

Clémence Réda | Marie Skłodowska-Curie Postdoctoral Fellow @ Universität Rostock

(updated on 03/10/2024)

Systembiologie und Bioinformatik Rostock, Ulmenstraße 69, 18059 Rostock, Germany

✉ clemence.reda@uni-rostock.de • 📄 <https://clreda.github.io> • 🌐 clreda

Professional Experience

Research Positions

Tenured research fellow | Chargé de recherche de classe normale **France**
Centre national de la recherche scientifique (CNRS), UMR 8197 *From 02/2025*

Marie Skłodowska-Curie Postdoctoral Fellow | **Pr. Olaf Wolkenhauer** **Rostock, Germany**
Universität Rostock (SBI Rostock) *05/2023–02/2025*

Development of the [RECeSS project](#), focusing on the development of new, improved techniques for drug development based on collaborative filtering approaches.

Skills Collaborative Filtering · Python (Programming Language) · Applied Machine Learning

Marie Skłodowska-Curie Postdoctoral Fellow (secondment) | **Dr. Jill-Jênn Vie** **Saclay, France**
Inria Saclay (SODA team) *07/2023–10/2023*

Development of the [RECeSS project](#), focusing on the development of new, improved techniques for drug development based on collaborative filtering approaches.

Skills Collaborative Filtering · Benchmarking · Applied Machine Learning

Postdoctoral position | **Pr. Andrée Delahaye-Duriez** **Paris, France**
Neurodiderot (UMR 1141) *09/2022–03/2023*

Development and implementation of the NORDic pipeline for Boolean networks, Prefiguration of the multiomics workflow for the [RHU FAME](#) project led by [Pr. Élie Azoulay](#).

Skills Systems Biology · Programming · Interdisciplinary Research · Bioinformatics

PhD position | **Pr. Andrée Delahaye-Duriez & Dr. Émilie Kaufmann** **Paris, France**
Neurodiderot (UMR 1141) & SCOOL (UMR 9189) *09/2019–09/2022 (36 months)*

Combination of gene regulatory networks and sequential machine learning for drug repurposing.

Skills Systems Biology · Multi-Armed Bandits · Interdisciplinary Research · Bioinformatics

Master internship | **Pr. Andrée Delahaye-Duriez & Dr. Émilie Kaufmann** **Paris, France**
Neurodiderot (UMR 1141) & SCOOL (UMR 9189) *03/2019–08/2019 (4 months)*

Design of a drug repurposing method through a bandit algorithm combined with the prediction of transcriptomic states by a gene regulatory network. Application to the prediction of new anti-epileptics.

Skills Interdisciplinary Collaboration · Interdisciplinary Research · Statistical Learning · Project Design · Bioinformatics

Predocutorial internship | **Dr. Bartek Wilczyński** **Warsaw, Poland**
Regulomics team (MIM UW) *10/2017–07/2018 (10 months)*

Proof-of-concept on the explicit inclusion of biological interactions in gene regulatory networks and its impact on inference and simulation of transcriptomic regulation. Led to a publication in Journal of Theoretical Biology (DOI : [10.1016/j.jtbi.2019.110091](https://doi.org/10.1016/j.jtbi.2019.110091)).

Skills Network Analysis · Epigenetics · Python (Programming Language) · Systems Biology · Scientific Presentation

Master internship | **Dr. Nicholas Luscombe & Dr. Garth Ilesley** **Onna-son, Japon**
Genomics and Regulatory Systems Unit (OIST) *02/2017–07/2017 (5 months)*

Design and implementation of a single-cell RNA sequencing clustering method taking into account intergene expression dependencies using a probabilistic model ; implementation in R Shiny of a web application for the visualisation and preliminary analysis of single-cell RNA sequencing data. Application to transcriptomic data analysis in *Ciona intestinalis*.

Skills Benchmarking · R Shiny · Unsupervised Learning · Data Visualization · Python (Programming Language)

Bachelor internship | **Dr. Macha Nikolski & Dr. Mathieu Raffinot** **Bordeaux, France**
Centre de Bioinformatique de Bordeaux (Université de Bordeaux) *05/2016–07/2016 (2 months)*

Design and implementation of compared analyses of taxonomic trees built from metagenomic data. Application to the analysis of data from intestinal guts of children afflicted with cystic fibrosis at Hôpital Pellegrin in Bordeaux.

Skills Metagenomics · Phylogenetics · Supervised Learning · Unsupervised Learning · Python (Programming Language)

Teaching & Mentoring Experiences

Biostatistics, programming and bioinformatics

Université Paris Cité

Doctorant Contractuel avec Mission d'Enseignement (DCME) (Teaching Assistant) 09/2020–09/2021 (64 hours)

References: Dr. Anne Badel & Pr. Olivier Taboureau

Co-supervision of a PhD

SBI Rostock

Joint supervision of Orell Trautmann with Pr. Olaf Wolkenhauer (50%)

08/2024–present

Design of a knowledge graph-based algorithm predicting drug combinations.

Co-supervision of a Masters-equivalent internship and a PhD

SBI Rostock

Joint supervision of Rahul Bordoloi with Pr. Olaf Wolkenhauer (33%)

09/2023–present

Development of a linear discriminant algorithm on multivariate temporal data: [paper](#).

Co-supervision of a Master's degree internship

Inserm Neurodiderot

Joint supervision of Adrien Dufour with Pr. Andrée Delahaye-Duriez (25%)

02/2020–07/2020 (6 months)

Identification of functional families of microglia cells from targeted single-cell RNA sequencing data of inflammatory microglia at a developmental stage: [paper](#).

Co-supervision of a Masters's degree project

ENS Paris-Saclay

Joint supervision of Ariane Alix with Dr. Émilie Kaufmann (50%)

11/2019–01/2020 (2 months)

Proposal of a project on the adaptation of a published drug-target prediction method to drug repurposing using collaborative filtering in the course *Graphs in Machine Learning* taught by Dr. Michał Valko in Master Vision Apprentissage (MVA 2020).

Education

Université Paris Cité, Inserm UMR 1141 & CNRS UMR 9189

PhD in Genetics

09/2019 – 09/2022

Doctorate Degree in Science. Title: **Combination of gene regulatory networks and sequential machine learning for drug repurposing**, supervised by Pr. Andrée Delahaye-Duriez (Inserm UMR 1141) & Dr. Émilie Kaufmann (CNRS UMR 9189).

Viva: 09/09/2022.

École Normale Supérieure[†] (ENS) Paris-Saclay

(ex-École Normale Supérieure de Cachan)

M2 Master Vision, Apprentissage (MVA)

09/2018 – 09/2019

Master's degree in Machine Learning. (*summa cum laude*, Grade: 16.17/20, no ranking)

ENS Paris-Saclay

M1 Master Parisien en Recherche en Informatique (MPRI)

09/2016 – 09/2017

Master's degree in Computer Sciences. (*summa cum laude*, Grade: 16.72/20, rank: 3/25)

École Normale Supérieure de Cachan

L3 Licence informatique fondamentale ENS Cachan

09/2015 – 09/2016

Bachelor's degree in Computer Sciences. (*cum laude*, Grade: 14.64/20, rank: 10/26)

[†] École Normale Supérieures are selective French schools for research and teaching.

Funding and Awards as Principal Recipient

Accessit from the Societe Savante Francophone d'Apprentissage Machine

SSFAM

PhD award ([award list](#))

2024

Marie Skłodowska-Curie Postdoctoral Fellowship 2022

Horizon 2020

Postdoctoral grant

2023–2025 (2 years)

RECeSS project, Project ID: 101102016.

Research

Preprints

Joint Embedding-Classifer Learning for Interpretable Collaborative Filtering

C. Réda, J.-J. Vie, O. Wolkenhauer

, Under review, HAL: [04625183](#)

Comprehensive evaluation of collaborative filtering in drug repurposing

C. Réda, J.-J. Vie, O. Wolkenhauer

, Under review, HAL: [04626970](#)

Multivariate Functional Linear Discriminant Analysis for the Classification of Short Time Series with Missing Data

R. Bordoloi, C. Réda, O. Trautmann, S. Bej, O. Wolkenhauer

, Under review, DOI: [10.48550/arXiv.2402.13103](https://doi.org/10.48550/arXiv.2402.13103)

An Anytime Algorithm for Good Arm Identification

M. Jourdan & C. Réda

, Under review, DOI: [10.48550/arXiv.2310.10359](https://doi.org/10.48550/arXiv.2310.10359)

Peer-Reviewed Scientific Journals

2024

Neonatal inflammation impairs developmentally-associated microglia and promotes a highly reactive microglial subset

A. Dufour*, A. Heydari-Olya*, S. Foulon*, C. Réda, et al.

, *Brain, Behavior, and Immunity*, DOI: [10.1016/j.bbi.2024.09.019](https://doi.org/10.1016/j.bbi.2024.09.019)

stanscofi and benchcofi: a new standard for drug repurposing by collaborative filtering

C. Réda, J.-J. Vie, O. Wolkenhauer

, *Journal of Open Source Software*, 9(93):5973, DOI: [10.21105/joss.05973](https://doi.org/10.21105/joss.05973)

2023

NORDic: a Network-Oriented package for the Repurposing of Drugs

C. Réda & A. Delahaye-Duriez

, *Journal of Open Source Software*, 8(90):5532, DOI: [10.21105/joss.05532](https://doi.org/10.21105/joss.05532)

2021

Machine learning applications in drug development

C. Réda, É. Kaufmann & A. Delahaye-Duriez

, *Computational and Structural Biotechnology Journal*, 18:241-252, DOI: [10.1016/j.csbj.2019.12.006](https://doi.org/10.1016/j.csbj.2019.12.006)

2020

Automated inference of gene regulatory networks using explicit regulatory modules

C. Réda & B. Wilczyński

, *Journal of Theoretical Biology*, 486:110091, DOI: [10.1016/j.jtbi.2019.110091](https://doi.org/10.1016/j.jtbi.2019.110091)

2019

Identification de cibles thérapeutiques et repositionnement de médicaments par analyses de réseaux géniques

A. Delahaye-Duriez, C. Réda & P. Gressens

, *Médecine/Sciences*, 35:515-518, DOI: [10.1051/medsci/2019108](https://doi.org/10.1051/medsci/2019108)

Peer-Reviewed Conference Proceedings

2022

Near-optimal Collaborative Learning in Bandits

C. Réda, S. Vakili, É. Kaufmann

, *Proceedings of the 36th Conference on Advances in Neural Information Processing Systems (NeurIPS 2022)*

HAL: [03825099](https://hal.archives-ouvertes.fr/hal-03825099) [Selected as Oral]

Prioritization of Candidate Genes Through Boolean Networks

C. Réda, A. Delahaye-Duriez

, *Proceedings of the 20th International Conference on Computational Methods in Systems Biology (CMSB 2022)*

Springer:89-121 [Best Student Paper Award]

2021

Dealing With Misspecification In Fixed-Confidence Linear Top-m Identification

C. Réda, A. Tirinzoni & R. Degenne

, *Proceedings of the 35th Conference on Neural Information Processing Systems (NeurIPS 2021)*, 34, HAL: [03409205](https://hal.archives-ouvertes.fr/hal-03409205)

Top-m identification for linear bandits

C. Réda, É. Kaufmann & A. Delahaye-Duriez

, *Proceedings of the 24th International Conference on Artificial Intelligence and Statistics (AISTATS 2021)*, 130

HAL: [03172145](https://hal.archives-ouvertes.fr/hal-03172145)

Oral Communications at International Conferences

C. Réda. Benchmarking collaborative filtering approaches to drug repurposing

e:Med Meeting 2023 on Systems Medicine (Berlin, Germany)

10/10/2023

C. Réda. Near-optimal Collaborative Learning in Bandits

35th International Conference on Advances in Neural Information Processing Systems (New Orleans, USA)

07/12/2022

C. Réda. Prioritization of Candidate Genes Through Boolean Networks

20th *International Conference on Computational Methods in Systems Biology (Bucharest, Romania)* 14/09/2022

C. Réda. Gene network oriented drug discovery: automated inference of Boolean networks (...)

13th *Conference on Dynamical Systems Applied to Biology and Natural Sciences (held virtually)* 10/02/2022

C. Réda. Dealing With Misspecification In Fixed-Confidence Linear Top-m Identification

NeurIPS@Paris 2021 (Paris, France) 08/12/2021

C. Réda. Automated inference of gene regulatory networks using explicit regulatory modules

Journées Ouvertes de Biologie, Informatique et Mathématique (JOBIM) 2020 (held virtually) 02/07/2020

Poster Presentations at International Conferences

C. Réda. JELI: an interpretable embedding-learning recommender system for drug repurposing

ECCB 2024 (Turku, Finland) 09/2024

C. Réda. JELI: an interpretable embedding-learning recommender system for drug repurposing

JOBIM 2024 (Toulouse, France) 06/2024

C. Réda. Towards a large-scale benchmark of collaborative filtering in drug repurposing

SMPGD 2024 (Paris, France) 02/2024

C. Réda. Drug repurposing in breast cancer by combining bandit algorithms and Boolean networks (...)

ISMB/ECCB 2023 (Lyon France) 07/2023

C. Réda. Prioritization of Candidate Genes Through Influence Maximization

Journées Ouvertes de Biologie, Informatique et Mathématique (JOBIM 2022, Rennes, France) 07/2022

C. Réda. Dealing With Misspecification In Fixed-Confidence Linear Top-m Identification

35th *International Conference on Advances in Neural Information Processing Systems (NeurIPS 2022, held virtually)* 12/2021

C. Réda. Top-m identification for linear bandits

24th *International Conference on Artificial Intelligence and Statistics (AISTATS 2021, held virtually)* 04/2021

Open-Source Softwares & Datasets

Softwares

2024

Joint Embedding-classifier Learning for improved Interpretability (JELI)

C. Réda

, Zenodo, DOI: [10.5281/zenodo.12193722](https://doi.org/10.5281/zenodo.12193722), GitHub: [recess-eu-project/JELI](https://github.com/recess-eu-project/JELI)

Python package implementing an explicitly interpretable collaborative filtering

2023

BENCHmark for drug Screening with COLlaborative FIltering (benchscofi)

C. Réda

, Zenodo, DOI: [10.5281/zenodo.8241505](https://doi.org/10.5281/zenodo.8241505), GitHub: [recess-eu-project/benchscofi](https://github.com/recess-eu-project/benchscofi)

Python package implementing algorithms and methods from the state-of-the-art in drug repurposing with collaborative filtering

STANdard for drug Screening by COLlaborative FIltering (stanscofi)

C. Réda

, Zenodo, DOI: [10.5281/zenodo.8038847](https://doi.org/10.5281/zenodo.8038847), GitHub: [recess-eu-project/stanscofi](https://github.com/recess-eu-project/stanscofi)

Python package for the automation of the training and validation of drug repurposing with machine learning

Network Oriented Repurposing of Drugs (NORDic)

C. Réda

, Zenodo, DOI: [10.5281/zenodo.7239047](https://doi.org/10.5281/zenodo.7239047), GitHub: [clreda/NORDic](https://github.com/clreda/NORDic)

Python package for the inference, analysis of Boolean networks & application to drug repurposing

Datasets

2023

PREDICT

C. Réda

, Zenodo, DOI: [10.5281/zenodo.7982964](https://doi.org/10.5281/zenodo.7982964)

Large drug repurposing dataset [with open-source generation](#)

TRANSCRIPT

C. Réda

, Zenodo, DOI: [10.5281/zenodo.7982969](https://doi.org/10.5281/zenodo.7982969)

Drug repurposing dataset on transcriptomic data [with open-source generation](#)

Commitment to Popularization of Sciences and Law Making

Popularization of Sciences.....

11/21/2024: Popularization paper (in French) on drug repurposing aimed at medical practitioners: [C. Réda](#), B. Villoutreix and A. Delahaye-Duriez. **Repositionnement de médicaments** *In* La Revue du Praticien, 21 novembre 2024, 74(9);942-6 ([link](#))

05/2023–hiatus: Created and published on [RECESS project blog](#): progress reports on the [RECESS project](#) and introductory blog posts on drug repurposing and collaborative filtering.

12/2016–09/2018: Published on [Tryalgo](#) [in French] : series of blog posts on known algorithms with concrete applications, aimed at high school and college students (approx. 2,400 unique monthly users ; two of these posts constitute the Top-2 most visited pages).

10/2016: Published on [Binaire](#) (blog on Computer Science affiliated with French newspaper *Le Monde*) and [The Conversation](#) [in French] : “A.P.B. : La vie après le bac” (conjointly written with [Serge Abiteboul](#)). Explanation of the algorithm of Gale-Shapley which has been in use in a previous version of the French national web application for high school students' applications to college

Popularization of Law-Making.....

12/2016–09/2018: Published on [Réfléchir.fr](#) [in French] : series of blog posts on laws passed since 2017 in France: explanation of their content and their consequences (534 followers on February, 24 2021).