



## Report

### D6.5 OLISSIPO innovation management and results exploitation plan

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## Executive Summary

This document details the innovation management and results exploitation plan of the OLISSIPO project. Task 6.4 is dedicated to Innovation Management and Results Exploitation. It aims to address the know-how developed during the project and design and implement strategies to protect this know-how (either through patenting, copyright, or any other more adequate means of IPR). This task has the intention to analyse technical aspects, bridging the project research achievements to a successful implementation, exploitation, and deployment in the real world, with a particular emphasis on leading joint IPR management activities and strategy. The OLISSIPO project is dedicated to initiating synergies between the partners through staff exchanges. During these visits, the Early-Stage Researchers (ESRs) had the opportunity to work in groups according to their interests and research to find synergies between partners, design possible collaboration plans, and identify in which institution the work can be carried out in the future. This was a starting point to continue working on joint projects in the future. In addition, several students developed part of their Master's and PhD thesis in the partner institutions (including institutions from the Scientific Advisory Board members), the results of which are detailed in a results exploitation plan in this document.

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## 1. Introduction

Innovation management aims to successfully implement appropriate creative ideas. Its typical outputs are new or improved products, services, or processes. OLISSIPO is a Twinning project that aims to train ESRs and INESC-ID staff and create awareness in Lisbon, and more generally in Portugal, for Computational Biology. Therefore, the work package (WP) Project Management has been responsible for tracking exploitable results and guaranteeing that generated innovation from the project is well managed.

The present document is a public deliverable, and its main purpose is to describe actions to ensure that new knowledge and key outputs are well managed and strategically exploited, while concurrently safeguarding intellectual property rights (IPR) as stated in the consortium agreement.

### 1.1. Objectives

The objective of this plan is to establish a framework for maximizing the impact of project outcomes, fostering innovation, and ensuring sustainable knowledge transfer and utilization in the field of Computational Biology in Portugal.

## 2. Innovation Management Plan

### 2.1 Innovation Governance and Capacity Building

During OLISSIPO, we have identified key researchers, students, and those dedicated to Computational Biology. OLISSIPO Schools and Workshops (WP2) offer a powerful and dynamic forum for education. With our comprehensive training programs, we provide an ideal platform for both personal and professional growth. Throughout our activities, it is now possible to join these partners with Portuguese bioinformatics and computational biology societies to organize training sessions and workshops in the future and engage with Portuguese universities to provide internships and hands-on training opportunities for students in computational biology, with the support of our international collaborative network.

It is now, therefore, possible to leverage the expertise of computational biologists in Portugal and form a network that includes representatives from research institutions and industry leaders, such as the participants of the OLISSIPO activities so far, including members of universities and research institutions such as INESC-ID, Instituto Superior Técnico (IST)/University of Lisbon, IDMEC Instituto de Engenharia Mecânica, Instituto de Telecomunicações, IST - CERENA and CEGIST, IST-ID, CERIS - Civil Engineering Research and

Innovation for Sustainability, CQE - Centro de Química Estrutural, LIP - Laboratório de Instrumentação e Física Experimental de Partículas, LASIGE FCUL, INIAV - Instituto Nacional de Investigação Agrária e Veterinária, iBB - Instituto de Bioengenharia e Biociências, IMM - Instituto de Medicina Molecular João Lobo Antunes, BioISI - Biosystems and Integrative Sciences Institute FCUL, Instituto Gulbenkian Ciência, FCT NOVA, Universidade Nova de Lisboa, NOVA Medical School Research, iBET - Instituto de Biologia Experimental e Tecnológica, i3S - Instituto de Investigação e Inovação em Saúde da Universidade do Porto, iNOVA4 Health) and also the industry (bioMérieux).

In the future, and also beyond the project timeframe, we plan to partner with these Portuguese institutions and universities to organize more training sessions, workshops, and hands-on training opportunities for students in computational biology.

## **2.2 Data and Intellectual Property (IP) Management**

### **2.2.1 Data and knowledge management**

OLISSIPO followed proven approaches in knowledge and data management (see also D6.2 - Data Management Plan). With the setup of a joint knowledge management system, all project documents and activity reports were continuously available to all project partners. Besides, OLISSIPO has been supporting several open-access publications produced by team members (see the project webpage <https://olissipo.inesc-id.pt/> for the full list).

### **2.2.2 Data utility and availability (IPR)**

Intellectual Property Rights (IPR) and management procedures and any potential issues arising from commercial exploitation have been clearly laid down in the consortium agreement, which all partners signed before project commencement. We adhere to an open policy when issues regarding IPR are raised, to ensure full data interoperability and integration.

## **2.3 Open innovation and monitoring**

The network developed during OLISSIPO will enable collaboration with Portuguese academic institutions, biotech companies, and pharmaceutical industries that specialize in life sciences and bioinformatics. It will also establish joint research initiatives with computational biology departments in Portuguese universities to encourage knowledge exchange, and also with other innovation organizations such as ANI - Agência Nacional de Inovação (<https://www.ani.pt/>) to be aligned with national goals, and define the corresponding KPIs considering the national context and feasibility of the proposed tasks.

## 3. Results Exploitation Plan

### 3.1. Target Audience

Throughout the course of the project we have focused on the target groups, most relevant for our dissemination and exploitation activities as: 1) the scientific community, 2) the general public, and 3) key stakeholders.

### 3.2. Dissemination and Communication

OLISSIPO aims to raise awareness in Lisbon and Portugal about Computational Biology. To accomplish this goal, several communication tools and activities were created to ensure that OLISSIPO outcomes and outputs reach the identified target groups. At the beginning of the project, the team developed an attractive project identity (project logo), printed material (project's leaflet and poster) and a promotional video (see D3.2 - Project Website and D3.3 - Promotional Materials, also available at <https://olissipo.inesc-id.pt/results/>). The website has played a major role in reaching OLISSIPO's external audience, serving as the project's main gateway to the outside world. Besides providing all information on project objectives, consortium, intermediate and final results (deliverables), publications and events, the website is also linked to social media platforms (LinkedIn, Twitter and YouTube), further enhancing outreach and allowing the project to build a broad list of subscribers. In addition, newsletters are periodically released to disseminate the project's activities and results (four issues have been released so far).

The OLISSIPO project has also been widely promoted at relevant external events across Europe. The activities targeted to a wider public will contribute to expanding OLISSIPO's results beyond the scientific community, both during and after the project's duration. OLISSIPO organised several activities targeting high schools, through specific programs to disseminate computational biology among young students, with the engagement of secondary schools and ESRs (*e.g.*, FICA Festival, Summer in ULisboa, 24th anniversary of Pavilhão do Conhecimento, among others).

During the extension, we plan to continue to engage with Portuguese scientific communities through national conferences, the promotion of seminars and workshops and collaborate with INESC-ID / Instituto Superior Técnico (Universidade de Lisboa) to disseminate OLISSIPO project findings and impact to a wider audience. In particular, we will continue to develop educational modules for students and public engagement events to raise awareness about computational biology and increase the impact even beyond the end of the project. Importantly, four students

developed part of their thesis in the partner institutions and in collaboration between the PIs (including institutions from the Scientific Advisory Board members):

- André Veríssimo. Network-based sparse regularization for the identification of disease signatures. PhD in Information Systems and Computer Engineering, IST-UL. Supervisor: S Vinga; Co-supervisors: AL Oliveira, MF Sagot. Feb 2021 (INESC-ID - Inria);
- Marianne Borderes. Characterization of host-gut microbiota interactions and identification of key players based on a unified reference for standardized quantitative metagenomics and metabolic analysis framework. PhD in Bioinformatics. U Lyon 1. Supervisor: MF Sagot; Co-supervisor: S Vinga. Jul 2021 (INESC-ID - Inria);
- Laura Quintas. Combined distance metric for labelled trees. MSc Biomedical Engineering. IST. Supervisor: S Vinga; Co-supervisor: N Beerenwinkel. Nov 2023 (INESC-ID - ETH);
- Raquel Romão. Detection of expression outliers in terminal exons. MSc Biological Engineering. IST. Supervisor: S Vinga; Co-supervisor: J Gagneur. Nov 2023 (INESC-ID - TUM);
- Gabriel Abrantes. Internship - 1st semester 2023-2024 at IST. Supervisor: S Vinga; Co-supervisor J Stoye. Ongoing (INESC-ID - Univ. Bielefeld).

We plan to continue to foster students' mobility activities by co-supervision of MSc and PhD Theses among the Consortium members and also the Scientific Advisory Board's collaborative network. It is expected that the exceptional collaboration between institutions will continue, promoting computational biology in Portugal and bringing international expertise to national institutions.

### **3.3. Sustainability and Long-Term Impact**

OLISSIPO has had an impact by reinforcing the international collaborative networks, visibility and attractiveness of INESC-ID and enhancing the scientific and technological capacity of the institution. The implementation of the OLISSIPO work, especially the staff exchange programme (WP1), Early Stage Researchers targeted activities (WP4), and strengthening of the research management skills of INESC-ID (WP5) has contributed to an enhanced scientific capacity of INESC-ID and also to the increase of the profile of its researchers and staff. It helps to create awareness that INESC-ID is a key institution in this area, which will foster further developments at the interface of computer science and health applications in different strategic areas. This project aimed to engage with Portuguese scientific communities through conferences, seminars, and workshops and collaborate with Portuguese science communication platforms to disseminate project findings to a wider audience (Biodata, INESC HUB, Instituto Superior Técnico). In addition, the OLISSIPO team presented project findings at several outreach

activities such as the Open Laboratories Initiative, “The Insider” podcast, PhD Open Days and Science and Technology 2021 Week. These activities can be found in detail in Deliverable 3.5. This raised awareness and interest within the local scientific community and beyond.

Through the organization of training events (WP2) and communication and outreach activities (WP3), OLISSIPO has also contributed to the Lisbon region’s priority “Health research, technologies and services”, which is also aligned with the Sustainable Development Goals (SDG) of the United Nations (UN), “Ensure healthy lives and promote well-being for all at all ages”. OLISSIPO’s impact is thus associated with promoting socio-economic development through R&D and dissemination activities. It is associated with the increased central role of Computational Biology in Pathology (interpreted as the study of diseases), from personalised healthcare and precision oncology to the analysis of infectious diseases. Additionally, Data Science and Artificial Intelligence applications to clinical and biological data are gaining increasing interest, due to the envisaged impact it will bring to pharmaceutical, biotechnology, and biomedical companies. The organization of activities targeting the industry, such as the round-table during the OLISSIPO Retreat or our support to the organisation of the 2nd Microbiome PT Summit also contributes to the Contribution to the Portuguese SMART specialization strategy and Sustainable Development Goals of the UN.

The project leveraged the INESC-ID scientific profile and also the ULisboa schools. The OLISSIPO PI, Prof. Susana Vinga, is co-chair of redeSAÚDE, one of the areas covered by the thematic networks of the University of Lisbon (ULisboa) to accomplish one of the priorities of the Smart Specialisation Strategies (RIS3) within Portugal2020 framework and Horizon 2020 societal challenges: fostering internationalisation and new collaborations between the different ULisboa Schools. This has been achieved with OLISSIPO activities being opened to several ULisboa schools.

The project team collaborated during the project's entire lifetime with the Pre-Award offices at INESC-ID and IST and in partner institutions (*e.g.*, Pre-Award Workshops) to target new programs to submit collaborative proposals to Horizon Europe (*e.g.*, EIC Pathfinder, ERA Chairs, Marie Skłodowska-Curie Actions) and National Funds through the Portuguese Foundation of Science and Technology (FCT).

We plan to continue to foster collaborative research initiatives with European Computational Biology centers, leveraging diverse expertise and resources. We also will encourage interdisciplinary collaboration between computational biologists and researchers from other disciplines.



### **3.4. Ethical Considerations and Regulatory Compliance**

The OLISSIPO project ensures that project activities adhere to ethical standards related to data privacy and consent, collaborating with INESC-ID and IST ethics committee (<https://etica.tecnico.ulisboa.pt/en/>) whenever necessary. Notably, the project manager, Dr. Sara Tanqueiro had training in General Data Protection Regulation (GDPR) in Research and Finance and European Commission Audits. We plan to actively encourage diversity in our teams and to promote inclusive training programs.

### **3.5. Monitoring and Evaluation**

We continuously monitored the project to assess the impact of computational biology research on the national scientific landscape, by direct feedback from the participants of our actions and activities. In particular, all our workshops and schools received a very positive assessment from ESR and Senior Researchers. We regularly reviewed and adjusted exploitation strategies based on feedback from Portuguese stakeholders during the duration of the project.. Some of our activities engage in discussions about exploring several critical aspects associated with Computational Biology, covering academic education, applications to clinical research, and translational bioinformatics for the biotechnology industry.

## **4. Conclusions**

This document functions as a guiding framework for the efficient management of innovation and the exploitation of the project's outcomes in the field of Computational Biology in Portugal. It emphasizes the collaboration with local entities, adherence to national regulations, and the sustainable integration of project outcomes into the national scientific and innovation ecosystem. It will contribute to the overall success of the project and enhance its impact on the scientific community, industry, and society at large.