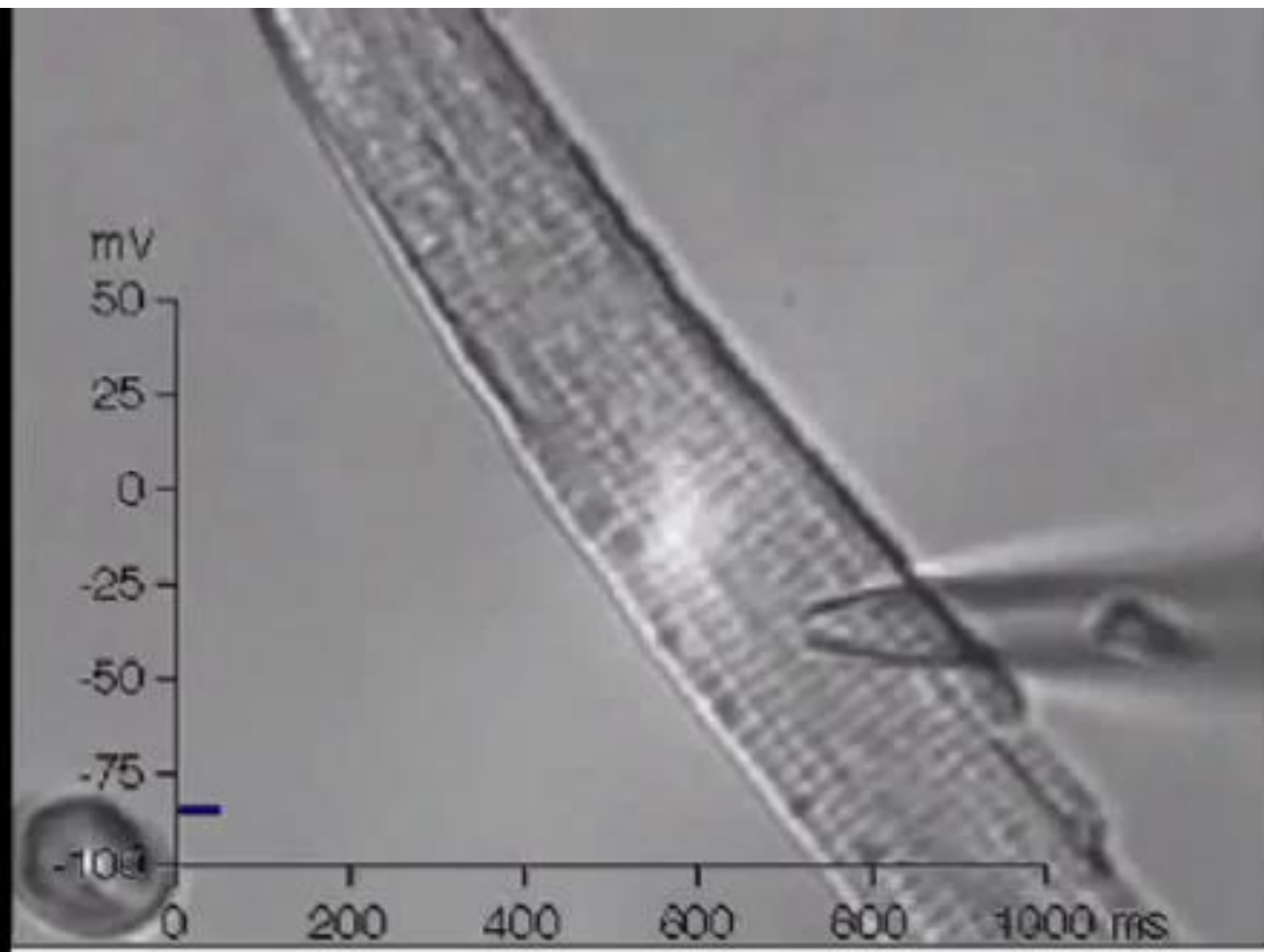


# Patch Clamp Yöntemi

Doç.Dr. Erkan Tuncay

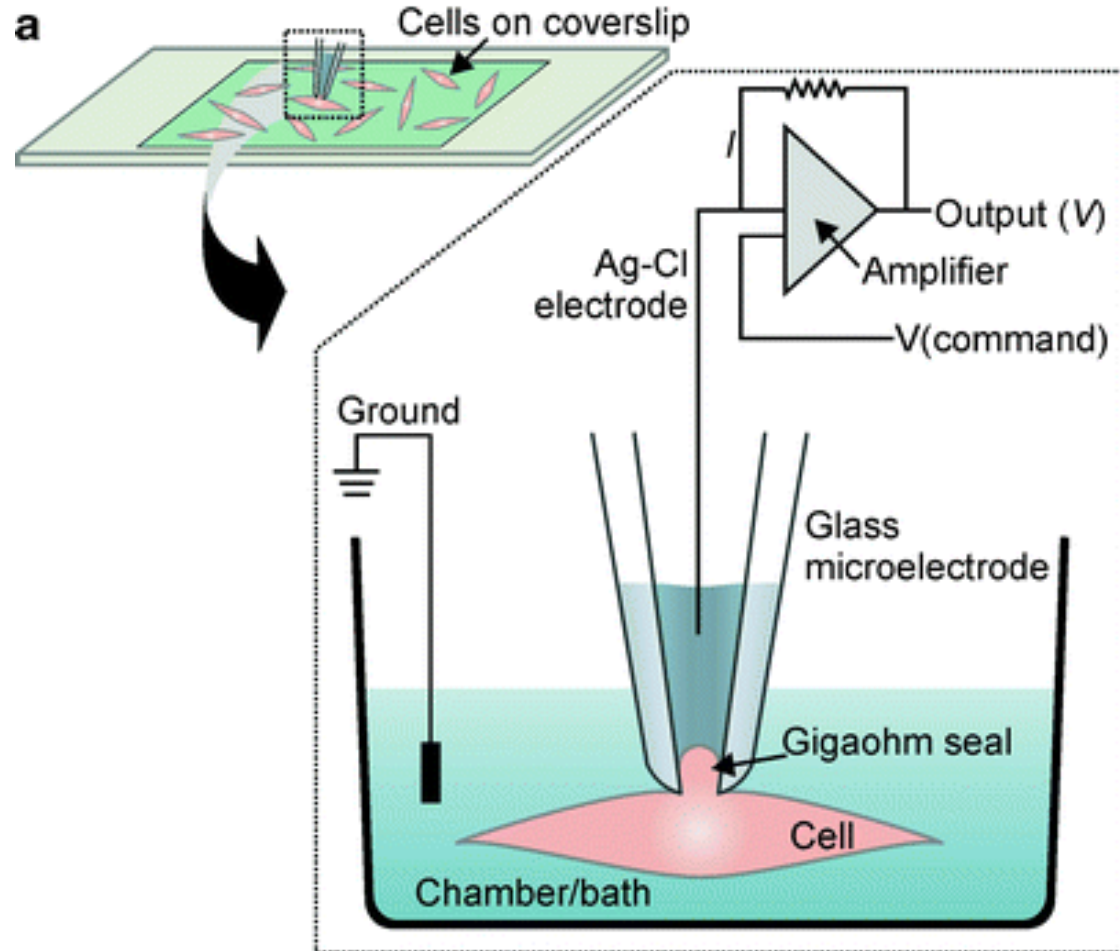
# Patch clamp tekniği



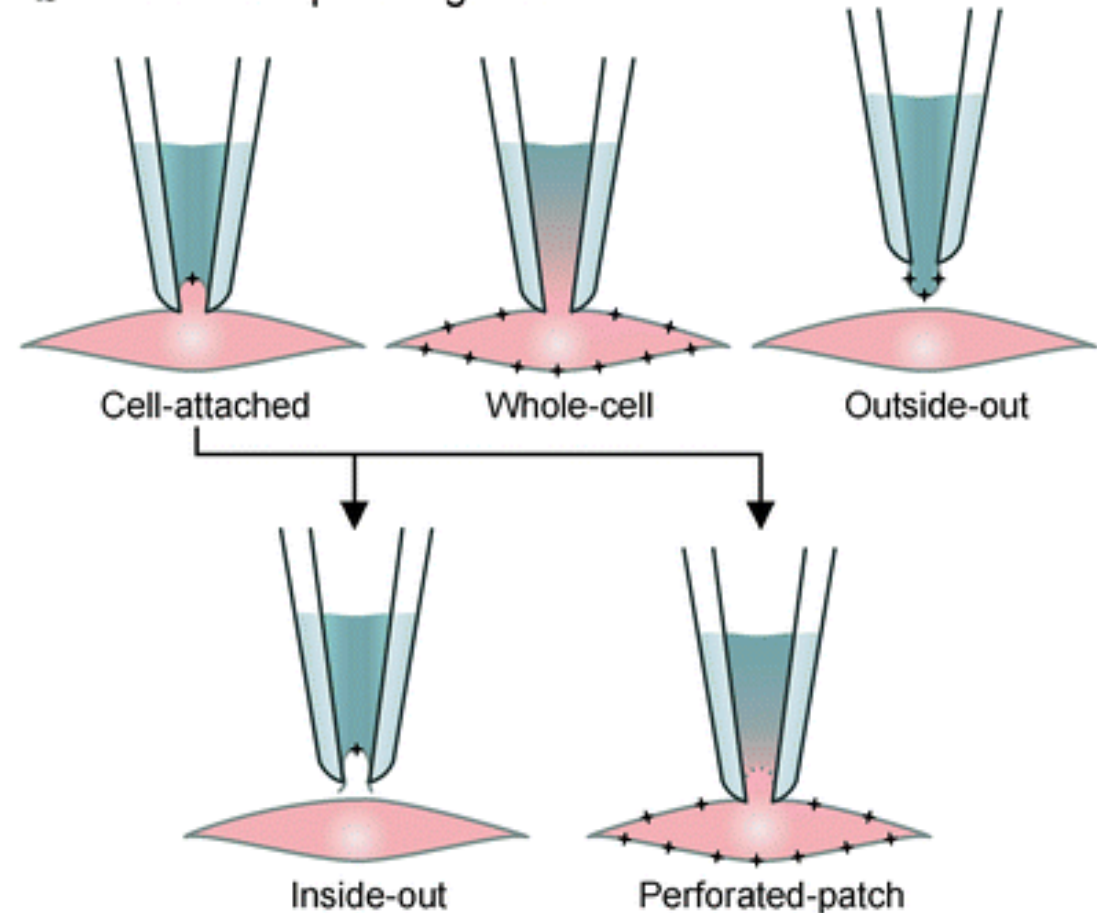


Courtesy of Anja Verkerk and Antoni van Ginneken, AMC, Amsterdam, The Netherlands

# Patch clamp tekniği



**b** Patch-clamp Configurations

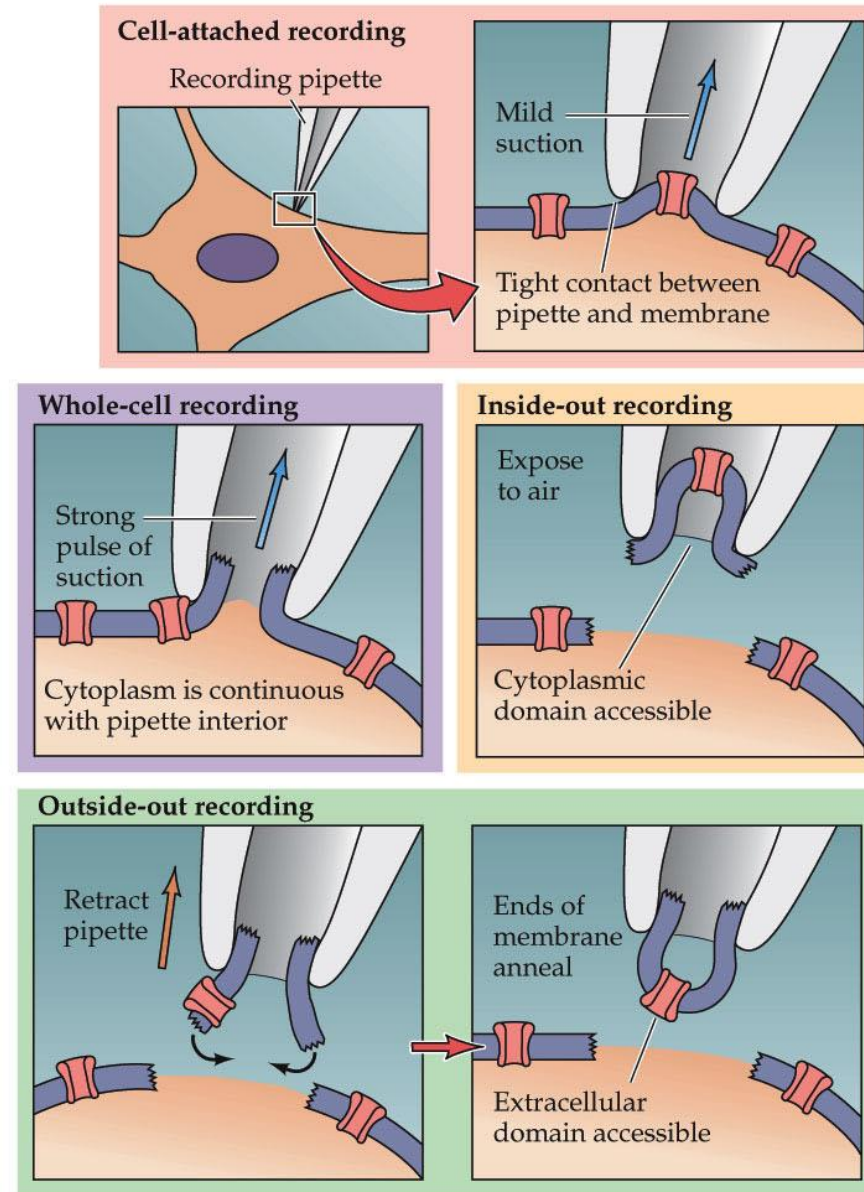




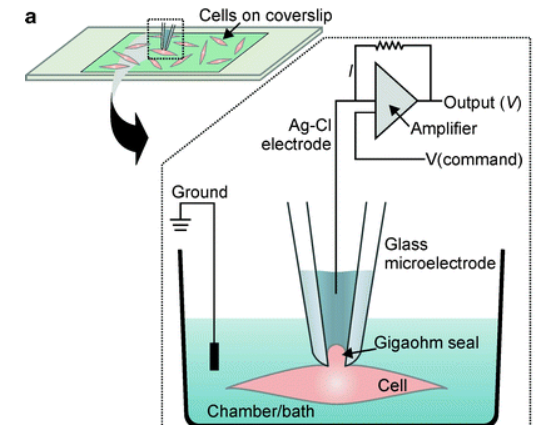
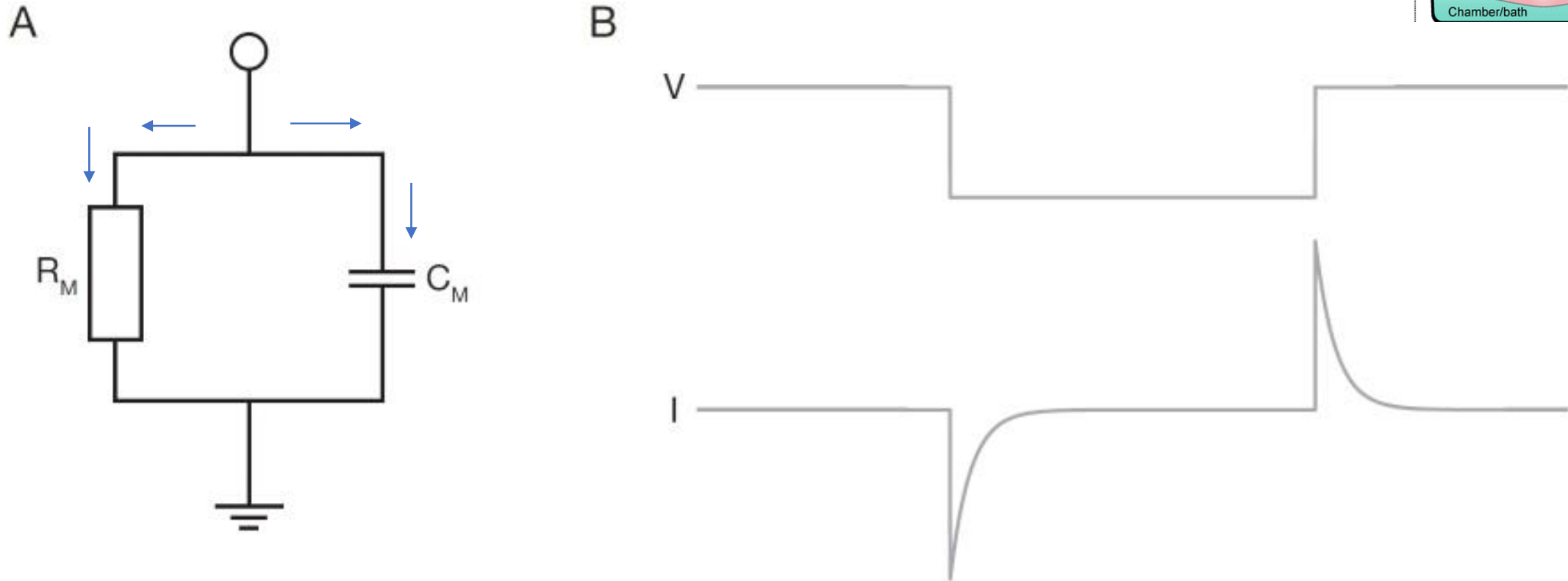
# Patch clamp tekniği

The voltage clamp technique shown before was adequate for large currents, but produced large ‘background noise’

‘Patch clamp’ technique has superior signal-to-noise ratio, so very small currents can be measured, even down to the current passed through a single ion channel!

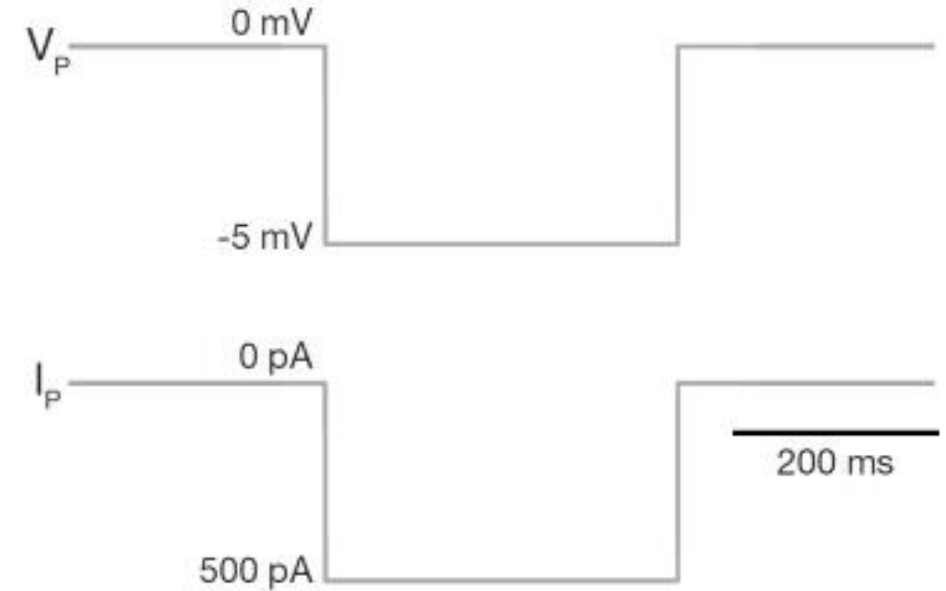
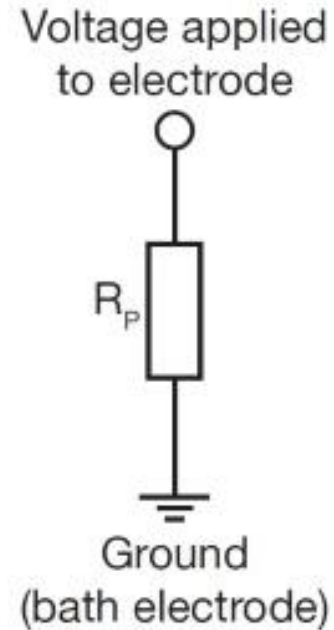
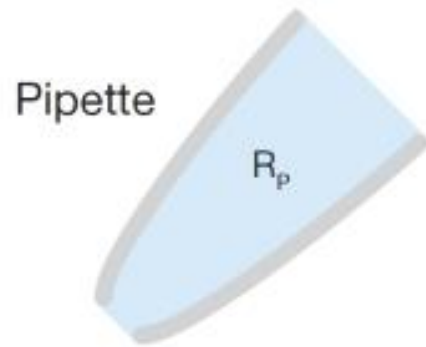


# RC devresi



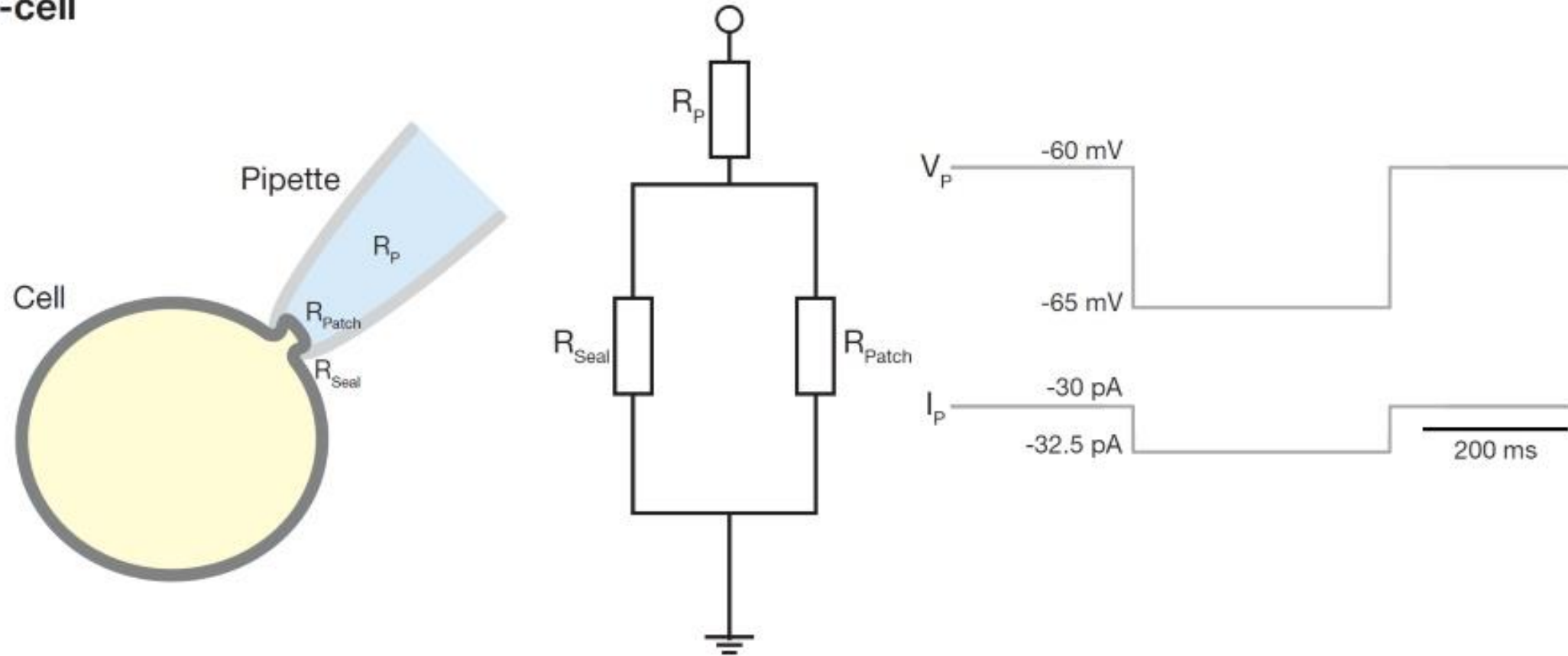
**Basic schematic of the electrical properties of a plasma membrane.** **A:** A circuit diagram showing the membrane capacitance and membrane resistance in parallel to each other. **B:** Traces showing a command voltage step (top) and the resulting current response (bottom) for a simple plasma membrane being voltage clamped.

## Pipette in bath



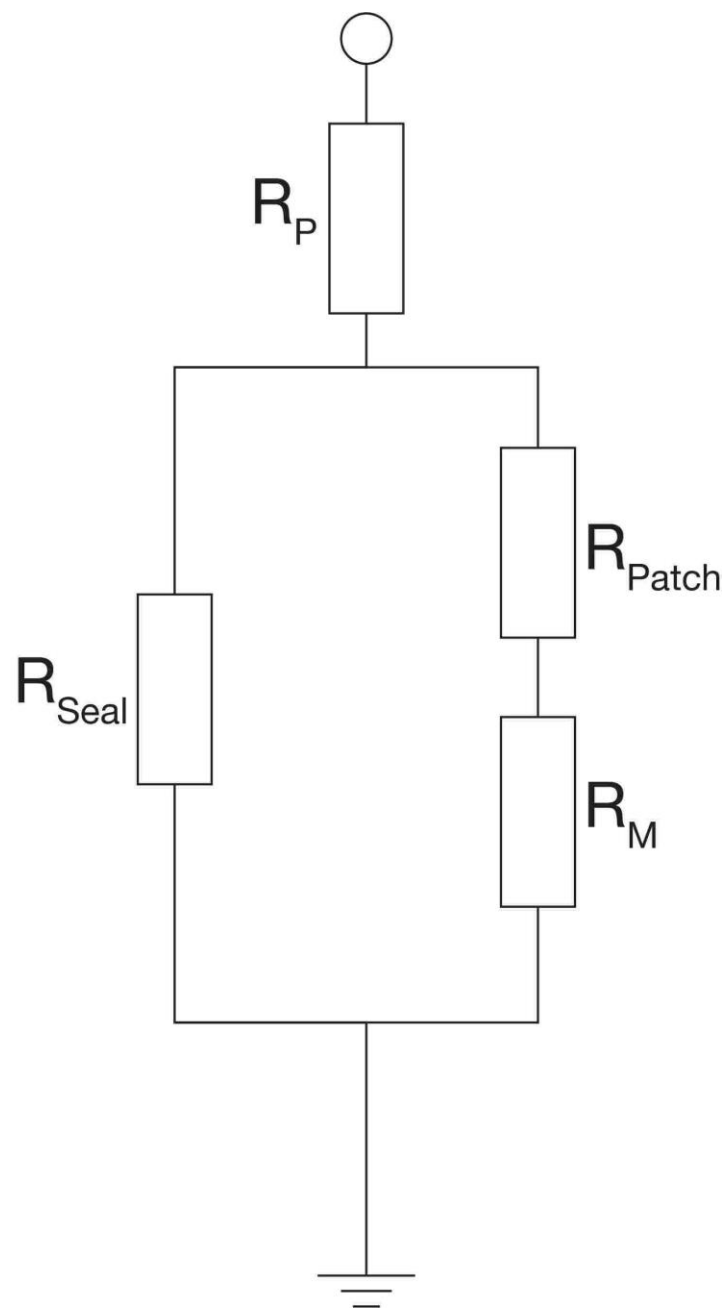
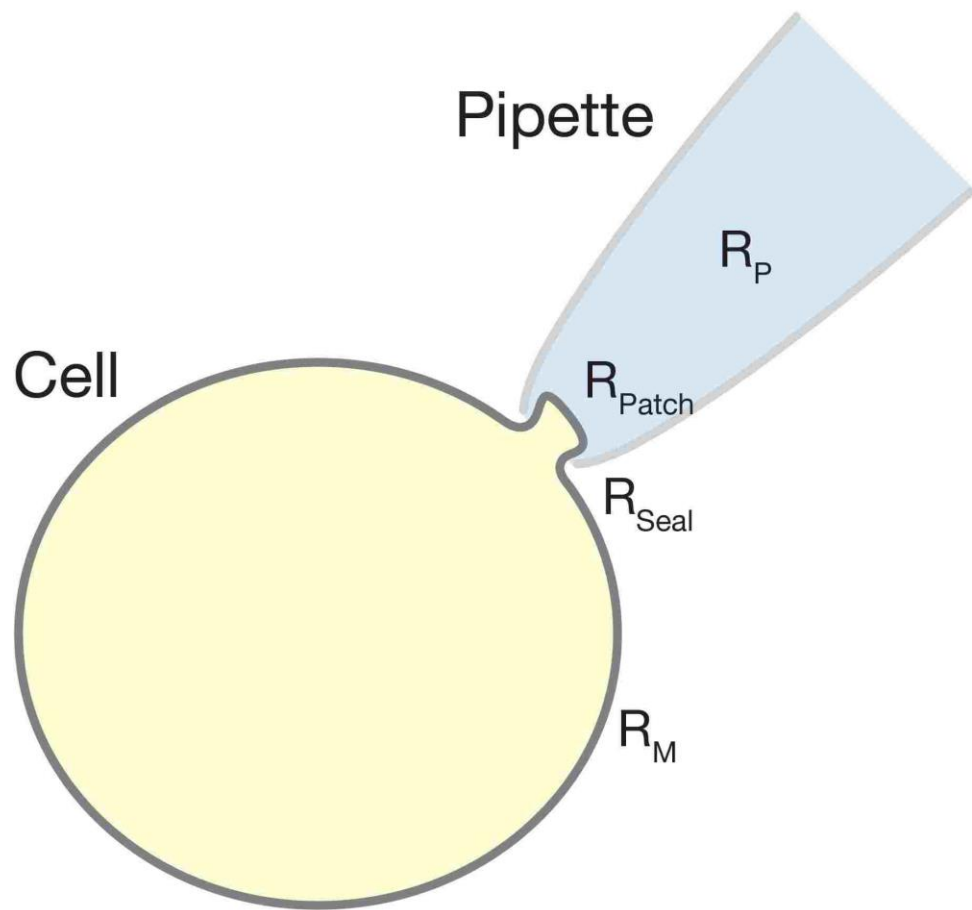
**Schematic explaining the ‘pipette in bath’ configuration.** In this configuration, the current is determined solely by the pipette resistance. The pipette is indicated on the left. The corresponding electrical circuit is shown in the middle with the voltage and current traces depicted on the right.

## On-cell

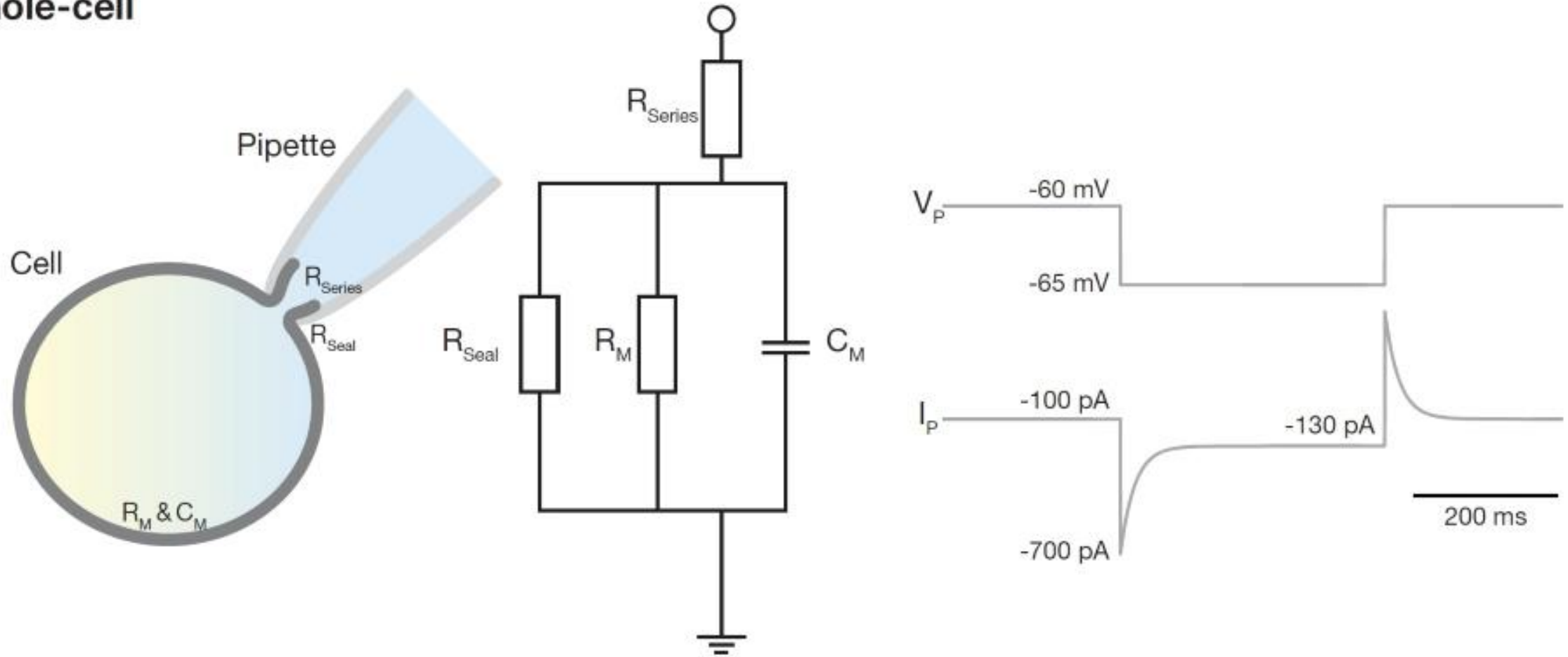


**Schematic explaining the 'on-cell' configuration.** In this configuration, the current is determined by the pipette resistance in series to a parallel circuit of the patch and seal resistances. The pipette with cell is indicated on the left. The corresponding electrical circuit is shown in the middle with the voltage and current traces depicted on the right. Note that as the patch resistance is very high, the current over this resistance is negligible.





## Whole-cell



**Schematic explaining the ‘whole-cell’ configuration.** In this configuration, the current is determined by the series resistance in series with a parallel circuit of the seal and membrane resistances as well as the membrane capacitance. The pipette with cell is indicated on the left. The corresponding electrical circuit is shown in the middle with the voltage and current traces depicted on the right.