

Open Science Policy and guidelines

2024-2029

Version: 1.0

Date of version: 08.08.2024

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Status: In progress

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1. Introduction to the Document

At NOVA Institute for Medical Systems Biology (NIMSB), we stand for innovation and discovery, committed to advancing knowledge for the society. In pursuit of this mission, NIMSB recognizes the pivotal role of Open Science (OS) in reshaping the landscape of research and fostering collaboration, transparency, and accessibility. Open Science embodies our core values of integrity, inclusivity, quest for excellence, and it serves as the foundation of our actions.

At NIMSB, several activities identify these values and principles. We will implement an open science culture, sharing data and results as open and as FAIR as possible. All peer-reviewed scientific publications will be freely accessible, and datasets and other relevant results will be shared with the community. Research activities will adhere to the highest standards of research integrity and researchers will have training to develop the necessary skills and support to apply OS principles and practices.

2. Introduction to Open Science Policies

Open Science emerges as a pivotal mechanism that not only promotes the societal and economic impact of science, but also increases comprehension of the scientific methodology and improves research efficacy. It fosters scientific collaboration, thereby strengthening the refinement of scientific knowledge and promoting scientific and technological advancement through knowledge dissemination. Moreover, it facilitates the establishment of novel research domains and themes while facilitating the reusing of scientific data. Finally, OS creates a more inclusive and transparent scientific environment, OS is being embraced globally and nowadays, several policies, regulations, guidelines, principles, and initiatives are in place.

2.1 International Initiatives

The UNESCO Recommendation on OS provides an internationally agreed definition, as well as a set of shared values and guiding principles for open science. It also identifies a set of actions conducive to a fair and equitable operationalization of open science for all at the individual, institutional, national, regional and international levels¹.

At European level, under the European Research Area Policy Agenda, the Commission has been facilitating the development of initiatives such as:

- Legislative and regulatory environment for practising OS;
 - Horizon Europe provisions on OS;
 - OS infrastructures and skills:
- i. The European Open Science Cloud (EOSC)², recognized as one of the Common European Data Spaces³, enhancing the EU's leadership in the global data economy;

¹ UNESCO Recommendation on Open Science, 2021; <https://doi.org/10.54677/MNMH8546>

² [European Open Science Cloud \(EOSC\)](#)

³ [European Common European Data Spaces](#)

- ii. Open Research Europe⁴, an innovative Open Access publishing platform for research funded by all EU Programmes;
- iii. Support for skills and education for equitably practising Open Science and FAIR research data management.

Plan S is an initiative launched by cOAlition S⁵ funders, a group that includes national research funding organizations, charitable foundations, the European Commission, and the European Research Council (ERC). The main principle of Plan S is:

“With effect from 2021, all scholarly publications on the results from research funded by public or private grants provided by national, regional and international research councils and funding bodies, must be published in Open Access Journals, on Open Access Platforms, or made immediately available through Open Access Repositories without embargo.”

The cOAlition S advocates for:

- Science open for all;
- Revision of the incentive and reward system of science, using the San Francisco Declaration on Research Assessment (DORA) as a starting point;
- Changes to the publishing system when “There is no valid reason to maintain any kind of subscription-based business model for scientific publishing”;
- Immediate open access with no embargo period;
- Initiatives that establish robust quality criteria for Open Access publishing, such as the Directory of Open Access Journals (DOAJ) and the Directory of Open Access Books (DOAB).

Budapest Open Access Initiative (BOAI)⁶, the Berlin Declaration on Open Access to Knowledge⁷ and the Bethesda Statement on Open Access Publishing⁸ are also initiatives of great importance and that had been around in its current common usage for reading and accessing scholarly publications for over 20 years.

2.2 National Initiatives

OS policies are being embraced globally. Portugal dedication to OS is evident through initiatives like the Council of Ministers Resolution no. 21/2016⁹, which outlined the core principles for establishing a National Open Science Policy. Additionally, the Science Law (Decree Law no. 63/2019)¹⁰, mandates that research and development (R&D) institutions play a role in OS by guaranteeing unrestricted access to scientific knowledge and fostering active involvement and collaboration with society.

The Foundation for Science and Technology (FCT), the Portuguese funding entity for science and technology, is committed to adopt instruments that promote the practice of OS within the framework of

⁴ [Open Research Europe](#)

⁵ [cOAlition S](#)

⁶ [BOAI](#)

⁷ [Berlin Declaration](#)

⁸ [Bethesda Declaration](#)

⁹ [RCM no. 21/2016](#)

¹⁰ [Decree Law no. 63/2019](#)

the scientific activity it funds. This effort begins with the adoption of the Policy on Open Access (OA) to Scientific Publications and on Management and Sharing of Data Resulting from Research Funded by the FCT, with the intent to guarantee the publication in OA for works resulting from FCT funding and the availability of data resulting from research funded by the FCT in open access. It's through its FCCN unit¹¹, that FCT manages a range of services and projects aimed at promoting Open Science practices at national level.

2.3. Institutional Initiatives

At institutional level, NOVA University Lisbon (NOVA) uses PURE as its central repository for research outputs. By depositing the work in PURE, it is ensured that other university systems, including RUN, are automatically informed about the activity, eliminating the need to duplicate information. NOVA Schools could also reuse the existing data in PURE to feed their individual websites, with publication lists and personalized researcher profiles complying with open access policies, through the automated submission of their validated publications in PURE in Open Access for RUN (national RCAAP network) and OpenAIRE from European Commission. PURE is fully interoperable with ORCID, since NOVA is an institutional partner. This allows all content uploaded to PURE to be exportable to ORCID. Consequently, NOVA aligns with the recent Ciência Vitae, a national science curriculum management system based on the DeGóis technological platform, enabling NOVA researchers to populate their profiles with data uploaded to ORCID. Having eighteen different European partners involved, covering a wide range of organizations with relevant expertise, NOVA is also a partner of the OPUS¹², a Horizon Europe-funded project. The project aims to promote open science practices and enhance research assessment by providing a more comprehensive and inclusive approach to evaluating research impact. In addition to conduct a comprehensive state-of-the-art on existing literature and initiatives for OS, the project is developing realistic indicators and metrics to monitor and drive Open Science at Research Performing Organizations (RPOs) and Research Funding Organizations (RFOs).

On the other hand, Max Delbrück Center for Molecular Medicine (MDC), the consortium partner of NIMSB, was a partner in the H2020 EU Open Responsible Research and Innovation to further Outstanding kNowledge (ORION) project. The aim of the ORION project¹³ was to explore and promote OS practices improving the quality of research, including the preparation of tailored action plans to embed Open Science in the consortium organizations. Since then, MDC has been committed to continuing to implement OS at different levels¹⁴.

¹¹ [FCCN unit](#)

¹² [OPUS Project](#)

¹³ [ORION Project](#)

¹⁴ [Open Science at the MDC](#)

3. NIMSB policy and guidelines

Open Science emerges as a pivotal mechanism that not only promotes the societal and economic impact of science, but also increases comprehension of the scientific methodology and improves research efficacy. It fosters scientific collaboration, thereby strengthening the refinement of scientific data and promoting scientific and technological advancement through knowledge dissemination. Moreover, it enables the establishment of novel research domains and themes while facilitating the reuse of scientific data and creating a more inclusive and transparent scientific environment.

For the European Commission, OS is a policy priority. Sharing knowledge and data with all relevant actors as early as possible in the research process promotes the dissemination of the most recent findings. Furthermore, creativity and trust in science increase when partners from academia, industry, public authorities, and citizen groups are invited to participate in the research and innovation process. With that intuit, the Commission requires beneficiaries of research and innovation funding to practice an OA to their publications and make their data as open as possible and as closed as necessary. It recognises and rewards the participation of citizens and end users.

NIMSB emerges from an OS culture since it partners with MDC and NOVA that are strongly involved on these actions, participating in European projects such as Open Responsible Research and Innovation to further Outstanding Knowledge (ORION) and Open and Universal Science (OPUS), respectively.

NIMSB stands for OS and will commit with its principles by:

- Supporting innovative research methods;
- Institutionalising and incentivising data sharing and compliance with Findability, Accessibility, Interoperability, and Reusability (FAIR) and Collective Benefit, Authority to Control, Responsibility, and Ethics (CARE);
- Promoting research methods and tools that fosters international collaboration;
- Demanding OA to publications and respective metadata;
- Allowing knowledge preservation to support reproducibility and reusability;
- Sustaining the necessary infrastructure to support open science;
- Supporting the development of open training, education and outreach.

3.1 Open research practices

Research data will be collected, stored, and processed to produce and validate original research results accordingly with NIMSB Data Management Plan¹⁵ and Dissemination and Exploitation Plan.

NIMSB researchers should ensure OA throughout the entire research lifecycle. This comprehensive approach includes, as highlighted in the European Code of Conduct (ECoC)¹⁶, the accessibility of publications, data, metadata, protocols, code, software, images, artefacts, and all other research materials and methods. Contracts with other entities should include fair agreements about access to and dissemination of research results. Repositories should be used for proper conservation and management of all research data including those unpublished, guaranteeing their protection and

¹⁵ [NIMSB Data Management Plan](#)

¹⁶ [ECoC](#)

suitable access for a reasonable time. The guidelines from European Commission on the responsible use of generative Artificial Intelligence (AI)¹⁷ in research will be followed accordingly.

3.2 Open Access Policy for Scientific Publications

To facilitate early and open sharing of research publications, the European Commission's OA publishing platform - Open Research Europe¹⁸, will be used whenever necessary for both publications and research data validating, with some exceptions for legitimate interests such as intellectual property rights (IPR). Additionally, publications will be shared as preprints on platforms like bioRxiv¹⁹ (life sciences), ArXiv²⁰ (computer science) and both Green and/or Gold OA will be ensured with the appropriate Creative Commons licenses. Data and other results necessary for validating the conclusions of scientific publications will be made available through Zenodo²¹, NOVA's Research Information System (PURE)²² and NOVA's Repository (RUN)²³, following the principle of “as open as possible, as closed as necessary” and linked to the corresponding publications. Moreover, team members will be encouraged to engage in other OS practices, including participating in open peer-review processes instead of traditional (“blind” or “closed”) peer-review, both as authors (publishing in journals/platforms that support open peer-review) and as reviewers.

Researchers are responsible for compliance with any conditions of publication made by external funders.

Scientific publications:

- **Written by students, postgraduate students, and postdoctoral staff** – these papers need to be co-authored by a member of NIMSB staff, typically the supervisor. For such papers, the supervisor is responsible for ensuring compliance. When a paper is written solely by a student, postgraduate student, or postdoctoral staff member, it is the supervisor's responsibility to inform the author of all applicable conditions, including the requirements for uploading to PURE and RUN.
- **With co-authors at other Universities** - For papers co-authored by researchers not employed by NIMSB, the NIMSB lead author is responsible for ensuring the paper is uploaded to PURE and, if necessary or desirable, made available in an Open Access format, including the payment of the article processing charges. The lead author must inform their co-authors of the institution's requirements. When research receives external funding, it is typically the principal investigator's responsibility to cover any costs associated with Open Access publication.

¹⁷ [Living guidelines on the responsible use of generative AI in research](#)

¹⁸ [Open Research Europe](#)

¹⁹ [bioRxiv](#)

²⁰ [ArXiv](#)

²¹ [Zenodo](#)

²² [NOVA Research Portal](#)

²³ [RUN](#)

- **Green Open Access Publication in NOVA's Repository (RUN)**- upon acceptance of an article, the lead author must add the publication's metadata and upload the final accepted manuscript to PURE. This record and document will then be accessible through NIMSB research profiles, the NOVA Research Portal, and RUN. The uploaded manuscript should be the version accepted by the publisher, including corrections made after peer review, but not yet copyedited or typeset by the publisher. The Pure team will provide guidance on publishers Open Access policies and ensure any required embargoes are applied before making the files available in PURE and RUN.

- **Funded by FCT** - any article accepted for publication that has been supported by an FCT grant should be deposited in one of the Open Access repositories hosted within Portuguese Scientific Repositories of Open Access (RCAAP)²⁴ immediately upon acceptance. To comply with this policy, all publications must acknowledge the funder by including the full name of the funder and the grant number in the following format: "This work was funded by Portuguese Foundation for Science and Technology (Grant number)."

- **Institutional repositior** - RUN is the repository of NOVA University Lisbon. Depositing in RUN enhances the online visibility of NOVA research, making it easier for a global audience of researchers to discover and reference the work. Additionally, RUN is one of the Open Access repositories hosted within RCAAP, enabling compliance with FCT funding policies.

- **PURE** - is NOVA's Current Research Information System (CRIS)²⁵. Information held in PURE relates to research staff and their publications and activities information. The system allows for relationships and associations to be created between research inputs and outputs, providing a broad picture of research activity at individual, department, research unit, academic unit and University levels. PURE is fully interoperable with ORCID taking advantage of NOVA's institutional partnership and allowing for all content uploaded in PURE to be exportable to ORCID. In this way, NOVA is in line with the recent Ciência Vitae – national scientific curriculum management system, based on the DeGóis technological platform, allowing NOVA researchers to feed their profile with the data loaded in ORCID.

3.3 Research Integrity

NIMSB is engaged to ensure research integrity. To facilitate the reuse of its research data, NIMSB will provide infrastructures to accommodate the scale and complexity of its research outputs. To enhance reuse and reproducibility, it is essential to practice comprehensive analysis preservation. This involves capturing all relevant research objects, including research data releases with supporting metadata, auxiliary data, linked software, reproducible analysis workflows, documentation and all relevant material that support the results obtained. NIMSB ensures that OS infrastructures will comply with FAIR principles which describes how research outputs should be organized so they can be more easily accessed, understood, exchanged and reused. These infrastructures will have long-term preservation

²⁴ [RCAAP](#)

²⁵ [NOVA Scientific Information Management Policy](#)

plans and will be interoperable with international initiatives such as the EOSC and OpenAIRE²⁶.

3.4 Open Education & Training

In moving towards Open Science, training plays a crucial role in advancing the skills of the multipliers who practice and make Open Science a reality. The MDC was a partner in the ORION project being responsible for the deliverable dedicated to training activities. The trainings in Open Science and Responsible Research and Innovation (RRI) carried out by this project targeted primarily researchers (PhD students and postdocs) and secondarily research managers, researcher funders and project coordinators to raise awareness about the topic of Open Science and establish the necessity and benefits of a transparent and accessible research cycle.

Based on the materials and resources developed by MDC under the ORION project, NIMSB is committed to developing training courses for researchers and support personnel, equipping them with the necessary skills and expertise to conduct life science research in an open and reusable (FAIR) manner. NIMSB will take advantage of the MDC expertise in the development of training activities to raise awareness on Open Science and Open Educational Resources (OER) on RRI²⁷.

3.5 Public Engagement & Citizen Science

One of the fundamental pillars of Open Science is the open engagement of societal actors. Like MDC under the ORION project, NIMSB intends to contribute to increase science literacy in society, in particular to health literacy. These plans include significant public participation in citizen science programs that advance the institutional mission and address societal challenges. Moreover, through collaboration with relevant stakeholders, NIMSB aims to support a diverse range of practices that open up science and innovation to citizens.

To transfer the knowledge to society, NIMSB it's committed to develop the following initiatives:

- Interviews with all partners to engage and educate the public on the benefits of collaborative work, and specific benefits of the R&D of novel solutions for bioeconomy;
- Open Centre and Lab initiatives to present NIMSB activities to a broad audience;
- Targeted communications with Industrial and Clinical partners;
- NIMSB participation in the EU Researchers Night, a culture embedded at NOVA Schools;
- Multimedia releases through virtual seminars and a podcast;
- Other digital activities through website and social media.

²⁶ [OpenAIRE](#)

²⁷ [ORION-Final report on the training](#)

3.6 Research Assessment

The OPUS Project helps reform the assessment of research towards a system that incentivize researchers to practice Open Science. Being NOVA one of the partners of this consortium, NIMSB will take advantage of the OPUS Research Assessment Framework (RAF) developed offering a comprehensive suite of indicators and metrics for RPO and RFO to access researchers for career progression and grant applications. It will also support a specific framework of indicators and metrics to incentive and reward Open Science career practice, the OPUS Science Career Assessment Matrix (OSCAM)²⁸.

²⁸ [OPUS – Interventions to test in the pilots](#)