Radboud University Nijmegen

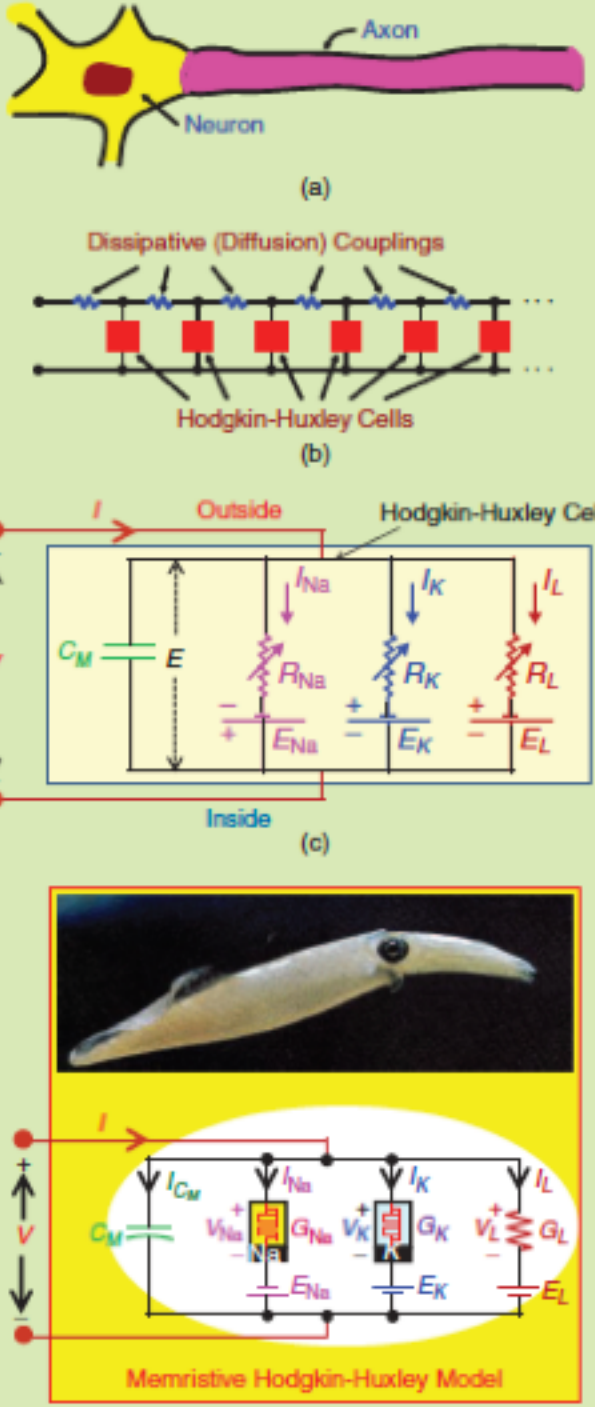

Figure 1. (a) Schematic of a neuron and its axon. (b) One-dimensional axon model made of resistively coupled Hodgkin-Huxley cells. (c) Hodgkin-Huxley circuit model made of a capacitor C_M, a resistor R_L, three batteries E_{Na}, E_K, and E_L, a *time-varying* potassium resistor R_K, and a *time-varying* sodium resistor R_{Na}. (d) Memristive Hodgkin-Huxley axon circuit model.

END DIRECTED EVOLUTION TO STATES OF HIGHER ENTROPY PRODUCTION

Complex behaviour from (physical) principles & laws (bottom-up)

27

Memristors

[memristor.org]

"memory resistors", are a type of passive circuit elements that maintain a relationship between the time integrals of current and voltage across a two terminal element. Thus, a memristors' resistance varies according to a devices memristance function, allowing, via tiny read charges, access to a "history" of applied voltage

More properties:

Memory

Classical conditioning (aversion / preference)

Sah, M. P., Kim, H., & Chua, L. O. (2014). Brains are made of memristors. *IEEE circuits and systems magazine*, *14*(1), 12-36.

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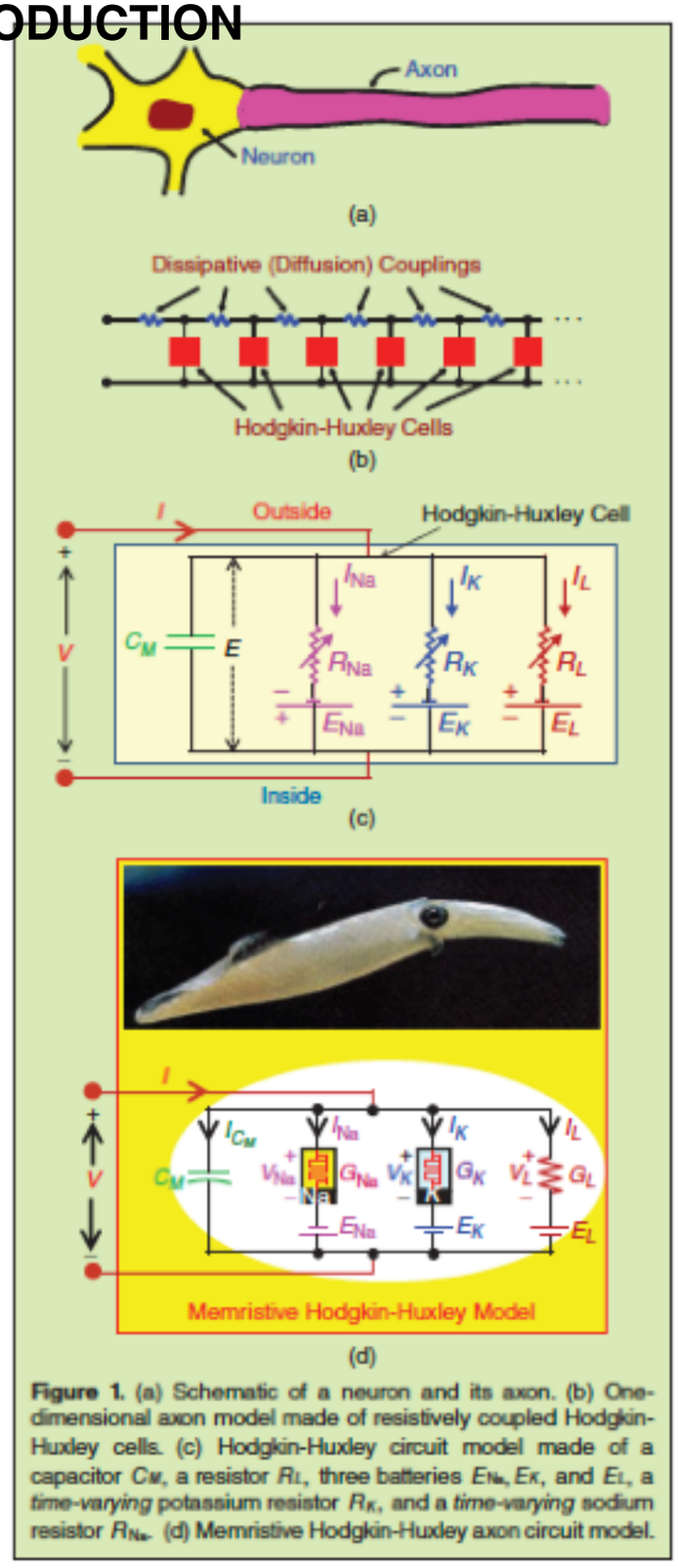

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