Gradual changes of membrane properties at high transmembrane electric potential simulate a breakdown threshold.

Glaser, R., Gimsa, J., 1993. *In* M. Blank (Ed.): Proceedings of the Electricity and magnetism in biology and medicine. 135–137, San Francisco Press. ISBN 9780911302677. 1st World Congress for Electricity and Magnetism in Biology and Medicine, 14.-19. June. Buena Vista Palace, Lake Buena Vista, Florida.

Abstract: *Pore formation, expansion, and resealing are time-dependent processes that depend strongly on transmembrane voltage, but have no threshold voltage. The electric properties of a system of membranes and electrolyte solutions undergo qualitative changes in a narrow range of voltage between low voltages at which transmembrane voltage is determined by the external field and time constant of membrane charging, and high voltages at which the conductance of the membrane limits the transmembrane voltage. This transition is described in the literature as reversible electrical breakdown. During pulses of higher voltage, the current through the membrane is of the same order of magnitude as the current that would flow in the system without a membrane. Voltage across the membrane is independent of external voltage. The size and number of pores that are necessary to downregulate transmembrane voltage depend on pore resistance, surrounding solutions, and the geometry of the system. This phenomenon is a key to an understanding of cell damage and other secondary effects following electrical pulsation.*