

## **Building back better methods: Best practices and tools for reporting reproducible fluorescence microscopy methods**

### **Imaging**

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The rapid development of quantitative imaging technologies and analysis tools has enabled significant breakthroughs in life sciences and biomedical research. Rigorous and unbiased imaged-based experimental design and analysis workflows are critical to providing accurate insight into the biological process under investigation. However, this rapid development has presented new challenges for researchers, as an in-depth understanding of each technology is needed to appreciate how it may impact bias and reproducibility. Thus, even though microscopy methods reporting is a critical aspect of scientific communication, it is often overlooked throughout the peer-review process, often being condensed into one or two sentences that are missing critical details required to reproduce the experiments and lack appropriate citations. Here we present guidelines and other resources to educate and assist researchers at reporting methods from some of the most common fluorescence light microscope modalities (widefield microscope, single point scanning confocal microscopy, spinning disk confocal microscopy, and multiphoton microscopy). Our goal for these resources is not only to improve methods reporting during manuscript preparation, but to also influence the design of the experiment and image acquisition before data collection, ultimately improving the quality, rigor, and reproducibility of image-based science.