Title	**Deep-brain imaging via epi-fluorescence Computational Cannula Microscopy**
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Abstract	Here we demonstrate widefield (field diameter = 200 µm) fluorescence microscopy and video imaging inside the rodent brain at a depth of 2 mm using a simple surgical glass needle (cannula) of diameter 0.22 mm as the primary optical element. The cannula guides excitation light into the brain and the fluorescence signal out of the brain. Concomitant image-processing algorithms are utilized to convert the spatially scrambled images into fluorescent images and video. The small size of the cannula enables minimally invasive imaging, while the long length (>2 mm) allow for deep-brain imaging with no additional complexity in the optical system. Since no scanning is involved, widefield fluorescence video at the native frame rate of the camera can be achieved.
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