



neurescence  
BIOLOGICAL OPTICAL IMAGING

# QUARTET

Simultaneous Multi Region Functional Imaging Of  
Neuronal Activity In Freely Behaving Animals



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We offer...

## SIMULTANEOUS MULTI-REGION

functional imaging of  
neuronal circuits and  
calcium imaging.



**Quartet®** is a light-weight fluorescence microscope and data collection software package.

**Services included:** hands-on-surgical training, neuronal trace extraction support and device synchronization with other behavior equipments.

# BRAIN IMAGING LIKE NEVER BEFORE...

- Enables simultaneous calcium imaging in up to four brain and spinal cord regions in freely behaving rodents.
- Four light-weight and flexible optical fiber bundles (total <1.5 g), with a *focus lock* capable connector design.
- Simultaneous imaging in up to four animals (social interaction studies).
- Electronics placed away from head of animal allows swimming experiments.
- Allows co-registration with other modalities (optogenetics, EEG, fMRI, PET).
- Highly flexible fibers minimize interference with animal behavior.
- Functional imaging of up to hundreds of neurons with single neuron resolution.
- Can be combined with optogenetics, stimulating one brain region, and recorded from 3 other brain regions.



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# TECHNICAL SPECIFICATIONS



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Number of imaging probes	4	Implant any where in brain and spine at any angle
Diameter of GRIN lens to implant	1mm	0.7mm or smaller lenses are also available
Available length of lens to enter brain tissue	2.5 mm for 1mm diameter lens	0.7mm diameter GRIN lens has about 7.5mm available to enter tissue
Field of view in each region	0.9 mm to 1mm diameter	For 0.7mm lens it is about 0.6mm
Weight of connector and lens	< 400 milligrams	
Length of imaging fiber bundles	84 cm	
Bending radius of fiber bundles	3 cm	Didn't observe changes in detected fluorescence signal with tight fiber twisting
Weight of each fiber bundle	Less than 3 gr	Animal does not carry this weight
Approximate weight carried by animal	Less than 1 gr	For one fiber-connector
Illumination wavelength	470nm $\pm$ 15nm	
Detection wavelength	517 $\pm$ 13 nm and 590 $\pm$ 20 nm	Simultaneous detection of both colors
Illumination power at tissue	1.2mW	Tunable from 0 to 1.2mW
Optical resolution	8.7micron	Measured by 1951 USAF optical resolution target
Image size per frame	3.2 megapixels	
Number of frames per second	20 in continuous color mode	Up to 140 fps in burst mode
Length of camera electric wire	2 meters	
Length of LED wire	1.5 meter	

