

- **Name** Laura Balbi
- **Occupation** PhD student and fellow researcher at LASIGE
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## **Background & Research Interests**

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I am currently a PhD student at Faculdade de Ciências da Universidade de Lisboa and researcher at LASIGE. In parallel, I have worked until recently in the EU-funded KATY Project, which aims at creating a multi-disciplinary clinical knowledge graph to function as the backbone of a personalized medicine explainable AI system. My main responsibilities have been in developing algorithms for KG alignment and in data modelling and extract-transform load (ETL). I have also contributed to the development of the Matcha-DL system for KG alignment, that has participated in the Ontology Alignment Evaluation Initiative (<https://oaei.ontologymatching.org/>), placing first in its 2023 Bio-ML task. These outreaches represent some of the major contributions of my research work post- master thesis and showcase the experience I have attained in dealing with Knowledge Graphs (in KG construction, alignment, representation and representation learning).

My current research objectives delve into exploring different approaches to combining knowledge with neural architectures. In fact, I am now building upon these approaches for my PhD project, where I will be developing Neuro-Symbolic AI approaches for conflict-aware learning over knowledge graphs.

## **Education**

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**2024** – PhD In Computer Science, Faculty of Sciences, University of Lisbon. Internal Grade: 18/20.  
Supervisor: Prof. Catia Pesquita.

**2023** MSc. In Bioinformatics and Computational Biology, Faculty of Sciences, University of Lisbon, 17/20.  
Dissertation: *Combining Deep Learning and Knowledge Graphs in PPI network prediction*, Dissertation's Presentation Grade: 18/20. Supervisor: Prof. Catia Pesquita.

**2020** BSc. In Biochemistry, Faculty of Sciences, University of Lisbon, 13/20.

## **Scholarships and Grants**

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**12/2024 –?** – PhD scholarship awarded by the Portuguese Foundation for Science and Technology (FCT Ref. 2024.01208.BD). Expected duration of 4 years.

**01/2024 – 11/2024** – Research Fellowship (BI 881.7) as Junior Researcher for the KATY Project, funded by the European Union's Horizon 2020 Programme through grant agreement 101017453.

**01/2023 – 01/2024** – Research Fellowship (BI 881.5) as Junior Researcher for the KATY Project, funded by the European Union's Horizon 2020 Programme through grant agreement 101017453.

## **Research Experience**

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**2023 - 2024 (23 months)** – Research Fellowship (Ref. 881) with integration of the project “KATY – Knowledge At the Tip of Your fingers: Clinical Knowledge for Humanity”, financed by European Union’s H2020 research and innovation programme under Grant Agreement no 101017453. The main goal of the project is the creation of an AI-empowered personalized cancer therapy system that provides human-interpretable knowledge that healthcare professionals can understand, trust and effectively use in their everyday working routine.

**2021 - 2022** – Development of a thesis project that sought the development and evaluation of neural approaches to solve relevant biological tasks by including available semantic information with graph data, as a student researcher of LiSeDa, the leading laboratory of the Health and Biomedical Informatics research line inside the LASIGE research and development unit, evaluated with an excellent grade by the Foundation for the Science and Technology (FCT).

**2019 - 2020** – Integration of a research project involving the use of a gene-disease prediction method based on detection of overlaps between networks (subS2B) to identify diseases associated with human gene products that interacted with SARS-CoV-2 proteins, with the final goal of redirecting known disease therapeutics into the treatment of the virus. The project was overseen by Professor Francisco Pinto from the BioISI lab (Faculty of Sciences of the University of Lisbon).

## **Scientific Outreaches**

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- Balbi, L. (2025). Neuro-Symbolic AI for conflict-aware learning over Knowledge Graphs. In *Proceedings of The Semantic Web: ESWC 2025 Satellite Events*.
- Faria, D., Silva, M., Cotovio, P., Ferraz, L., Balbi, L. & Pesquita, C. (2024). Results in OAEI 2024 for Matcha. In *Proceedings of the 19<sup>th</sup> International Workshop on Ontology Matching, OM 2024, collocated with the 23<sup>rd</sup> International Semantic Web Conference ISWC-2024*
- Faria, D., Eugénio, P., Contreiras Silva, M., Balbi, L., Bedran, G., Kallor, A. A., ... & Pesquita, C. (2024). The Immunopeptidomics Ontology (ImPO). In *Database*, 2024.
- Coquelet, E., Silva, M., Balbi, L,... & Battail, C. (2023). Data Lakehouse to support the development of AI models for predicting patient response to anti-tumor therapies. In *ECCB/ISMB 2023*.
- Faria, D., Silva, M., Cotovio, P., Ferraz, L., Balbi, L., & Pesquita, C. (2023). Results for Matcha and Matcha-DL in OAEI 2023. In *Proceedings of the 18<sup>th</sup> International Workshop on Ontology Matching, OM 2023, collocated with the 22<sup>nd</sup> International Semantic Web Conference ISWC-2023 November 7th, 2023, Athens, Greece*.
- Cotovio, P. G., Ferraz, L., Faria, D., Balbi, L., Silva, M. C., & Pesquita, C. (2023). Matcha-DL a tool for supervised ontology alignment. In *Semantic Web Journal*. preprint

## **Oral Presentations & Scientific Posters**

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- “**Neuro-Symbolic AI for Conflict-Aware learning over Knowledge Graphs**”. Laura Balbi.
  - Presented in the 8<sup>th</sup> International Semantic Web School (ISWS 2025) – 09/06/2025.
  - Presented at the 22<sup>nd</sup> Extended Semantic Web Conference (ESWC 2025) – 03/06/2025.
  - Presented in the “BRIDges: Boosting research in interdisciplinary domains” event at Ciências ULisboa – 14/05/2025.
- “**LET'S AGREE TO DISAGREE: Neuro-Symbolic AI for conflict-aware learning over Knowledge Graphs**”. Laura Balbi, Catia Pesquita.
  - Presented in the 10th Meet-up of the Turing Interest Group on Knowledge Graphs, University of Edinburgh – 29/11/2024.
  - Presented to participants of the 16<sup>th</sup> Workshop on Biomedical Engineering (WBME) – 14/10/2024;
- “**Improving data mining of PPI networks by combining deep learning methods with knowledge graphs**”. Laura Balbi, Catia Pesquita.
  - Presented in Health project showcase in the 2<sup>nd</sup> Thematic Wide Health Summer School, Faculty of Sciences of the University of Lisboa – 13/07/2022.
  - Presented in the 7<sup>th</sup> LASIGE Workshop, Faculty of Sciences of the University of Lisboa – 17/04/2022;
  - Presented in Bioinformatics Open Days (BOD XI), University of Minho, 11<sup>a</sup> edition, 03 – 05/03/2022;

## **Awards & Recognitions**

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- Best Doctoral Symposium Paper Award at the 22<sup>nd</sup> Extended Semantic Web Conference (ESWC 2025)
- Best Poster Award at the “BRIDges: Boosting research in interdisciplinary domains” event at Ciências ULisboa

## **Complementary Training**

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- 8<sup>th</sup> International Semantic Web School (ISWS). Summer school in Bertinoro, Bologna – 08/06 - 14/06/2025.
- 22<sup>nd</sup> Extended Semantic Web Conference (ESWC), Portoroz, Slovenia – 31/05 - 06/06/2025.
- 10th Meet-up of the Turing Interest Group on Knowledge Graphs, University of Edinburgh – 29/11/2024.
- 27<sup>th</sup> European Conference on Artificial Intelligence (ECAI), Universidade de Santiago de Compostela – 19/10/2024 – 24/10/2024;

- 2<sup>nd</sup> Thematic Wide Health Summer School on “*Human Factors in Pervasive Health*”, Faculty of Sciences at the University of Lisbon – 11/07/2022 - 15/07/2022;
- Workshop in “*Machine and Deep Learning Applied to Protein Sequences*”, UMinho – 05/03/2022;
- Participation in the 11<sup>th</sup> edition of the event Bioinformatics Open Days (BOD XI) in UMinho university – 03/03/2022 - 05/03/2022;
- Workshop in management and security measures in the context of a laboratory, FCUL – 13/03/2019;
- Attendance in several seminars promoted by the Chemistry and Biochemistry Department at FCUL:
  - ✓ 1st Masterclass seminar: *Cancer Immunology* - 8/11/2018
  - ✓ 2<sup>nd</sup> Masterclass seminar: *Enzyme Evolution* - 13/12/2018
  - ✓ 3<sup>rd</sup> Masterclass seminar: *Biology of Membrane Transport* - 11/4/2019
- IV National Meeting of Biochemists (ANBIOQ), FCUL – 25/02/2018;

### ***Organization of Scientific Events and Community Outreach***

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- **Head of Communications of the PhD Student Commission** of the LASIGE research unit at the Faculty of Sciences of the University of Lisbon. The Commission oversees the organization of scientific and social events for a community of over 300 members, researchers and students of different study cycles. – **2024 – 2025**
- **16th Workshop on Biomedical Engineering (WBME), ULisboa.** The WBME is organized by Biomedical Engineering and Biophysics Student Union. Organized and presented a welcome and poster session for students from areas of Health, Technology and Biomedical Engineering – **14/10/2024**
- **29th International Symposium on Carbohydrates, Faculty of Sciences of the University of Lisbon.** Event performed under the highest sponsorship of the President of the Portuguese Republic. Integration of the organization committee, providing planning, organization, and logistic support while orienting the speakers, guests of honor and visitors. – **14/07/2018 - 19/07/2018**
- Participation as member of the organizing organs in several extra-curricular activities promoted by FCUL, additionally helping with student orientation and monitoring in the following events:
  - ✓ **Verão ULisboa**, FCUL, **2017/2018**
  - ✓ **Dia Aberto**, FCUL, **2017/2018**