UNIVERSITY OF LAUSANNE

OPEN SCIENCE STRATEGY AND ACTION PLAN

2019-2021

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Status of the document

Approved by the Rectorate – 17 December 2019.

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Open Science Strategy: summary

The Rectorate of the University of Lausanne is aware that the production, management and dissemination of research results and data are key elements of good quality research.

The Open Science (OS) movement is transforming the research environment and the way researchers advance and share science. Open access to scientific knowledge and research results has the potential to improve the quality of science by making it more transparent, more responsive to societal challenges, more inclusive and more accessible to new users.

UNIL intends to develop its Open Science approach around the free access to scientific publications (Open Access - OA) and research data (Open research Data - OrD) in order to rise up to the challenge of disseminating knowledge.

In terms of Open Access, UNIL prioritises:

- *The communication of the opportunities offered by Open Access;*
- *The training of its community in new complementary modes of scientific publication in order to promote bibliodiversity;*
- *The development of technical infrastructures and the provision of tools for publishing journals in Open Access;*
- *The redefinition of research evaluation criteria to include the efforts to improve the visibility and access to scientific results (e.g. depositing publications in our institutional repository, SERVAL).*

In terms of Open research Data, UNIL prioritises:

- *The awareness and communication of this "new" scientific culture;*
- *The support and training of its researchers to prepare them to the evolving research landscape;*
- *The development of technical infrastructure;*
- *The establishment of a participatory governance structure capable of effectively meeting the needs of its community.*

In order to carry out its strategy successfully, UNIL has defined an action plan which can be divided into 5 priority areas:

1. ***Governance****: to develop an Open Science policy, strategy, processes and guidelines to support UNIL's vision.*

2. ***Organization****: to set up administrative and support structures that ensure a participatory and inclusive approach.*

3. ***Infrastructures*** *and tools: to provide the technical means to manage, store, secure, share and archive scientific information.*

4. ***Training*** *and advice: to support, accompany and empower researchers in the management of their projects.*

5. *A **new culture** and communication: to raise awareness in the community and the public about the challenges and opportunities of OS.*

UNIL's Open Science strategy – Action plan 2019-2021

5 priority axes to support UNIL researchers
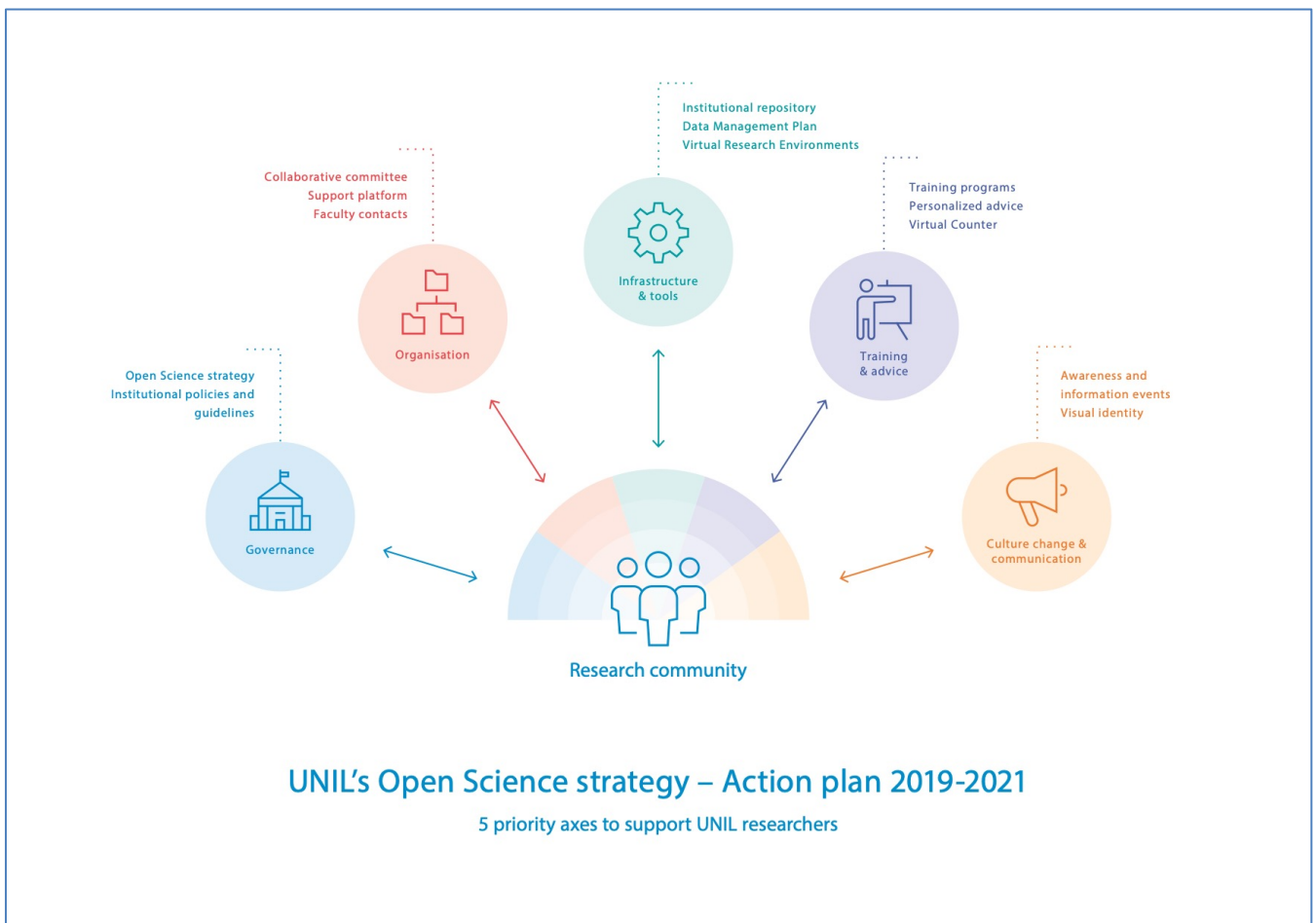
Introduction: UNIL in today's research landscape

The UNIL Rectorate's 2017-2021 plan of intent states that:

> *"UNIL researchers and teachers devote a significant part of their time to their research activities and the funds invested in them are considerable. However, the visibility of the results of this research cannot be taken for granted. It depends essentially on the motivation of their authors to publicize them, beyond their traditional publication in scientific journals, books or conference proceedings. Today's research is open, participatory and transdisciplinary. (…)*
>
> *The Rectorate of the University of Lausanne intends to adopt a very clear promotion policy in favour of openness, both for publications (Open Access) and for research data (Open Data). This policy of openness must be carried out in collaboration with editorial partners, UNIL researchers, (...) as well as national partners (...), the political world, the research community or the Consortium of Swiss University Libraries. »*[1]

This Open Science strategy links to UNIL's 2019 digital strategy as well as the digital strategy of the canton of Vaud[2] drawn up by the *Conseil d'État*. This document is also intended to respond to the 2017-2022 state legislative program[3], which aims to promote open and participatory science, as well as the University of Lausanne's strategic plan[4] adopted by the *Grand Conseil* in May 2019.

The new paradigm of Open Science is transforming the research environment and the way researchers do and share science. In an era of digitization, citizen science and "fake news", Open Science offers an opportunity for a verifiable, reproducible, closer to the citizens, and overall fairer Science.

UNIL's OS strategy is not intended as a management document from which periodic reports would be produced, but will be supplemented by a document for internal use to monitor the achievement of its objectives. It will be reviewed every two years, whereas the action plan will be reviewed yearly.

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[1] Plan of intentions of the University of Lausanne 2017 - 2021

[2] Digital strategy for the canton of Vaud - 2019

[3] Legislative programme 2017 - 2022 of the Vaud Council of State

[4] Strategic Plan 2017-2022 of the University of Lausanne (UNIL)

Open Science: an open and free science

Accessible and high quality scientific knowledge

Open Access to scientific knowledge and research results has the potential to improve the quality of science by making it more transparent, more integrated, more responsive to societal challenges, more inclusive and more accessible to new users.

The *Amsterdam Call for Action on Open Science,* based on the reflections of many experts gathered in 2016 by the Dutch Presidency of the EU, defines Open Science as

> « *Open Science is about the way researchers work, collaborate, interact, share resources and disseminate results. A systemic change towards open science is driven by new technologies and data, the increasing demand in society to address the societal challenges of our times and the readiness of citizens to participate in research.* »[5]

The eight dimensions of *Open Science*

The European Commission has set up an Open Science Policy Platform[6] (OSPP) which has identified eight priorities for the Open Science agenda: Rewards and Incentives, Research Indicators and Next-Generation Metrics, Future of Scholarly Communication, European Open Science Cloud, FAIR Data, Research Integrity, Skills and Education and Citizen Science. More than 40 recommendations have been issued for all these priorities by the European League of Research Universities (LERU) in order to implement them and support the cultural change necessary for their acceptance.[7]

Several factors must be considered in order to successfully open up science: integration at all levels and in all aspects of current practices; taking into account the different disciplinary sensitivities to ensure transparency throughout the

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[5] Amsterdam call for action on Open Science – European Union (2016)

[6] Open Science Policy Platform – European Commission (2016)

[7] Open Science and its role in universities : A roadmap for cultural change – LERU (2018)

system; setting up administrative and financial support to ensure minimise the administrative impact on researchers, etc.

Binding national and international rules

On a global scale, and particularly on a European scale, it can be observed that transparent research data management (Open research Data - OrD) has become a priority for both states and public funding bodies. They require the preparation of Data Management Plans (DMP), as well as free access to scientific publications and its underlying data. On the other hand, an increasing number of scientific publishers now have data policies which request access to data, metadata, codes, materials, methods and protocols associated with both qualitative and quantitative research results.

In Switzerland, the Swiss National Science Foundation (SNSF) has been committed to opening up science since 2006.[8] Beneficiaries of SNSF grants are required to submit a DMP with all funding applications since 2017, as well as to open all scientific works resulting from the projects the SNSF funds. Furthermore, swissuniversities aims for 100% open access for all scholarly publications from 2024 onwards, in line with its national Open Access strategy.[9]

Since November 2015, UNIL has been a signatory of the LERU Statement on Open Access to Research Publications, which aims to promote opening publications, archiving and the availability of scientific data. UNIL also signed in 2018 the Berlin Declaration on Free Access to Knowledge in the Natural, Life, Human and Social Sciences (Berlin Declaration) and the San Francisco Declaration on Research Evaluation (DORA), which questions the widespread use of bibliometric rankings as metrics for the evaluation of research and researchers.

The benefits of *Open Science*

Many benefits can be expected when science becomes Open:

Transparency and visibility: Open science is synonymous with honest, accountable, transparent, reproducible, valid and good research. The visibility of researchers and universities is increased as open data and publications are more downloaded, read and shared.

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[8] Open science - Swiss National Science Foundation (2017)

[9] Swiss National Open Access Strategy - Swissuniversities (2018)

Impact and new discoveries: through its greater visibility, Open Science enables higher impact: many studies show that the citation rate increases when data and publications are open. The circulation of knowledge is also improved, thus fostering innovation and the development of new knowledge.

Democratization of knowledge: access to knowledge is a universal right. Open Science reduces the gaps between states, institutions and citizens. It defends free and open access to knowledge and opposes any discrimination based on financial criteria.

Public funding = public good: most of the research carried out at UNIL is financed by public funds and, consequently, by citizens. The data, publications and research results thus obtained are a public good and must therefore be accessible quickly and freely for the benefit of society.

Open Science is also a way to restore trust between citizens and the science they fund while strengthening its integrity.

The two priorities of *Open Science* for UNIL: Open Access and Open research Data

OS is an umbrella term that includes a wide variety of initiatives and mouvements. UNIL intends to focus on the challenges of disseminating knowledge by developing its Open Science approach mainly around Open Access to scientific publications and Open research Data, while integrating components from the other pillars of Open Science.

A responsibility shared by many actors

Open Science is the responsibility of the entire scientific community. This includes researchers, but also UNIL's rectorate, which must set the objectives and provide the means to make this transition a success. Faculties my also commit through the reward of necessary skills. The support of many other stakeholders, such as expert librarians, the information and archive resources department, the legal department, the Ethics Commission, the Communication Department, the Computer Centre and finally funding agencies, editorial partners and political authorities, is vital for the success of Open Science.

Open Access - open access scientific publications

The colours of Open Access: green and gold

Open Access is a global movement launched by the Budapest Open Access Initiative in 2002[10]. It aims to make research results available to everyone through the development of the Internet. Open Access provides free access to scientific productions mainly in two ways: the gold road – through which works are freely accessible immediately at the time of publication, sometimes at a cost (Article Processing Charges - APC), and the green road – or self-archiving of the publication in an open repository by the author. The latter constitutes a form of delayed Open Access, since editors often require a waiting period, or embargo, before the deposited manuscript can be made available to everyone. Restrictions to the version of the manuscript that can be self-archived are also common.

An institutional approach that guarantees academic freedom

The results of a survey conducted in 2017[11] show a good predisposition of the UNIL academic community towards Open Access, highlighting a desire to democratize knowledge and a concern for financial considerations.

Given the richness and variety of UNIL's disciplinary fields, a unique approach to Open Access that favours one path over another could never succeed. UNIL has the academic freedom of its researchers at heart and thus wants to develop a mixed and pragmatic approach where the golden and green roads coexist and complement each other. Researchers will firstly choose the journal or editor best suited to their case based on scientific criteria, and they will then be able to choose which path to follow to make their publication freely accessible.

Challenges of Open Access for UNIL

This mixed strategy requires the improvement of SERVAL (**SERVeur A**cadémique **L**ausannois), which is the institutional repository at UNIL and CHUV. Over the past two years, SERVAL has undergone a substantial optimisation to become a tool focused on the needs of researchers and the current challenges of Open Access publication: ease of use, internationalization of Lausanne-based research, visibility

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[10] Budapest Open Access Initiative - 2002

[11] Open Access at UNIL: 2017 Institutional Survey Report

of scientific works, citations of UNIL researchers, exhaustive list of publications funded by UNIL, etc.

As for the publication of monographs, the path is yet to be paved. UNIL will develop its policy in partnership with the research community and stakeholders, including publishers, historical partners in the promotion of scientific research.

Solutions acceptable to all parties will still have to be found, taking into account the requirements of funding bodies, the national strategy, the needs of researchers and the institutional challenges of a public university, which must reach beyond cantonal and national borders through the quality of its research and teaching.

UNIL therefore gives priority to:

- **Supporting** its researchers and **communicating** the opportunities offered by Open Access;
- **Training of** the community in new complementary modes of scientific publication (bibliodiversity);
- The **development of** technical **infrastructures** and the provision of **tools for publishing** journals in Open Access;
- The consideration, in the context of the researchers' **evaluations**, of visibility and access to scientific results efforts (SERVAL and Open Access).

This reasonable and thoughtful approach should allow us to meet the challenges of OA and scientific communication landscape of the beginning of the 21st century.

Open research Data - transparent and reasonable data management

Data management throughout the research process

It is generally accepted that research data are factual records used as primary sources for scientific research and are recognized by the scientific community as necessary to validate research results[12]. They may take the form of experimental

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[12] OECD Principles and Guidelines for Access to Publicly Funded Research Data - 2007

data, observational data, operational data, third party data, public sector data, monitoring data, processed data or reused data.

From the development of a DMP to the final deposit in an archive, researchers are concerned with the management of their data throughout its lifecycle: creation, processing, analysis, preservation, access, sharing and reuse.

An open and responsible institutional approach

UNIL's research data strategy is defined within a binding international and national framework. It is also based on the needs and expectations of its community as identified in a survey conducted in 2015.[13]

In this context, UNIL advocates honest and responsible research. This approach aims to manage research data in a transparent and open manner, within the limits of the law and scientific requirements in terms of ethics, professional conduct and compliance with standards for the protection of individuals and intellectual property.

Challenges of Open research Data for UNIL

Research data derived from scholarly work is a public good whose management - in the short, medium and long term - raises many scientific, ethical, deontological, legal, technical, economic and societal issues. Proper data management is essential and crucial in many respects: it ensures compliance with legal and regulatory frameworks as well as with the requirements of scientific funders and publishers. It also guarantees the authenticity, integrity, reliability and usability of data as well as facilitating its reproducibility, sharing and reuse. Finally, it makes research results more visible[14] and contributes to their quality.

These challenges and their complexity require a high number of skills that must first be identified and then reinforced to assist researchers. Additionally, disciplinary specificities must be carefully considered, as well as a number of obligations that arise from today's research environment.

UNIL, in collaboration with the University of Zurich, is actively participating in the SWISSUBase[15] project led by the Swiss Competence Centre for Social Sciences (FORS), which aims to develop a general, non-commercial, open and sustainable

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[13] Research data management at the University of Lausanne: transdisciplinary challenges (2015)

[14] Piwowar HA, Vision TJ. Data reuse and the open data citation advantage (2013). PeerJ 1:e175

[15] See the summary of the SWISSUBase project at https://www.swissuniversities.ch/fr/organisation/projets-et-programmes/p-5/projects/axe-principal-escience/

data repository to comply with the *FAIR Data Principles* (i.e. data that is findable, accessible, interoperable and reusable).

To meet these multiple challenges, UNIL focuses its interventions and support on the following areas:

- **Awareness** and **communication of** this "new" scientific culture;
- The support and **training of** its researchers in the face of this evolution;
- The **development of** technical **infrastructure**;
- The establishment of a **participatory organization** and **governance** capable of effectively meeting the needs of its community.

This multivariate approach must make it possible to respond to the challenges and issues of OrD so that the management *of* research data becomes a responsible management of data *for* research.

Open Science action plan 2019-2021

As part of its reflections, its surveys of researchers and faculty and the involvement of stakeholders within faculties and services, UNIL has defined a plan of action in 5 priority areas:

1. **Governance**: to develop an Open Science policy, strategy, processes and guidelines to support UNIL's vision.

2. **Organization**: to set up administrative and support structures that ensure a participatory and inclusive approach to researchers.

3. **Infrastructures** and tools: to provide the technical means to manage, store, secure, share and archive scientific information.

4. **Training** and advice: to support, accompany and empower researchers in the management of their projects

5. A **new culture** and communication: to raise awareness in the community and the public about the challenges and opportunities of OS.

Each of these 5 axes is broken down into specific objectives, concrete measures to be carried out and expected deliverables.

Axis 1 - Governance

In short: the establishment of an institutional framework supported by the Rectorate; the development of an Open Science institutional strategy and guidelines; the definition of processes and the development of procedures for OA and OrD.

Objectives of the project	Measures	Deliverable
1.1 Establish an institutional framework for OS in a participatory manner by clarifying roles and responsibilities	Submit to the UNIL community a draft OS strategy combining OA and OrD Integrate the OS and its various issues into existing internal directives and faculty regulations	✓ Institutional strategy Open Science ☐ OA and OrD Directives ✓ Existing documents updated by integrating OS issues
1.2. Actively participate in national or international projects related to OS	Support the SWISSUBase project (*swissuniversities* P5) SCOSS (Support to DOAJ and SHERPA/RoMEO)	✓ Co-financing, with UNIZH, of the FORS project to create a data repository (SWISSUBase)
1.3. Affirm UNIL's position on OS and its support for open and responsible	Sign international declarations and treaties related to OS	✓ UNIL position paper on the action plan of the National

research at national and international levels	Participate in associative or academic bodies in relation to OS Support the participation and organization of OS-related events	Open Access Strategy (swissuniversities) ✓ Signing of international declarations on OS, OA and OrD ([Berlin](#), [DORA)](#) ✓ Representation of UNIL at the AKOA[16] ✓ National Open Access Conference 2018
1.4. Review the researche evaluation system	Integrate visibility and sharing of publications and data into the evaluation process	☐ New directive on the evaluation of research based on DORA principles
1.5. Assess UNIL's OS compliance with national and international requirements	Monitor the costs and compliance of Open Access publishing and data deposit	☐ Financial monitoring system ☐ Monitoring report of the OA publication rate (in all its variants)

Axis 2 - Organization

In short: the identification of internal expertise; the creation of Open Science support services and a single help desk; the support, coordination and recognition of OS expertise within faculties.

Objectives of the project	Measures	Deliverable
2.1. Develop a participatory culture for OS issues at UNIL	Rely on internal (Management, Central Services, Faculties) and external (partners) expertise Develop a participatory organization for the development of OS	☐ Participatory and representative committee of OS researchers ☐ Introduce the issues of OS into the relevant UNIL charters
2.2. Provide support to researchers on OS issues	Identify the specific needs of researchers according to their disciplinary fields Develop an interface/platform (virtual help desk)	✓ HEG Master's work on the organisation of support for researchers ✓ Support services integrating OS issues ☐ Virtual help desk answering researchers' questions
2.3 Consolidate the network of internal OS respondents within the Faculties	Recognize contact points' OS skills in their job descriptions Lead a knowledge sharing network	✓ Research consultants and correspondents recognized as privileged interlocutors in the field of OS ✓ Regular meetings with OS respondents

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[16] Groupe de travail *Open Access* nommé par *Swiss Library Network for Education and Research* (SLiNER)

Axis 3 - Infrastructure and tools

In short: the creation of online DMPs; an infrastructure and tools for storage, collaborative work, sharing, repository, long-term preservation and valorisation of scientific publications and research data.

Objectives of the project	Measures	Deliverable
3.1 Provide IT tools adapted to each stage of the research life cycle	Evolve existing solutions in accordance with norms and standards (FAIR principles, OAIS norms, etc.). Identify needs according to disciplines in terms of collaborative tools Participate in the SWISSUbase project (FORS) as a privileged partner (see 1.2)	✓ Evolution of the institutional repository for scientific publications (SERVAL) ✓ Integration of ORCID into SERVAL ☐ Repository for research data related to publications (see 1.2) ☐ Virtual research environments / active data management tools / electronic laboratory notebooks
3.2 Facilitate the preparation **and monitoring of DMPs**	Develop an online tool dedicated to the DMP adapted to possible future solutions proposed at the national level	☐ UNIL online tool for the development and monitoring of DMPs ✓ Generic DMP model
3.3. Develop interactive tools to support researchers	Centralize and facilitate access to relevant Open Access and Open research Data information Support alternative scientific publication initiatives	✓ Short video tutorials on the use of SERVAL and ORCID ✓ Guides, FAQs and resources on Open Access on the Open Science UNIL website. ✓ Open Access Personal Assistant (PAPAGO) ✓ Publishing platform for journals published internally by UNIL (EdiPub UNIL)

Axis 4 - Training and advice

In short: generalist training and tailor-made workshops; a platform for advice and support for researchers.

Objectives of the project	Measures	Deliverable
4.1. Train the UNIL community in OS	Develop a training program for the UNIL community	☐ Workshops and practical training ✓ Online training modules for general OS, OA and OrD issues

Objectives of the project	Measures	Deliverable
4.2. Develop a service infrastructure such as personalized advice	Develop personalized consulting training at the request of the faculties for their doctoral students and as part of the Graduate Campus or other interested circles	✓ Support offices in the faculties ✓ Organization of DMP lunches in the faculties ✓ Individual support ✓ Creation of video tutorials dedicated to the operation of OS tools ✓ Open Access Personal Assistance (PAPAGO)

Axis 5 - New culture and communication

In short: raising awareness in the UNIL community of the challenges of Open Science; supporting a new, more open and accessible scientific culture; promoting Open Science and organizing events.

Objectives of the project	Measures	Deliverable
5.1. Sensitize the UNIL community to the issues of OS, OA and OrD	Develop awareness campaigns for the different target audiences	✓ Promotional material, OS flyer ✓ Awareness articles for internal magazines (Uniscope and Allez savoir) ✓ Website updated regularly ☐ Creation of an OS UNIL award highlighting the management, sharing and openness of science (publication and data)
5.2 Organize scientific and cultural events dedicated to OS	Implementation of a series of events on the themes of OA and OrD (study day / annual conference / *Open Science* exhibition) Organize exposures to broad themes (e.g., *Data Visualization*)	✓ UNIL-Wallonia International Conference on Open Access (2017) ✓ National OA Conference (2018) ✓ Political presentation SNSF OA FNS (2019) ✓ Conference on OrD and OS (2015, 2016, 2017) ✓ OA and Copyright Webinar (2019) ☐ *Open Science week* at UNIL
5.4. Communicate on the status of OS file to UNIL	Create communication channels for OS at UNIL Adapt the message to the different target audiences	☐ Communication strategy based on the different target audiences ☐ Table of annual costs for UNIL of subscriptions to scientific journals and OA-related expenses (in collaboration with BCUL and faculties)

		☐ Annual barometer of the adoption of the OA at UNIL

Glossary

Research data life cycle: the standard reference model defines six main key steps in data life: creation or collection; organization and processing; analysis; accessibility or sharing; preservation; and reuse.

Research data: all factual records - of any nature, type and on any medium - collected or produced and used as the main sources for scientific research. Research data are generally recognized by the scientific community as necessary to validate research results.

FAIR Data Principles: Published in 2016[17], these guidelines apply to research data and aim to ensure that they can be **F**indable, **A**ccessible, **I**nteroperable and **R**e-usable.

Research Data Management (**RDM**): All strategies, processes, activities, practices and resources (human, material and financial) covering the entire life cycle of research data that manage and process data.

Open Science (**OS**): Open science refers to the way researchers work, collaborate, interact, share their resources and disseminate the results of their work. Open Science is a movement that aims to make scientific research, data and their dissemination accessible to all. The paradigm shift towards more open science is driven in particular by the growth of new technologies, the expectations of donors, society's growing demand for scientists to address societal challenges and the willingness of citizens to participate more actively in research.

Open Access (**OA**): Formalized by the Budapest Initiative in 2002, the Open Access movement is generally presented in two ways: the Green Road allows the self-archiving of a version of articles (or books) on the author's website or an open institutional archive, often after a waiting period (embargo); the Gold Road is the publication of an article (or book) in an Open Access journal. These items are immediately available to all. Publication fees sometimes apply (Article/Book Processing Charge) for the golden path, but the green path remains free for authors and readers. Between these two, there is the hybrid route. This is highly criticized because it consists in paying the publisher to publish a single article in Open Access *in* a journal accessible on a subscription basis (double dipping).

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[17] Wilkinson MD, Dumontier M […] Mons B. The FAIR guiding principles for scientific data management and stewardship (2016). Scientific Data volume 3, Article number: 160018

Open research Data (**OrD**): data collected or generated as part of a research project, freely available and that can be used or reused by other people, scientific or not. There is also talk of Open Access to research data, a movement that advocates that publicly funded research publications should not only be open access, but that the data underlying them should also be shared and freely accessible.