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Siskiyou Simplifies Laser Integration for Optogenetics Microscopy

2/16/15 – The Siskiyou **IS-OGP** is a simple, turnkey, modular solution (patent pending) for integrating an external laser beam into an existing microscope in optogenetics experiments that utilize a laser spot to stimulate target neurons in the cortex of lab animals. Specifically, the **IS-OGP** provides a means to introduce a fiber-coupled laser beam into the infinity space of leading optical microscopes having a trinocular setup (including those from Nikon, Olympus, and Zeiss), and then to position the focused laser stimulation spot (10 μm typical with 20X objective) with sub-micron accuracy, anywhere within the field of view.

The **IS-OGP** optomechanical module accepts a single-mode, FC connectorized fiber optic cable input from the light source, thus enabling rapid connection and “hot-swapping” of any single-mode, fiber-coupled laser. The system then internally collimates the fiber output and introduces it into the microscope through a user-specified dichroic beamsplitter. Independent x and y axis positional control of the focused laser spot is provided by two differential drive screws which permit scanning and positioning of a focused laser beam anywhere in the microscope field of view. These can be operated manually or automatically using Siskiyou’s DC servo drivers, long-proven in other demanding photonic applications, such as patch clamp experiments and laser cavity optimization.

The broadband optical performance of the integrated fiber connector and collimator makes the **IS-OGP** ideal for all types of optogenetic stimulation, including opsins like ChR1 and ChR2 as well as longer wavelength activators like C1V1. It is also applicable to both visible (one-photon) and near-infrared (two-photon) excitation of these opsins and other activators.

Siskiyou Corporation (Grants Pass, OR) provides a diverse range of micromanipulators, microscope sample positioners, motion control systems and modular opto-mechanical mounts and positioners to life science and photonics researchers and OEMs. The goal of the company is simple – to offer the highest quality product at an economical price, and to support customers with superior service. Founded in 1972, Siskiyou is a vertically integrated company, performing all design, manufacturing, anodizing, and assembly in-house.