Introducing Data Descriptors: A New Article Type to Advance Data-Driven Science

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Data have become the backbone of contemporary science. From large-scale genomic initiatives to real-time environmental monitoring, modern science increasingly relies on the generation, integration, and reuse of complex datasets. However, a substantial proportion of these data remain underutilized, poorly documented, or inaccessible limiting reproducibility, slowing discovery, and diminishing the long-term value of scientific investment.

To further support open science and data sharing, the Journal of Biomedical Physics and Engineering (JBPE) is pleased to introduce a new article type: the *Data Descriptor*.

What exactly is a *Data Descriptor*?

Unlike traditional research articles that focus on hypothesis testing and the presentation of novel findings, *Data Descriptors* are peer-reviewed publications primarily intended to provide a comprehensive description of research datasets [1, 2]. They explain the nature and scope of the data, how they were collected and processed, and how they can be accessed and reused by the scientific community. In essence, a *Data Descriptor* offers a structured framework that transforms datasets into discoverable, interpretable, and reusable scientific resources.

Each *Data Descriptor* includes several key components, typically comprising a narrative description of the dataset's content and scope; detailed provenance information describing data collection and processing methods; structured, machine-readable metadata that facilitates discoverability and indexing; persistent repository links with clear licensing terms; and evidence of technical validation [2, 3]. This structured approach aligns with the principles of making research data Findable, Accessible, Interoperable, and Reusable (FAIR).

Why does this matter? *Data Descriptors* address an important gap in scientific publishing by providing proper recognition for researchers who invest significant time and resources in developing high-quality datasets, which are often underappreciated. Traditional publication metrics tend to reward novel analyses and interpretations rather than the rigorous work involved in data generation and curation. By offering a citable publication format, *Data Descriptors* help correct this imbalance, formally crediting data creators and encouraging responsible data sharing [4]. Evidence also suggests that datasets described in dedicated data publications receive substantial scholarly attention and citations [3].

Furthermore, *Data Descriptors* improve reproducibility and

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transparency, which are fundamental principles of rigorous science. These articles require detailed documentation of data collection, quality control, and processing steps, enabling others to independently validate and replicate the studies [2]. In addition, *Data Descriptors* facilitate data-driven discovery by making datasets easier to locate, integrate, and analyze across multiple studies.

Leading journals have already demonstrated the value of this approach. Nature's Scientific Data pioneered the *Data Descriptor* format, and specialized data journals and platforms across fields like biodiversity and geoscience have adopted similar models [1, 5].

We therefore invite JBPE community to submit *Data Descriptors* for datasets that can advance research in their respective fields. Whether you have generated comprehensive survey data, curated reference collections, or produced novel experimental datasets, JBPE provides a platform to share these resources with the global scientific community. Together, we can build a more open, transparent, and data-driven scientific ecosystem.

We have prepared detailed guidelines to assist authors in preparing and submitting a *Data Descriptor* manuscript. These guidelines outline the required manuscript structure and the essential components for each section. We encourage all potential authors to review the guidelines available in the "Guide for Authors" on the journal's website prior to submission.

Authors' Contribution

T. Mahmoudi and A. Razmkon contributed to the conceptualization, methodology, and writing of the manuscript and read, modified, and approved the final version.

Conflict of Interest

None

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