

EDITORIAL

Open Access



# Empowering scientific progress: the vital role of open-access, peer-reviewed methods and protocols

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## Abstract

In the ever-evolving landscape of scientific research, the importance of detailed, accessible methods and step-by-step reusable protocols cannot be overstated. In alignment with this *BMC Methods*, is dedicated to facilitating the dissemination of open-access, peer-reviewed novel experimental procedures, techniques, and methodologies to promote reproducibility, transparency, and the advancement of scientific methods in the natural sciences.

## Main

In the ever-evolving landscape of scientific research, the importance of detailed, accessible methods and step-by-step reusable protocols cannot be overstated. They are essential for reproducibility, as well as trust in science and scientific advancement.

Despite progress in open science, particularly in areas like open access publications, open data, and open code, advances in open methods have lagged behind [1]. This discrepancy raises concerns because the lack of openly accessible detailed methods undermines trust in published data and severely limits the adoption of new methodologies, as well as the use of data. Addressing this challenge requires a cultural shift within the scientific community and a commitment to promoting transparency, openness, and collaboration in research practices. In alignment with this, *BMC Methods* (<https://bmcmethods.biomedcentral.com/>) is dedicated to facilitating the dissemination of open-access, peer-reviewed novel experimental procedures, techniques, and methodologies to promote reproducibility, transparency, and the

advancement of scientific methods in the natural sciences. To assist our authors in effectively showcasing their innovative techniques and procedures, *BMC Methods* offers two primary article types, Methodology Articles and Protocols. These article types serve to facilitate the dissemination of innovative experimental and computational methods or provide detailed step-by-step descriptions of experimental techniques, respectively. This approach will then enable our readers to scrutinise, validate, and build upon easily accessible and peer-reviewed methodologies, establishing a foundation of shared knowledge that elevates the integrity of scientific pursuits.

We also acknowledge the scientific community's demand for living protocols, recognizing that the question about protocols is generally not whether they will change, but when and how they will evolve or be adapted by others. In collaboration with protocols.io (<https://www.protocols.io/>), we facilitate the deposition of protocols on their dynamic platform. This enables versioning or forking as they evolve or are adapted by other research groups, preserving an original version that undergoes peer review and is published with us. Additionally, we offer the opportunity for researchers to publish protocol extensions in cases of significant advancements or adaptations.

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We firmly believe that *BMC Methods* will play a pivotal role in addressing the pressing issue of inadequate reporting of methods, a primary factor contributing to the widely recognized ‘reproducibility crisis.’ Coined in the early 2010s, this term refers to a significant challenge faced by the scientific community, where a substantial number of published scientific studies and experiments cannot be reliably reproduced by other researchers [2]. A 2016 survey by Nature on 1,576 researchers who took a brief online questionnaire on reproducibility, found that more than 70% of researchers have tried and failed to reproduce another scientist’s experiment results and more than half have failed to reproduce their own experiments [3]. Additionally, the “Reproducibility Project: Cancer Biology” sought to replicate findings from 193 high profile experiments in cancer research [4]. No paper contained sufficient methodological details to allow researchers to design and conduct a replication study. Contact with authors was always required to design and conduct replication studies, and many authors were not able to provide helpful information. These examples clearly demonstrate that research findings are important but not useful if the methods used to generate the data are not accessible or not sufficiently detailed to allow reproducibility, understanding and trust.

In conclusion *BMC Methods*, as the first Springer Nature open-access, peer-reviewed journal that will focus on providing updates in methods and lab protocols, aims to position itself at the forefront of the cultural shift that will eventually result in elevating the quality and rigour of scientific research. We warmly encourage you to submit your methodologies and step-by-step reusable protocols to our journal (<https://submission.springernature.com/new-submission/44330/3>), embracing the transformative potential of open-access and peer-review to methodologies and protocols, propelling science into a future marked by reproducibility, continual progress and shared discovery.

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#### Authors’ contributions

CC conceived and drafted the manuscript. CC read and approved the final manuscript.

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#### Declarations

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#### Consent for publication

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