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Memristive model of amoeba learning YURIY V. PERSHIN, Department of Physics and Astronomy and USC Nanocenter, University of South Carolina, STEVEN LA FONTAINE, MASSIMILIANO DI VENTRA, Department of Physics, University of California, San Diego — Recently, it was shown that the amoeba-like cell *Physarum polycephalum* when exposed to a pattern of periodic environmental changes learns and adapts its behavior in anticipation of the next stimulus to come. Here we show that such behavior can be mapped into the response of a simple electronic circuit consisting of a LC contour and a memory-resistor (a memristor) to a train of voltage pulses that mimic environment changes [1]. We also discuss a possible biological origin of the memristive behavior in the cell. These biological memory features are likely to occur in other unicellular as well as multicellular organisms, albeit in different forms. Therefore, the above memristive circuit model, which has learning properties, is useful to better understand the origins of primitive intelligence. [1] Yu. V. Pershin, S. La Fontaine, and M. Di Ventra, *Phys. Rev. E* 80, 021926 (2009)

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