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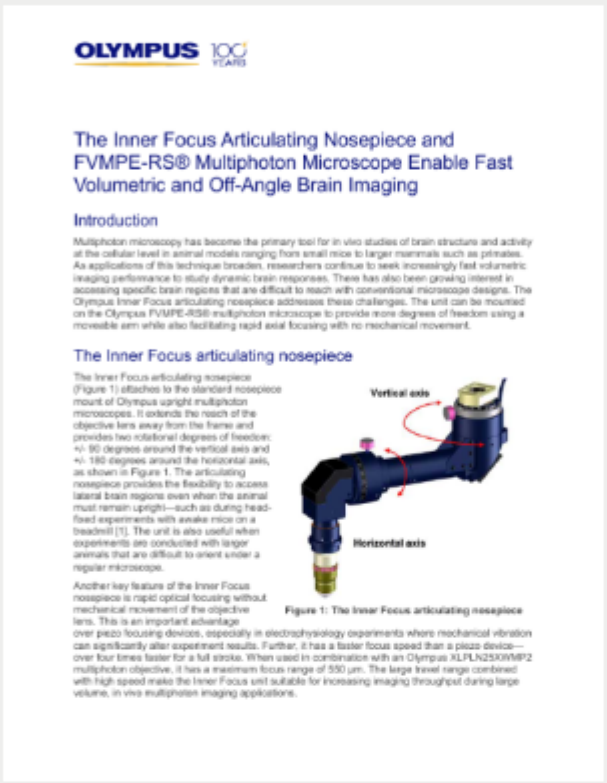

OLYMPUS 100 YEARS

The Inner Focus Articulating Nosepiece and FVMPE-RS® Multiphoton Microscope Enable Fast Volumetric and Off-Angle Brain Imaging

Introduction

Multiphoton microscopy has become the primary tool for in vivo studies of brain structure and activity at the cellular level in animal models ranging from small mice to larger mammals such as primates. As applications of this technique broaden, researchers continue to seek increasingly fast volumetric imaging performance to study dynamic brain responses. There has also been growing interest in accessing specific brain regions that are difficult to reach with conventional microscope designs. The Olympus Inner Focus articulating nosepiece addresses these challenges. The unit can be mounted on the Olympus FVMPE-RS® multiphoton microscope to provide more degrees of freedom using a moveable arm while also facilitating rapid axial focusing with no mechanical movement.

The Inner Focus articulating nosepiece

The Inner Focus articulating nosepiece (Figure 1) attaches to the standard nosepiece mount of Olympus upright multiphoton microscopes. It extends the reach of the objective lens away from the frame and provides two rotational degrees of freedom: +/- 90 degrees around the vertical axis and +/- 180 degrees around the horizontal axis, as shown in Figure 1. The articulating nosepiece provides the flexibility to access lateral brain regions even when the animal must remain upright—such as during head-fixed experiments with awake mice on a treadmill [1]. The unit is also useful when experiments are conducted with larger animals that are difficult to orient under a regular microscope.

Figure 1: The Inner Focus articulating nosepiece

Another key feature of the Inner Focus nosepiece is rapid optical focusing without mechanical movement of the objective lens. This is an important advantage over piezo focusing devices, especially in electrophysiology experiments where mechanical vibration can significantly alter experiment results. Further, it has a faster focus speed than a piezo device—over four times faster for a full stroke. When used in combination with an Olympus XLPLN25XWMP2 multiphoton objective, it has a maximum focus range of 550 µm. The large travel range combined with high speed make the Inner Focus unit suitable for increasing imaging throughput during large volume, in vivo multiphoton imaging applications.

Fast Volumetric and Off-Angle Brain Imaging with the FVMPE-RS® Multiphoton Microscope

Multiphoton microscopy has become the primary tool for in vivo studies of brain structure and activity at the cellular level in animal models ranging from small mice to larger mammals such as primates. As applications of this technique broaden, researchers continue to seek increasingly fast volumetric imaging performance to study dynamic brain responses. There has also been growing interest in accessing specific brain regions that are difficult to reach with conventional microscope designs. The Olympus Inner Focus articulating nosepiece addresses these challenges. The unit can be mounted on the Olympus FVMPE-RS® multiphoton microscope to provide more degrees of freedom using a moveable arm while also facilitating rapid axial focusing with no mechanical movement.

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