Optogenetics with OBIS and OBIS Galaxy

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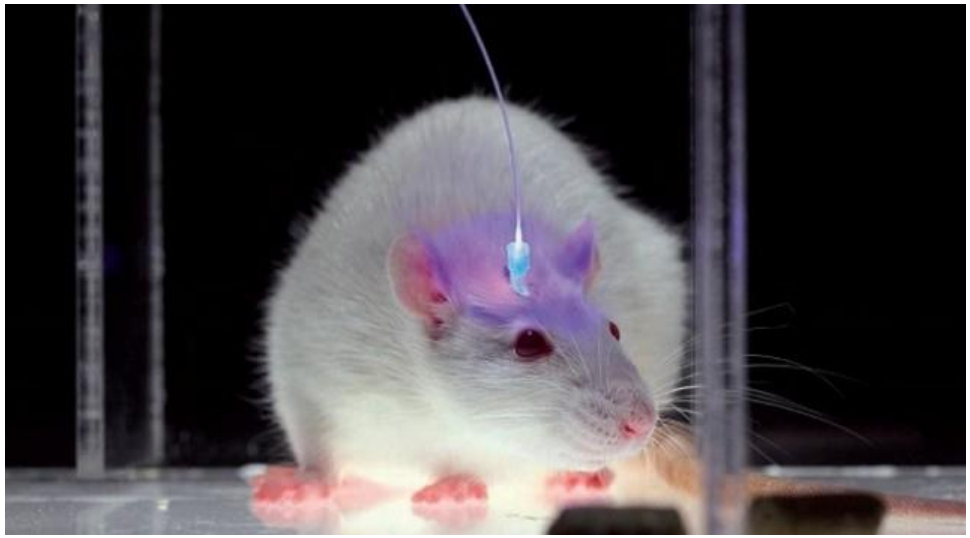
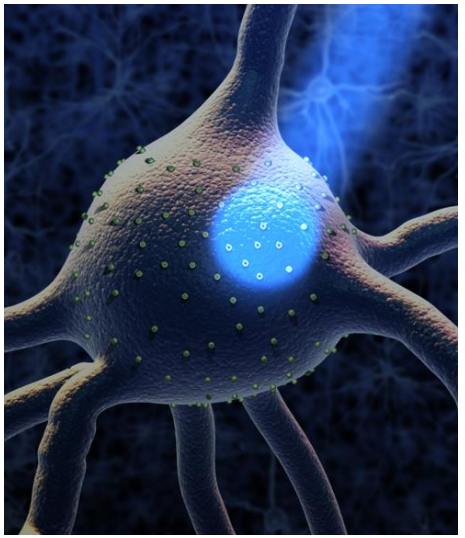
Overview

Optogenetics is a neuromodulation technique employed in neuroscience that uses a combination of techniques from optics and genetics to control and monitor the activities of individual neurons in living tissue — even within freely-moving animals — and to precisely measure the effects of those manipulations in real-time. (Wikipedia)



From Website: ExtremeTech: ***"Optogenetics: Controlling and Eradication Epilepsy with Lasers."***
http://www.extremetech.com/extreme/146661-optogenetics-controlling-and-eradicating-epilepsy-with-lasers



From Massachusetts Institute of Technology website, *"MIT News."*
http://newsoffice.mit.edu/topic/optogenetics

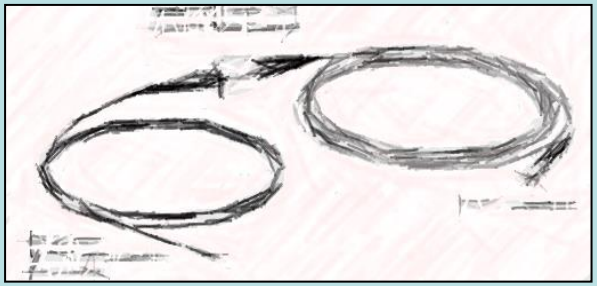
How Can OBIS be Used as the Light Source?

OBIS laser can easily connect to the Optogenetics fiber delivery systems. The schematic is shown below:

Coherent OBIS Fiber Pigtailed Laser with FC/UFC Connector

Commercially Available Fiber Connector, FC/PC to FC/PC

Commercially available multimode fiber components

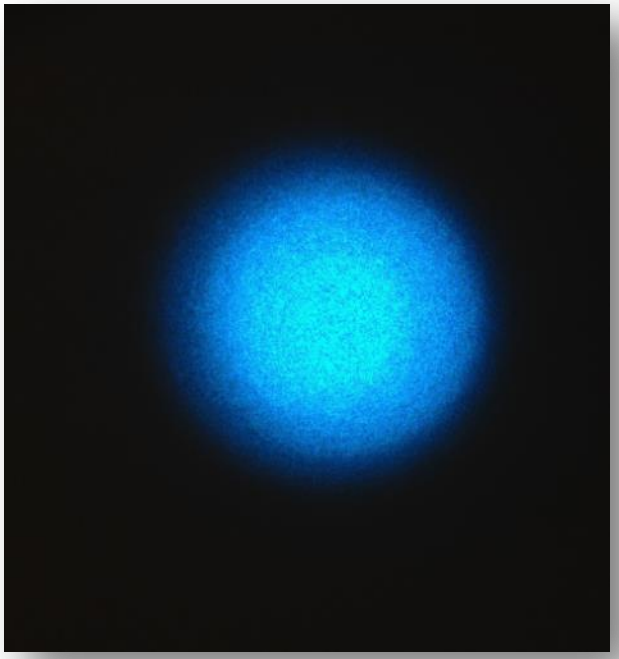


Please contact us for advice in sourcing

Results with an OBIS Laser into a Multimode Fiber

Approximately 80% of the laser power can transmit to the sample. The 20% loss includes the loss at the coupler into the 200 µm MM Fiber and the loss at the rotary joint.

Example image of the output beam:



Conclusions: OBIS Laser into the Optogenetics Fiber

1. OBIS FP lasers with UFC are part of the Galaxy system.
2. OBIS FP lasers with UFC have their own data sheet.
3. Many wavelength choices of the OBIS FP lasers with UFC are released for sale.
4. The Optogenetics Kits, including rotary joints are commercially available from different vendors. The mode structure from the fiber does change as the fiber is rotated.
5. Please apply care in handling fibers and use commercially available cleaning accessories whenever applicable.

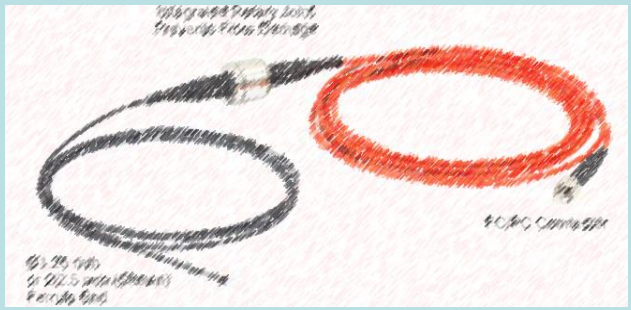
How Can OBIS Galaxy be Used as the Light Source?

OBIS laser can easily connect to the Optogenetics fiber delivery systems. The schematic is shown below:

Coherent OBIS Galaxy

Remove the Galaxy White Output Fiber

Commercially Available Multimode Fiber Components



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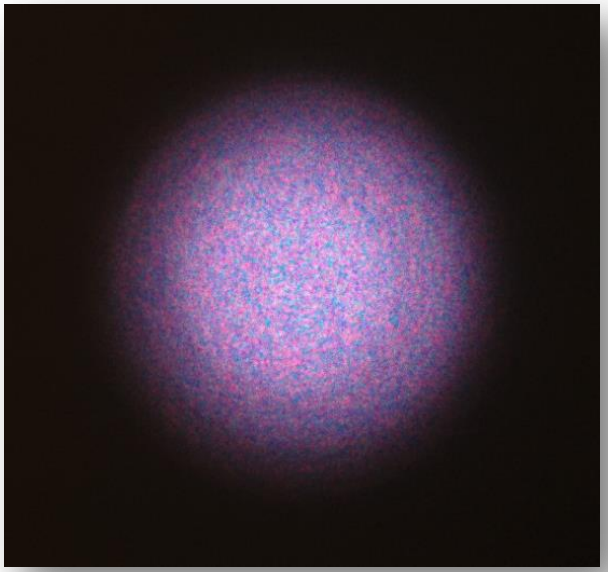
Results with an OBIS Galaxy Coupled into a Multimode Fiber

There is improved power transmission into the Multimode fiber as compared to the OBIS Galaxy White Output Fiber. For example the MM fiber can transmit and additional 10% more power to the application.

Example image of the output beam with 488 nm and 640 nm combined:



Conclusions: OBIS Galaxy into the Optogenetics Fiber

1. OBIS Galaxy can easily accept a FC/PC multimode fiber.
2. Recommend the customer clean and inspect the fiber tips before coupling.
3. With a 200 µm fiber you can expect 10% of the power to the application.
4. The mode structure from the fiber does change as the fiber is rotated.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