

REPORT 2017 - 2019

BioData.pt 

THE PORTUGUESE
INFRASTRUCTURE FOR
BIOLOGICAL DATA



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OUR CEO'S STATEMENT

Ana Portugal Melo

ELIXIR PT|BioData.pt emerged from the vision of José Leal, Ana Teresa Freitas and Arlindo Oliveira to pace Portuguese research with the state of the art in Bioinformatics and Data Management for Life Sciences.

Bridging our beta users' needs and our expertise, BioData.pt developed intuitive tools for data analysis, like "Biome Shiny" and "Python Video Annotator", and capacity building programs like "Ready for BioData Management?". Tailor made solutions are also available.

BioData.pt is strongly committed with the greatest society endeavors of present times, namely participating in the One Million Genomes initiative by building the prototype of the Portuguese

repository of human genomes, and in the CONVERGE project to deliver sustainable FAIR life-science data management services.

"BioData.pt engages with academic and private sector researchers, as well as with new generations of bioinformaticians."

BioData.pt organizes and participates in several initiatives, targeting academic and private sector researchers, as well as the new generations of bioinformaticians. "Cool Tools for Science: user's innovation" is one of the most popular events co-organized by BioData.pt, dedicated to sharing users' capacity to develop custom made solutions to support their research. A long way is open to be walked together. BioData.pt exists for you. You can use it!

Recent past...

The initial establishment of Biodata.pt was leveraged by the earlier work of the partners who spawned the Portuguese Node of ELIXIR. Their embryonic infrastructure was ready to scale up quite fast as soon as biodata.pt was able to hire its own dedicated resources.



Mário Silva, INESC-ID



Cristina Vieira, IBMC

Bioinformatics tools that can be used by all researchers, independently of their background.

... and vision of BioData.pt

BioData has the potential to become one of the most important infrastructures for biologically-related research in Portugal, if the scientific community begins to understand the importance of bioinformatics as an enabling technology.



Arlindo Oliveira, IST



Célia Miguel, IBET

BioData.pt will leverage the biological research outputs by providing the tools to make data widely available and useful for other scientists and the society.

HIGHLIGHTS

June 2017-September 2019

COURSES

To be at the forefront of Science with Bioinformatics expertise.

29

386 participants

18

INTERNATIONAL PUBLICATIONS

Achieving international recognition.

EVENTS

Sharing a vision towards value creation from biological data management and innovative tools.

4

196 participants

51

Communications

7

Academic Thesis

1

New Projects

1

Communication Awards

17

Computing Applications

18

Models

3

Compute Infrastructure Nodes

7000+

New Website Users

ELIXIR PT|Biodata.pt is the Portuguese node of ELIXIR - European Distributed Infrastructure for Biological Data. It supports the research strategy and programs of the national scientific system through a distributed computing infrastructure and a network of bioinformatics and data management experts, promoting scientific research in the agrofood and forestry, sea and health sectors. Another key activity includes leveraging value creation projects based on biological information, in partnership with business R&D. BioData.pt | ELIXIR PT maps and disseminates ELIXIR resources to Portuguese users in academia and industry, and builds training and services focused on fulfilling national needs and promoting excellence.

BioData.pt | ELIXIR PT gathers expertise in a broad range of scientific topics, spanning health, biological, agriculture and marine sciences. It provides seven ELIXIR Node Services: Computing Services, GTPB, CorkOak DB, Yeabstract, Small RNA workflow, PEA0, and Phyloviz. It develops and deploys community services, including the Python Video Annotator, Bioinformatics Docker Images Project, and Ready for BioData Management?, and hosts a customized bioinformatics user support service.

BioData.pt | ELIXIR PT coordinates communities in Marine Metagenomics, Plant Sciences, and Microbiology and Biotechnology, which work together with the Compute, Interoperability and Training platforms to develop and maintain the services contracted with ELIXIR. National communities and platforms engage with their counterparts at the ELIXIR European level.

Human



Develops standards, protocols and best practices for managing and accessing sensitive human data.

Marine



Develops infrastructure to support marine metagenomics. Survey PT marine data resources.

Galaxy



Fosters a PT Galaxy community, by providing Galaxy instances, tools, compute resources, and training.

Microbial



Develops tailor-made microbes and biological systems and model gene regulation networks in yeasts.

Plants



Develops implements and promotes standards and repositories for plant data publication.

COMMUNITIES

PLATFORMS

Interoperability



Develops and promotes standards and data management best practices to enable interoperability.

Compute



Provides cloud services such as VMs and containers to PT researchers. Provide compute to Galaxy Europe.

Training



Delivers training on key topics in Bioinformatics and Data Management to PT researchers.

Data



Enables findability and accessibility of PT data with protocols like BrAPI or beacons and bioschemas markup.

Tools



Develops user-friendly tools to empower PT researchers. Promote their registry in ELIXIR's bio.tools.

SERVICES

**EMPOWERING
RESEARCHERS**

NODE SERVICES

Mature tools and services formally endorsed by BioData.pt, reviewed by our Scientific Advisory Board, and included in our service delivery plan.

COMMUNITY SERVICES

Other tools and services developed and/or provided by BioData.pt.



CorkOakDB

CorkOakDB aims to integrate the knowledge generated from fundamental and applied studies about *Quercus suber*, with a focus on genetics.

TOOLS

- BLAST
- Genome Browser
- Feature Expression Visualization
- Data Searches
- Direct Downloads

Apr - Dec 2019

337

Users

7

Countries

CorkOakDB features the first draft genome of *Quercus suber*, released in 2018 by the GENOSUBER consortium, and allows genome browsing and gene search.

It also incorporates other types of data from cork oak scientific research, including gene expression data from publicly available datasets.

The knowledge of the genetic structure of cork oak is essential for the future development of innovative breeding and production strategies.

From here on it will be possible to identify and study genes involved in the acquisition of traits of interest, such as cork production or resistance to pests. The genome sequence now available will also serve as a reference for sequencing other trees and identifying genetic variability related to characteristics of interest. This portal is intended to become a repository of data originated by scientific research in multiple areas.

ELIXIR PT COMPUTING SERVICES

Coordinated by INESC-ID, the BioData.pt computing infrastructure includes IST, IGC and CCMAR as cloud service providers. The service provides virtual machines on demand, complemented by a user-support service.

Additionally, the infrastructure provides computing capacity to Galaxy Europe through the Pulsar network, which enables Portuguese researchers to use the infrastructure when submitting jobs to Galaxy Europe.

Report Period



PYTHON VIDEO ANNOTATOR

APPLYING
FOR ELIXIR
NODE
SERVICE

Credits: NASA/Dominic Hart

An open source graphical application for analyzing and annotating events captured in video, PythonVideoAnnotator was developed in concert with a video-capturing rig, with the aim of helping neuroscience and ethology researchers study animal behaviors.

Ultimately, the goal of this software tool and supporting set-up is to bring Open Science practices to the study of animal behavior and promote reproducibility and standardization.

During the period of this report, PVA was **downloaded more than 2700 times**.

GULBENKIAN TRAINING PROGRAM IN BIOINFORMATICS

2019 COURSES

The GTPB is the longest-running Bioinformatics training programme in Portugal, and was chosen as the core pillar of BioData.pt's Training Platform.

- Entry Level Bioinformatics
- Proteomics Data Analysis
- Population Genetics and Demographic History
- Analysis of Differential Expression (using RNAseq)
- Computational PANGenomics
- Integrative Biological Interpretation using Proteomics

Report Period

298
Trainees

21
Courses



The Yeast Search for Transcriptional Regulators And Consensus Tracking is a curated repository of regulatory associations between transcription factors and target genes in *Saccharomyces cerevisiae*, based on more than 1580 bibliographic references.

It has been online for nearly fifteen years, making it one of the longest running Bioinformatics databases in Portugal, and it supports a well established community of users worldwide.

310
binding sites

175.000
regulatory associations

183
transcription factors

Report Period

30000+
Sessions

200000+
Page Views

40+
Countries

OTHER NODE SERVICES

PEAO is a semantically rich ontology that models plant experimental biology in its full extent, from plant growing, to sample collection, to molecular experiments, to data analysis.

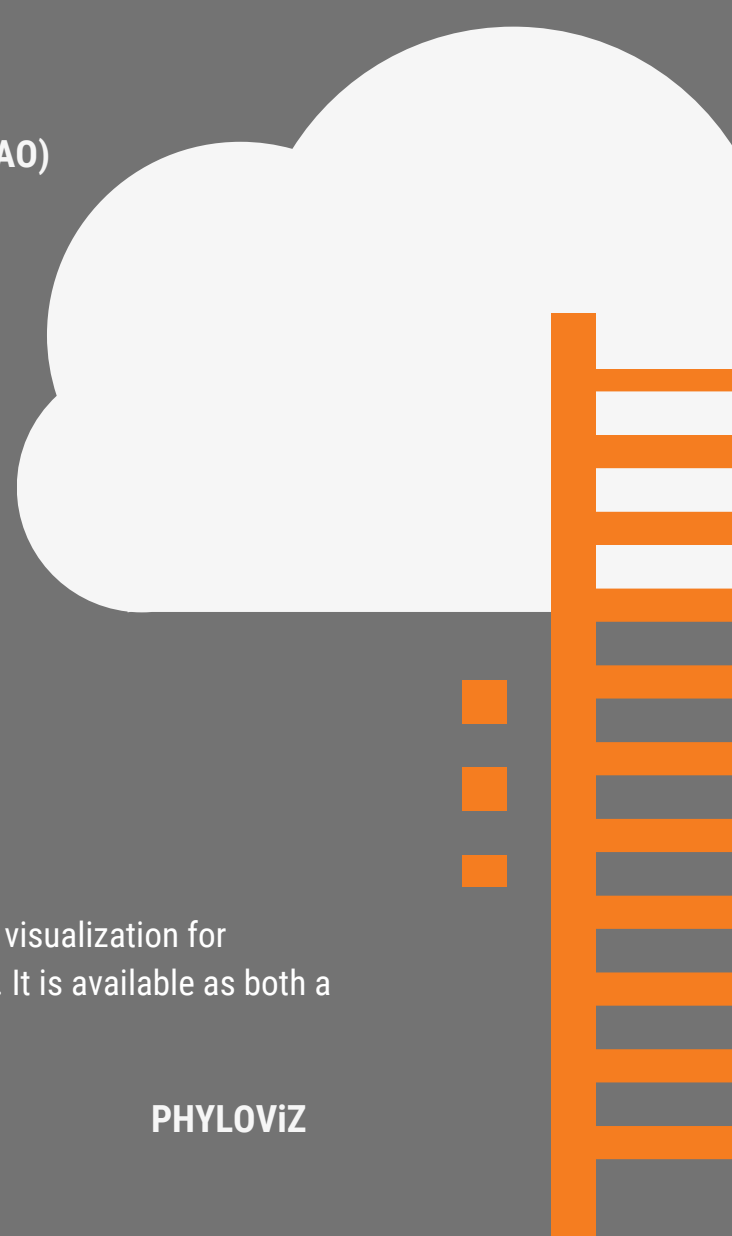
Plant Experimental Assay Ontology (PEAO)

sRNA workflow is a workflow for the analysis of plant small RNA sequencing data developed at iBET.

sRNA workflow

PHYLOViZ allows phylogenetic inference and data visualization for large datasets of sequence based typing methods. It is available as both a standalone tool and a Web application/service.

PHYLOViZ





COMMUNITY
SERVICE

READY FOR BIODATA MANAGEMENT?

Capacity Building for the Life Sciences

Ready for BioData Management?, our capacity building programme for data management in the life sciences, started with Ana Melo's plan to host an event to raise awareness of data management plans. She challenged João Cardoso and Daniel Faria to organize a hands-on exercise on the topic, and Marta Silva to design a canvas to support it, and the result was a recipe for success.

A very well-received first event spawned a flagship programme, with an increasing variety of training offers. Currently we are offering the One-day Workshop - Introduction to Data Management Plans, the One-day Course - Advanced Data Management Plans and the Class Modules - Introduction to Data Management and Demystifying Data Management Plans. Several events are already scheduled for late 2019 and early 2020.

Given the upcoming ELIXIR-CONVERGE project, data management plans will be a focal point in European research over the next three years, and thanks to this programme, BioData.pt is well placed to reap the rewards.

OTHER COMMUNITY SERVICES

Bioinformatics Docker Images Project (Pegi3s)

A project aiming to containerize commonly used Bioinformatics tools and workflows to enable accessibility and reusability.

Currently includes over 40 well-documented Docker images.

EvoPPI

A web tool for the analysis of Protein-Protein Interaction data that supports both within- and between-species interactome comparisons.

**APPLYING
FOR ELIXIR
NODE
SERVICE**

Systems Biology Tools

- merlin
- CoBAMP
- OptFlux
- Stem Cell
- NetStem Checker

Bioinformatics Tools

- BiomeShiny
- PhagePromoter
- GOEnrichment
- ADOPS
- BLAST DataBase Manager
- SEDA
- EbolaID
- MITOBREAK
- 4Pipe4
- TriFusion

Other Tools & Services

- PHENO
- NCBI Mass Downloader
- Structure_threader

PROJECTS

ENGAGING WITH YOU

COMPETITIVE FUNDING

BioData.pt - funded by PT2020

Goal: Found the Portuguese Infrastructure of Biological Data to operate the National Node of ELIXIR. This RI is aimed to provide state of the art expertise in data management and bioinformatics, as well as computing resources to portuguese academy and industry researchers.

Duration: 36 months

Funding: 2.728.291,98€

Start Date: 17/06/2017

ELIXIR CONVERGE - funded by H2020

Goal: Connect ELIXIR Nodes to provide FAIR data management as a service, through support, training, and the development of a data management toolkit

Duration: 36 months

Funding: 210.159,38€

Start Date: 01/02/2020

ELIXIR FUNDING

ELIXIR Implementation Studies

Overall funding: 83.091,25€

Project Plan for Interoperability Platform – Interoperability with a Purpose

Duration: 31 months Participation : 2 PMs
Start Date: 01/06/2019

Expanding the Galaxy: meeting the needs of ELIXIR Communities

Duration: 24 months Participation: 2 PMs
Start Date: 01/06/2019

BioSchemas

Duration: 24 months Participation: 2 PMs
Start Date: 01/01/2020

Federated Human Data

Duration: 31 months Participation: 1 PM
Start Date: 01/06/2019

Deploying Reproducible Containers and Workflows Across Cloud Environments

Duration: 24 months Participation: 1 PM
Start Date: 01/06/2019

ELIXIR FUNDING

ELIXIR Staff / Knowledge Exchange Scheme

Overall funding: 29.600,00€

Duration: 6 months

01/01/2020

Enabling FAIR plant phenotyping data submission through the Breeding API

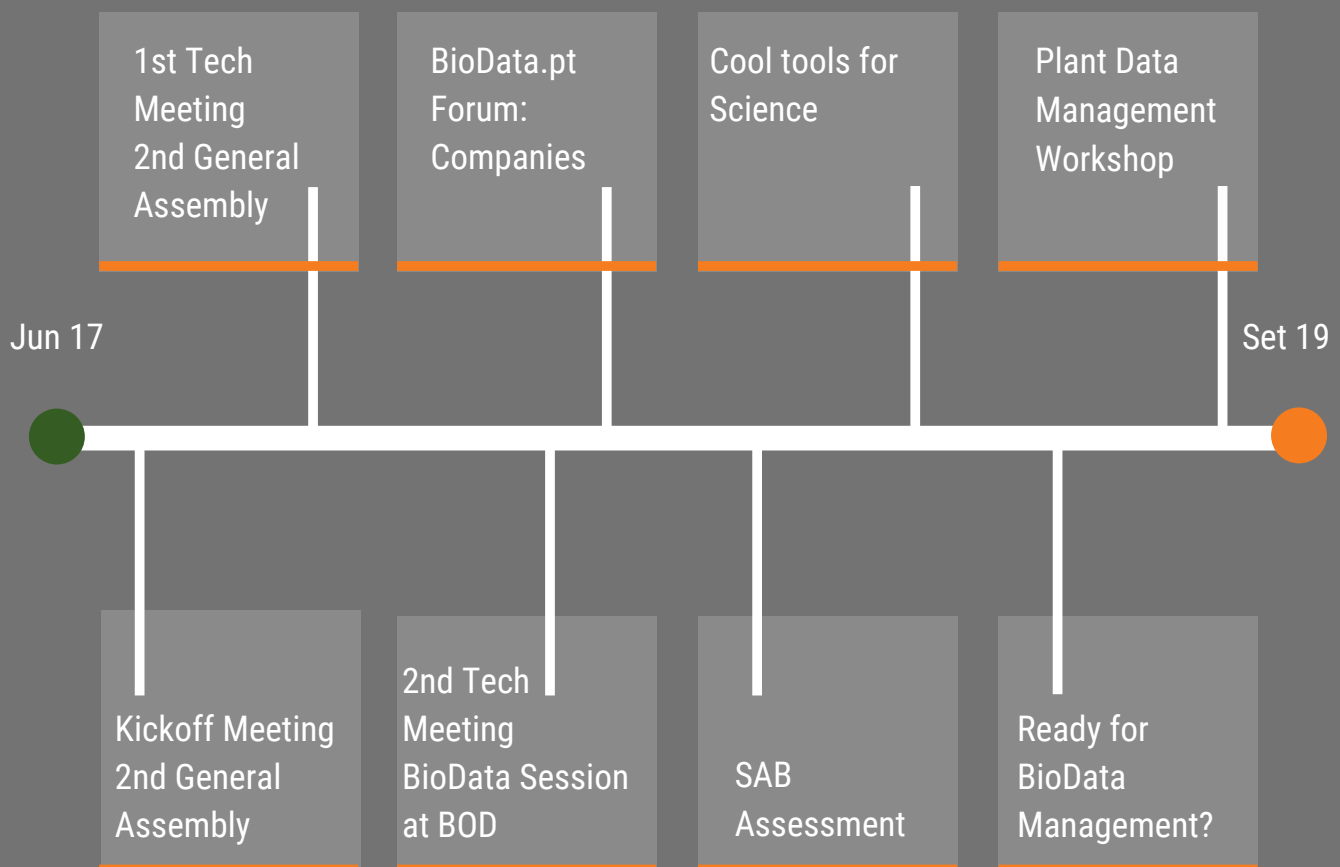
Bringing the ELIXIR plant data infrastructure to the Portuguese pulp and paper industry

Empowering ELIXIR Nodes capabilities to deploy and operate Local EGA instances

Empowering ELIXIR Nodes to measure and communicate their performance and impact

EVENTS

SHARING A VISION WITH YOU



COOL TOOLS 29 / MAY

for science

CHAMPALIMAUD FOUNDATION

Submission showcase
APRIL

CONTACT US:
info@biodata

PROMOTED BY
BioData.pt,
in collaboration
Research Infrastr

The Cool Tools for Science conference put the spotlight on tools and solutions to support research, rather than on research itself.

The event was very successful, attracting even participants from abroad, and showing that there is a clear interest in this topic.

We are looking forward to hosting further editions of the conference.



user innovation

79
Participants

26
Tools

BioData.pt Events • BioData.pt Events • BioData.pt Events

This workshop served to disseminate the work on standards and data management practices developed by the Plant Sciences Community at the ELIXIR-wide level, with strong participation from the PT node. The workshop included a keynote lecture from the notable Dr. Anne-Françoise Adam-Blondon, which nearly filled the ITQB auditorium to capacity, and a hands-on exercise on MIAPPE data submission, which did fill the classroom to capacity.

Lectures

Hands-On

80+
Participants

30
Participants

COMMUNICATION

Communication has been a major concern of BioData.pt to keep internal cohesion and reach and engage with users and stakeholders.

The BioData.pt website is available since 2017 to disseminate our news, events, training activities, services and resources. Complementary to the Portuguese node's website is the ELIXIR's, with information about the overall resources made available by this Research Infrastructure. BioData.pt is also present in LinkedIn, Facebook and Twitter to ensure a broad coverage of our target audience.

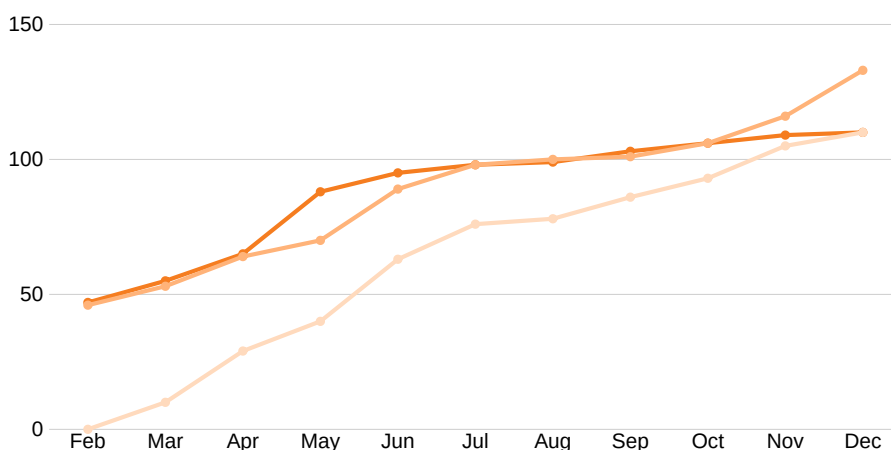
WEBSITE

Report Period



SOCIAL NETWORKS

New followers over one year



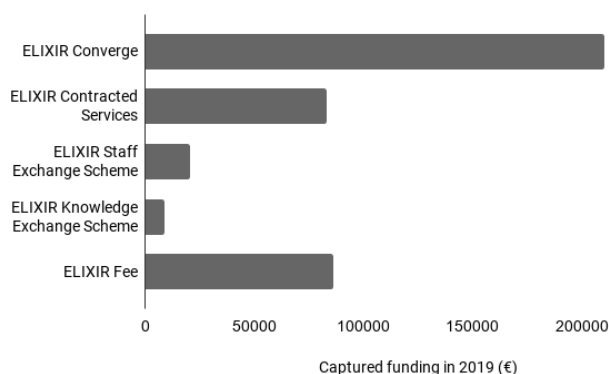
New followers



FINANCIAL STATEMENT

FUNDS CAPTURED IN 2019

ELIXIR PT was able to capture 83.091,25€ to participate in ELIXIR implementation studies, 29.600,00€ for ELIXIR Staff / Knowledge Exchange Schemes, plus 210.159,38€ of competitive funding from H2020 to the ELIXIR Converge project, to execute until 2022. Captured funding surpasses the ELIXIR fee.



CUMULATIVE EXECUTION OF BIODATA.PT 2017-19

Execution is 25% behind schedule and at 65% of global budget - 2.728.291,98€.

Partner	Cummulative Budget	Cumulative Execution	Cumulative Execution
	Y1+Y2 (€)	Y1+Y2 (€)	Y1+Y2 (%)
1. IGC	664,247.81	567,127.30	85.38%
2. PBio	43,842.00	15,228.01	34.73%
3. CEBAL	20,482.00	4,724.40	23.07%
4. CCMAR	90,546.48	90,546.48	100.00%
5. F. Champ.	138,416.32	83,851.20	60.58%
6. IBET	161,020.00	122,399.09	76.01%
7. IBMC	69,120.00	61,985.57	89.68%
8. INESC ID	274,000.00	113,711.89	41.50%
9. ITQB	45,880.00	30,504.87	66.49%
10. IST+IBB	692,525.03	562,670.74	81.25%
11. Univ Minho	143,856.00	109,308.77	75.98%
Total	2,343,935.64	1,762,058.32	75.18%

Based on information provided by project managers, on the 30th of September

10

Contracts

16

Fellowships

2

Projects

BUDGET-BIODATA.PT

OCTOBER 2019 - JUNE 2020(21)

Project extension was required for one year, without additional funding. The main challenge is to keep BioData.pt operational through this drought period, and retain as many human resources as possible.

Partner	Budget (€)
1.IGC	239,937.49
2. PBio	31,866.59
3.CEBAL	24,577.60
4. CCMAR	37,660.60
5. F. Champ.	81,123.28
6. IBET	50,380.91
7. IBMC	26,694.43
8. INESC ID	215,388.11
9. ITQB	33,315.13
10. IST+IBB	171,314.29
11. Univ Minho	53,975.23
Total	966,233.66

In spite of several attempts, it was not possible to get the information from all partners distributed by the different headings: human resources, building adaptations and equipment.

KEY BIODATA.PT GOALS FOR 2020

DEFINE BIODATA.PT ECOSYSTEM

Data management as the cross-cutting issue to communities and platforms

Prioritize domains and projects
Develop and implement procedures
Identify and showcase flagship projects/tools

EXPAND TRAINING

Replicate existing programs
Stimulate collaboration

Promote TtT
Expand R4BDM? and Crash-courses
Produce e-learning materials
Disseminate GTPB contents

CLARIFY PORTFOLIO OF SERVICES

Define services, procedures and metrics

Integrate BioData services in a common platform (Agendo)
Create BioData.pt Forum for Bioinformatics and Compute Resources

IMPROVE SUSTAINABILITY

Secure new funding
Increase number of payed service users

Assess impact of RI activities
Lobby to secure government funding
Apply to new infrastructure and service projects.



PUBLICATIONS



Antunes, M., Palma, M., Sá-Correia, I. (2018) "Transcriptional profiling of *Zygosaccharomyces bailii* early response to acetic acid or copper stress mediated by ZbHaa1", *Scientific Reports*, 8: 14122, doi: 10.1038/s41598-018-32266-9



Chaves, I., Costa, B., Rodrigues, A., Bohn, A., Miguel, C.M. (2017) "miRPursuit - sRNA-workflow analysis using NGS Data to non-model plants". *FEBS Letters*, doi: 10.1002/1873-3468.12746



Costa, B.V., Faria, D., Chaves, I., Miguel, C.M. (2018) "PHENO - the BrAPI endpoint provided by the Portuguese node of ELIXIR". <https://brapi.biodata.pt>



López-Fernández, H., Duque, P., Henriques, S., Vázquez, N., Fdez- Riverola, F., Vieira, C.P., Reboiro-Jato, M., Vieira, J. (2018) "A Bioinformatics Protocol for Quickly Creating Large-Scale Phylogenetic Trees - 12th International Conference on Practical Applications of Computational Biology & Bioinformatics". Toledo, Spain. doi: 10.1007/978-3-319-98702-6_11



López-Fernández, H., Duque, P., Henriques, S., Vázquez, N., Fdez-Riverola, F., Vieira, C.P., Reboiro-Jato, M., Vieira, J. (2018) "Bioinformatics Protocols for Quickly Obtaining Large-Scale Data Sets for Phylogenetic Inferences", doi: 10.1007/s12539-018-0312-5.



Michotey, C., Chaves, I. (2017) "Woody Plant Ontology (WPO) Crop Ontology". http://www.croponontology.org/ontology/CO_357/Woody%20Plant%20Ontology



Monteiro, P.T., Oliveira, J., Pais, P., Antunes, M., Palma, M., Cavalheiro, M., Galocha, M., Godinho, C.P., Martins, L.C., Bourbon, N., Mota, M.N., Ribeiro, R.A., Viana, R., Sá-Correia, I., Teixeira, M.C., (2019) "YEASTRACT+: a portal for cross-species comparative genomics of transcription regulation in yeasts", *Nucleic Acids Research*, in press, doi: 10.1093/nar/gkz859



Monteiro, P.T., Pais, P., Costa, C., Manna, S., Sá-Correia, I., Teixeira, M.C., (2017) "The PathoYeasttract database: an information system for the analysis of gene and genomic transcription regulation in pathogenic yeasts", *Nucleic Acids Research*, 45: D597-D603, 2017 doi: 10.1093/nar/gkw817



Vázquez, N., Vieira, C.P., Amorin, B.S.R., Torres, A., López-Fernández, H., Fdez- Riverola, F., Sousa, J.L.R., Reboiro-Jato, M., Vieira, J. (2018) "Large Scale Analyses and Visualization of Adaptive Amino Acid Changes Projects", *Interdisciplinary Sciences: Computational Life Sciences*, doi: 10.1007/s12539-018-0282-7



Vázquez, N., Vieira, C.P., Amorin, B.S.R., Torres, A., López-Fernández, H., Fdez- Riverola, F., Sousa, J.L.R., Reboiro-Jato, M., Vieira, J. (2017) "Automated Collection and Sharing of Adaptive Amino Acid Changes Data", 11th International Conference on Practical Applications of Computational Biology & Bioinformatics. Porto, Portugal. doi: 10.1007/978-3-319-60816-7_3

- > Vázquez, N., Rocha, S., López-Fernández, H., Torres, A., Camacho, R., Fdez-Riverola, F., Vieira, J., Vieira, C.P., Reboiro-Jato, M. (2018) "EvoPPI: a Web Application to Compare Protein-Protein Interactions (PPIs) From Different Databases and Species - 12th International Conference on Practical Applications of Computational Biology & Bioinformatics". Toledo, Spain. doi: 10.1007/978-3-319-98702-6_18
- > Ouma-Mugabe, J., Chaminuka, P., Melo, Ana M.P. (2018) "Characterising partnership for research and innovation in Sub-Saharan Africa: Lessons from the case of the Africa-EU ProIntensAfrica Initiative", South African Journal of International Affairs-SAJIA, 25: 531-545, doi: 10.1080/10220461.2018.1551152
- > Ramos, A.M., Usié, A., Barbosa, P., Barros, P.M., Capote, T., Chaves, I., Simões, F., Abreu, I., Carrasquinho, I., Faro, C., Guimarães, J., Mendonça, D., Nóbrega, F., Rodrigues, L., Saibo, N., Varela, M.C., Egas, C., Matos, J., Miguel, C.M., Oliveira, M.M., Ricardo, C.P., Gonçalves, S. (2018) "The draft genome sequence of cork oak", Sci Data, 5:180069, doi: 10.1038/sdata.2018.69
- > Selby, P., Abbeloos, R., Backlund, J. E., *et al* (2019) "BrAPI-an application programming interface for plant breeding applications" Bioinformatics, 15;35(20): 4147-4155, doi: 10.1093/bioinformatics/btz190.
- > Teixeira, M.C., Monteiro, P.T., Palma, M., Catarina, C., Godinho, C.P., Pais, P., Cavalheiro, M., Antunes, M., Lemos, A., Pedreira, T., Sá-Correia, I. (2018) "YEASTRACT, an upgraded database for the analysis of transcription regulatory networks in *Saccharomyces cerevisiae*." Nucleic Acids Research, 46: D348-D35. 3 doi: 10.1093/nar/gkx842
- > Teixeira, M.C., Monteiro, P.T., Palma, M., Catarina, C., Godinho, C.P., Pais, P., Cavalheiro, M., Antunes, M., Lemos, A., Pedreira, T., Sá-Correia, I. (2018) "YEASTRACT, an upgraded database for the analysis of transcription regulatory networks in *Saccharomyces cerevisiae*", Nucleic Acids Research, 46: D348-D353 doi: 10.1093/nar/gkx842
- > Vázquez, N., López-Fernández, H., Vieira, C.P., Fdez-Riverola, F., Vieira, J., Reboiro-Jato, M. (2019) "DBM 1.0: A Desktop Application for Efficient Retrieval and Processing of High-Quality Sequence Data and Application to the Identification of the Putative Coffea S-Locus", doi: 10.1007/s12539-019-00320-3.
- > Vázquez, N., Rocha, S., López-Fernández, H., Torres, A., Camacho, R., Fdez-Riverola, F., Vieira, J., Vieira, C., Reboiro-Jato, M. (2019) "EvoPPI 1.0: a Web Platform for Within- and Between-Species Multiple Interactome Comparisons and Application to Nine PolyQ Proteins Determining Neurodegenerative Diseases", doi: 10.1007/s12539-019-00317-y.



BIODATA.PT IS ONLY POSSIBLE DUE TO THE COMMITMENT OF OUR MEMBERS:



WE MADE IT HAPPEN



José Pereira Leal
President



Mário Gaspar da Silva
Vice-President / Head of Node



Ana Portugal Melo
Executive Director / Deputy HoN



Alexandre Francisco
Technical Coordinator



Pedro Fernandes
Training Coordinator



Isabel Rocha
ELIXIR Board Member



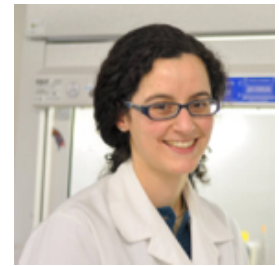
Alexandra Caetano



Ana Teresa Freitas



André Cordeiro



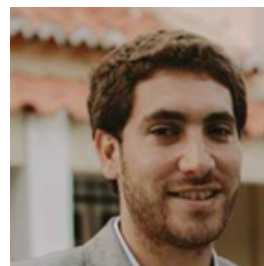
Ângela Guerra



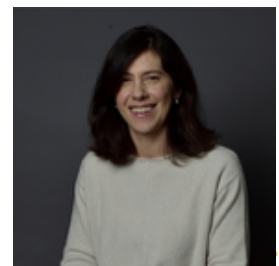
Arlindo Oliveira



Beatriz Lima



Bruno Costa



Célia Miguel



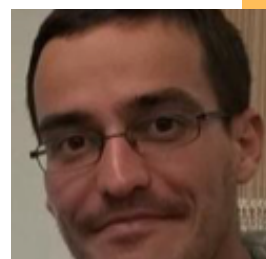
Cristina Vieira



Cymon Cox



Daniel Faria



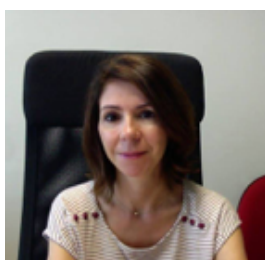
Daniel Neves



Daniel Sobral



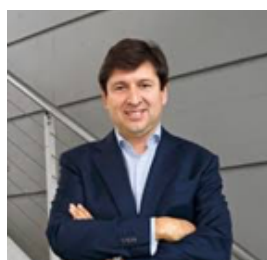
Fátima Duarte



Filipa Almeida



Filipa Sacadura



Filipe Assoreira



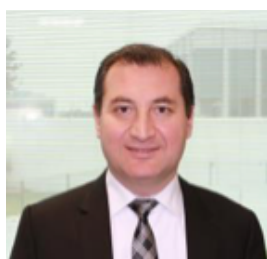
Gianluca de Moro



Henrique Costa



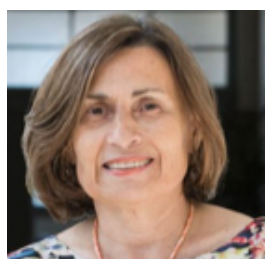
Hugo Lopéz-Fernández



Hussein Demirci



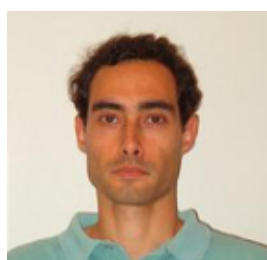
Inês Chaves



Isabel Sá Correia



João Cardoso



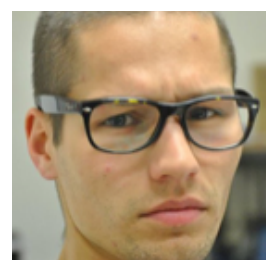
João Garcia



João Sousa



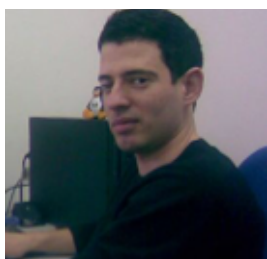
Jorge Vieira



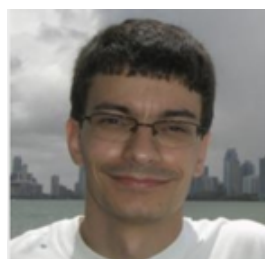
Jorge Oliveira



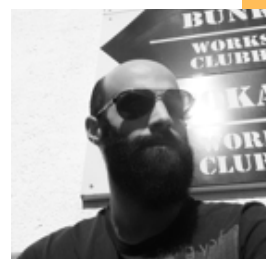
José Borbinha



Luís Guerra e Silva



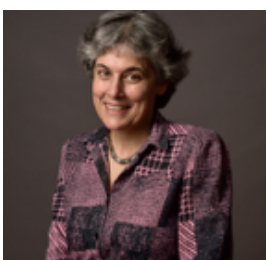
Luís Teixeira



Manuel Torrinha



Marcos Ramos



M. Margarida Oliveira



Marta Silva



Miguel Cardoso



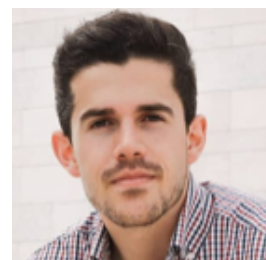
Miguel Rocha



Miguel Teixeira



Nelson Saibo



Nuno Melo



Pedro Barros



Pedro Ferreira



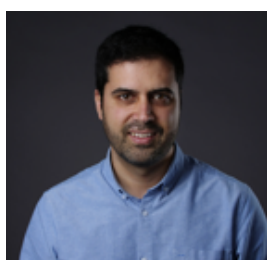
Pedro Garcia da Silva



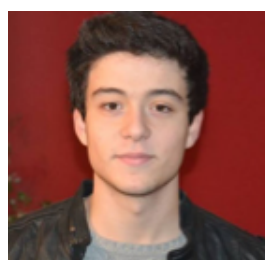
Pedro Monteiro



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