Simulation of Experimental Artefacts in the Electrophysiology of Small Cells

Jim Wilson

Faculty of Kinesiology

University of Calgary

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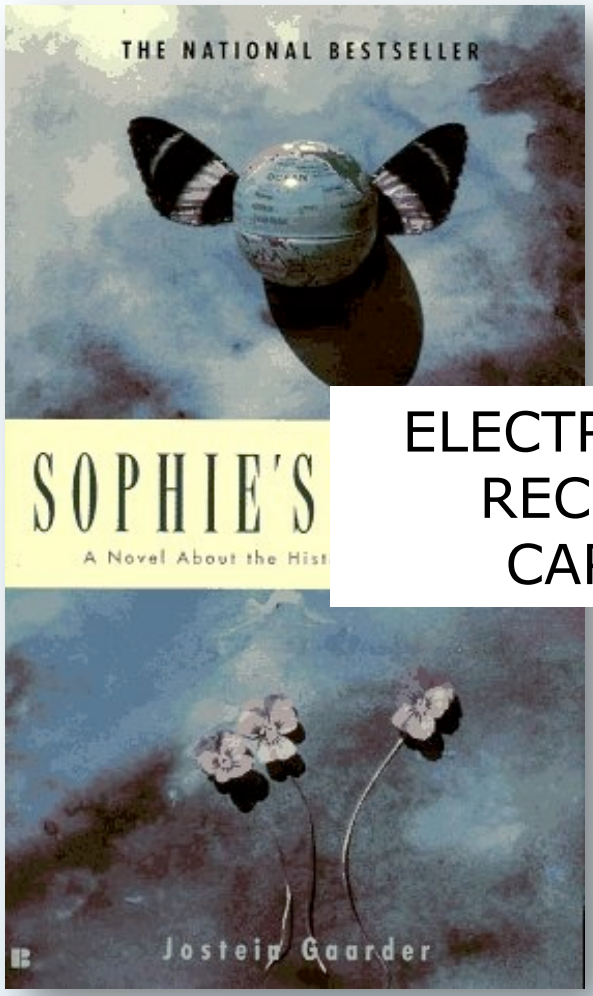

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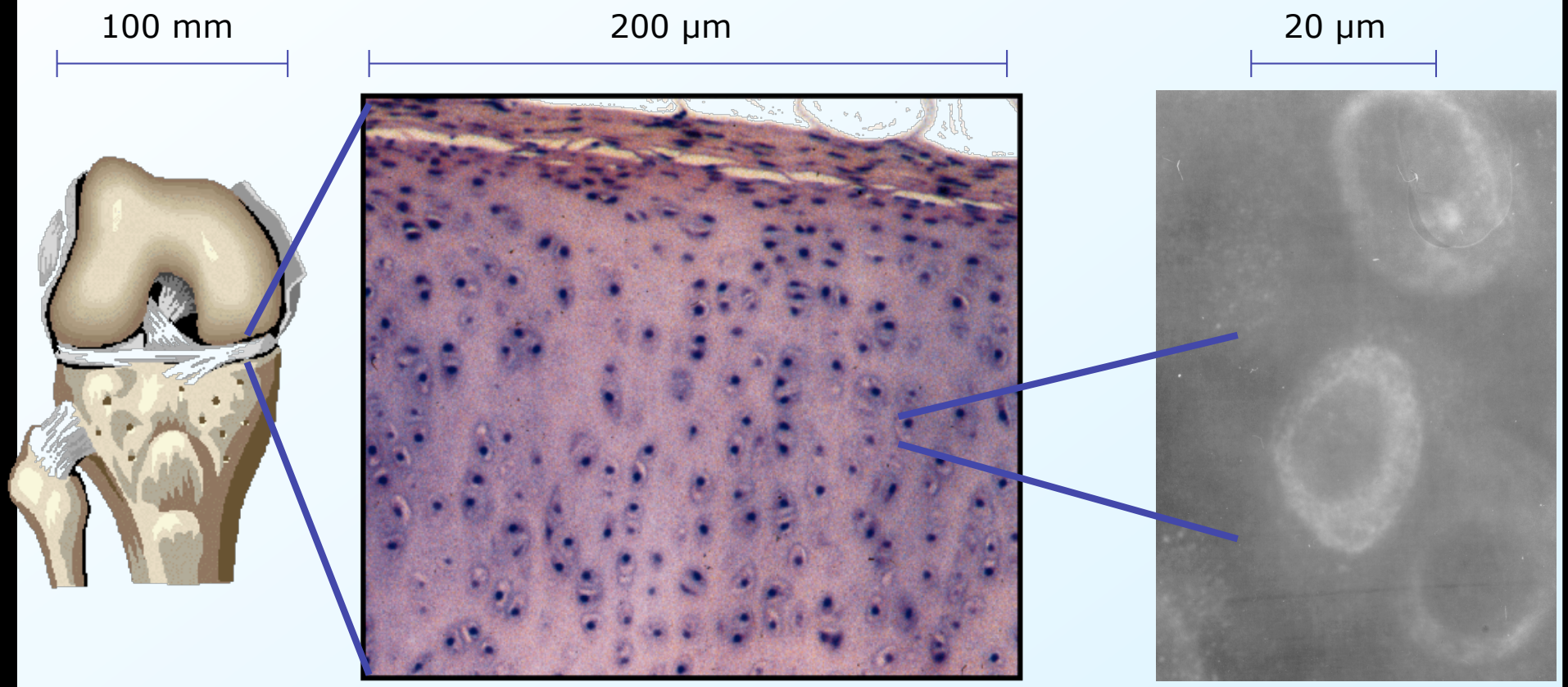
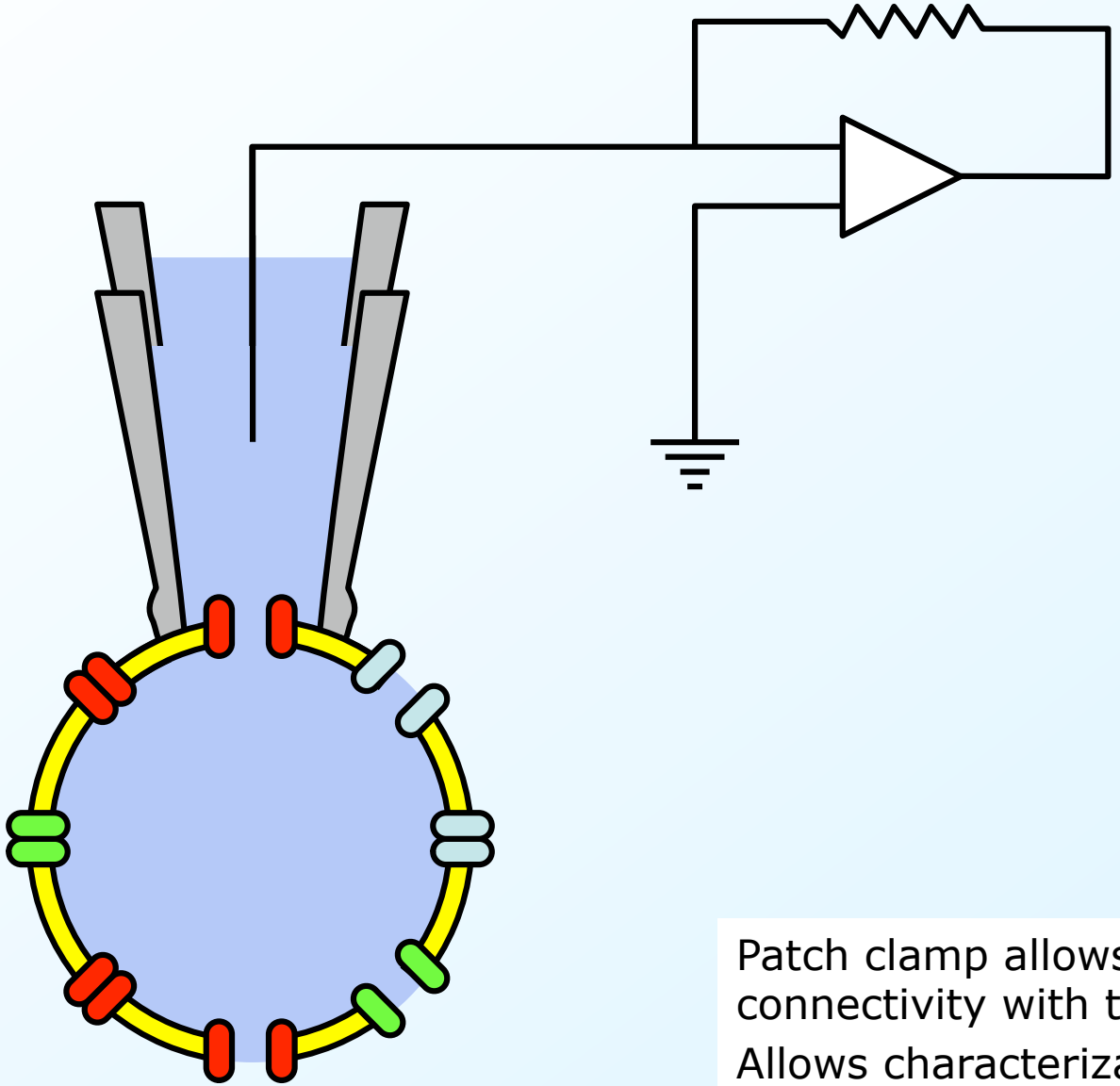
Why is CellML the most ingenious toy in the world?

ELECTROPHYSIOLOGICAL RECORDINGS FROM CARTILAGE CELLS

Cartilage Cells - Chondrocytes



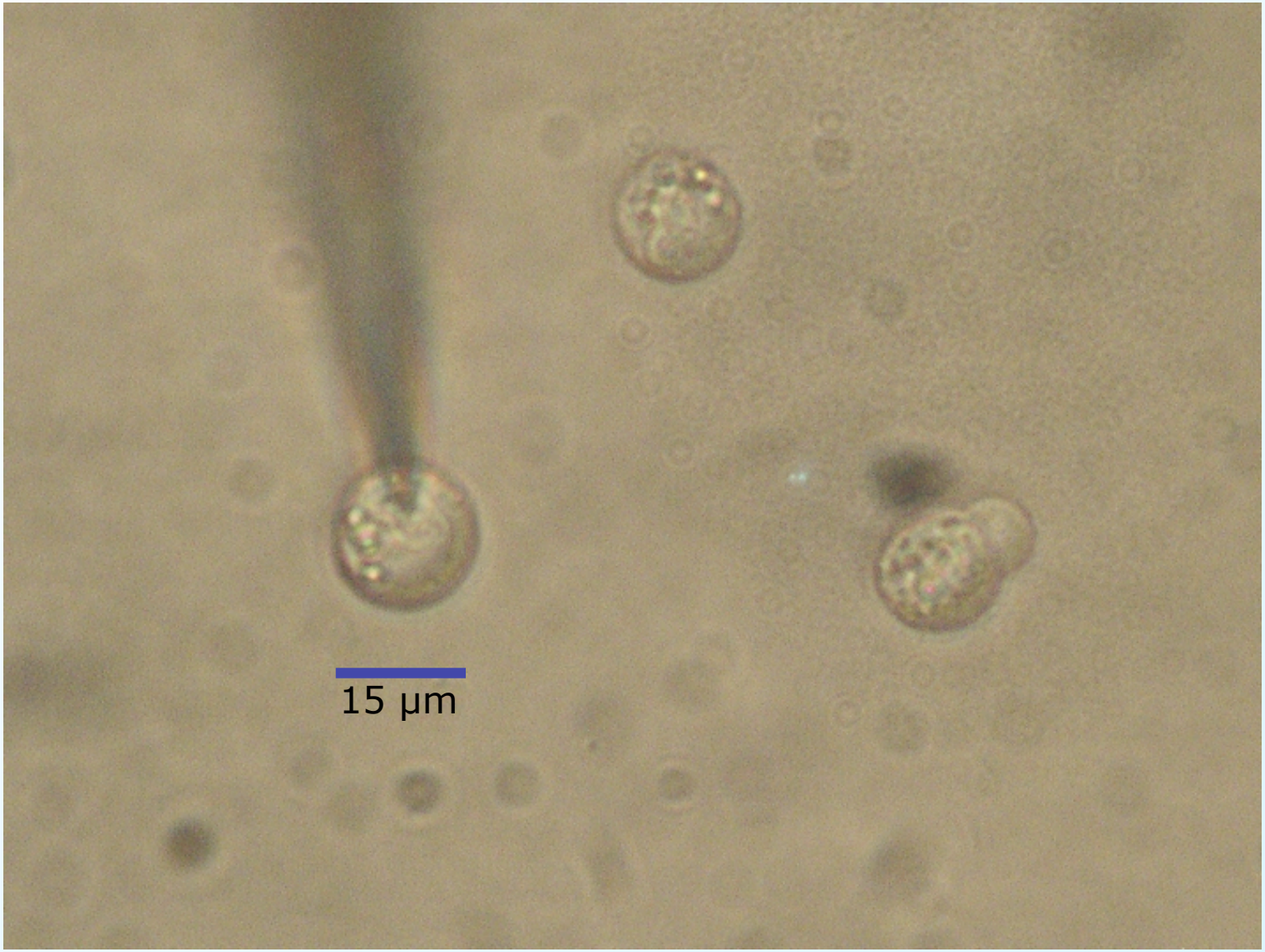
Patch Clamp Method



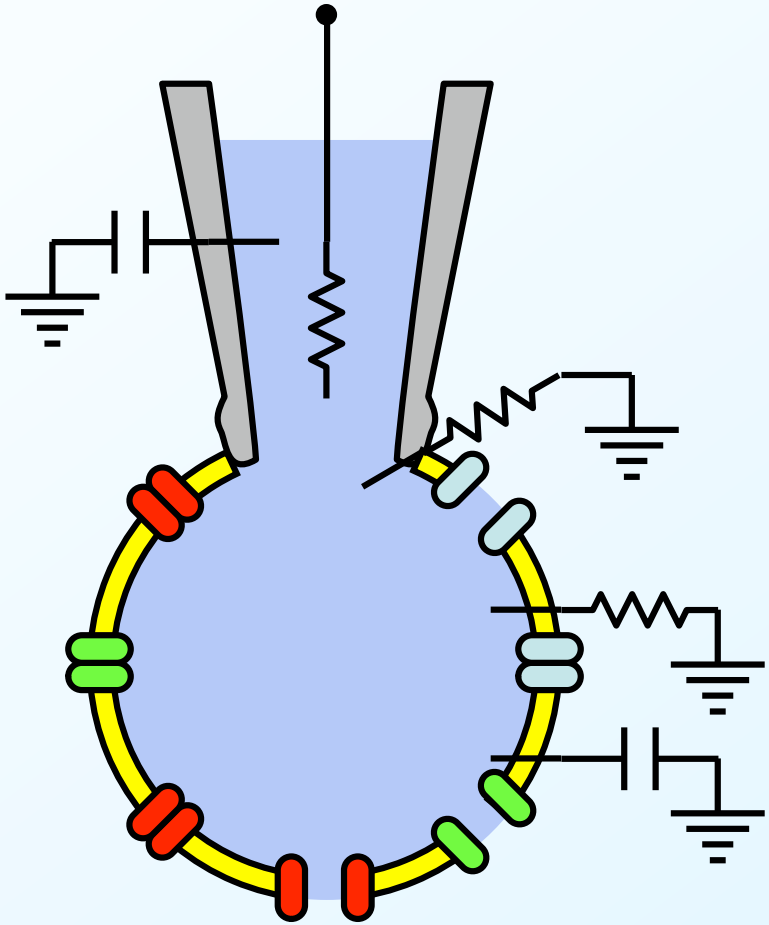
Patch clamp allows direct electrical connectivity with the cell interior.

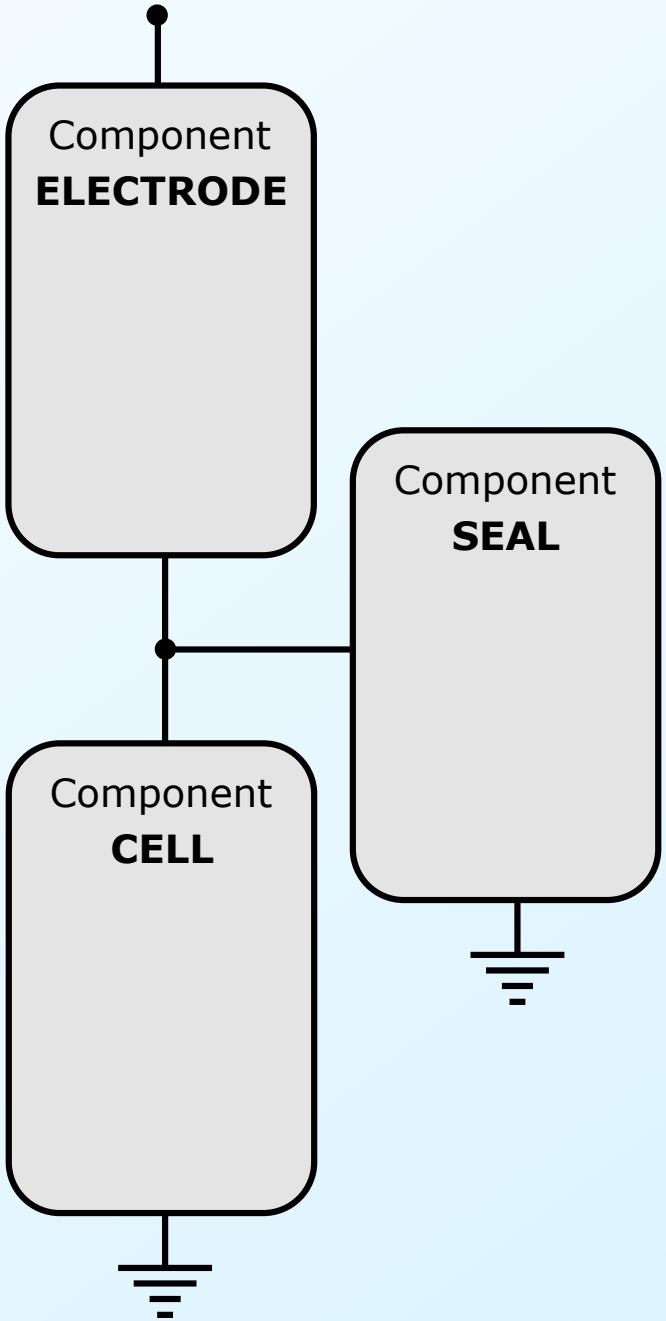
Allows characterization of cell electrophysiology.

Electrode Attached to a Chondrocyte

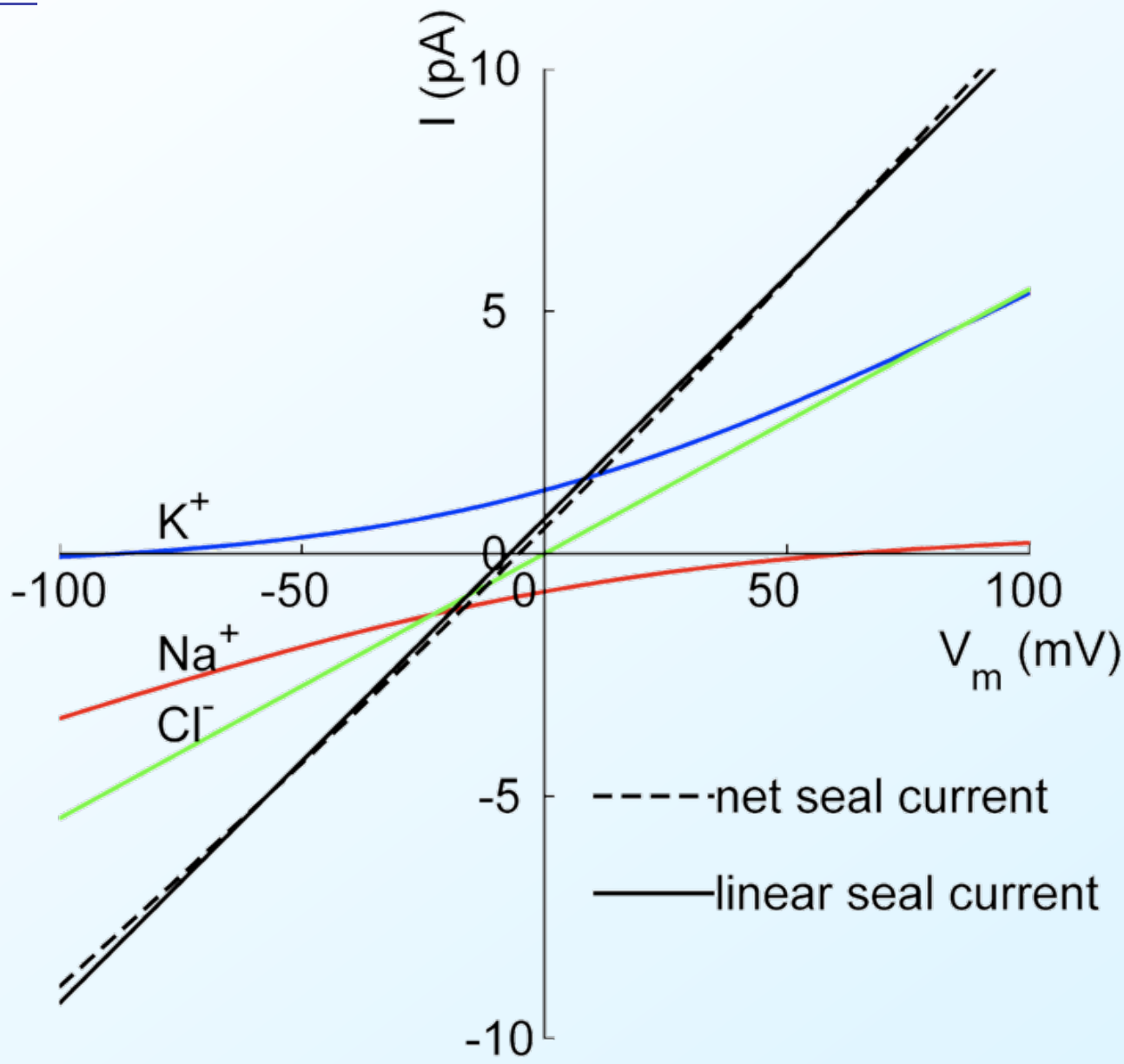


CellML Model of Small Cell

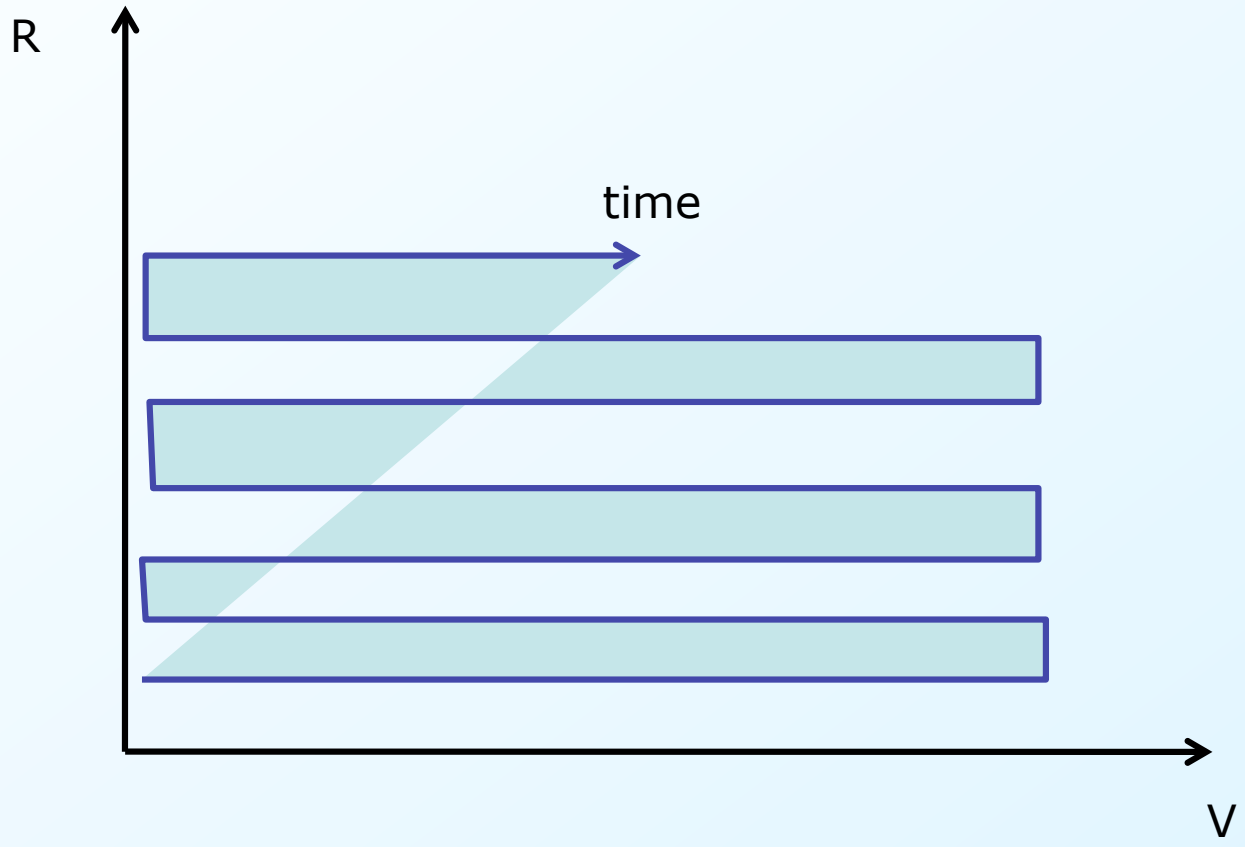




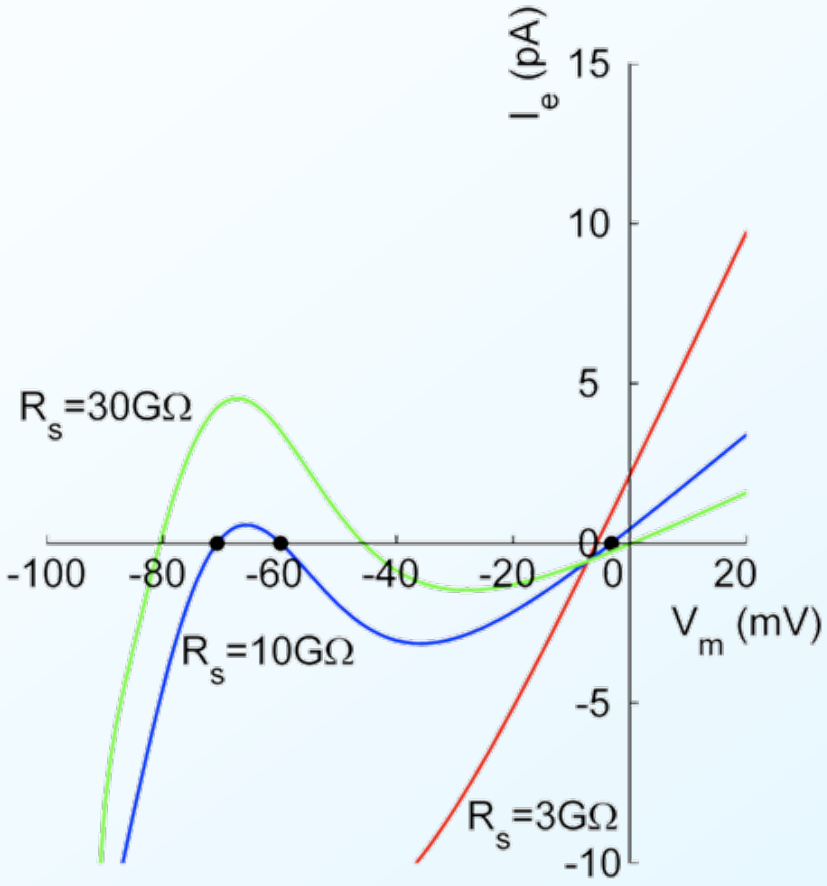
Seal Currents

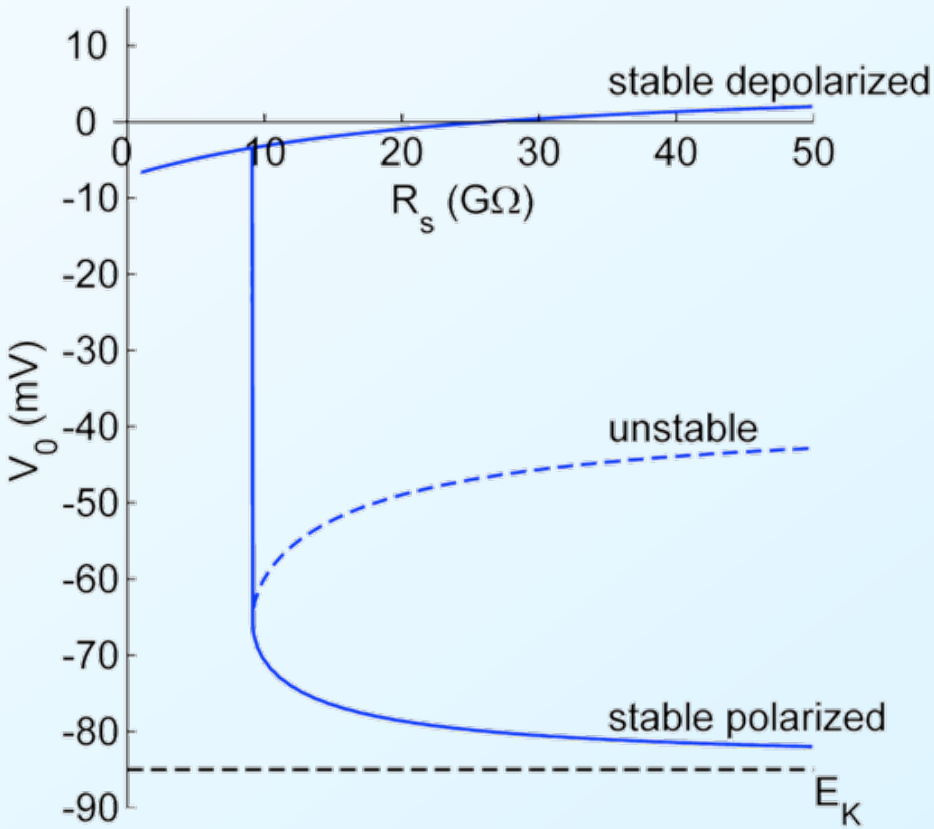


2 Independent Variables



Apparent Resting Potential





Conclusion

The standard electrophysiological recording techniques can be dramatically compromised for small cells.

Mathematical modelling allows for the correct interpretation of the measured data.

Modified recording protocols can be designed to mitigate the artefacts of the recording electrode.

Acknowledgements

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AHFMR
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Single Channel Recordings

25 single channel recordings approximate one whole-cell.