

# NEURON SIMULATOR: RUNNING SCRIPTS

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**Problem 1: Run the script for Pospischil et al 2008** In class today, we downloaded a set of Neuron scripts to implement the ion channels that we had earlier studied in the paper of Pospischil et al, 2008<sup>1</sup>. For homework, lets retrace the steps for downloading this material from the MODELDB database <https://senselab.med.yale.edu/ModelDB/>. So go to that URL, and find the scripts implementing the paper of Pospischil(2008a) – you can use the "First Author" tab to find them.

- Try downloading the zip file.
- make a directory to hold MODELDB files if you haven't already.
- mv the zip file there and unzip it
- Recall that you need to run nrnivmodl in that dir to build the script
- Now run the hoc file which makes use of this ".mod" file
- Finally run "nrngui mosinit.hoc" and execute all five ion channel models Turn in a copy of the result of running the five models.
- Now look at the \*.mod files which actually implement these ion channels
- Briefly describe, with reference to the paper, each of the five current outputs that are modeled in these scripts
- Look at the file HH\_Traub.mod – describe where the alpha and beta functions come from in the paper by Pospischil.

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<sup>1</sup>Pospischil M, Toledo-Rodriguez M, Monier C, Piwkowska Z, Bal T, Fregnac Y, Markram, Destexhe (2008) Minimal Hodgkin-Huxley type models for different classes of cortical and thalamic neurons. Biol Cybern 99:427-41

**Problem 2: Check out the range of simulators available** Click on the button, (on the main web page for MODELDB), for "Simulators" How many different simulation environments are available? What are the five most popular simulation systems.

**Problem 3: Explore MODELDB** Under the simulator categories "neuron" and "matlab" download one of each that we haven't looked at yet and run it in neuron. Turn in one output from your choice of matlab and python examples (labeling where it came from in modeldb.)