The Son of MOM (SOM) is a small, simple microscope designed to allow a single experimental setup to be used for both in vivo and in vitro experimentation. As in our two-photon Movable Objective Microscope (MOM), positioning over the sample and focusing is accomplished robotically. This removes the need for the large translators and stages that normally limit the available space beneath the objective for in vivo experimentation. For example, the SOM will allow whole-cell patch recordings from neurons in vivo on one day followed by multi-cell recordings in slices on the next.

The SOM opens up experimental possibilities that otherwise might be limited by the ever growing space constraints in modern laboratories. The SOM is designed to take full advantage of our new free Multi-Link™ software program for micromanipulator positioning.

For instance, during whole-cell patch recording in slices it is commonly necessary to search over a large area of tissue to find neurons appropriate to your experiment. With the SOM, you simply translate over your sample to search for your target. The software programs will then retrieve your recording and stimulation pipettes so that you can begin recording immediately. Moreover, if you then find you need to stimulate a region outside of the current objective’s field of view, the programs will allow you to lock the position of your recording pipette and reposition the objective and stimulating pipette(s) to their required positions.

How it Works:
The SOM is designed to take advantage of the high-quality images that can be obtained with a simple IR LED-based transmitted light source combined with an IR capable CCD camera. This combination is sufficient for the majority of in vitro electrophysiology needs. The SOM is also designed with a two-position filter cube to allow for identification of fluorescently-tagged cells for recording or for photostimulation. If you populate both of the filter cube positions, one of the filter sets will need to pass IR to allow for transmitted light imaging.

The fluorescence excitation port of the microscope has C-mount threading as well as mounting holes for standard cage components. This allows for customization by the user to various experimental needs. For instance, multiple light sources can be coupled to the excitation port with small cage assemblies.