

# SARA FONSECA COSTA

## Postdoctoral Researcher

I am a data scientist/bioinformatician at the University of Lausanne.

My research interests include genomics, transcriptomics, stats and ageing. My current work on Bgee (<https://bgee.org/>) involves the development of a new pipeline to analyze different single cell RNA-Seq protocols (full length and target based protocols) in order to integrate this data type with others already present in the database.

I use mainly R for data analysis and visualization.

## EDUCATION

- 2013  
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2017
- **University of Fribourg**  
PhD Biochemistry 📍 Fribourg, Switzerland
- Thesis: Model based inference of photoperiod and age related changes in circadian oscillators.
- Advisor & Co-advisors: Prof. Dr. Urs Albrecht, Dr. Jürgen Ripperger and Prof. Dr. Daniel Wegmann
- Jan 2012  
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Out 2012
- **University of Geneva**  
Master thesis 📍 Geneva, Switzerland
- Thesis: Study of an automatization model to analyse genetic diversity in human populations.
- Advisors: Dr. José Nunes (UNIGE) and Prof. Dr. Miguel Rocha (UM)
- 2010  
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2012
- **University of Minho**  
M.S. in Bioinformatics 📍 Braga, Portugal
- 2006  
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2010
- **Polytechnic Institute of Bragança**  
B.S. in Biotechnology Engineering 📍 Bragança, Portugal

## RESEARCH EXPERIENCE

- Jul 2018  
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current
- **Postdoctoral Researcher**  
University of Lausanne 📍 Lausanne, Switzerland
- Data analysis and integration of single cell RNA-Seq data in Bgee database
  - Maintenance and update of the Bgee pipeline (RNA-Seq, Affymetrix).
  - Contribution/development of R Packages.



## CONTACT INFO

✉ [sara.fonsecacosta@unil.ch](mailto:sara.fonsecacosta@unil.ch)

🐙 [github.com/SFonsecaCosta](https://github.com/SFonsecaCosta)

ORCID - <https://orcid.org/0000-0001-7794-7997>

📞 +4121 692 4221

For more information, please contact me via email.

## SKILLS

Experienced in Bioinformatics, data analysis and statistics.

Full experience with next generation sequencing data analysis (RNA-Seq, Chip-Seq, single cell RNA-Seq).

Experienced in molecular biology, biochemistry, genetics and functional genomics.

Highly skilled in R, Bash, LaTeX

Highly skilled of Unix/Linux and HPC

Knowledge of Python, Perl, C++

Sep 2017  
|  
Dec 2017

### Postdoctoral Researcher

Walter and Elisa Hall Institute / SIB

📍 Lausanne, Switzerland

Advisor & Co-advisor: Prof. Dr. Terry Speed (WEHI) and Prof. Dr. Mauro Delorenzi (SIB)

- Improvement of data analysis of circadian and aging data using new statistical approaches.



## PROFESSIONAL EXPERIENCE

2009  
|  
2011

### Student researcher

University of Porto - Department of Molecular Pathology and Immunology, Hospital Santo Antonio

📍 Porto, Portugal

Molecular Biology and Bioinformatics (HLA OSAS)

Advisor: Prof. Dr. Berta Martins



## TEACHING EXPERIENCE

2019  
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2021

### Molecular evolution (Bachelor)

Teaching assistant

📍 Lausanne, Switzerland

2018  
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2020

### Molecular genetics methods (Master)

Teaching assistant

📍 Lausanne, Switzerland

2018  
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2019

### Data analysis (Bachelor)

Teaching assistant

📍 Lausanne, Switzerland

2013  
|  
2017

### TP's Biochemistry

Teaching assistant

📍 Fribourg, Switzerland

2014  
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2015

### Bioinformatics practical Classes

Teaching assistant

📍 Fribourg, Switzerland

2013  
|  
2015

### Genotyping by Southern Blot Hybridization

Teaching assistant

📍 Fribourg, Switzerland



## ORGANISER

2021

### Gene expression made useful easily: tools and database of Bgee

Organizing team

📍 UNIL, Lausanne, Switzerland

Practical available: [https://hub.docker.com/r/bgeedb/bgee\\_r](https://hub.docker.com/r/bgeedb/bgee_r)

2020

### Gene expression made useful easily: tools and database of Bgee

Organizing team

📍 UNIL, Lausanne, Switzerland

Practical available: <https://github.com/SFonsecaCosta/Bgee>

2012

### Bioinformatics Open Days 2012

Organizing Committee

📍 UM, Braga, Portugal

Info available: <http://hdl.handle.net/1822/33574>



## PEER REVIEW PUBLICATIONS

- 2020 ● **The Bgee suite: integrated curated expression atlas and comparative transcriptomics in animals**  
Nucleic Acids Research, <https://doi.org/10.1093/nar/gkaa793>  
Frederic B Bastian, Julien Roux, Anne Niknejad, Aurélie Comte, Sara S Fonseca Costa, Tarcisio Mendes de Farias, Sébastien Moretti, Gilles Parmentier, Valentine Rech de Laval, Marta Rosikiewicz, Julien Wollbrett, Amina Echchiki, Angélique Escoriza, Walid H Gharib, Mar Gonzales-Porta, Yohan Jarosz, Balazs Laurenczy, Philippe Moret, Emilie Person, Patrick Roelli, Komal Sanjeev, Mathieu Seppey, Marc Robinson-Rechavi
- 2020 ● **Single-cell transcriptomics allows novel insights into aging and circadian processes**  
Briefings in Functional Genomics, <https://doi.org/10.1093/bfpg/elaa014>  
Sara S Fonseca Costa, Marc Robinson-Rechavi and Jürgen A Ripperger
- 2017 ● **Normalisation against Circadian and Age-Related Disturbances Enables Robust Detection of Gene Expression Changes in Liver of Aged Mice**  
PloS one 12 (1), <https://doi.org/10.1371/journal.pone.0169615>  
Sara S Fonseca Costa, Daniel Wegmann, Jürgen A Ripperger
- 2017 ● **Internal normalization of nascent RNA sequencing experiments to identify age-related changes of the mouse liver transcriptome**  
Genomics and Computational Biology 3 (2), <https://doi.org/10.18547/gcb.2017.vol3.iss2.e34>  
Sara S Fonseca Costa and Jürgen A. Ripperger
- 2016 ● **REV-ERB $\alpha$  influences the stability and nuclear localization of the glucocorticoid receptor**  
Journal of cell science 129 (21), <https://doi.org/10.1242/jcs.190959>  
Takashi Okabe, Rohit Chavan, Sara S Fonseca Costa, Andrea Brenna, Jürgen A Ripperger, Urs Albrecht
- 2016 ● **Liver-derived ketone bodies are necessary for food anticipation**  
Nature communications 7 (1), 1-10, <https://doi.org/10.1038/ncomms10580>  
Rohit Chavan, Céline Feillet, Sara S Fonseca Costa, James E Delorme, Takashi Okabe, Jürgen A Ripperger, Urs Albrecht
- 2015 ● **Impact of the circadian clock on the aging process**  
Frontiers in neurology 6, 43, <https://doi.org/10.3389/fneur.2015.00043>  
Sara S Fonseca Costa and Jürgen A. Ripperger



## BOOK CHAPTERS

2020

- **Chromatin Immunoprecipitation (ChIP) from Mouse Liver Nuclei**  
Springer US - [https://doi.org/10.1007/978-1-0716-0381-9\\_9](https://doi.org/10.1007/978-1-0716-0381-9_9)  
Sara S. Fonseca Costa and Jürgen A. Ripperger



## OPEN SOURCE CONTRIBUTIONS

2019

- **BgeeCall R Package**  
Julien Wollbrett [aut, cre], Sara Fonseca Costa [aut], Julien Roux [aut],  
Marc Robinson Rechavi [ctb], Frederic Bastian [aut]

<https://bioconductor.org/packages/release/bioc/html/BgeeCall.html>



## CONFERENCE PRESENTATIONS

2019

- **Expression calls from RNA-seq using BgeeCall R package**  
Talk + poster presentation, Bioconductor conference - eurobioc2019  
📍 UCLouvain, Brussels, Belgium  
Sara Fonseca Costa

2016

- **Internal normalization of nascent RNA sequencing experiments to identify age-related changes of the mouse liver transcriptome**  
Talk presentation, 2nd Challenges in Computational Biology: Gene Expression Data Analysis  
📍 Mainz, Germany  
Sara S Fonseca Costa



## LANGUAGE

- **Portuguese**  
Native
- **English**  
Fluente
- **French**  
Medium
- **Spanish**  
Basic