



Forget
"multiphoton ready"!
The new Sutter
3P-MOM is ready
to go for deep-tissue,
three-photon imaging.

3P-MOM® THREE-PHOTON IMAGING

Most two-photon microscopes these days are labeled "multiphoton" and are specified as transmitting IR excitation out to 1900 nm. While very few of these microscopes are currently used for three-photon imaging, Sutter's **MOM**™ already has an established record in 3P microscopy.

A specially modified Sutter **MOM** was the first scope used by Chris Xu at Cornell for pioneering work in 3P imaging at 1700 nm (Horton et al, 2013). The same scope was used in the Xu lab for early 3P work at 1300 nm (Tianyu Wang, personal communication).

A **MOM** installed in late 2016 at the Allen Institute of Brain Science in Seattle was modified by researchers at the Allen and is actively used for 3P imaging (mentioned in McCoy and Arrigoni, Biophotonics, April 2018). This work was first described by Jack Waters at a satellite meeting at Society for Neuroscience 2018 in San Diego (Takasaki et al, 2019, Takasaki et al, 2020).

A second **MOM** at the University of Washington is being converted to 3P excitation by Jack Waters and collaborators.

We are also collaborating with Jing Wang at UCSD, who is carrying on the work begun by his lab and the lab of the late Joel Kubby at UCSC. Their published work demonstrated that three-photon excitation enables non-invasive imaging of the fly brain. We are modifying the optics in an existing **MOM** at UCSD to transmit the longer excitation wavelengths needed for three-photon imaging. Wang and coworkers are modifying the detector path to better collect scattered photons. This scope will start 3P imaging as soon as the laser arrives!

Since the founding work above, 3P excitation is now being used for imaging neuronal activity. Applications include 3P-GCaMP6 imaging in mouse hippocampus (Ouzounov, T. Wang et al 2017, Weisenburger et al,

2019), in mouse visual cortex (Yildirim et al, 2018), in mouse cortex through the intact skull (T. Wang et al, 2018), and in deep cortical layers of freely moving rats (Klioutchnikov et al 2020). 3P excitation of GCaMP6 has also been used to measure brain calcium activity in fruit fly (Aragon et al, 2019), and in adult zebrafish (Chow et al, 2020).

Since 2015, we have sold nine **MOMs** preconfigured for three-photon imaging: two to Shenzhen University China, two to UT San Antonio, two to KIST South Korea, and one each to University of Kansas, University of Rochester, and NTU Singapore,

Sutter **3P-MOM**: a proven platform for 3 photon microscopy! Let us help you configure a three-photon system that will allow you to image deeper. Please contact Sutter for more information.



SUTTER INSTRUMENT®



One Digital Drive • Novato • CA 94949 • Phone +1.415.883.0128
Fax +1.415.883.0572 • Web www.sutter.com • Email info@sutter.com

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