

TALLER 1:
Simulación del modelo de Lapicque
“integrate-and-fire linear neuron”, mediante
Brian2-Python.

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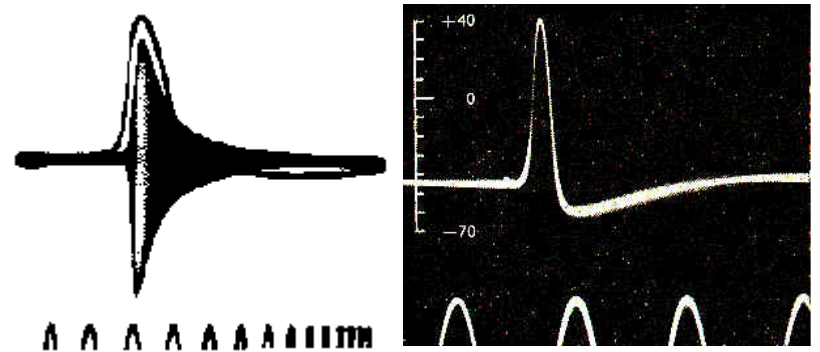
objetivos

- La hipótesis de Bernstein (1902).
- Las fuerzas iónicas.
- Spike, threshold, rheobase.
- El modelo de Lapicque: integrate-and-fire.
- Práctica con Brain2 (.py).

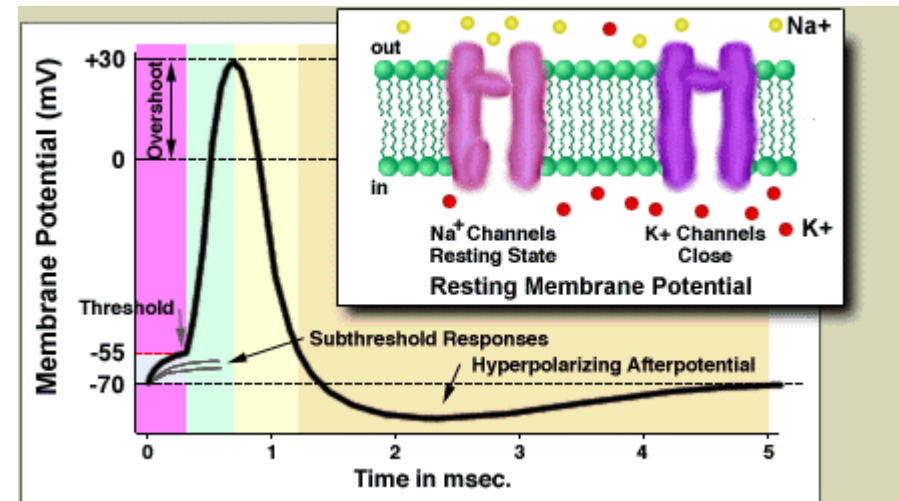
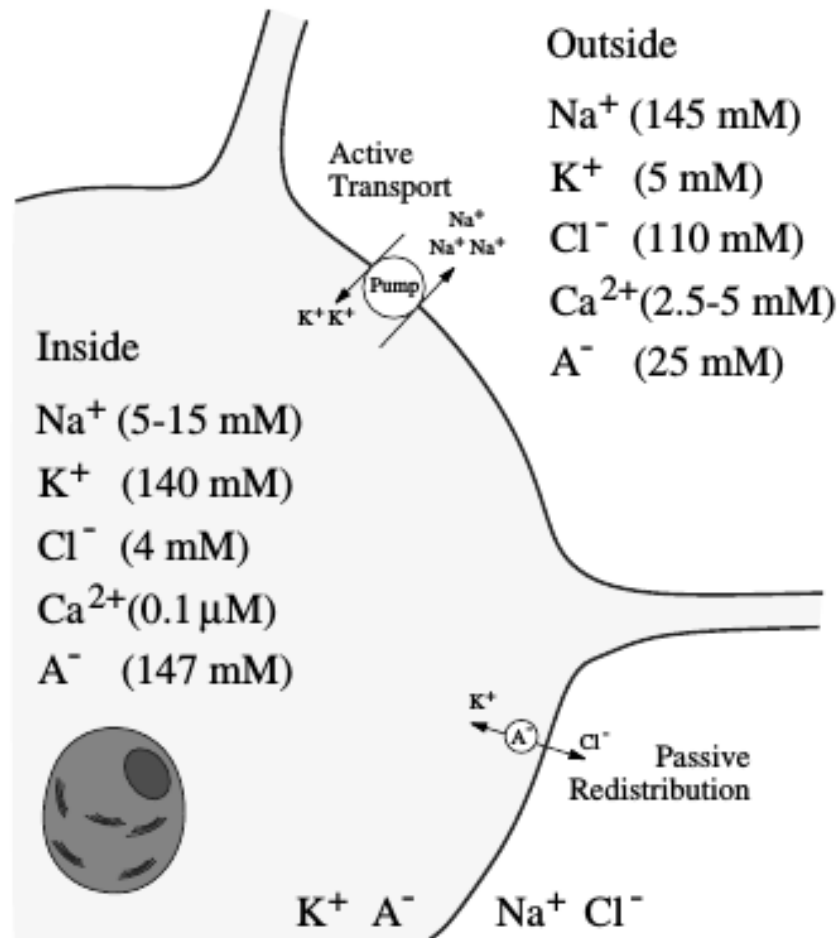


La hipótesis de Bernstein

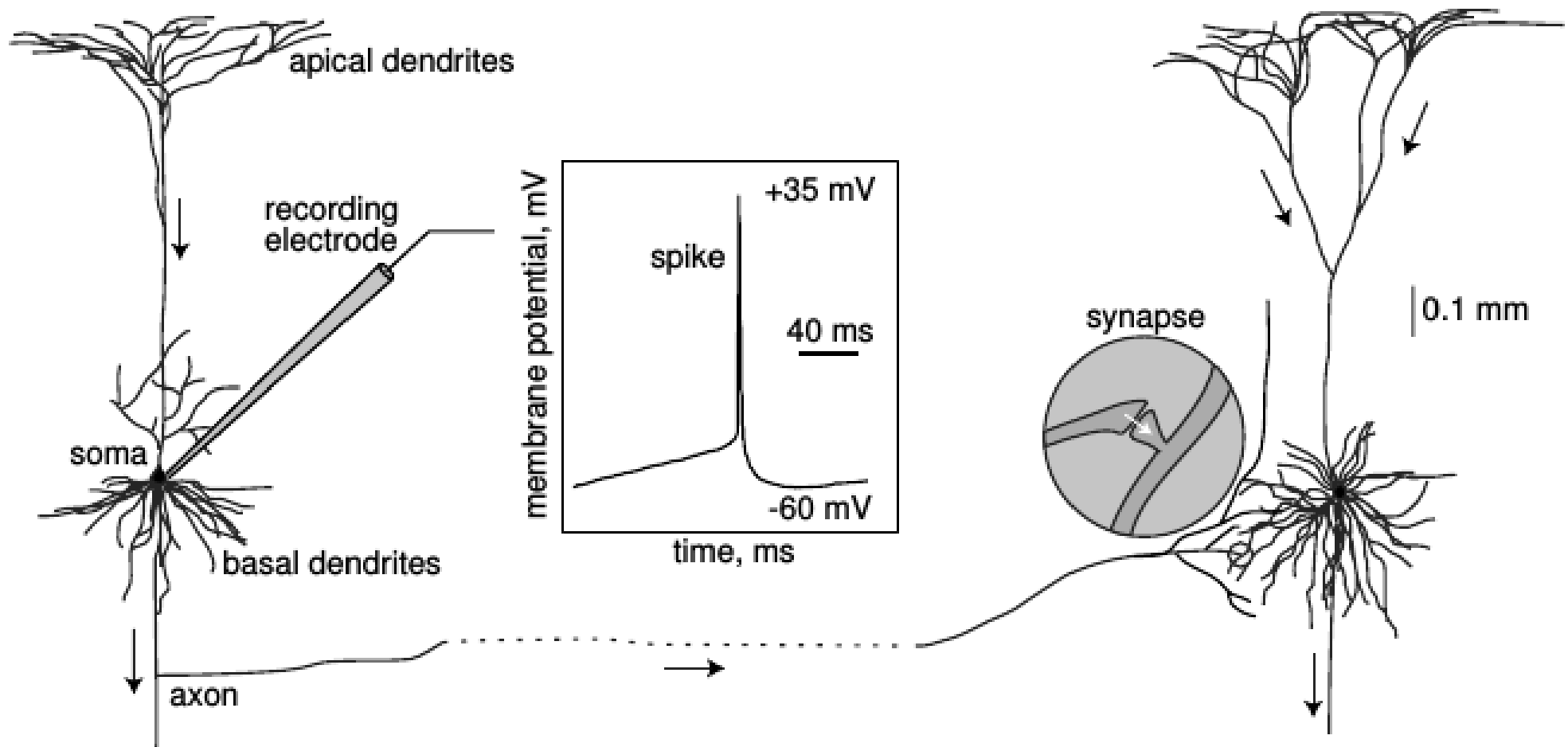
- **Julius Bernstein**, postuló en 1902 que el impulso nervioso debe estar representado por una irrupción a la resistencia del potencial de membrana neuronal.
- En sus palabras, dijo:
 - *“the peak of the action potential represented the point of minimum resistance (or maximum conductance) and thus would simply approach zero millivolts.”*.



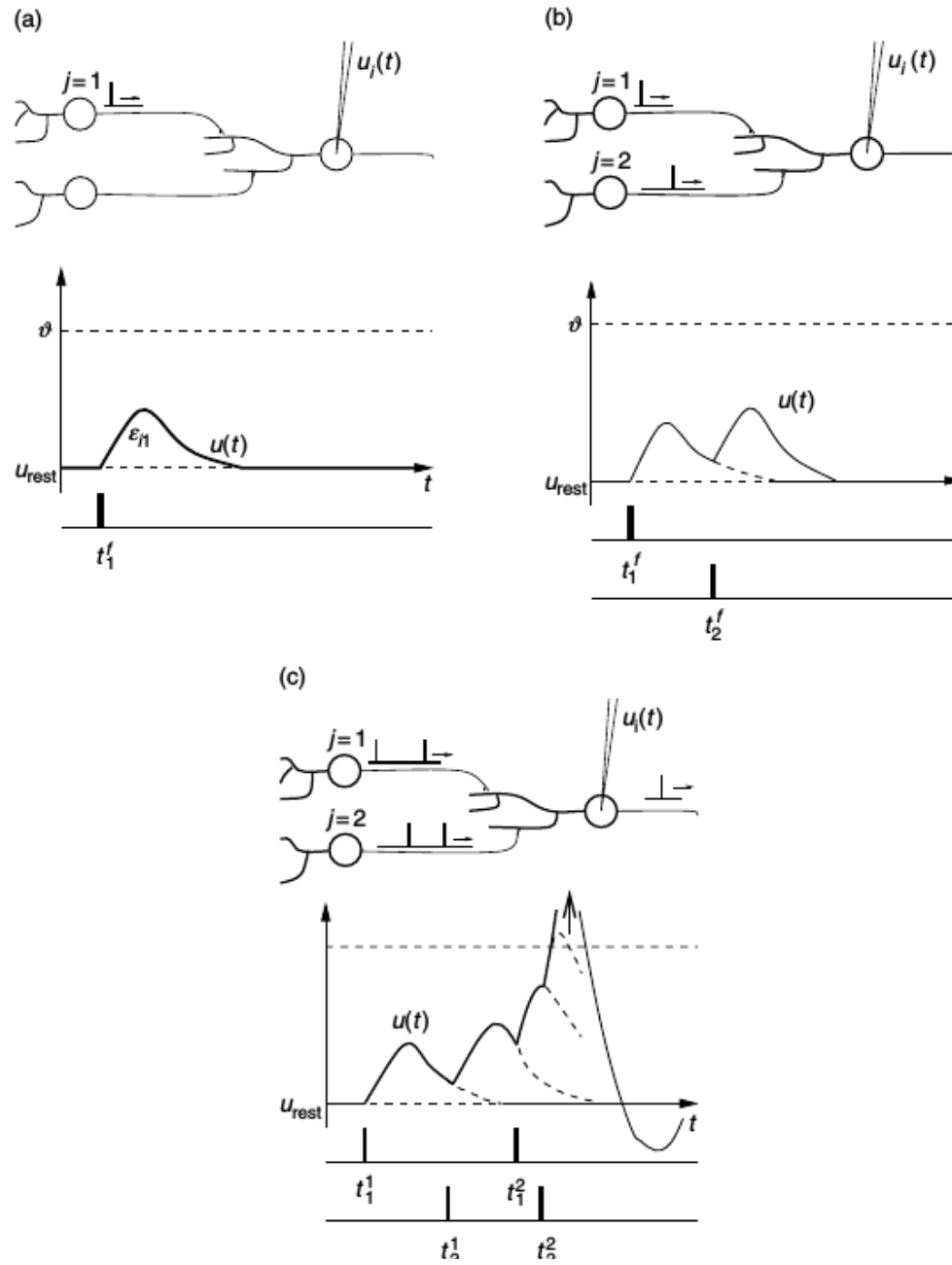
Las fuerzas iónicas



Spike, threshold, rheobase.

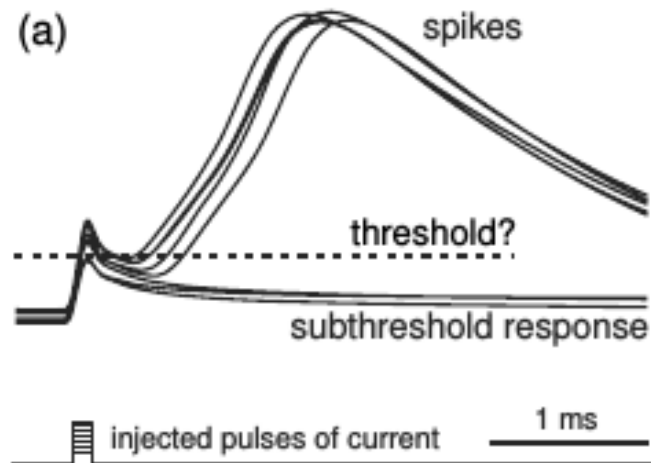


Spike, threshold, rheobase



Spike, threshold, rheobase.

Script que usaremos
será de la librería
Brian2 en Python.



-40 mV
20 mV

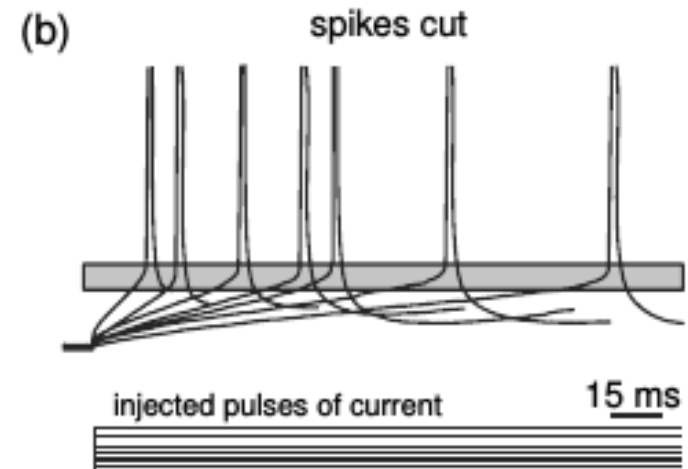
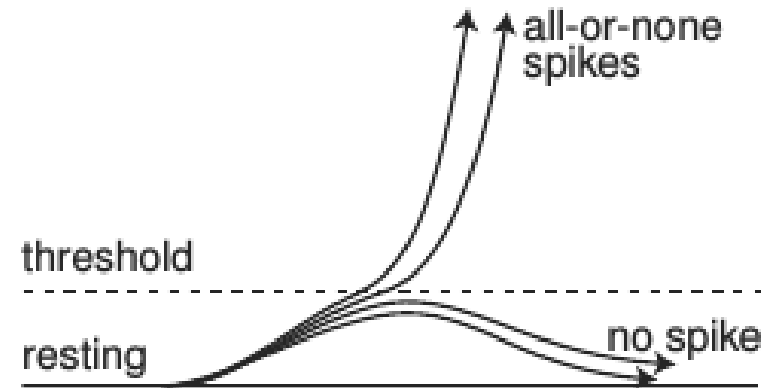


Figure 1.4: Where is the firing threshold? Shown are in vitro recordings of two layer 5 rat pyramidal neurons. Notice the differences of voltage and time scales.

Spike, threshold, rheobase.

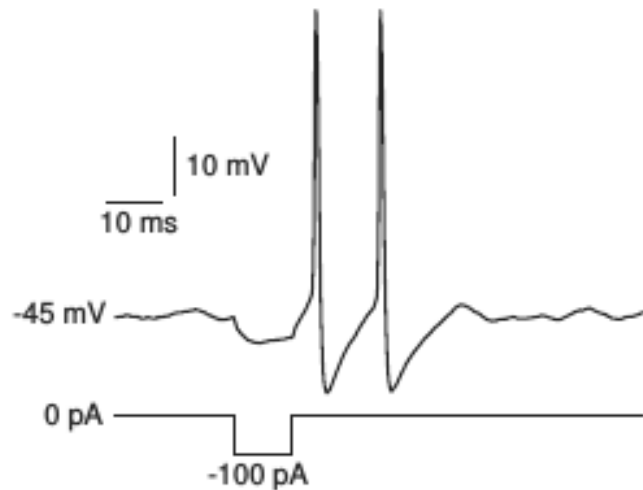


Figure 1.6: In vitro recording of rebound spikes of a rat's brainstem mesV neuron in response to a brief hyperpolarizing pulse of current.

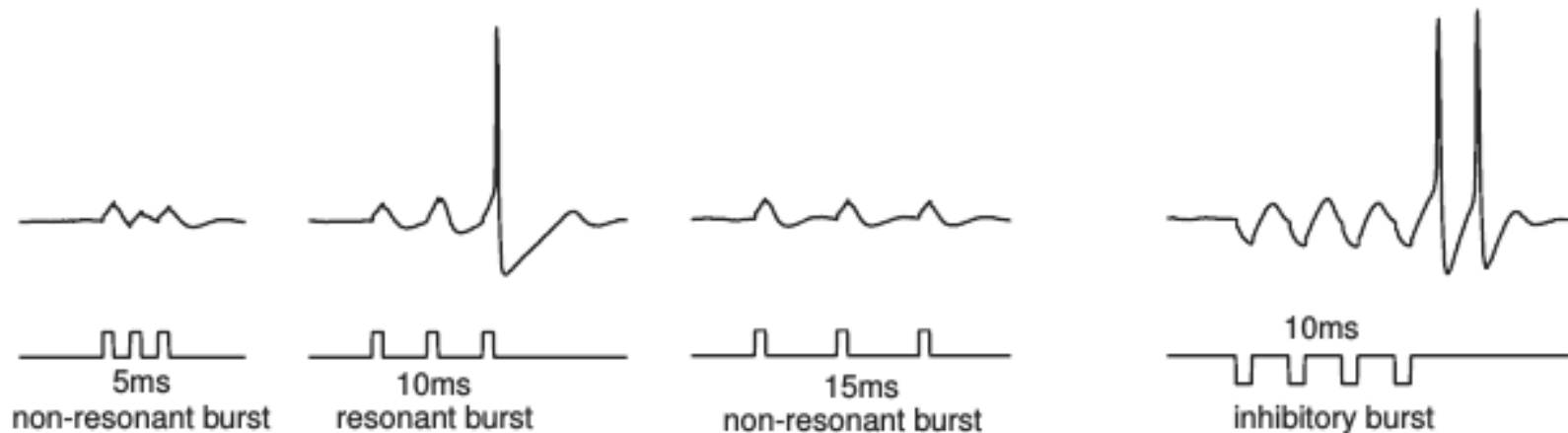
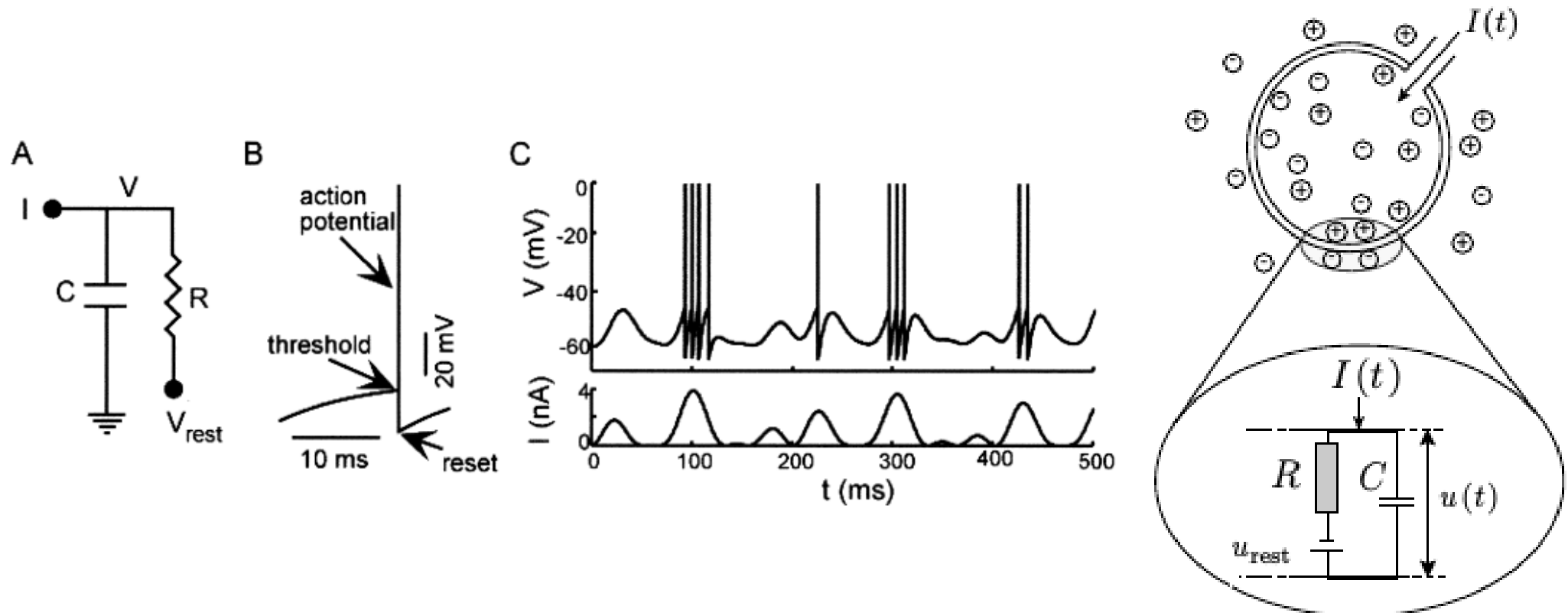


Figure 1.7: Resonant response of the mesencephalic V neuron of a rat's brainstem to pulses of injected current having a 10 ms period (in vitro).

El modelo de Lapicque: integrate-and-fire.



Brian2: lo simularemos?

