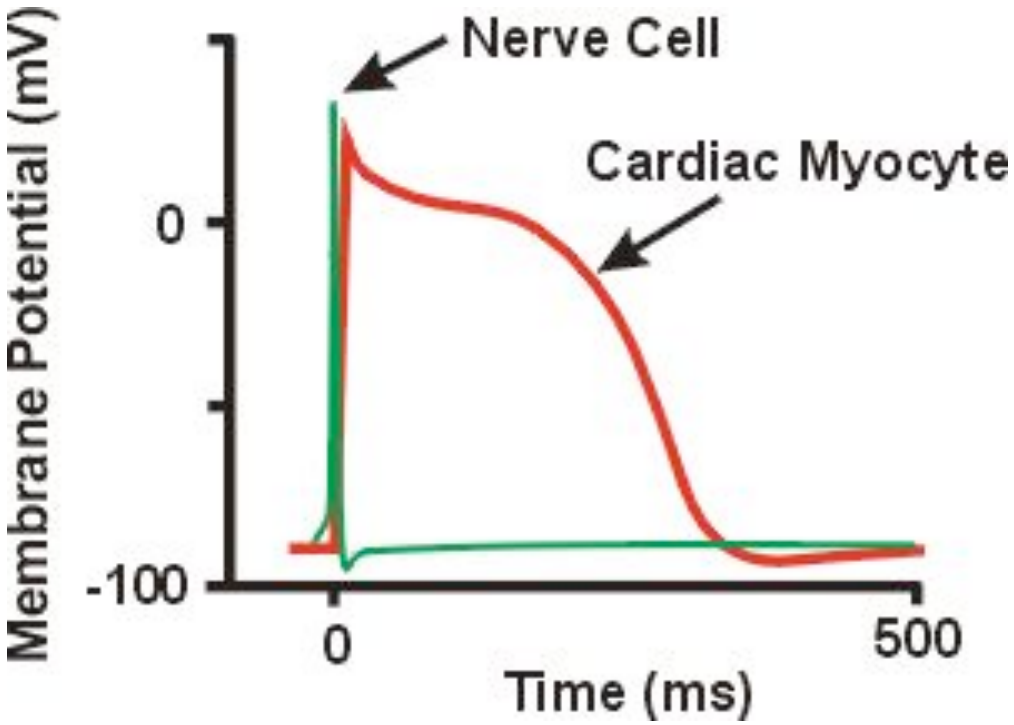

Nerve Cell
Cardiac Myocyte
Membrane Potential (mV)
0
-100
0
500
Time (ms)

Table 15-1. $[X]_i$, $[X]_o$ and E_{Nernst} for Cardiac Muscle Cells

Ion	$[\ ]_o$, mM	$[\ ]_i$, mM	E_N, mV
Na^+	145	10	70
K^+	4	135	-94
Ca^{2+}	2	$1 \cdot 10^{-4}$	132

$$E_m = \frac{g_K}{\Sigma g} E_K + \frac{g_{Na}}{\Sigma g} E_{Na} + \frac{g_{Ca}}{\Sigma g} E_{Ca}$$

For cardiac cells …

$g_{K,\ resting} \approx 100X\ g_{Na,\ resting}$

$g_{K,\ resting} \approx 100X\ g_{Ca,\ resting}$

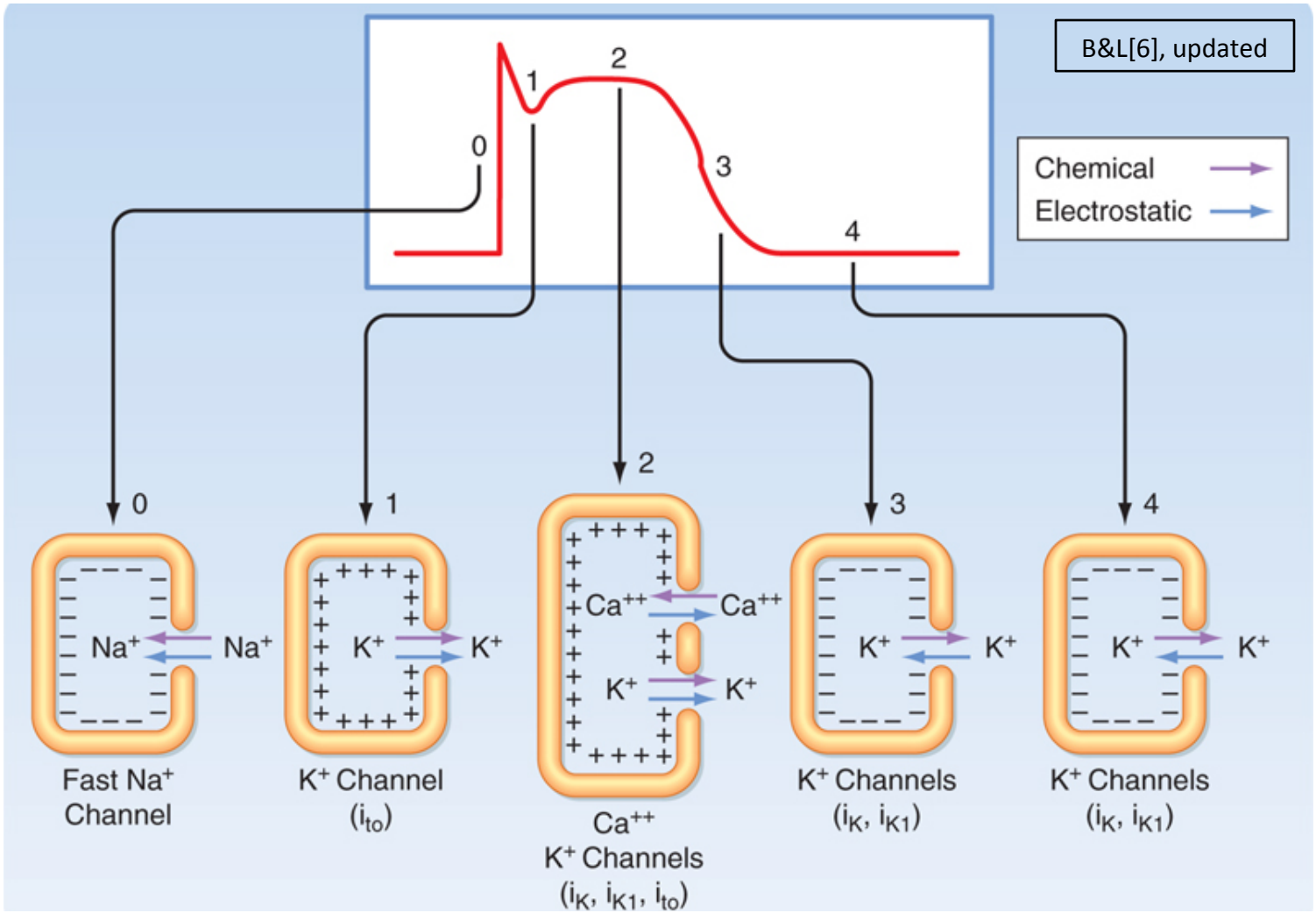
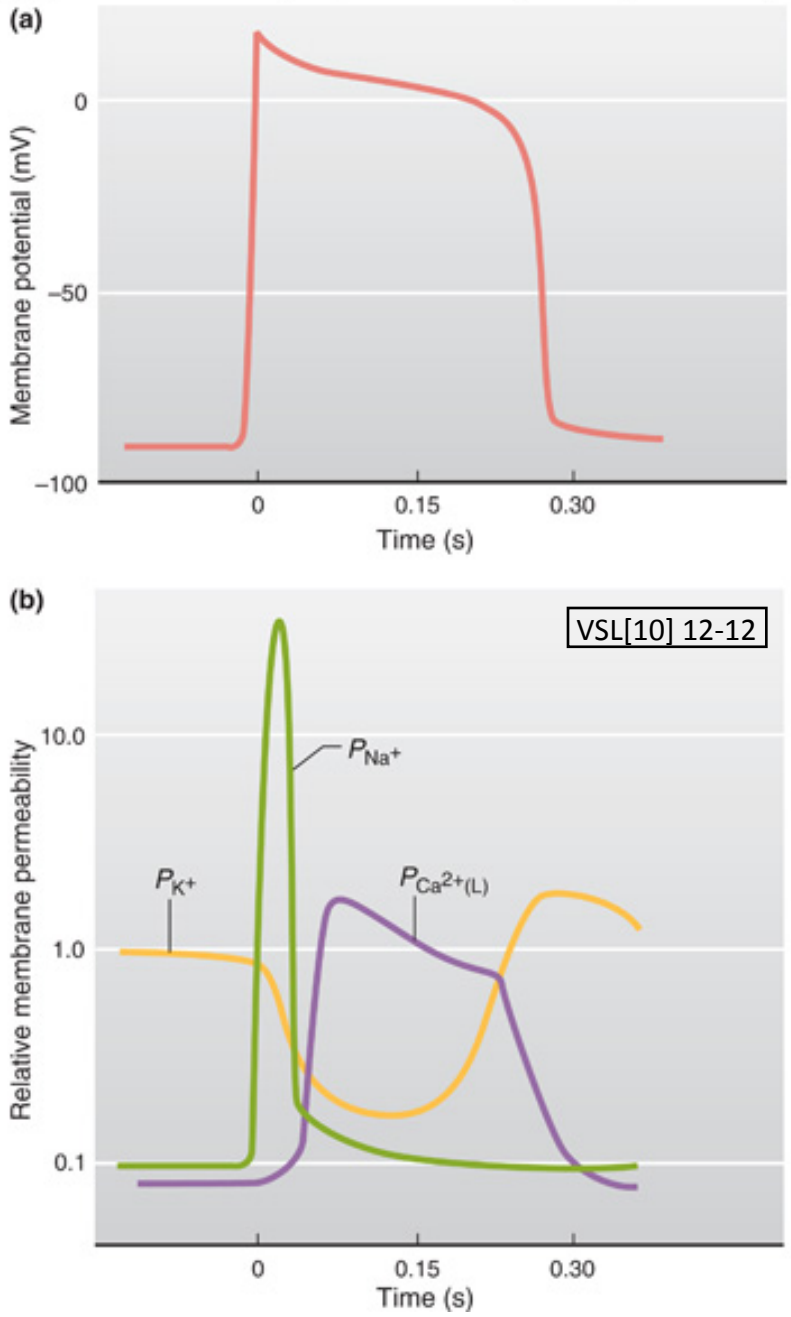


Figure 16-3 Principal ionic currents and channels that generate the various phases of the action potential in a cardiac cell. **Phase 0:** The chemical and electrostatic forces both favor the entry of Na^+ into the cell through fast Na^+ channels to generate the upstroke. **Phase 1:** The chemical and electrostatic forces both favor the efflux of K^+ through i_{to} channels to generate early, partial repolarization. **Phase 2:** During the plateau, the net influx of Ca^{++} through Ca^{++} channels is balanced by the efflux of K^+ through i_K, i_{K1}, and i_{to} channels. **Phase 3:** The chemical forces that favor the efflux of K^+ through i_K and i_{K1} channels predominate over the electrostatic forces that favor the influx of K^+ through these same channels. **Phase 4:** The chemical forces that favor the efflux of K^+ through i_K and i_{K1} channels very slightly exceed the electrostatic forces that favor the influx of K^+ through these same channels.



END

Video 2, Module 6