



Report

D3.4 OLISSIPO outreach activities programme

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Executive Summary

Outreach activities targeted to a broader public will expand OLISSIPO's results beyond the scientific community during the project duration and beyond. These activities will also contribute to disseminate the 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.

Thus, this Deliverable outlines the main planned outreach activities, which will be regularly reviewed and updated to include new activities and formalise new opportunities to ensure that outreach objectives are met and amended if necessary.

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1. Introduction

The goal of the following activities is to ensure proper awareness of Computational Biology (CB) among diverse audiences and to maximise the impact of OLISSIPO. Due to the current worldwide pandemic, we have agreed during the kick-off meeting that the outreach activities described below will be postponed when travelling in Europe and in-person meetings are possible again.

1.1 Deliverable objective

This report describes the preliminary plans for the activities in year 1, which may change depending on the circumstances at the time of the realisation. It also highlights activities to be held in years 2 and 3 which had to be postponed.

2. CB-School Computational Biology School

This activity targets communication and dialogue with young students from secondary schools. We will organise bi-annual educational sessions at Portuguese schools to divulge the area of Computational Biology, namely the impact of multidisciplinary activities and challenges, in order to promote interest and curiosity in scientific areas, especially in STEM (Science, Technology, Engineering and Mathematics) applications to Medicine. Students will be engaged to think, interact and debate their ideas formulated during the proposed activities.

Year 1 (2021): educational sessions in the Summer and Autumn

School names (to be confirmed):

1. Escola Secundária D. Filipa de Lencastre, Lisbon (students are 15-18 years old)
2. Escola Secundária António Damásio, Lisbon (students are 15-18 years old)
3. Colégio Valsassina, Lisbon (students are 15-18 years old)

Tutors: Senior Staff from INESC-ID involved in the OLISSIPO project, e.g. Susana Vinga, Rui Henriques, Alexandre Francisco, José Basílio, Carolina Peixoto.

Duration: One hour (interactive presentation + plenty of time for discussion)

Topic: Computational Biology and Bioinformatics (same topic for the sessions in the three schools in 2021).

Students will have the opportunity to stay in touch with the tutors after the educational sessions via email or Slack and are welcome to follow up on the project activities on the OLISSIPO

website. Bi-annual educational sessions will take place in the Spring and Autumn of project year 2 with new topics. The visits to the schools will also offer the opportunity to place OLISSIPO project posters and distribute project leaflets in the schools.

3. CB2Lab - Computational Biology to Laboratory

To cope with the growing demand for professional development of secondary school teachers, INESC-ID/IST-Ulisboa will launch the "Computational Biology to Laboratory" (CB2Lab) learning course series in year 2 (2022) of the project, to take place at the INESC-ID facilities in Lisbon. Although initially scheduled for year 1, the realisation of this activity is not possible due to the worldwide pandemic. We have all the necessary resources to catch up with the delayed activities, once in-person meetings in Europe are possible again.

The Lab will be created to bridge the gap between research and schools. Teachers and students will have the opportunity to share state-of-the-art Computational Biology and Bioinformatics techniques (e.g., algorithms for sequence analysis, dynamic models for cell physiology, and optimisation methods for analysing metabolic networks) and attend seminars by invited renowned scientists. CB2Lab topics range from the study of single molecules to organism development, bioinformatics and evolution, along with science and society aspects, covering controversial issues such as genetic testing and stem cell research. The CB2Lab courses will take advantage of the partnership with EMBL and be created based on the example of EMBL's existing European Learning Laboratory for the Life Sciences (ELLS) (https://www.embl.de/training/scienceforschools/teacher_training/).

4. CB-Challenge

Portuguese secondary schools, which have participated in OLISSIPO activities so far and beyond, will be invited to participate in the Computational Biology Challenge (CB-Challenge), where teachers and students will be challenged to provide a solution to a particular biocomputational problem. A group of students from the winning school (selected by subject grades) and teachers will have the opportunity to visit the INESCID/IST-ULisboa facilities for the "Computational Biology to Laboratory" (CB2Lab) learning courses. Teachers will also be enrolled in a 3-day CB2Lab course, where they will learn cutting-edge science presented in a simple manner and, therefore, easily transferable to the classroom.

5. CB-OpenHouse

The CB-OpenHouse will become part of the existing “Dia do Técnico” (<https://tecnico.ulisboa.pt/pt/eventos/cerimonia-comemorativa-do-110-o-aniversario-do-tecnico/>), “Dia Aberto” Instituto Superior Técnico (IST)/ULisboa and/or the European Researchers’ Night (https://ec.europa.eu/research/mariecurieactions/actions/european-researchers-night_en) public events about science in Lisbon. OLISSIPO will participate in these activities during 2022 and share with the invited school classes and the general public how Computational Biology can be used nowadays in the resolution of biological problems.

“Dia Aberto” IST/ULisboa shows what Instituto Superior Técnico (IST) has to offer. Its main aim is to contribute to a more informed and secure choice when applying for Higher Education. During several days (three days up to one week), the public is invited to participate in presentation sessions of all degrees and in talks with special guests. This allows the public to broaden their perspective on the professional world and increase their awareness about the opportunities created by IST. Secondary schools are also invited to the event. This event typically occurs in March.

The European Researchers’ Night, funded under the Marie Skłodowska-Curie actions (MSCA), is a Europe-wide public event that brings researchers closer to the public. The Night provides researchers with the opportunity to showcase the diversity of science and its impact on citizens’ daily lives, and to stimulate interest in research careers – especially among young people. The event highlights how researchers contribute to our society by displaying their work in an interactive and engaging forum.

In Portugal, different cities from all around the country participate in this initiative, usually taking place between September and November. In the last few years, the Lisbon edition of the “Noite Europeia dos Investigadores” (European Researchers’ Night) took place in the National Museum of Natural History and Science and Pavilhão do Conhecimento - Centro de Ciência Viva.

6. Round-table discussions and events open to the wide public

We will organise yearly round-tables in Lisbon in the early summer (e.g. in June) with topics such as ethics and data privacy in order to raise awareness about the impact of Information and Communication Technologies (ICT) in the Health area. These events will involve experts and participants from the fields of social sciences, ethics, law, and technology relevant

to the project, with the support of the ULisboa Thematic Lines (redeSaúde). The project will also promote participation in public events such as the European Researchers' Night (see above).

7. Open Laboratories Initiative

The Department of Bioengineering (DBE), in collaboration with the Biological Engineering Students Association (NEBIST) and the "Núcleo de Engenharia Biomédica" (NEBM-IST) from Instituto Superior Técnico (IST), carry out the Open Laboratories every year.

This initiative targets secondary school students, who participate in lectures by DBE professors and researchers, watch small experimental demonstrations, and virtually visit DBE teaching and research laboratories in the scientific areas of Biological Sciences, Bioengineering, Biomechanics and Biomaterials, Neuroimaging, Stem Cells and Regenerative Medicine. In 2020, more than 700 students from 24 Portuguese secondary schools participated in this initiative.

The OLISSIPO project coordinator, Professor Dr. Susana Vinga has been involved in this initiative for the past years. In 2021, the "Open Laboratories Initiative" was fully implemented in a virtual format and presented through the ZOOM video conference system from 22 to 26 February 2021 (<https://tecnico.ulisboa.pt/files/2021/01/laboratorios-abertos-dbe-online-2021.pdf>). The involvement of OLISSIPO members as speakers or volunteers in this initiative will be maintained and reinforced for 2022.

8. "Engineers for a day" project

The "Engineers for a day" project (<https://www.engenheirasporumdia.pt/>) is an initiative of the Secretary of State of Citizenship and Equality, Dr. Rosa Monteiro, which promotes the engagement of women in engineering and technology, deconstructing the idea that these are male domains among the students of non-higher education. This project is coordinated by the Portuguese Commission for Citizenship and Gender Equality, Portuguese Diversity Charter (APPDI), the IST and the Engineers Order.

In the European Union, Eurostat indicates that more than eight out of ten Information Communication Technology (ICT) jobs are filled by men. Although girls and women make up half of the people in secondary or higher education, they represent only 12.8% among ICT students and 22.8% among engineering students. In Portugal, the proportion of women graduating in these areas dropped from 26.2% in 1999 to 20.6% in 2017. A study carried out by Microsoft

(https://news.microsoft.com/uploads/2017/03/ms_stem_whitepaper.pdf) in 12 European countries showed that girls become estranged in the age range of 14 and 16 years old.

This initiative is aligned with two of the OLISSIPO objectives: engage women in Computational Biology and, more broadly, in STEM, and target communication and dialogue with young students from secondary schools. Throughout the year, this initiative promotes the interaction between girls and women working on ICT (e.g., short talks, workshops or mentoring actions).

The OLISSIPO project coordinator, Professor Dr. Susana Vinga, was enrolled in this initiative this year and in the corresponding event on 9 April 2021 and will continue to be involved in the coming years.

9. Educational videos

Outreach activities with young students promoted by the OLISSIPO project will certainly benefit from the availability of educational videos. In line with this, we are planning to create 2-3 videos to explain concepts from the field of Computational Biology, showing its direct implications in our daily lives in a clear and humorous way. The videos will be used for outreach purposes in schools and will be made available on the project website and on the OLISSIPO YouTube channel (<https://www.youtube.com/channel/UCJNgPI-HssN6qHz0njE940A>).

10. Podcasts

Team members of OLISSIPO (e.g., Prof. Susana Vinga, Prof. Arlindo Oliveira, Prof. Ana Teresa Freitas), had already recorded a few episodes of "The Insider" (<https://pod.co/the-insider>), a podcast prepared in Brussels by the INESC HUB about research and innovation in Europe, people and institutions dedicated to research, science and technology management, and science communication. We expect to have three more sessions (Spring 2022, Spring 2023, and Fall 2023) with all OLISSIPO PIs and researchers from their institutions.