



Report

D2.4 Final report on organized joint events, schools, workshops and conferences

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Executive Summary

The main aim of WP2 is to organize scientific events such as summer schools, workshops and international conferences. These actions benefit from the consortium experience and will cover the research topics identified. The activities align with the objectives of OLISSIPO, in particular, to establish a leading pole of excellence in Computational Biology at INESC-ID and support regional initiatives under the SMART specialization strategy for Lisbon and Portugal.

This deliverable outlines the final report on the organization of scientific events such as schools, workshops, and the invited lecture series.

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1. Introduction

The goal of WP2 was to organize scientific events, covering the research topics identified in the project: single-cell analysis, modeling and simulation; mathematical modeling of inter-cell and communities' interactions; computational phylogenetics of cells and communities; and translational bioinformatics, data management and software development. These activities were in line with the objectives of OLISSIPO, in particular, the establishment of a leading pole of excellence in Computational Biology in Europe and to support regional initiatives under the SMART specialization strategy for Lisbon and Portugal.

In line with this, OLISSIPO supported the organization of Computational Biology seminars—the OLISSIPO Twin Seminars—which contributed to disseminating the scientific work and expertise of all the consortium and attracting new talented researchers to INESC-ID. In addition, the project also organized workshops and schools and supported the preparation of international conferences.

During the first year, due to the COVID-19 pandemic, some of the planned activities were postponed and others organized (online) to encourage institutions' interaction (OLISSIPO week). Afterward, whenever possible, activities were held in person.

All the Twinning partners supported these actions, given their leading experience in program committees, steering committees and in conference chairs.

1.1 Deliverable objective

This deliverable outlines the final report on the organization of scientific events such as schools, workshops, and the invited lecture series.

2. Final report on organized joint events, schools, workshops and conferences

1.1 OLISSIPO Schools

1.1.1 Modelling and Analysis of Single Cell Multiple Biological Omics

During 5-10 February 2023, the [OLISSIPO Winter School on Modelling and Analysis of Single Cell Multiple Biological Omics](#) was held at Olissippo Marquês de Sá in Lisbon, Portugal. This school was open to all members of the OLISSIPO project but also, importantly, to the community in general. During one week, 6 invited speakers involved 25 ESRs and researchers in total in insightful sessions and discussions. Besides external participants from institutions outside the consortium (e.g., Université Paris Cité, University of Palermo, Universidade de São

Paulo), we had 5 ESRs from INESC-ID, 4 ESRs from ETH Zürich, 3 from EMBL participating and 3 researchers from Inria in this event. This school had two main types of presentations: one that had a class format exclusively, and the other that had a class plus hands-on session format. The class was divided into two slots of 1h and 1h30. The same happened for the hands-on session. On Wednesday afternoon, we organised our social event and all participants visited Mafra National Palace and Ericeira. The agenda of the event can be found in Figure 1.

Time (WET)	Sunday February 5	Monday February 6	Tuesday February 7	Wednesday February 8	Thursday February 9	Friday February 10	
09h30-10h00	Arrival	Registration	Course 1 Theoretical and practical aspects of dimensionality reduction. <i>Lecturers: Dr Mathurin Massias and Dr Titouan Vayer</i>	Course 2 Computational tools to study transcriptional landscapes with single-cell resolution. <i>Lecturer: Dra Laura Elo</i>	Free	Course 4 Multiomics tools to model dynamics cellular systems in health and disease. <i>Lecturer: Dra Ana Conesa</i>	
10h00-11h00		Introduction School					
11h00-11h30		Coffee Break					
11h30-12h30		Course 1 Theoretical and practical aspects of dimensionality reduction. <i>Lecturers: Dr Mathurin Massias and Dr Titouan Vayer</i>	Course 3 Engineered algorithms for large-scale single-cell RNA sequencing and multimodal data analysis. <i>Lecturer: Dr Stefan Canzar</i>	General discussion	Course 2 Computational tools to study transcriptional landscapes with single-cell resolution. <i>Lecturer: Dra Laura Elo</i>	Conclusion School	
12h30-14h30		Lunch					
14h30-16h00		Course 3 Engineered algorithms for large-scale single-cell RNA sequencing and multimodal data analysis. <i>Lecturer: Dr Stefan Canzar</i>	Hands-on 1 Theoretical and practical aspects of dimensionality reduction. <i>Lecturers: Dr Mathurin Massias and Dr Titouan Vayer</i>	Excursion + Dinner	Hands-on 2 Analysing single-cell data using R. <i>Lecturer: Dra Sini Junttila</i>	Departure	
16h00-16h30		Coffee Break			Coffee Break		
16h30-17h30		General discussion	Hands-on 1 Theoretical and practical aspects of dimensionality reduction. <i>Lecturers: Dr Mathurin Massias and Dr Titouan Vayer</i>		Hands-on 2 Analysing single-cell data using R. <i>Lecturer: Dra Sini Junttila</i>		
17h30-19h30		Dinner	Free	General discussion	General discussion	Free	
19h00			Free	Free	Free		

Figure 1. Agenda of the OLISSIPO School on Modelling and Analysis of Single Cell Multiple Biological Omics.

Lecturers:

Profs. Mathurin Massias and Titouan Vayer (Inria Lyon, France)

Theoretical and practical aspects of dimensionality reduction.

Stefan Canzar (University of Munich/Pennsylvania State University, Germany/USA)

Engineered algorithms for large-scale single-cell RNA sequencing and multimodal data analysis.

Prof. Laura Elo (University of Turku, Finland)

Computational tools to study transcriptional landscapes with single-cell resolution.

Prof. Ana Conesa (Spanish National Research Council, Spain)

Long Reads sequencing to unravel the functional impact of alternative splicing.

Multiomics tools to model dynamics cellular systems in health and disease.

Sini Junttila (University of Turku, Finland)

Analysing single-cell data using R.



Figure 2. Lecturers, group photo and social event of the OLISSIPO School (February 5-10, 2023).

“The workshop was fantastic. From my personal experience, it allowed me to introduce myself in the very basics of computational and mathematical models/tools for biology. Despite my lack of previous expertise, I enjoyed and learned a lot.”, ESR

1.1.2 EMBL Training

The EMBL team visited INESC-ID for a week (9-12 May 2023) to give [training](#) in Computational Biology. This school was opened to other Portuguese institutions and divided into 4 workshops according to the subject. This event had 38 participants, 14 ESRs from INESC-ID and IST and the remaining from external institutions such as IMM, iBB, iNOVAHealth, Nova Medical School, i3S and BitOmics.

Lecturers:

Dr Mike Smith

Workshop 1: Introduction to R with.

Dr Sarah Kaspar

Workshop 2: Biostatistical Basics in R by Dr Sarah Kaspar

Petr Smirnov

Workshop 3: Drug synergy

Donnacha Fitzgerald, Hosna Baniadam, Harald Vöhringer, Petr Smirnov and Tümay Capraz
Workshop 4: Single- Cell

OLISSIPO EMBL Training				
WEST time	May 9	May 10	May 11	May 12
09:00-09:30	Opening Session	WS2: Biostatistical Basics in R	WS2: Biostatistical Basics in R	WS4: Single-cell Workshop
09:30-11:00	WS1: Introduction to R			
11:00-11:30	Coffee Break	Coffee Break	Coffee Break	Coffee Break
11:30-13:00	WS1: Introduction to R	WS2: Biostatistical Basics in R	WS2: Biostatistical Basics in R	WS4: Single-cell Workshop
13:00-14:00	Lunch	Lunch	Lunch	Free
14:00-15:30	WS1: Introduction to R	WS3: Drug Synergy Workshop	WS4: Single-cell Workshop	
15:30-16:00				
16:00-16:30	Free	Coffee Break	Coffee Break	
16:30-18:00		WS3: Drug Synergy Workshop	WS4: Single-cell Workshop	

Figure 3. Agenda of the EMBL Training at INESC-ID.



Figure 4. Group photo with the participants of the EMBL Training.

1.1.3 Computational phylogenetics to analyse the evolution of cells and communities – Tree for a Tango School

From 2-7 July 2023, the [OLISSIPO Summer School on Computational phylogenetics to analyse the evolution of cells and communities – Tree for a Tango School](#) was held at INESC-ID.

This school was open to all members of the OLISSIPO project and the community in general.

We had 25 participants, including 8 ESRs from INESC-ID/IST, 3 ESRs from ETH Zürich, 1 from EMBL and 1 researcher from Inria. In this event we had external students joining from LUISS University, Karolinska Institute, Vigo University, Université de Montréal, TU Delft (outside the country) and FCT NOVA and bioMérieux (Portugal). This school had a similar format as the first one. However, slots for students' flash talks were added so they could share their interests and research. On Wednesday afternoon, we organised our social event and the participants had the opportunity to make a walking tour with a guide to discover Lisbon's best-hidden gems.

The agenda of the event can be found in Figure 5.

Lecturers:

Profs David Posada and João Alves (University of Vigo, Spain)

Phylogenetic analysis of single-cell DNA sequencing data.

Nadia El-Mabrouk and Mattéo Delabre (Université de Montréal, US)

Inferring the Evolution of Genes and Syntenies from Tree Reconciliation. An application to CRISPR-Cas systems.

Ran Libeskind-Hadas (Claremont McKenna College, US)

Adventures in Cophylogenetic Tree Reconciliation.

Russell Schwartz (Carnegie Mellon University, US)

Designing phylogenetic models for clonal lineage reconstruction.

Time (WEST)	Sunday July 2	Monday July 3	Tuesday July 4	Wednesday July 5	Thursday July 6	Friday July 7		
09:00-09:30	Arrival	Registration	Flash Talks	Installations required for Hands-on 3	Free			
09:30-10:00		Introduction School			Flash talks or Free	Hands-on 3 with coffee Phylogenetic analysis of single-cell DNA sequencing data. Lecturer: João Alves	Hands-on 4 with coffee Adventures in Cophylogenetic Tree Reconciliation. Lecturer: Ran Libeskind-Hadas	
10:00-11:00		Course 1 Designing phylogenetic models for clonal lineage reconstruction. Lecturer: Russell Schwartz	Course 2 Inferring the Evolution of Genes and Syntenies from Tree Reconciliation. An application to CRISPR-Cas systems. Lecturer: Nadia El-Mabrouk	Course 3 Phylogenetic analysis of single-cell DNA sequencing data. Lecturer: David Posada				
11:00-11:30		Coffee Break						
11:30-12:00		Course 1 Designing phylogenetic models for clonal lineage reconstruction. Lecturer: Russell Schwartz	Course 2 Inferring the Evolution of Genes and Syntenies from Tree Reconciliation. An application to CRISPR-Cas systems. Lecturer: Nadia El-Mabrouk	Course 3 Phylogenetic analysis of single-cell DNA sequencing data. Lecturer: David Posada	Conclusion School			
12:00-12:30		Lunch						
12:30-14:00		Installations required for Hands-on 1	Installations required for Hands-on 2	Lunch				
14:00-14:30		Hands-on 1 with coffee Designing phylogenetic models for clonal lineage reconstruction. Lecturer: Russell Schwartz	Hands-on 2 with coffee Inferring the Evolution of Genes and Syntenies from Tree Reconciliation. An application to CRISPR-Cas systems. Lecturer: Mattéo Delabre	Lunch + Social Event		Installations required for Hands-on 4	Departure	
14:30-15:30						Course 4 Adventures in Cophylogenetic Tree Reconciliation. Lecturer: Ran Libeskind-Hadas		
15:30-16:00						Coffee Break		
16:00-17:00						Course 4 Adventures in Cophylogenetic Tree Reconciliation. Lecturer: Ran Libeskind-Hadas		
17:00		Free		Free				
19:30		Dinner	Free		Free			

Figure 5. Agenda of the OLISSIPO School on Computational phylogenetics to analyse the evolution of cells and communities (Tree for a Tango School).

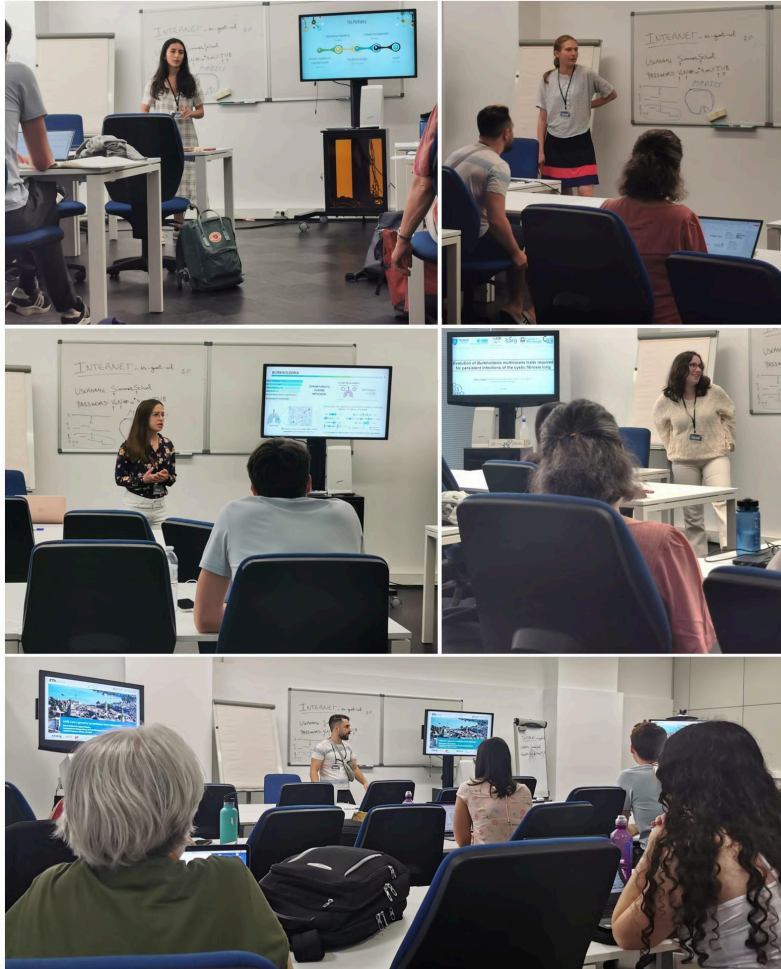


Figure 6. Flash talks of the ESRs during July 4 and 6, 2023.



Figure 7. Group photo.

1.1.4 Mathematical modelling of inter-cell and communities' interactions with a focus on metabolism

The [OLISSIPO Winter School Mathematical modelling of inter-cell and communities' interactions with a focus on metabolism](#) was held at INESC-ID from 6-9 February 2024. This school was open to all members of the OLISSIPO project and the community in general. We had 43 participants, including 20 ESRs from INESC-ID/IST, 1 from ETH Zürich, 1 from EMBL and 1 researcher from Inria. In this event we had external students joining from Claude Bernard Lyon 1 University, Oslo University Hospital, Johannes Gutenberg-University Mainz, Biomedical Sciences Institute - University of São Paulo, Faculty of Mathematics University of Belgrade, Imperial College London, TU Delft, University of Southern Denmark, University of Salamanca, Paris-Saclay University, Technical University of Denmark and University of Bielefeld (outside the country) and iBET, INIAV, I.P., ITQB, NOVA School of Science and Technology, NOVA Medical School (Portugal). This school had a similar format as the previous one. ESR had the opportunity to present their ongoing work in Flash Talks, including the following topics:

- [Casper Asbjørn Eriksen](#) [University of Southern Denmark](#) *Reconciling Inconsistent Molecular Structures from Biochemical Databases*
- [Constance Le Gac](#) [ETH Zurich](#) *Global Enzyme Cost Minimization can predict metabolic overflow*
- [Estefania Torrejón](#) [NOVA Medical School](#) *Diabetogenic Gut derived Extracellular Vesicles Reaching Kupffer Cells: A Lipidomic Connection*
- [Gabriela Torres Montanaro](#) [University of São Paulo](#) *Studying Trypanosoma metabolism using GEMs*
- [Gonçalo Pinto](#) [Instituto Superior Técnico - ULisboa](#) *Deep learning-based enhancement of CRISPR-Cas9 screens for the discovery of novel cancer targets*
- [Thomas Naake](#) [EMBL](#) *Biomarker discovery for cancer recurrence from plasma proteomics and metabolomics within SMART-CARE'*

On Wednesday afternoon, we organised our social event and the participants had the opportunity to make a walking tour with a guide to discover Lisbon's best-hidden gems.

The agenda of the event can be found in Figure 8.

Time (WET)	Tuesday February 6	Wednesday February 7	Thursday February 8	Friday February 9
09:00-09:30	Registration + Introduction	Course 2	Flash Talks	Course 4
09:30-10:00	Course 1 Metabolic Modelling in a Nutshell: From Single Reactions to Metabolic Networks to Communities. <i>Lecturer: Jürgen Zanghellini</i>	Constraint-based modeling and design of metabolic networks with CellNetAnalyzer and CNApy. <i>Lecturer: Steffen Klamt</i>	Course 3 Predicting metabolic interactions from first principles. <i>Lecturer: Jörg Stelling</i>	Cooperation vs competition in cell communities. <i>Lecturer: Kiran Patil</i>
10:00-10:30	<i>Coffee Break</i>	<i>Coffee Break</i>	<i>Coffee Break</i>	<i>Coffee Break</i>
10:30-11:00	Course 1 Metabolic Modelling in a Nutshell: From Single Reactions to Metabolic Networks to Communities. <i>Lecturer: Jürgen Zanghellini</i>	Constraint-based modeling and design of metabolic networks with CellNetAnalyzer and CNApy. <i>Lecturer: Steffen Klamt</i>	Course 3 Predicting metabolic interactions from first principles. <i>Lecturer: Jörg Stelling</i>	Course 4 Cooperation vs competition in cell communities. <i>Lecturer: Kiran Patil</i>
11:00-11:30	Hands-on 1 Metabolic Modelling in a Nutshell: From Single Reactions to Metabolic Networks to Communities. <i>Lecturer: Jürgen Zanghellini</i>	Constraint-based modeling and design of metabolic networks with CellNetAnalyzer and CNApy. <i>Lecturer: Steffen Klamt</i>	Hands-on 3 Predicting metabolic interactions from first principles. <i>Lecturer: Jörg Stelling</i>	Hands-on 4 Cooperation vs competition in cell communities. <i>Lecturer: Arianna Basile</i>
12:00-12:30	<i>Lunch</i>	<i>Lunch</i>	<i>Lunch</i>	<i>Lunch</i>
12:30-13:00	Hands-on 1 with coffee Metabolic Modelling in a Nutshell: From Single Reactions to Metabolic Networks to Communities. <i>Lecturer: Jürgen Zanghellini</i>	Hands-on 2 with coffee Constraint-based modeling and design of metabolic networks with CellNetAnalyzer and CNApy. <i>Lecturer: Steffen Klamt</i>	Hands-on 3 with coffee Predicting metabolic interactions from first principles. <i>Lecturer: Jörg Stelling</i>	Hands-on 4 with coffee Cooperation vs competition in cell communities. <i>Lecturer: Arianna Basile</i>
13:00-13:30	<i>Lunch</i>	<i>Lunch</i>	<i>Lunch</i>	<i>Lunch</i>
13:30-14:00	<i>Lunch</i>	<i>Lunch</i>	<i>Lunch</i>	<i>Lunch</i>
14:00-14:30	Hands-on 1 with coffee Metabolic Modelling in a Nutshell: From Single Reactions to Metabolic Networks to Communities. <i>Lecturer: Jürgen Zanghellini</i>	Hands-on 2 with coffee Constraint-based modeling and design of metabolic networks with CellNetAnalyzer and CNApy. <i>Lecturer: Steffen Klamt</i>	Hands-on 3 with coffee Predicting metabolic interactions from first principles. <i>Lecturer: Jörg Stelling</i>	Hands-on 4 with coffee Cooperation vs competition in cell communities. <i>Lecturer: Arianna Basile</i>
14:30-15:00	<i>Lunch</i>	<i>Lunch</i>	<i>Lunch</i>	<i>Lunch</i>
15:00-15:30	Hands-on 1 with coffee Metabolic Modelling in a Nutshell: From Single Reactions to Metabolic Networks to Communities. <i>Lecturer: Jürgen Zanghellini</i>	Hands-on 2 with coffee Constraint-based modeling and design of metabolic networks with CellNetAnalyzer and CNApy. <i>Lecturer: Steffen Klamt</i>	Hands-on 3 with coffee Predicting metabolic interactions from first principles. <i>Lecturer: Jörg Stelling</i>	Hands-on 4 with coffee Cooperation vs competition in cell communities. <i>Lecturer: Arianna Basile</i>
15:30-16:00	<i>Lunch</i>	<i>Lunch</i>	<i>Lunch</i>	<i>Lunch</i>
16:00-16:30	Hands-on 1 with coffee Metabolic Modelling in a Nutshell: From Single Reactions to Metabolic Networks to Communities. <i>Lecturer: Jürgen Zanghellini</i>	Hands-on 2 with coffee Constraint-based modeling and design of metabolic networks with CellNetAnalyzer and CNApy. <i>Lecturer: Steffen Klamt</i>	Hands-on 3 with coffee Predicting metabolic interactions from first principles. <i>Lecturer: Jörg Stelling</i>	Hands-on 4 with coffee Cooperation vs competition in cell communities. <i>Lecturer: Arianna Basile</i>
16:30-17:00	<i>Lunch</i>	<i>Lunch</i>	<i>Lunch</i>	<i>Lunch</i>
17:00-17:30	<i>Free</i>	<i>Back to hotel</i>	<i>Flash Talks</i>	<i>Conclusion</i>
17:30-18:00	<i>Free</i>	Social Event + Dinner	Flash Talks	<i>Departure</i>
18:00-...	<i>Free</i>	<i>Free</i>	<i>Free</i>	<i>Free</i>

Figure 8. Agenda of the OLISSIPO School Computational phylogenetics to analyse the evolution of cells and communities.



Figure 9. Group photo.

1.2 Training Workshops

1.2.1 Scientific Workshops

1.2.1.1 OLISSIPO Inaugural Workshop

On 20 July 2021, OLISSIPO hosted the project [Inaugural Workshop](#) on Computational Cell Biology, which was held virtually. The workshop included four speakers, experts in the fields of Computer Science and Computational Biology. Lectures were made available on the [OLISSIPO YouTube channel](#). More than 140 participants joined our event.

Speakers:

Prof. Rolf Backofen (Albert-Ludwigs-Universität Freiburg, Germany)

Machine learning in the context of CRISPR systems.

Prof. Susan Holmes (Stanford University, US)

Integrating networks, probabilities and trees into multidomain methods for immunology and microbiology.

Prof. Dana Pe'er (Memorial Sloan Kettering Cancer Center, US)

Trajectories in cancer and development.

Prof. Luay K. Nakhleh (Rice University, US)

Elucidating Intra-tumor Heterogeneity from Single-cell DNA Sequencing Data.

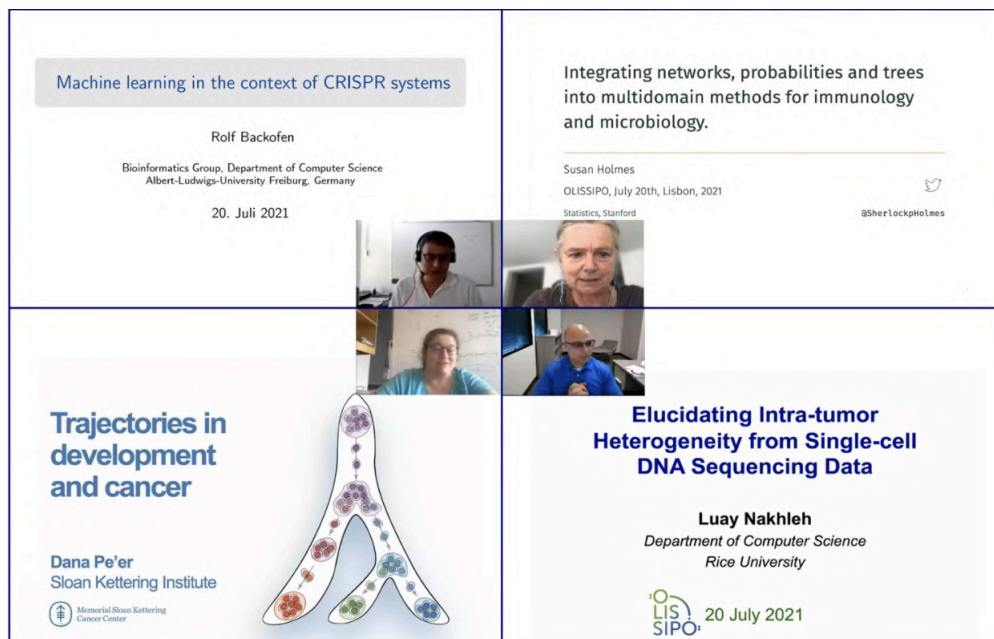


Figure 10. Keynote speakers presentations on the Inaugural Workshop on Computational Cell Biology.

1.2.1.2 Workshop Metabolism and mathematical models: Two for a Tango | 1st Edition

The [first edition](#) of the Two for a Tango Workshop was held between 18-19 November 2021. This workshop was organised with the Inria European Team Erable in the context of OLISSIPO and another project which involves a partnership with the University of São Paulo (USP), in São Paulo, Brazil, more specifically the Institute of Mathematics and Statistics (IME) and the Institute of Biomedical Sciences – Inria Associated Team Capoeira. More than 150 participants joined this event.



Figure 11. Workshop Two for Tango.

The topic of this workshop was metabolism in general, with a special focus, although not exclusive, on parasitology. Besides an exploration of the biological, biochemical and biomedical aspects, the workshop will also aim at presenting some of the mathematical modelling, algorithmic theory and software development that have become crucial to explore such aspects.

	Thursday 18	Friday 19
14h00-14h10 CET time	Introduction to the workshop	Introduction to the second day
14h10-14h50 CET time	Talk 1: Fabien Jourdan	Talk 4: Alena Ziková
14h50-15h05 CET time	Questions and discussion on Talk 1	Questions and discussion on Talk 4
15h05-15h15 CET time	Short break	Short break
15h15-15h55 CET time	Talk 2: Michael Barrett	Talk 5: Daniel Merkle
15h55-16h10 CET time	Questions and discussion on Talk 2	Questions and discussion on Talk 5
16h10-16h20 CET time	Short break	Short break
16h20-17h00 CET time	Talk 3: Daniel Segrè	Talk 6: Frédéric Bringaud
17h00-17h15 CET time	Questions and discussion on Talk 3	Questions and discussion on Talk 6
17h15-17h30 CET time	Final discussion and conclusion of the first day	Final discussion and conclusion of the workshop

Figure 12. Workshop Two for Tango (1st edition) agenda.

Speakers:

Prof. Fabien Jourdan (Inrae Toulouse, MetaboHUB, France)

Making sense of metabolic profiles using network science and knowledge graphs.

Prof. Michael Barrett (University of Glasgow, Scotland)

Metabolomics of drug response in trypanosomes and leishmania.

Prof. Daniel Segrè (Boston University, US)

Using computational models to help design synthetic microbial communities.

Prof. Alena Ziková (Institute of Parasitology, Czech Academy of Sciences, Czech Republic)

Unexpected metabolic flexibility of mammalian forms of trypanosomes.

Prof. Daniel Merkle (University of Southern Denmark, Denmark)

Graph Transformations and Algorithmic Cheminformatics for an Atom-Level Modelling of Metabolic Networks.

Prof. Frédéric Bringaud (University of Bordeaux, France)

Adaptation of trypanosomes to available carbon sources and carbon source preference.

The videos of this workshop are available [here](#). Importantly, the OLISSIPO team elaborated a participant's feedback to improve future events. The results are depicted on Annex I.

1.2.1.3 Workshop Metabolism and mathematical models: Two for a Tango | 2nd Edition

Due to the success of the first edition of the Two for a Tango Workshop, the OLISSIPO project joined the Twinning partner Inria and the University of São Paulo in São Paulo, to organize a [second edition](#) of this workshop between 25-26 October 2022.

	Tuesday 25	Wednesday 26
14h00-14h10 CET time	Introduction to the workshop	Introduction to the second day
14h10-14h40 CET time	Talk 1: Jörg Stelling	Talk 4: Miguel Rocha
14h40-14h55 CET time	Questions and discussion on Talk 1	Questions and discussion on Talk 4
14h55-15h05 CET time	Short break	Short break
15h05-15h35 CET time	Talk 2: Carlos Robello	Talk 5: Emma Saavedra
15h35-15h50 CET time	Questions and discussion on Talk 2	Questions and discussion on Talk 5
15h50-16h00 CET time	Short break	Short break
16h00-16h30 CET time	Discussion 1	Discussion 2
16h30-17h00 CET time	Talk 3: Pedro Mendes	Talk 6: Joshua Chan
17h00-17h15 CET time	Questions and discussion on Talk 3	Questions and discussion on Talk 6
17h15-17h30 CET time	Final discussion and conclusion of the first day	Final discussion and conclusion of the workshop

Figure 13. Workshop Two for Tango (2nd edition) agenda.

Speakers:

Prof. Jörg Stelling (ETH Zürich, Switzerland)

Model-based analysis of microbial communities.

Prof. Carlos Robello (Institut Pasteur de Montevideo and Faculty of Medicine, Uruguay)

From gene profiling to inferences about metabolic changes in Trypanosoma cruzi infection.

Prof. Pedro Mendes (University of Connecticut Health Center, US)

Metabolic model development with COPASI.

Prof. Miguel Rocha (University of Minho, Portugal)

Constraint-based modeling of human metabolism and artificial intelligence towards biomedical applications.

Prof. Emma Saavedra (Instituto Nacional de Cardiología Ignacio Chavez, Mexico)

Kinetic modeling and Metabolic Control Analysis to understand the control and regulation of metabolic pathways.

Prof. Joshua Chan (USAColorado State University, US)

Modeling stable metabolic interactions in microbial communities.

The videos of this workshop are available [here](#). For this second edition of the workshop, besides the keynote talks, there were also two slots, one per day, for a discussion on two specific open questions. Each one was managed and moderated by two invited researchers.

Discussion 1

How is it formally established what represents the biomass for a given organism?

Moderators: Michael Barrett (University of Glasgow, Scotland) and Sanu Shameer (University of Oxford, UK)

Discussion 2

How to accurately establish what is transported in and out of a cell or organism?

Moderators: Nathalie Poupin and Pierre Millard (INRAE Toulouse, France)

1.2.1.4 Workshop Metabolism and mathematical models: Two for a Tango | 3rd Edition

The [third edition](#) of the Two for a Tango Workshop was held on 14-15 November 2023. The videos of this workshop are available [here](#). The agenda of the workshop is in Figure 14.

Speakers:

Prof. Ina Koch (Goethe Universität, Germany)

Bipartite graphs for computational modeling in systems biology: from KEGG to Petri nets.

Prof. Vassily Hatzimanikatis (École Polytechnique Fédérale de Lausanne, Switzerland)

One method does not fit all: A Hierarchy of Modelling and Computational Methods for Metabolic Analysis and Design.

Prof. Igor Cestari (Institute of Parasitology, McGill University, Canada)

Nuclear signaling and antigenic switching in trypanosomes.

Prof. Barbara Bakker (Faculty of Medical Sciences, University of Groningen, The Netherlands)

Digital twins: a personalised systems medicine approach for metabolic disease.

Prof. Steffen Klamt (Max Planck Institute for Dynamics of Complex Technical Systems, Germany)

Network-wide thermodynamic constraints shape NAD(P)H cofactor specificity of biochemical reactions.

Prof. Laura-Isobel McCall (San Diego State University, US)

Metabolism in a 3D environment: chemical cartography of Chagas disease.

	Tuesday 14	Wednesday 15
14h00-14h10 CET time	Introduction to the workshop	Introduction to the second day
14h10-14h40 CET time	Talk 1: Ina Koch	Talk 4: Barbara Bakker
14h40-14h55 CET time	Questions and discussion on Talk 1	Questions and discussion on Talk 4
14h55-15h05 CET time	Short break	Short break
15h05-15h35 CET time	Talk 2: Vassily Hatzimanikatis	Talk 5: Steffen Klamt
15h35-15h50 CET time	Questions and discussion on Talk 2	Questions and discussion on Talk 5
15h50-16h00 CET time	Short break	Short break
16h00-16h30 CET time	Discussion 1	Discussion 2
16h30-17h00 CET time	Talk 3: Igor Cestari	Talk 6: Laura-Isobel McCall
17h00-17h15 CET time	Questions and discussion on Talk 3	Questions and discussion on Talk 6
17h15-17h30 CET time	Final discussion and conclusion of the first day	Final discussion and conclusion of the workshop

Figure 14. Workshop Two for Tango (3rd edition) agenda.

For this edition, the open questions and invited moderators were:

Discussion 1

There are many databases related to metabolism, and there are for a given organism, many metabolic networks that have been reconstructed that provide different and not always compatible information. How could the community address these issues?

Discussion 2

What further constraints could be integrated in stoichiometric models, going beyond mass balances, flux bounds, thermodynamic constraints and resource (including enzyme) allocation constraints.

Moderators: Ariel Silber, Mayke Bezerra Alencar and Gabriela Torres Montanaro (University of São Paulo) and Mariana Ferrarini and Marie-France Sagot (Inria, France)

1.2.2 Other Workshops

1.2.2.1 Voice and Communication Training Workshop (1st and 2nd Editions)

Between 5 – 7 July 2021, Carolina Peixoto, Prof. Susana Vinga and the project manager Sara Tanqueiro, participated in this intensive and practical 3-day workshop, organized by Raquel Bulha from TIMBRE at INESC-ID. Participants had the opportunity to discover how to effectively communicate with others in both a professional and personal sense and become aware of their own voice. A second Edition was held on 4 – 5 February 2022, in which the ESRs Mónica Silva and José Basílio participated (more details in Deliverable 4.3 - *Final Report on activities target ESRs*).

1.2.2.2 Workshop on Mental Health

This workshop, given by Dr. Isabel Gonçalves from the Academic Development Office of IST, was held on 13 December 2021 and focused on mental health and how the pandemic has been affecting people's daily lives, thoughts, and behaviours. The INESC-ID ESRs Carolina Peixoto and Mónica Silva, Prof. Susana Vinga, Prof. Inês Lynce, and Dr Sara Tanqueiro participated in this event (more details in *D4.3 - Final Report on activities target ESRs*).

1.2.2.3 Career Development

During the OLISSIPO Retreat in Lisbon, Prof. Susan Holmes, one of the SAB members of OLISSIPO, gave a talk about Career development to 29 ESR and researchers on 14 July 2022 (more details in *D4.3 - Final Report on activities target ESRs*).

1.2.2.4 Workshop in Science Communication and Outreach

On 15 July 2022, during the OLISSIPO Retreat in Lisbon, Prof. Ana Sanchez, from ITQB/UNL (Portugal), gave a workshop on Science Communication and Outreach for the ESR and researchers of the team (more details in *D4.3 - Final Report on activities target ESRs*).

1.2.2.5 Workshop on European Proposal Submissions

On 7 September 2022, OLISSIPO received, at INESC-ID, Dr Matthieu Py from Inria to talk about European Calls and discuss several aspects of Pre-Award. It was a full-day filled out with discussions, exchange of ideas and good practices. Sara Tanqueiro, Susana Vinga, Cláudia Vieira, Manuela Sado, Ana Rita Nunes, Pedro Ferreira, Pedro Monteiro, Emanuel Gonçalves

(INESC-ID), Marta Candeias, Alexandra Carvalho (IST) Marie-France Sagot and Matthieu Py (Inria) participated in this workshop of Proposal Writing.

OLISSIPO Workshop on European Projects and Proposal Writing	
WEST time	September 7, 2022
09:00-09:30	Welcome & <i>Tour de Table</i>
09:30-10:30	Horizon 2020 and Horizon Europe Matthieu Py, EU funding specialist INRIA centres of Lyon and Grenoble
10:30-11:00	<i>Coffee Break</i>
11:00-12:30	European Calls: EIC Pathfinder Matthieu Py, EU funding specialist INRIA centres of Lyon and Grenoble
12:30-14:00	<i>Lunch</i>
14:00-15:30	European Calls: MSCA Innovative Training Networks (ITN) Matthieu Py, EU funding specialist INRIA centres of Lyon and Grenoble
15:30-17:00	European Calls: ERC Matthieu Py, EU funding specialist INRIA centres of Lyon and Grenoble
17:00- 17:30	<i>Coffee Break</i>
17:30-18:30	General discussions All
19:00	Dinner

Figure 15. Workshop on European Proposal Submissions agenda.



Figure 16. Workshop on European Proposal Submissions conducted by Dr Matthieu Py from Inria.

1.2.2.6 Workshop on EU Research Management and Administration (Pre-Award)

On 9-10 February 2023, in parallel to the Winter School, Dr Matthieu Py from Inria and Dr Marta Candeias from IST-ID conducted a two-day workshop on Pre-Award (2nd Edition) with 23 participants from different institutes of the IST world. Thank you to all the participants who shared their experiences on Pre-Award and contributed to the lively discussions.

WET time	9 February 2023	10 February 2023
09:15-09:30	Welcome	Presentation of the institutes research topics
09:30-09:45	Tour de table	
09:45-10:00	Case study - existing organisations/structures	
10:00-10:15		
10:15-11:15	Interactive brainstorming session on service improvement	Interests in EU calls 2023-2024: matches from the joint file for pillar 2
11:15-11:30	<i>Coffee Break</i>	<i>Coffee Break</i>
11:30-11:45	Discussion time 'RMA VS researchers: how do we interact in practice?'	Future possible collaboration strategy for pillars 1 and 3
11:45-12:15		
12:15-12:30		<i>Pillar 4 & widening</i>
12:30-12:45		
12:45-14:30	<i>Lunch</i>	<i>Lunch/End</i>
14:30-15:45	Pre-award process from A to Z	
15:45-16:00	<i>Coffee Break</i>	
16:00-17:30	Pre-award process from A to Z (continued)	

Figure 17. Workshop on EU Research Management and Administration (Pre-Award) agenda.



Figure 18. The workshop on EU Research Management and Administration had more than 20 participants from INESC-ID and IST world.

1.2.2.7 Workshop on EU Project Management | February 9-10, 2023

On 10 May 2023, taking advantage of the EMBL team's visit to INESC-ID for the scientific workshop, the senior project manager Simone Bell gave a workshop on project management to the administrative staff in Lisbon (Dr Sara Tanqueiro, Dr Ana Rita Nunes, and Dr Natália Souza). Simone talked about the different steps in managing a project, highlighting several important tips for a successful project. It was very important to share experiences.

1.2.2.8 Workshop on Horizon Europe for ICT

On 14 February 2024, INESC-ID hosted a training workshop focused on the Pre-award phase of European projects, with 14 participants. This initiative was open to staff and researchers from INESC-ID, INESC-INOV, and INESC-MN (other research institutions from INESC Lisboa). Facilitated by Dr Matthieu Py, the European Strategy Officer at Inria (France), the workshop was divided into two parts. The first part covered fundamental principles for preparing Horizon Europe applications, while the second part focused on more specific topics of interest to the development of project proposals.

Agenda

14:30 - 15:45: The basics of HE for staff & researchers

Speaker: Matthieu Py, Eu office, Inria

- Introduction to Horizon Europe (tailored on-site according to needs)
- ICT in Horizon Europe: plain sight & hidden calls
- Decision tree (short version)
- Open questions

15:45 - 16:00 *Break*

16:00 - 17:00 Focus on topics of interest within Horizon Europe

- Gender & diversity (in research, in research teams)
- Ethics & data (Ethics protocols & assessment, GDPR, DMPs, etc.)
- RRI and open science in ICT
- Open questions

This part of the workshop's main aim was to equip researchers and staff with practical knowledge for the pre-award phase of Horizon Europe Proposals.



Figure 19. INESC-ID workshop with Dr. Matthieu Py from Inria.

On **15 February 2024**, the OLISSIPO supported a [training session](#) on Pre-award (morning) and Post-award (afternoon), open to the IST world, with 14 participants.

9:30 - 10:45: Focus on open calls given by Dr Matthieu and Dr Mariana Santa-Marta (IST)

- The types of open calls: ERC, MSCA-DN, MSCA-SE, MSCA-PF, EIC
- Specifics in preparing for open calls (timing, template etc)
- Best practice in supporting researchers for open calls
- Discussion and sharing practices from the participants

10:45 - 11:15: *Break*

11:15 - 12:30: Ideation session coordinated by Marta Candeias and Ana Espada (IST)

Purpose: to find subjects of interest to both Inria and IST teams that may serve as a bottom-up approach to create or join projects together:

- Ideation Sessions” performed at CQE, by Ana Espada
- Q&A

14:00 - 15:30: Project valorisation by Matthieu Py (Inria), Carla Patrocínio and Patricia Lima (IST)

- Structure and purpose of the ‘valorization’ office
- Stage 1: Communication & public engagement

- Stage 2: Informing policy making & influence
- Stage 3: Tech transfer
- Q&A

15:30 - 16:00: *Break*

16:00 - 17:00: Project management by Matthieu Py (Inria)

- The structure and purpose of the project management 'office'
- The process of project management: when does it start? what does it entail?
- Good practices: within the institution, with the partners, with the Commission
- The (digital)tools for management and reporting

17:00 - 17:15: Perspectives & wrap-up

On **16 February 2024**, Dr Matthieu Py and Dr Sílvia Castro (Pre-Award Officer, INESC-ID) invited coordinators of the INESC-ID research Thematic Lines for a talk about the Pre-Award of European projects and to meet with each coordinator to find synergies and possible collaborations between INESC-ID and Inria.

9:00 - 11:00 Discussion with all the Thematic Lines at INESC-ID

Life and Health Technology with Ana Teresa Freitas

Societal Digital Transformation with José Borbinha

Energy Transition with Hugo Morais

Security & Privacy with Miguel Correia

11:00 - 11:30 Coffee break

11:30 - 13:00 Preparing future EU projects with collaborations between INESC-ID and Inria

13:00 - 14:00 Lunch

14:00 - 15:00 Final discussion and closing

Additionally, Professors Susana Vinga, Marie-France Sagot, and the two members from the OLISSIPO SAB, Dan Gusfield and Jonas Almeida, together with Dr Matthieu Py discussed future projects to be submitted in Horizon Europe, including EIC Pathfinder, ERA-CHAIR, ERC, and CSA.



Figure 20. SAB members Jonas Almeida and Dan Gusfield, PI Susana Vinga.

Overall, this meeting significantly strengthened the collaboration between INESC-ID and Inria, with valuable external feedback from the members of the SAB present.

1.2.2.9 Workshop on “How to Design a Graphical Abstract”

(See also D4.3 - Final report on activities targeted for Early Stage Researchers)

The Workshop “How to design a graphical abstract” took place at INESC-ID on 19 April 2024, from 9:00 - 18:00, by Dr. Rita Félix (CNC Center for Neuroscience and Cell Biology, Coimbra, Portugal - <https://ritalfelix.wixsite.com/portfolio>). It aimed to explain what a graphical abstract is and to give design tools and tips on how to create a better, clearer, and engaging graphical abstract. This workshop is tailored to give participants tools to improve their graphical abstract, without having to learn how to use a new software program (like Adobe Illustrator). In the hands-on part of the Workshop, the participants worked on their own graphical abstract, shared it with the class, worked on it, and took home a new version.



Figure 21. Group Picture with the Participants of the Workshop “How to design a graphical abstract”.

The feedback from the 16 participants, mostly ESR, was extremely positive (see *D4.3 - Final report on activities targeted for Early Stage Researchers*).

1.3 OLISSIPO Invited Lectures Series

1.3.1 OLISSIPO Twin seminars

The Twin Seminars were created to disseminate the scientific work and expertise of INESC-ID and all the Consortium including Inria, ETH Zürich and EMBL. These seminars comprised two short presentations, one researcher from Lisbon and one from a twin international institution working on similar topics in Computational Biology. The seminars were open to everyone interested and included a discussion to further promote the interaction between all the participants.

1.3.1.1 OLISSIPO Twin Seminar on Sparse regularization for multi-omics data

On 20 May 2021, the first OLISSIPO Twin Seminar on [Sparse regularization for multi-omics data](#) was held online with Prof. Susana Vinga (INESC-ID) and Prof. Valentina Boeva (ETH Zürich). Moderated by Prof. Niko Beerenwinkel (ETH Zürich), this seminar had 62 participants. Videos of the two talks are available on YouTube: [Link 1](#) and [Link 2](#).



Figure 22. OLIS IPO Twin Seminar on Sparse regularization for multi-omics data.

1.3.1.2 OLIS IPO Twin Seminar on Towards the clinical utility of polygenic risk scores

On 16 September 2021, the second OLIS IPO Twin Seminar on [Towards the clinical utility of polygenic risk scores](#). With 50 participants, this seminar was held online with Prof. Ana Teresa Freitas (INESC-ID) and Michael Inouye (Baker Institute, University of Cambridge and Alan Turing Institute). Prof. Mário Gaspar da Silva (INESC-ID/IST) chaired this seminar. Videos are available on YouTube: [Link 3](#) and [Link 4](#).

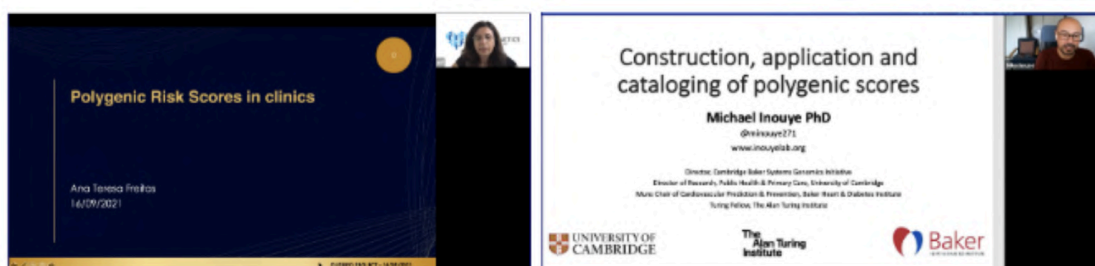


Figure 23. OLIS IPO Twin Seminar on Towards the clinical utility of polygenic risk scores.

1.3.1.3 OLIS IPO Twin Seminar on Towards the clinical utility of polygenic risk scores

The third Twin seminar was held on 10 February 2022 on [Protein driven machine learning and network approaches for precision medicine](#) with Prof. Emanuel Gonçalves (INESC-ID) and Pedro Beltrao (ETH Zürich). Chaired by Dr Thomas Naake (EMBL), 48 participants attended these sessions. Videos are available on YouTube: [Link 5](#) and [Link 6](#).



Figure 24. OLISSIPO Twin Seminar on Towards the clinical utility of polygenic risk scores.

1.3.1.4 OLISSIPO Twin Seminar on Algorithms and software for phylogenetic analysis

On 18 April 2024, the fourth edition of the OLISSIPO Twin Seminars was held online with Prof. Cátia Vaz (INESC-ID/ISEL, IPL) and Prof. Daniel Huson (University of Tübingen) on [Algorithms and software for phylogenetic analysis](#). Chaired by Prof. Alexandre Francisco, this seminar involved 15 participants. Videos are available on YouTube: [Link 7](#) and [Link 8](#).

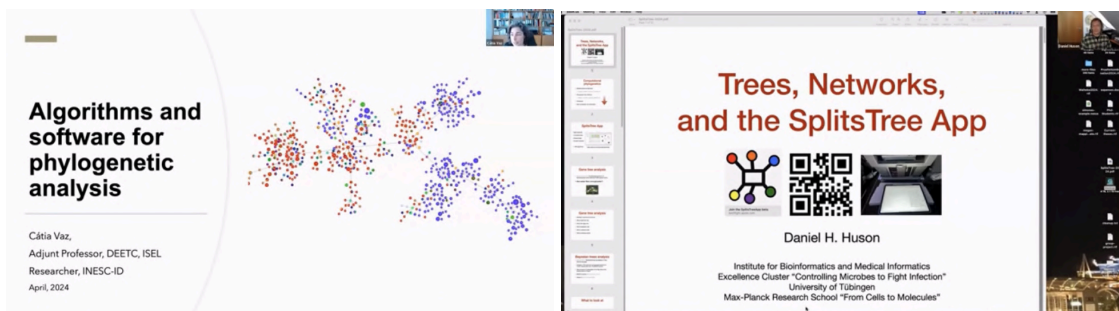


Figure 25. OLISSIPO Twin Seminar on Algorithms and software for phylogenetic analysis.

1.3.2 OLISSIPO Alumni Talks/Workshops

During the first annual meeting with the Scientific Advisory Board on January 13, 2022, the OLISSIPO team concluded that it would be useful to assembly successful cases of Alumni from portuguese institutions and share them with the project ESRs. To promote this activity when lecturers bring their expertise back home, the coordination created the Alumni Seminars or Workshops.

1.3.2.1 Analysis of Single-Cell data from Tumours

On 4 April 2023, the ETH Zürich ESR and INESC-ID Alumni Pedro Ferreira conducted a one-day [Workshop on the Analysis of single-cell data from tumors](#). With more than 30 participants from Instituto Superior Técnico, Instituto de Medicina Molecular, BioISI – Biosystems & Integrative Sciences Institute, Faculdade de Ciências da Universidade de Lisboa, Instituto Gulbenkian de Ciencia and NOVA School of Science and Technology, the workshop consisted on 2 lectures and 1 hands-on session.

LISIPO **WORKSHOP**
Analysis of single-cell data from tumors

April 4, 2023 | INESC-ID, Lisbon

Programme

- 09:15 - 09:30 Welcome and Registration
- 09:30 - 11:00 Lecture 1 - Introduction to tumor evolution, single-cell data and analysis methods
- 11:30 - 12:30 Lecture 2 - Statistical inference methods and applications on single-cell data
- 12:30 - 14:00 Lunch
- 14:00 - 15:30 Hands-on session - Clustering and matrix factorization methods for scDNA-seq and scRNA-seq analysis of tumors in Python

Pedro Ferreira
ETH Zürich

Pedro Falé Ferreira is a PhD student at the Computational Biology Group at the Department of Biosystems Science and Engineering of ETH Zürich in Basel, Switzerland. He is supervised by Prof. Niko Beerenwinkel and Dr. Jack Kuipers. He develops computational methods to analyse high-throughput single-cell sequencing data and reconstruct the evolutionary history of tumors and has presented his work in several international venues. He obtained his MSc. from Instituto Superior Técnico in Lisbon, Portugal in 2018 under the supervision of Prof. Susana Vinga and Prof. Alexandra M. Carvalho. More information about his research is available at <https://pedrofale.github.io>.

inescid lisboa | EMBL | ETH zürich | *lisboa*

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 951970.

Figure 26. Agenda of the alumni workshop on Analysis of Single-Cell data from Tumours.



Figure 27. Group photo with the participants from the first Alumni Talk with Pedro Ferreira.

1.3.2.2 Analysis of Single-Cell data from Tumours

Bernardo Almeida, ESR in IMP and University of Vienna and alumni of a Portuguese institution in Lisbon (iMM, Instituto de Medicina Molecular João Lobo Antunes), held a workshop on 27 April 2023 for more than 25 participants on [Decoding the genome with deep learning](#) for more than 25 participants. The event was opened to INESC-ID and other Portuguese institutions.

OLISSIPO WORKSHOP
Decoding the genome with deep learning

April 27, 2023 | INESC-ID, Lisbon

Programme

- 09:15 - 09:30 Welcome and Registration
- 09:30 - 10:30 Lecture 1 - Introduction to regulatory genomics, classical methods for analysis of DNA sequences, and deep learning
- 11:00 - 12:00 Lecture 2 - Deep learning methods and applications in genomics
- 12:00 - 13:30 Lunch
- 13:30 - 15:00 Hands-on session 1 - Training CNNs to predict enhancer activities from DNA sequences
- 15:30 - 16:30 Hands-on session 2 - Using attention and transformers to predict gene expression from sequence

Bernardo Almeida
IMP and University of Vienna,
iMM alumni

Bernardo Pereira de Almeida is a final-year PhD student in the lab of Dr. Alex Stark at the Research Institute of Molecular Pathology (IMP) in Vienna, Austria, where he is combining deep learning approaches and massively parallel transcriptional reporter assays to study the regulatory information encoded in the genome sequence. He received a MSc. in Oncobiology and a BSc. in Biomedical Sciences from the University of Algarve, Portugal. Previously, during his master thesis with Nuno Barbosa Morais at Instituto de Medicina Molecular (iMM, Portugal), and in collaboration with Mónica Bettencourt Dias (IGC, Portugal), Bernardo studied the genetics and molecular mechanisms underlying tumour development. His ultimate goal is to build computational models that can read the human genome and interpret its variation. More information about his research is available at <https://bernardo-de-almeida.github.io/>.

inescid lisboa | EMBL | ETH zürich | iMM

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 951970.

Figure 28. Agenda of the Alumni Talk on Decoding the Genome with Deep Learning.



Figure 29. Group photo with participants of the Alumni Talk with Bernardo Almeida.

1.3.3 OLISSIPO Invited Lectures

1.3.3.1 From oncology to cardiology: Spatial omics technologies for topographic biomarker discovery

Invited by Prof. Emanuel Gonçalves (INESC-ID/IST) during the OLISSIPO Retreat 2023 in Heidelberg, Dr Denis Schapiro (University Hospital Heidelberg) visited INESC-ID on 23 November 2023 for a lecture on [Spatial omics technologies for topographic biomarker discovery](#).



Figure 30. Invited Lecture with Dr Denis Schapiro.

1.3.3.2 Bioinformatics, Computational Biology and Genomics

Taking advantage of joining the team in Heidelberg for the OLISSIPO Retreat 2023, Prof. Dan Gusfield, a member of the Scientific Advisory Board, gave a lecture on 18 October 2023 about the past of Bioinformatics, Computational Biology, and Genomics. This lecture was open to EMBL and hosted by Prof. Wolfgang Huber.



Figure 31. Invited Lecture with Prof Dan Gusfield from the OLISSIPO Scientific Advisory Board.

1.3.3.3 Integer Linear Programming and SAT-Solving in Computational Biology

Prof. Dan Gusfield, one of the SAB members, visited INESC-ID from 14-16 February 2024, in the context of the Workshop on Horizon Europe for ICT given by Dr Matthieu Py from Inria to discuss new projects. Taking advantage of this, Prof. Dan Gusfield gave a lecture on 15 February 2024 at INESC-ID for ESRs and researchers, with 31 participants. This session was also opened to the scientific community via ZOOM and is available on the OLISSIPO YouTube channel [here](#) (with 111 visualizations).

1.3.3.4 Universal Sequence Maps, from biological sequences to numbers and back

Prof. Jonas S. Almeida, one of the SAB members, visited INESC-ID from 14-16 February 2024, in the context of the Workshop on Horizon Europe for ICT given by Dr Matthieu Py from Inria to discuss new projects. Taking advantage of this, Prof. Jonas gave a lecture on 14 February 2024 at INESC-ID for ESRs and researchers, with 30 participants. This session was also opened to the scientific community via ZOOM and is available on the OLISSIPO YouTube channel [here](#) (with 94 visualizations).

1.3.3.5 Bioinformatics Infrastructure in Bielefeld and in Germany

Prof. Jens Stoye, one of the SAB members, visited INESC-ID between 22-23 April 2024, to discuss new projects and future plans. Specifically, Prof. Susana and Prof. Jens discussed a joint project for an MSc of Gabriel Abrantes, a student at Bielefeld University who came to Lisbon to do an internship with Susana's group from September 4 to February 9, 2023. Gabriel Abrantes demonstrated interest in developing his MSc at INESC-ID and IST (starting in 2024). Taking

advantage of his visit, Prof. Jens was invited to give an open lecture on 23 March 2024 at INESC-ID about The Bioinformatics Infrastructure in Bielefeld and in Germany, with 15 participants. This session was also opened to the scientific community via ZOOM and is available on the OLISSIPO YouTube channel [here](#) (now with 25 visualizations).

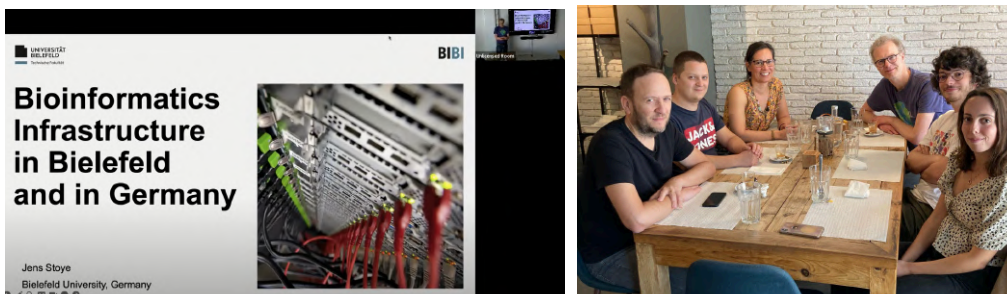


Figure 32. Invited Lecture with Prof. Jens Stoye from the OLISSIPO Scientific Advisory Board.

1.4 Conferences

1.4.1 ISMB/ECCB 2021

This is the year's most important computational biology event globally. It is a multidisciplinary forum for disseminating the latest developments in bioinformatics and computational biology. Marie-France Sagot (Inria) was one of the conference co-chairs from 25 to 30 July 2021.

1.4.2 ALGO 2021

OLISSIPO was one of the supporters of [ALGO 2021](#), the major European event for researchers, students, and practitioners in algorithms, which was held between 6 and 10 September 2021 and organized by INESC-ID. Professor Susana Vinga, along with other members of the IDSS (Information and Decision Support Systems) lab at INESC-ID, participated in organizing this international conference.

1.4.3 Ascona 2022

Prof. Niko Beerenwinkel from ETH and Prof. Wolfgang Huber from EMBL, two PIs participating in the OLISSIPO project, were part of the organizing committee of this event held on 27 March – 1 April, 2022. Prof. Susana Vinga participated in this event.



Figure 33. OLISIPO PIs at the Ascona Workshop 2022.

1.4.4 CSAMA 2022

The EMBL PI, Dr Wolfgang Huber, and senior project manager Simone Bell organized this intensive course in Brixen between 19 and 24 June 2022, with 80 participants. Two INESC-ID ESRs, Mónica Silva and João Aparício, participated in this school.



Figure 34. OLISIPO team at CSAMA 2022.

1.4.5 European Bioconductor Conference 2022

The EMBL PI, Prof. Wolfgang Huber, and project manager, Simone Bell, organize this international conference, held between 14-16 September 2022. The INESC-ID ESR José Basílio watched the Livestream.



Figure 35. Prof. Wolfgang Huber hosted the Bioconductor Conference 2022 in Heidelberg.

1.4.6 CSAMA 2023

The EMBL PI, Prof. Wolfgang Huber, and project manager, Simone Bell, organize a new edition of this course in Brixen during 11-16 June 2023.

1.4.7 European Bioconductor Conference 2023

The EMBL PI, Prof. Wolfgang Huber, and project manager, Simone Bell, organize this international conference between August 2-4, 2023.

1.5 Other events

1.5.1 Round-tables

1.5.1.1 OLISSIPO Retreat

In the context of the OLISSIPO Retreat, held in Lisbon during 14 July 2022, the OLISSIPO coordination organised a round-table about “Computational Biology: bridging academic education and data science applications for clinical and biotechnology research” with Prof. Niko Beerenwinkel (ETH Zürich), Doctor Luís Costa (Hospital de Santa Maria & IMM, Lisbon), and Dr.

Simão Soares (P-BIO & SilicoLife). We explored several critical aspects associated with Computational Biology, covering academic education, applications to clinical research, and translational bioinformatics for the biotechnology industry. We also approached solutions that may frame computational biology graduate education in entirely different ways, maybe as part of a broader trans-disciplinary approach with Data Science and Engineering foundations - with wider career development opportunities.



Figure 36. Round-table with Prof Susana Vinga, Doctor Luís Costa, Dr Simão Soares and Prof Niko Beerenwinkel during the OLISSIPO Retreat.

1.5.1.2 Microbiome PT Summit

On 26-27 October 2023, the Microbiome PT Summit was held at Instituto de Medicina Molecular – João Lobo Antunes. The Summit had several sessions with renowned names in the field of microbiome and health and disease. OLISSIPO supported the organization of a round-table on Industry.



Figure 37. Prof. Susana Vinga at the PT Summit hosted by the BioData.pt.

1.5.1.3 INESC Lisboa Meeting 2023

On 3 November 2023, Prof. Susana Vinga moderated a round table with INESC-ID ESRs to hear from them about the main obstacles they face daily and what should be improved in the institutions.



Figure 38. The OLISSIPO coordinator moderating the INESC-ID ESRs round-table.

1.5.1.4 OLISSIPO Final Meeting

On 17 June 2024, in the context of the final OLISSIPO Meeting in Basel, we held our last seminar series with two members of the SAB, Prof. Pavel Pevzner and Prof. Magnus Rattray (see *D6.7 - Final project meeting with the SAB*).

1.5.2 Small RNAs Bioinformatics club

The Small non coding RNA Bioinformatics Club was organized by several [researchers](#), including Prof. Marie-France Sagot. Its main aim is to provide a virtual place of discussion around such molecules. To animate these discussions, a seminar is organized every two months. OLISSIPO disseminate the event in the project website and social media.

Seminars are available on the [YouTube channel](#) of the club.

- 8 Nov 2021 Hervé Seitz - A functional definition of "microRNA targets": current issues, biological implications, perspectives for improvement.
- 19 Jan 2022 Han Liang - Role of enhancer RNAs in human cancer.
- 21 Mar 2022 Stefan Kirsch - Single Cell microRNA sequencing: *Protocol Comparison, Automation and Application to Clinical Samples.*
- 2 May 2022 Prof. Isana Veksler-Lublinsky - *miRNA target prediction through a machine learning lens.*
- 10 Oct 2022 Marc Friedländer - *agoTRIBE experimentally maps microRNA targets transcriptome-wide in single cells.*
- 7 Nov 2022 Amy Buck - *RNA communication in host-pathogen interactions.*
- 3 Apr 2023 Cynthia Sharma - *Regulatory RNAs in pathogenic Epsilonproteobacteria.*
- 22 May 2023 Daniel Cifuentes - *Single-cell transcriptomics reveal two distinct modes of action of microRNAs during hematopoietic stem cell differentiation.*

3. Conclusions

The organization of joint events, schools, workshops, and conferences was pivotal in creating a critical mass at the convergence of computer science and health research. Beyond individual development, the initiative sought to fortify collaborative networks by enhancing proficiency in theoretical modelling, computer science, and statistical learning, directly impacting the fields of biology, medicine, and health applications.

Annexes

Feedback from Workshop Metabolism and mathematical models: Two for a tango. (1 – Don't agree/Not useful at all, 5– Fully agree/Extremely useful).

Would you prefer these workshops to occur during 1 or 2 days?	Do you have preference for the weekdays when the events occur?	What format would you like to see more in these workshops?	The duration of each presentation was adequate.	The duration of time allocated for questions was adequate.	How useful was the workshop to you?	Do you have any further comments or suggestions?
Two days	I don't have any preference.	Days with the two subjects (mixed), as done previously.	5	5	5	
Two days	I don't have any preference.	Days with the two subjects (mixed), as done previously.	5	5	5	
Two days	I don't have any preference.	Days with the two subjects (mixed), as done previously.	4	4	5	
Two days	monday	Each day dedicated to one subject.	4	4	5	
Two days	I don't have any preference.	Days with the two subjects (mixed), as done previously.	5	5	4	More Hands on work and takeaway assignments to do as homework
Two days	monday, tuesday, friday	Days with the two subjects (mixed), as done previously.	5	5	5	Excellent fruitful sessions. Thanks a lot for the speakers and the organizers.
Two days	I don't have any preference.	Days with the two subjects (mixed), as done previously.	3	4	3	
Two days	I don't have any preference.	Each day dedicated to one subject.	4	4	2	
Two days	I don't have any preference.	Each day dedicated to one subject.	5	5	5	