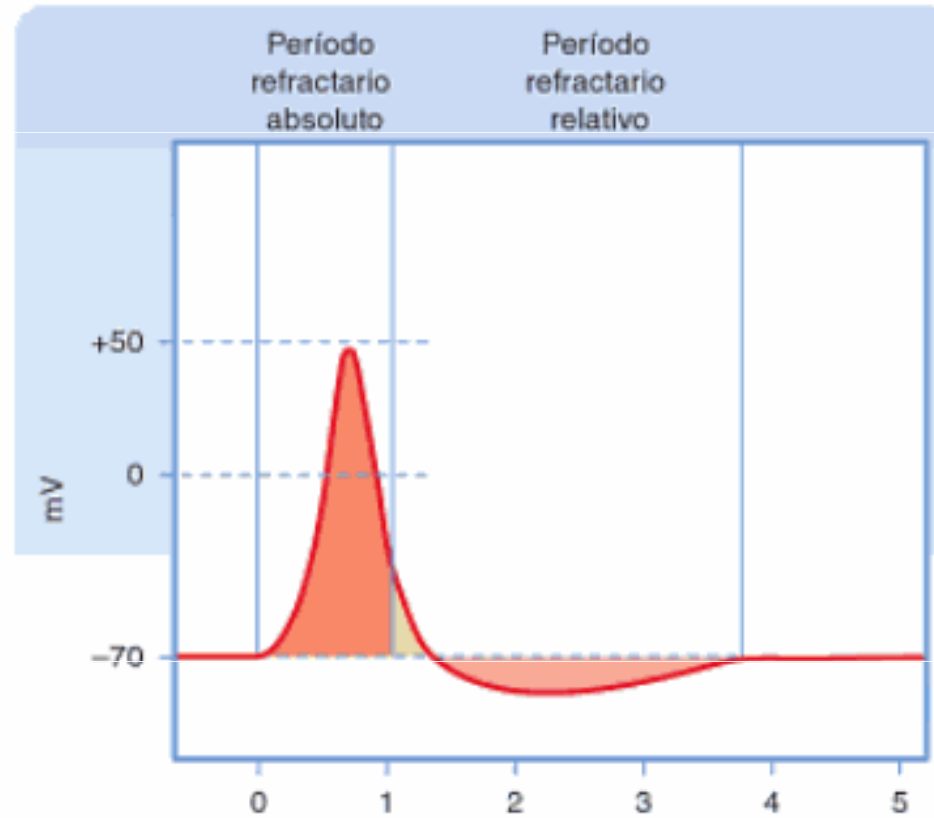
Canales de Na^+ y K^+



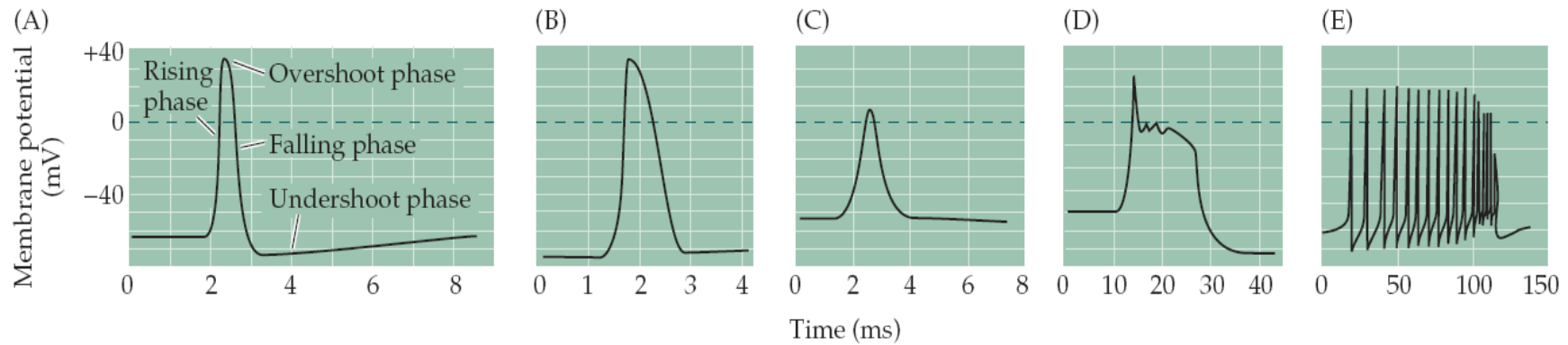
Canales de Na⁺ y K⁺



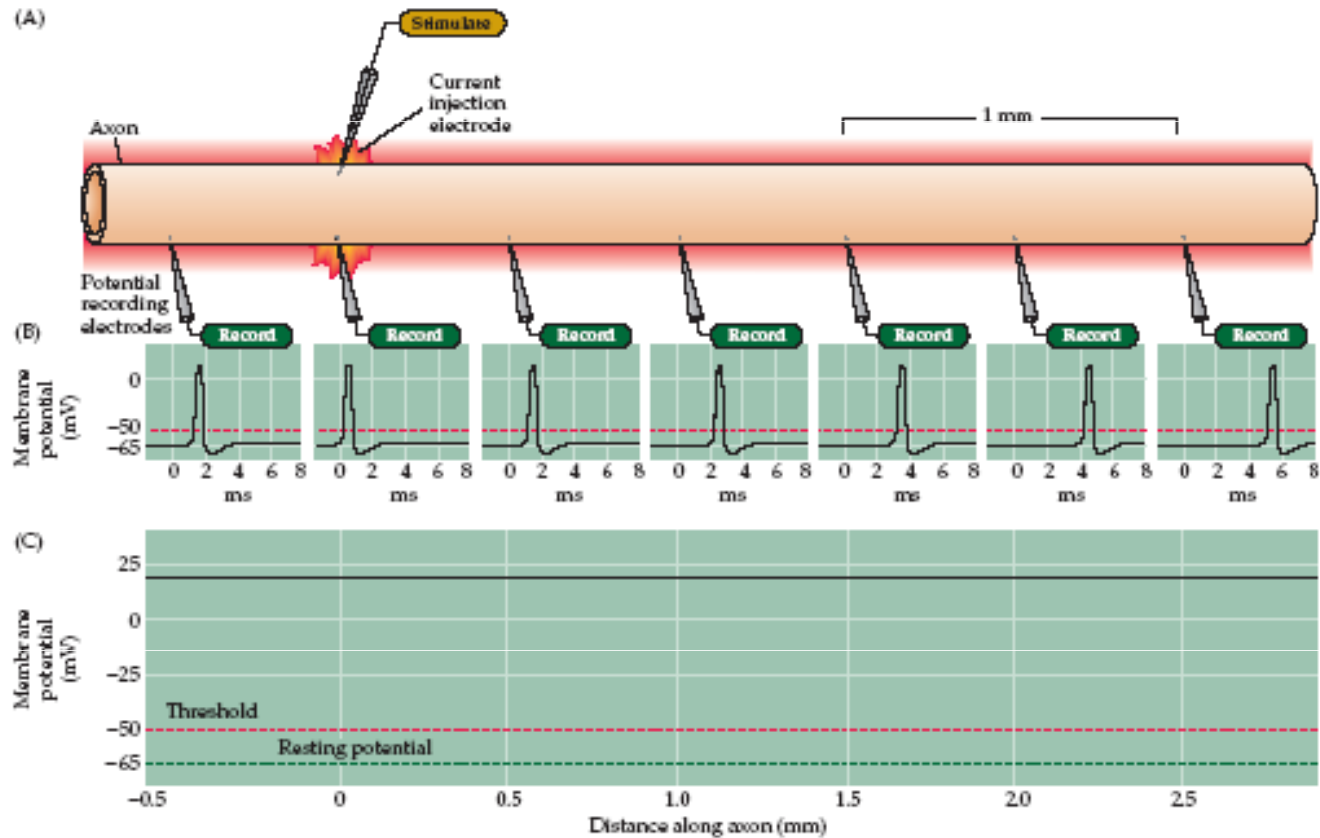
Periodo refractario



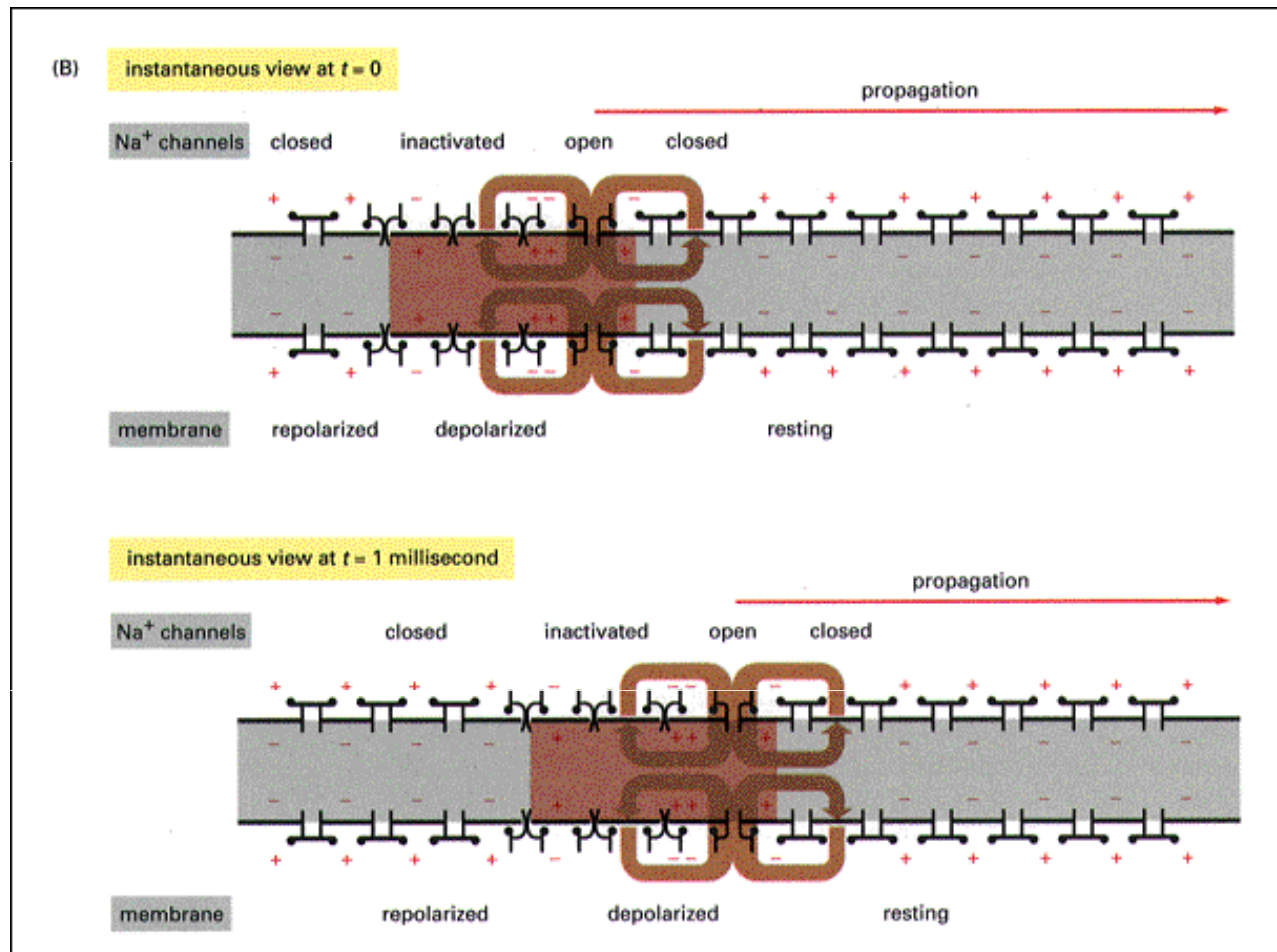
Potencial de Acción



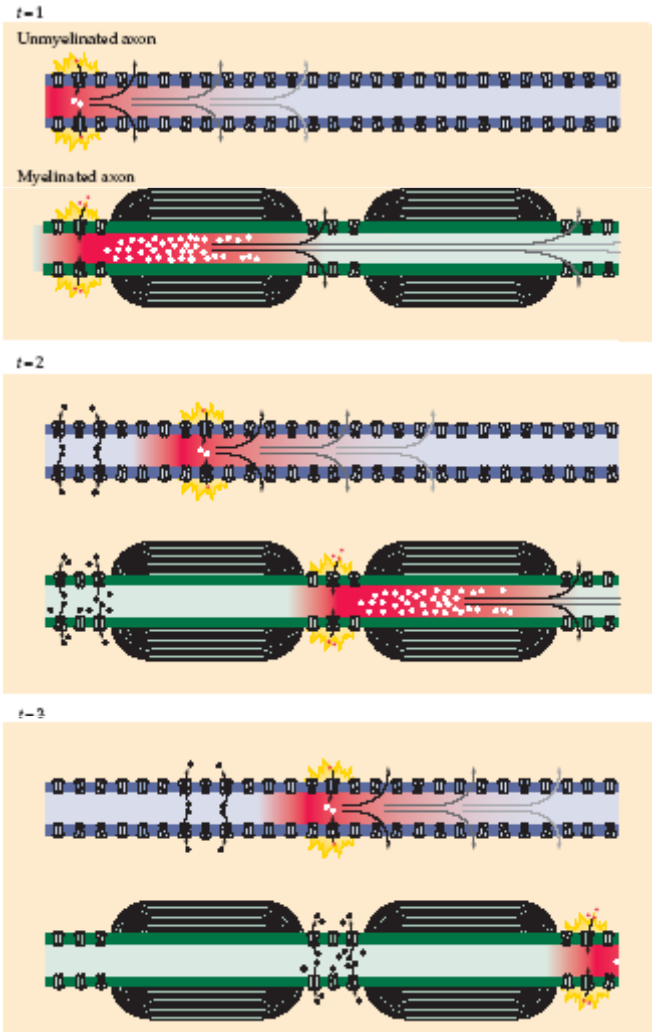
Conducción



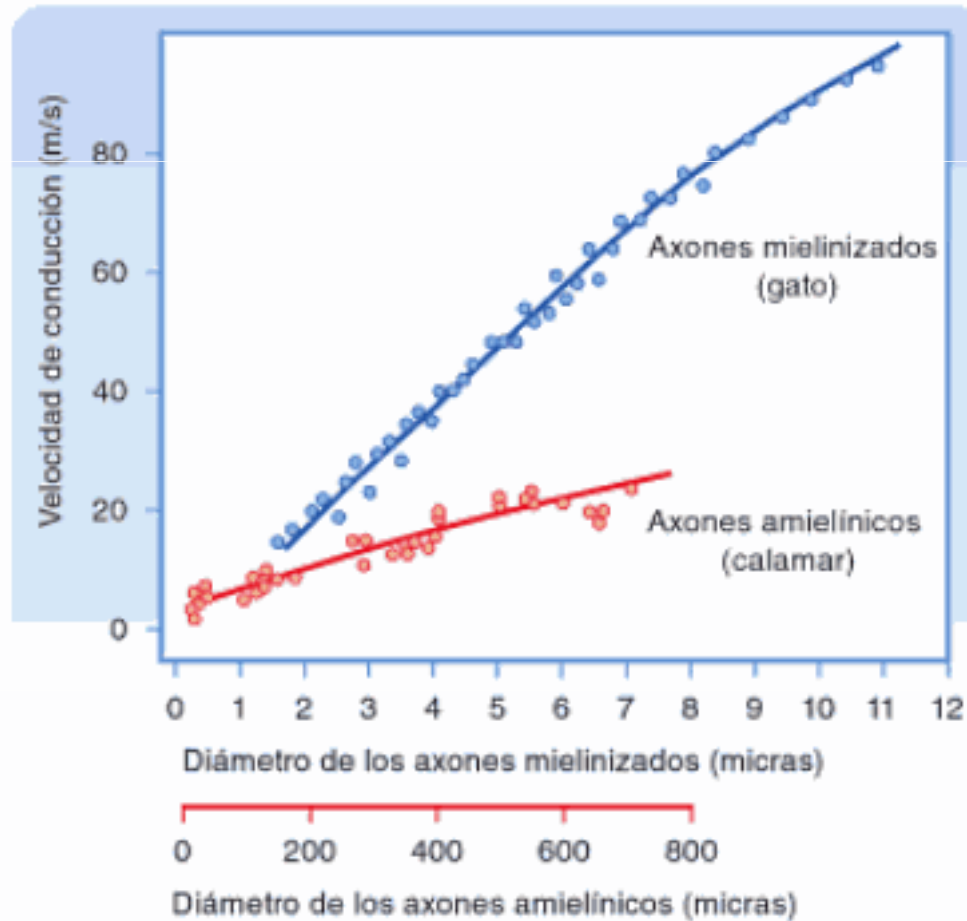
Conducción



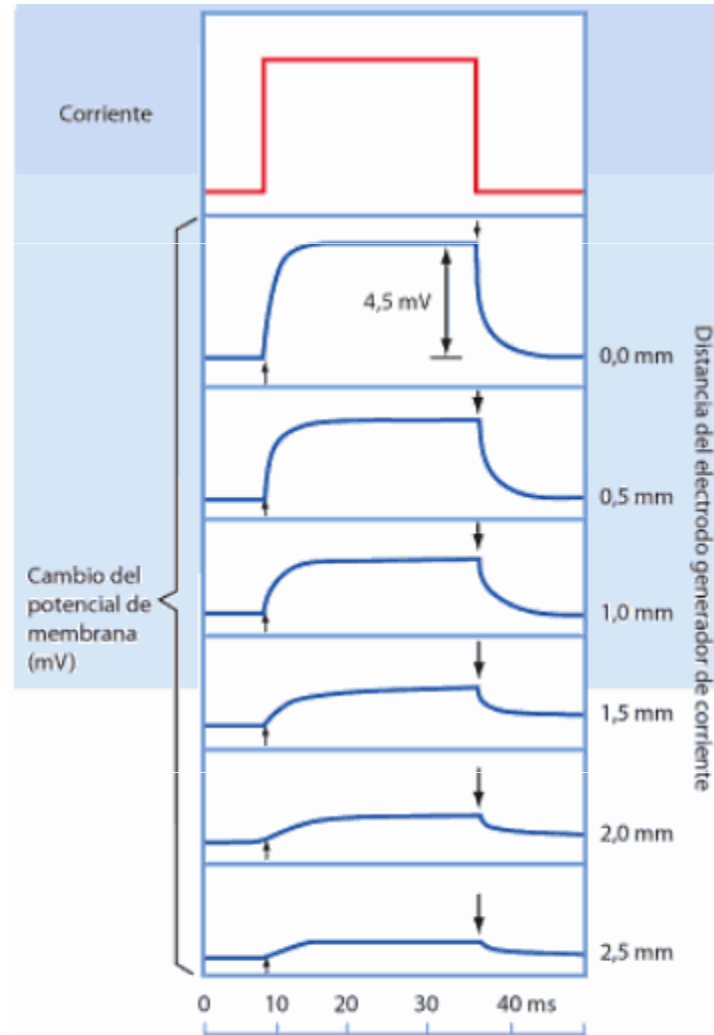
Conducción



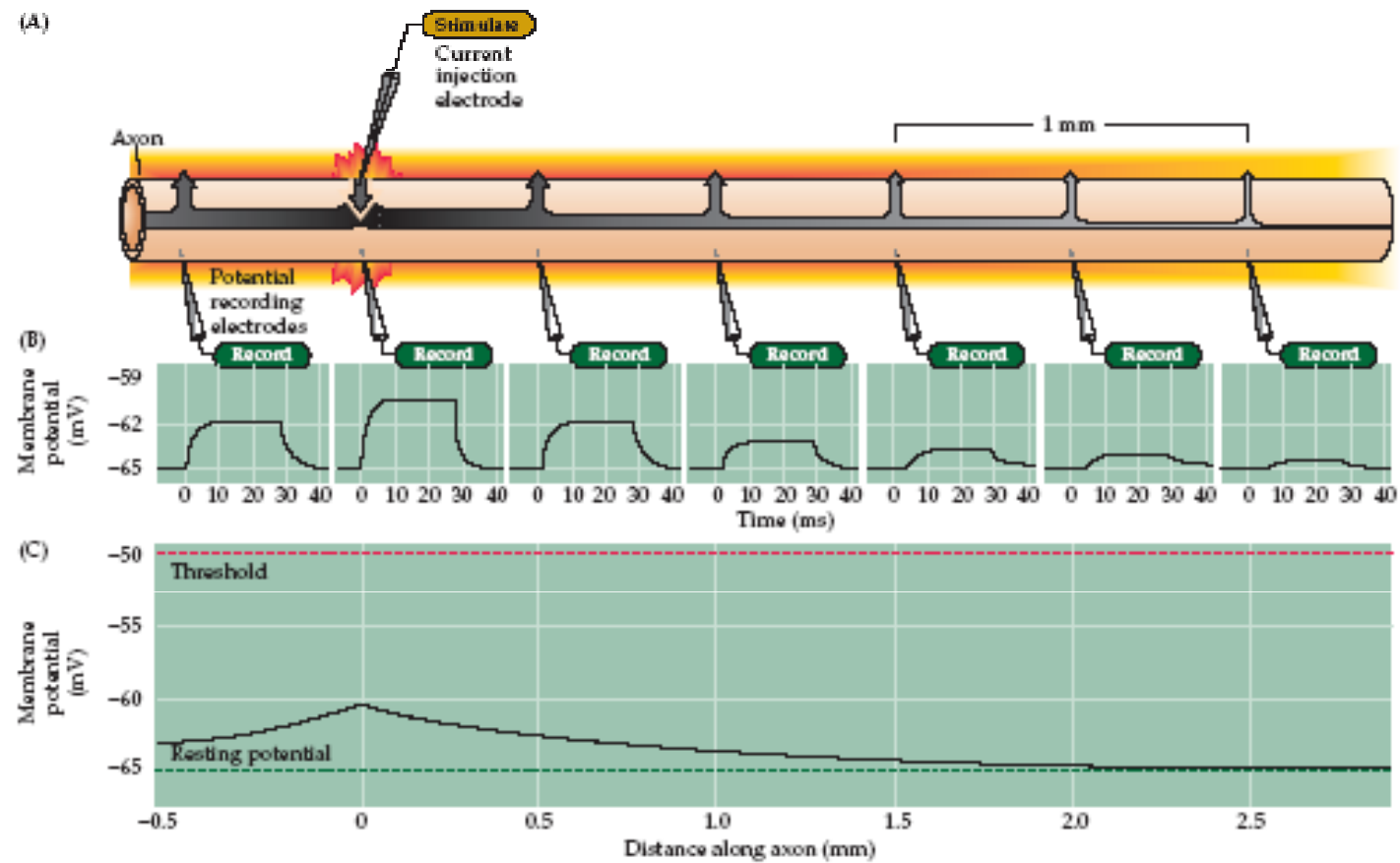
Conducción



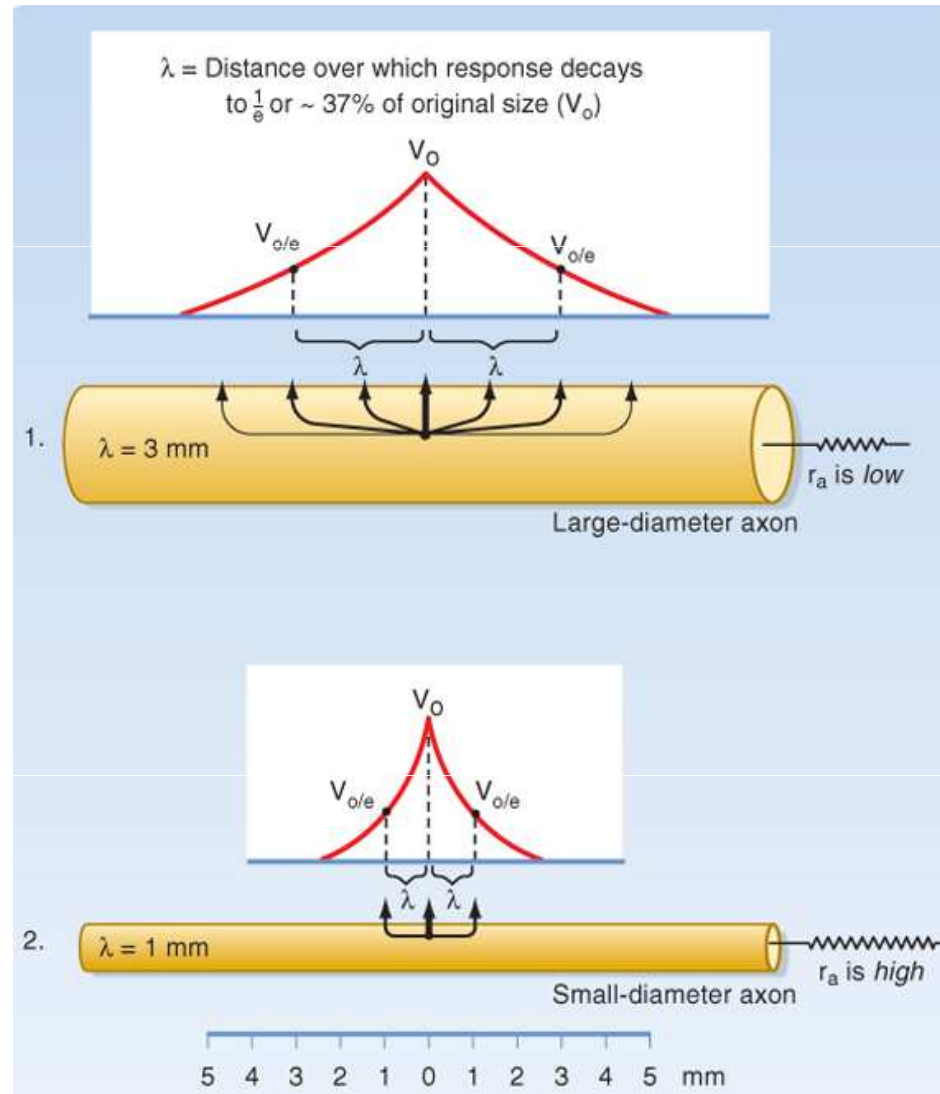
Respuestas pasivas



Respuestas pasivas



Respuestas pasivas



Codificación

