

**France ROSE, Ph.D.**  
Biomedical Data Scientist  
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## Research and professional experience

- Oct 2021 - now    Bozek Lab. Data Science of Images. *Center of Molecular Medicine Cologne (CMMC), University of Cologne, Germany.*  
Post-doctoral research : **Deep learning analysis of rodent behavior through 3D motion-tracking data and of spatial interaction of immune and cancer cells with mass spectrometry imaging**
- 2019 - 2021    *MyndBlue.* Start-up incubator *X-Novation - Ecole Polytechnique, Palaiseau, France.*  
Biomedical data scientist : **Development of machine learning platform for Major Depression and PTSD prediction and prognosis.**
- 2016 - 2019    Computational BioImaging & Bioinformatic. Group of Auguste Genovesio. *Institut de Biologie de l'ENS (IBENS), Paris, France.*  
Doctoral research : **Analysis of cell phenotypical and spatial heterogeneity from microscopy images in the context of High-Content Screening.**
- Aug - Nov 2018    Spatial Metabolomics. Group of Theodore Alexandrov. *European Molecular Biology (EMBL), Heidelberg, Germany.*  
Short-term collaboration : Statistical spatial analysis of combined microscopy images and spatial metabolomics data, published in the form of a *Python* package,  
**PySpacell : A Python package for spatial analysis of cell images**
- Feb - Jun 2016    *KeenEye Technologies.* Start-up incubator *Institut de la Vision, Paris, France.*  
Supervision : Sylvain Berlemont and Leandro Almeda.  
R&D project : **Development of an image analysis pipeline to detect co-localization on mouse brain slices.**
- Jul - Dec 2015    Center for Discovery and Innovation in Parasitic Diseases. Group of Jim McKerrow. Supervision : Jair Lage de Siqueira Neto.  
*University of California San Diego, Skaags School of Pharmacy and Pharmaceutical Sciences, USA.*  
**Development of a robust method to access host cell and parasites counting, and their morphological properties as a part of a high throughput screening facility.**
- Feb - Jun 2014    Computational Biology & Bioinformatic Platform. Group of Auguste Genovesio.  
*Institut de Biologie de l'ENS (IBENS), Paris, France.*  
Master 2 research : **Development of a system to perform a fully automated analysis of image sequences of cell division generated by live microscopy (detection of the mitosis from 2 to 3 cells).**
- Jun - Jul 2013    Molecular Adaptation and Genome evolution. Group of Dmitri Petrov.  
*Stanford University, USA.*  
**Using positive selection measurement to detect co-adaptation during Mammalian evolution.**

- Feb - Jun 2013    Single Molecule Nanometry. Group of Taekjip Ha.  
*University of Illinois at Urbana-Champaign, USA.*  
 Master 1 research : **Study of the looping of small double-stranded DNA molecules (around 80bp) with a smFRET technic.**
- Jun - Jul 2012    Biophotonic of Molecular Interactions (Biology and Applied Pharmacology).  
 Group of Eric Deprez.  
*École Normale Supérieure (ENS) Cachan, France.*  
 Bachelor research : **Testing properties of a new designed inhibitor of Nitric Oxid Synthase with fluorescence microscopy.**

## Education

- 2016 - 2019    **PhD in Bioinformatics and System Biology**  
 Institute of Biology of ENS (IBENS)  
 Université Pierre et Marie Curie (Paris 6)  
 Doctorate school *Life Complexity* (Complexité du Vivant)
- 2012 - 2014    **Master in Bioinformatics**  
 Courses taken include : Image treatment and pattern recognition.  
 ENS Ulm - Université Pierre et Marie Curie (Paris 6)
- 2011 - 2012    **Licence in Biology (French bachelor's degree)**  
 ENS Ulm - Université Pierre et Marie Curie (Paris 6)
- 2009 - 2011    **Classe préparatoire aux grandes écoles (CPGE)**<sup>1</sup>  
 "BCPST" option : specialized in Biology, including courses of Physics, Chemistry and Mathematics.  
 Lycée Henri 4 (highschool), Paris.
- 2009    **Baccalauréat général spécialité Mathématiques  
 obtained with highest honors.**  
 equivalent to a *high school graduation diploma* (major : Mathematics).  
 Lycée Louis-le-Grand (highschool), Paris

## Teaching experience

- 2020 - now    **Volunteer tutoring for high-school girls in Programming.**  
 Association *Coding Sisters*, [codingsisters.fr](http://codingsisters.fr).
- 2019    **Teaching Assistant in Programming, 1st year of Bachelor**  
 Professor : Virginie Gabrel-Willemin  
 Paris Science Lettres (PSL) University, Paris.
- 2016 - 2018    **Teaching Assistant in Cell and Molecular Biology, 2nd year of Bachelor**  
 Professor : Zsolt Lenkei  
 Paris Science Lettres (PSL) University, Paris.
- 2016 - 2018    **Teaching Assistant in Developmental Biology, 2nd year of Bachelor**  
 Professor : Xavier Morin  
 Paris Science Lettres (PSL) University, Paris.

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1. A two-year intensive course preparing for highly competitive national entrance examinations to French "Grandes Écoles", including engineering schools and the ENS.

- 2017                    **Tutoring high-school students in the lab as an initiation to research**  
Two students coming twice a month to work on image and high-throughput screening data.  
*Apprentis Chercheurs* program organised by *L'arbre des connaissances* association.
- 2014 - 2015            **Oral examiner in Mathematics and Informatics, 1st year of CPGE BCPST (equivalent 1st year Bachelor)**  
Teacher : Martine Ginestet at Lycée Fénelon (highschool), Paris.  
Teacher : Mlle Launay at Lycée Saint Louis (highschool), Paris.
- 2011 - 2012            **Volunteer tutoring for highschool students in Biology.**  
Association *TalENS*, Paris.

## Publications

- Li, Y. \*, **Rose, F.** \*, di Pietro, F., Morin, X., & Genovesio, A. (2016). Detection and tracking of overlapping cell nuclei for large scale mitosis analyses. *BMC Bioinformatics*, 17(1). <http://doi.org/10.1186/s12859-016-1030-9>
- Rose, F.** \*, Basu, S. \*, Rexhepaj, E., Chauchereau, A., Del Nery, E. & Genovesio, A. (2017) Compound Functional Prediction Using Multiple Unrelated Morphological Profiling Assays. *SLAS TECHNOLOGY: Translating Life Sciences Innovation*. <https://doi.org/10.1177/10972472630317740831>
- Rose, F.**, Rappez, L., Triana, S. H., Stadler, M., Heikewalder, M., Alexandrov, T., & Auguste Genovesio. (2020) PySpacell : A Python package for spatial analysis of cell images. *Cytometry Part A* <https://doi.org/10.1002/cyto.a.23955>
- Fompeyrine, D.A., Vorm, E.S., Ricka, N., **Rose, F.** & Pellegrin, G.. (2021). Enhancing human-machine teaming for medical prognosis through neural ordinary differential equations (NODEs). *Hum.-Intell. Syst. Integr.*, p. 1-15 <https://doi.org/10.1007/s42454-021-00037-z>

## Oral presentations

- ”Spatial heterogeneity of cell responses in drug treatment.”**  
- *Young Researchers in Life Science Conference*. Paris, France. June 4th-6th 2019.  
- *Quantitative BioImaging conference*, Göttingen, Germany. January 4th-6th 2018.

## Posters

- ”Quantifying the heterogeneity of cell responses to cancer drugs.”**  
— *StatLearn meeting*, French Society of Statistics (SFDS). Lyon, France. April 6th-7th 2017.  
— *France BioImaging meeting*. Paris, France. April 14th 2017.  
— *Young Researchers in Life Science Conference*. Paris, France. May 15th-17th 2017.

- ”Studying spatial heterogeneity of cell responses to cancer drugs”**  
*2018 SLAS Advanced 3D Human Models and High-Content Analysis Conference*. Leiden, Netherlands. October 17th-19th 2018.

## Fellowships and programs

- 2018                    4-month DAAD (Deutsche Akademischer Austauschdienst) fellowship for PhD students for a collaboration with a laboratory in Germany.
- 2022                    1-year IFS-Mentoring : Mentoring Program for International Female Scholars.
- 2022                    5-weeks Quantitative Biology Summer Course at KITP, ”Neurophysics of Locomotion” (UC Santa Barbara).

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\*. First co-authors

## Languages

Native French speaker

Fluent English (TOEFL 107/120)

German B2 level

## Computer skills

Highly proficient *Python* and python deep learning libraries *Keras*, *Tensorflow* and *PyTorch*.

Good programming in *bash*, *Matlab*, *C++* and *R*

Extensive experience with cluster job scheduler (*condor*, *slurm*), *git* versioning and *Linux* operating system.

Good command of office softwares (*Word*, *Excel*, *PowerPoint*, *Latex*, *Inkscape*, *Scribus*).

## Personal activities

- Creator and president of *Coding Sisters*, tutoring program for high-school girls in programming.
- President of the doctorate students association Doc'&Co (2017-2018).
- Initiated and organizing the *Machine Learning Journal Club* at IBENS (2017-2018).
- Semi-professional in operatic singing and music theory. Ongoing personal chamber music projects. Classes taken at the ENS in 2014-2015 and at the *Conservatoire Nadia et Lili Boulanger, Paris 9* where I got my Final certification of operatic singing in 2019.
- Bronze medal-winner at IBO (International Biology Olympiads) in 2010 in Changwon, South Korea.