

# The Optopatcher

## *Patch Clamp Micropipette Holder with integrated fiber optic*



The Optopatcher provides unmatched accuracy in applying optical stimulation to an in-vivo patch-clamp protocol, integrating the fiber optic within the same microelectrode being used to make the electrode recording.

### *Instructions*

The Optopatcher consists of a main body, with two threaded side bodies. One side body contains the fiber optic base (ferrule) and light guide; the other a silver wire and pin connector designed for use with a common headstage connectors. The bodies are interchangeable, so the user can decide if the headstage connector is parallel with the micropipette and the light fiber path is angled through the optopatcher, or if the light fiber path through the body is straight and the headstage connector is angled. The side bodies can simply be repositioned, provided care is taken when re-inserting the light fiber or the silver wire into the main body's internal ports.



When shipped, the light fiber installed in the optopatcher is of considerable length; most likely it is longer than required for use. End users need to determine the final length they require based on their typical pipette length and trim the fiber accordingly. Optimum performance is obtained the closer the end of the light fiber is to the pipette end. Cutting the optical fiber to length is a simple task, provided you have access to a fiber optic scribe is used to score/snap the fiber.

Additional polishing of the fiber end is not typically necessary. If needed, this process can be performed with the fiber optic remaining inside the optopatcher. Should the fiber optic need to be removed/replaced, reinsertion can be challenging. Routing the fiber optic around the junction of the internal optopatcher ports can be aided by slowly rolling the base end of the fiber (the white ceramic ferrule end) between your thumb and index finger while inserting the fiber into the optopatcher body.



If replacing the fiber be sure to put the o-ring and gasket back on the fiber ferrule in the correct order.



The ferrule at the end of the cable from your light source mates to the optopatcher via the included 1.25mm split mating sleeve. It is recommended that the sleeve be placed on the cable and then the assembly connected to the optopatcher. There is a stop within the side body port preventing insertion of the mating sleeve beyond a certain point, Roughly 80% of the mating sleeve will cover the cable's ferrule, and 20% will cover the optopatcher's ferrule.



The outside of the Optopatcher should be wiped dry before insertion into the headstage. No electrolyte should be allowed to accumulate on the external surfaces and that no air spaces exist in the current path. To maximize Optopatcher life, it should be blown dry after use, wiped dry on external surfaces and stored without touching each other, in a dry atmosphere. Alcohol or other solvents are not suitable for cleaning. Use distilled water to soften and remove deposits.

The use of opaque coating materials to reduce light leakage from the pipette can be beneficial if needed. Suggested materials include acrylic paint, nitrocellulose-based lacquers and non-toxic nail-polish. For best results, the coating should reach the very tip of the electrode (within a few microns) but can lead to poor patching if it interferes with the tip surface. By manually painting the pipette you can get close to the tip but this procedure will have high variability and must be done carefully under the microscope to reach <math><1\text{mm}</math> resolution.