



OPEN SCIENCE BADGES



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Editorial Office / Journal of Neurochemistry



What are the Open Science Badges?

Recognizing the importance of research transparency and data sharing to cumulative research, *Journal of Neurochemistry* encourages authors to share the data, materials, research instruments, and their research plan by archiving them in an appropriate public repository. Qualifying public, open-access repositories are committed to preserving data, materials, and/or registered research plans and keeping them publicly accessible via the web into perpetuity. Examples include the [Open Science Framework](#) (OSF) and the [various Dataverse networks](#). Hundreds of other qualifying data/materials repositories are listed at the [Registry of Research Data Repositories](#). Personal websites and most departmental websites do not qualify as repositories.

Open Science Badges (see the [Open Science Framework Wiki](#) as well), developed by the non-profit [Center for Open Science \(COS\)](#) are awarded to researchers to acknowledge data and materials sharing as well as the preregistration of scientific studies. The badges indicate that a strict practice was followed, thus ensuring that the research conducted is of high quality and high impact. A recent study demonstrated that implementing these badges significantly increased rates of data and materials sharing in a high impact journal ([Kidwell et al., 2016](#)). The adoption of badges across a broader range of journals could have a large effect on the field, and may lead to a cultural shift among scientists toward increased transparency and sharing of research data and materials.

The Journal of Neurochemistry aims to provide strong incentives for individual researchers to share data, materials, or their research process **by acknowledging open practices with badges in publications.**

Here, we introduce three badges to acknowledge [Open Data, Open Materials, and Preregistration](#). The badges will be awarded to published manuscripts of experimental research.



A Guide for Authors

How are badges awarded to the Authors?

The badges, visual icons placed on publications, certify that an open practice was followed and signal to readers that an author has shared the corresponding research evidence.

Each badge has its own criteria, but all signal to the reader that its resource has been made available in its entirety and certify its accessibility in a linked, persistent location. The opportunity to apply for a badge will arise upon submission of a manuscript or upon submission of a revision.

You can apply for more than one badge if your manuscript meets the Badge criteria. For each badge selected, the journal uses the disclosure verification to confirm you meet the criteria to earn the badge. Read each badge's criteria to identify which badge(s) you'd like to apply for. If you cannot meet the criteria to earn a badge due to confidentiality or ethical concerns, you'll have an opportunity to explain why. Once published, the badge(s) earned will appear on your publication along with a disclosure statement indicating where the corresponding resource is located.

Please follow the step-by-step process below to avail of the badge system.

1. During manuscript submission, authors review badge criteria to determine whether they wish to apply.
2. Authors identify whether they will apply for one or more badges for each study appearing in the manuscript.
3. The authors complete the [Open Practices Disclosure](#) in which they identify for which badge they want to apply.
4. If badge criteria cannot be met, authors have opportunity to provide text to appear in place of the badge, such as "For protection of human participant privacy, the University's Data Access Committee must review all data access requests. All reasonable data requests from qualified researchers are granted. Contact your university's data access committee to initiate data request process."

The Editorial Office will evaluate the disclosure before issuing the badge, but does not do more than a cursory evaluation of the data, materials, or registration. Such a review might include: confirming that the provided link leads to the data, materials, or registration on a public, open access repository, and that the linked materials are related to the report. Authors are accountable to the community for disclosure accuracy.

The badges

The Open Data Badge



The **Open Data** badge is awarded for making publicly available the digitally shareable data necessary to reproduce the reported results. Publicly available means that the material is accessible to anyone with an internet connection using a modern web browser.

Criteria

Criteria for earning the Open Data badge on a report of research are:

1. Digitally-shareable data are publicly available on an open-access repository. The data must have a persistent identifier and be provided in a format that is time-stamped, immutable, and permanent (e.g., university repository, a registration on the Open Science Framework, or an independent repository at www.re3data.org).
2. A data dictionary (for example, a codebook or metadata describing the data) is included with sufficient description for an independent researcher to reproduce the reported analyses and results. Data from the same project that are not needed to reproduce the reported results can be kept private without losing eligibility for the Open Data Badge.
3. An open license allowing others to copy, distribute, and make use of the data while allowing the licensor to retain credit and copyright as applicable. Creative Commons has defined several licenses for this purpose, which are described at www.creativecommons.org/licenses. CCo or CC-BY is strongly recommended.

State of Data Notations

Open data badges assume that at least raw data are available. If only derived, constructed data are available (i.e. the data used to conduct the reported analyses), it is denoted with the badge. Sharing derived datasets must include descriptions of how the data were constructed or, even better, provide the code used to construct the data.

Open data badges assume that all collected data are made available. If only the subset of data used to conduct the reported analyses is available, it is denoted with the badge. Sharing reported subsets must include descriptions of how the data were reduced from the complete dataset or, even better, provide the code used to reduce the dataset.

Specification of open data explicitly excludes data that compromises confidentiality or anonymity of human participants. If access to identifying data is necessary to reproduce the reported analyses, then the report is not eligible for an open data badge.



The Open Materials Badge



The **Open Materials** badge is earned by making publicly available the components of the research methodology needed to reproduce the reported procedure and analysis.

Criteria

Criteria for earning the Open Materials badge on a report of research are:

1. Digitally-shareable materials are publicly available on an open-access repository. The materials must have a persistent identifier and be provided in a format that is time-stamped, immutable, and permanent (e.g., university repository, a registration on the [Open Science Framework](#), or an independent repository at www.re3data.org).
2. Infrastructure, equipment, biological materials, or other components that cannot be shared digitally are described in sufficient detail for an independent researcher to understand how to reproduce the procedure.
3. Sufficient explanation for an independent researcher to understand how the materials relate to the reported methodology.

The Preregistered Badge



The **Preregistered badge** is earned for having a preregistered design. A preregistered design includes:

- (1) Description of the research design and study materials including planned sample size
- (2) Description of motivating research question or hypothesis
- (3) Description of the outcome variable(s)
- (4) Description of the predictor variables including controls, covariates, independent variables (conditions).
- (5) When possible, the study materials themselves are included in the preregistration.



Criteria

Criteria for earning the preregistered badge on a report of research are:

1. A public date-time stamped registration is in an institutional registration system (e.g., ClinicalTrials.gov, [Open Science Framework](http://Open_Science_Framework), list of registries by nation or region: <http://www.who.int/ictrp/network/primary/en/>).
2. Registration pre-dates the intervention.
3. Registered design and analysis plan corresponds directly to reported design and analysis.
4. Full disclosure of results in accordance with registered plan.

Badge eligibility does not restrict authors from reporting results of additional analyses. Results from preregistered analyses must be distinguished explicitly from additional results in the report. Notations may be added to badges. Notations qualify badge meaning: TC, or Transparent Changes, means that the design was altered but the changes and rationale for changes are provided. DE, or Data Exist, means that (2) is replaced with "registration postdates realization of the outcomes, but the authors have yet to inspect or analyze the outcomes.

Examples of Experimental Data to be shared

Western Blotting Experiment

1. Provide raw images obtained using darkroom development techniques for chemiluminescence, or normal image scanning methods for colorimetric detection.
2. Provide the name of the system which was used to visualize membranes
3. State the name and version of the Software used to analyze the membranes (for e.g. Quantity One Software).
4. Describe what setting was used to capture the images
5. State the blot exposure times
6. Provide a copy of the raw data obtained
7. Provide the excel data and the equation which was used to calculate the standard curve for the protein standards
8. State if the amount of protein present on the blot was quantified and specify the software used to do this
9. Provide the raw data that was used to calculate a standard curve for the dilution series
10. State if data normalization was performed

Immunohistochemistry Experiments

1. Provide the raw images obtained by light or fluorescence microscopy
2. Provide the raw images obtained by confocal microscopy
3. Provide the name and version of the software employed to obtain images
4. Provide a spreadsheet of the raw quantifications and a description of analysis parameters and program

Electrophysiological

1. Provide raw data of recorded signals
2. Please provide information about the number and types of electrodes, the species and recording site, the preparation, the stimulation paradigm, and of course all the detail parameters of the recording and stimulation equipment.
3. to ensure reproducibility, all of the data should be recorded as metadata
4. Organizing metadata in itself is a challenge and exchanging metadata requires standardized mechanisms such as a common format (www.g-node.org/odml) (1).

Sequencing Techniques

Nucleic acid and protein sequences, microarray data, ChIP sequences, proteomic data, metabolomic data, and other data obtained using high throughput sequencing techniques, as well as materials and associated protocols are important products of the scientific enterprise. Any material (including transgenic animals and antibodies) that is key to replication of the reported results must be accessible without undue restriction from the date of publication in order to allow others to replicate and build upon the authors' claims for decades in the future. **Any restriction on the access to material or data must be disclosed at the time of submission.** Authors must investigate and disclose any restrictions associated with the human or other tissue they are using. Only material without legal, financial or other restrictions should be used. If the use of material mandates consent forms, any limits that result from those forms must be disclosed upon submission.

Readers who encounter refusal by the authors to comply with these policies should contact the Chief Editor. In cases where editors are unable to resolve a complaint, the journal may refer the matter to the authors' funding institution and/or publish a formal statement of correction, attached online to the publication, stating that readers have been unable to obtain necessary materials to replicate the findings.

Microarray data should be MIAME compliant (see www.mged.org/Workgroups/MIAME/miame.html, FGED (The Functional Genomics Data) Society: MIAME (Minimum Information About a Microarray Experiment).

The public repositories ArrayExpress at the EBI (UK), GEO at NCBI (US) and CIBEX at DDBJ (Japan) are designed to accept, hold and distribute MIAME compliant microarray data.

The utility of archived data is greatly enhanced when the scripts and input files used in the analyses are also made available. Given that scripts may be a mix of proprietary and freely available code, their deposition is not compulsory, but we nonetheless strongly encourage authors to make these scripts available whenever possible.

Protein sequences, which have been determined by direct sequencing of the protein, must be submitted to SWISS-PROT at the EMBL Outstation - The European Bioinformatics Institute. Please note that we do not provide accession numbers, IN ADVANCE, for protein sequences that are the result of translation of nucleic acid sequences. These translations will automatically be forwarded to us from the EMBL nucleotide database and are assigned SWISS-PROT accession numbers on incorporation into TrEMBL.

Results from characterization experiments should also be submitted to SWISS-PROT at the EBI. This can include such information as function, subcellular location, subunit etc.

Contact information: SWISS-PROT Submissions, European Bioinformatics Institute, Wellcome Trust Genome Campus, Hinxton, Cambridge CB10 1SD, UK. Tel: +44 (0)1223 494400; Fax: +44 (0)1223 494472. Email: datasubs@ebi.ac.uk (for sequence admissions) update@ebi.ac.uk (for characterization information) Website: www.ebi.ac.uk

Authors may elect to have the data publicly available at the time of publication, or, if the technology of the archive allows, may opt to embargo access to the data for a period up to a year after publication. Exceptions may be granted at the discretion of the editor, e.g. for sensitive information that might compromise the anonymity of human subjects.

An entry name or accession number, together with a direct link, should be included in a 'Data Accessibility' section at the end of the "Methods" section at initial submission if

available. This should list the database and the respective accession numbers for all data from the manuscript that has been made publicly available. An example follows:

-DNA sequences: Genbank accessions F234391-F234402; NCBI SRA: SRX0110215
-Final DNA sequence assembly: uploaded as online supporting information
-Phylogenetic data: TreeBASE Study accession no. S9345
-R scripts: uploaded as online supporting information
-Sample locations, IMa2 input files and microsatellite data: DRYAD entry doi:10.5521/dryad.1311

Please note that reviewers may be asked to comment on the completeness of the Data Accessibility section.

For additional guidelines on data deposition best practice, please visit <http://datadryad.org/depositing> or <http://data-archive.ac.uk/media/2894/managingsharing.pdf>.

If you have any questions about the formatting of this section, please contact JNC-CE@ukaachen.de

Mass Spectrometry

1. Provide access to the raw dataset obtained from MS

PET

1. Provide the raw data collected by a PET scanner
2. Specify the statistical image reconstruction techniques employed to analyse the data
3. Provide the image processing algorithm used for the pre-processing of the raw data