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**Paulina Czarnecki\*** (pczarn@umich.edu), **Jennifer Crodelle** and **Calina Copos**. *Building a Mathematical Model of the Merkel Cell*. Preliminary report.

Indentation of the epidermis is communicated to the brain through the electrical activity of nerve cells. Recent experiments suggest that cells located in the upper layer of the skin, called Merkel cells, may work together with neurons to sense light touch, but their exact role is not well defined. Mechanosensitive channels on the Merkel cell membrane are found to be activated by the indentation of the skin and are responsible for the generation of calcium-dependent action potentials. Experimental observations suggest that communication between the Merkel cell and the nerve cell occurs through synaptic transmission. We present a mathematical model that describes the action potential of a Merkel cell in response to an applied current and indentation. We use a Hodgkin Huxley formulation to model the behavior of ion channels found on the Merkel cell membrane. Additionally, we incorporate a model of the mechanosensitive nonspecific cation channel and analyze the resulting electrical activity of the cell. We show that our model qualitatively matches the experimentally measured behavior of a Merkel cell in response to electrical and physical stimuli. (Received September 15, 2019)