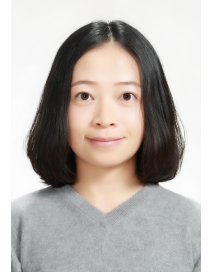


# WENCAN ZHU

Ph.D. in Applied Mathematics

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## RESEARCH EXPERIENCE

University of Paris-Saclay & Sanofi R&D

PhD Research

2019 – Present Paris, France

- Dissertation: development of novel machine learning methods for biomarker selection in high-dimensional settings with strong correlations.
  - WLasso and Generalized Elastic Net: select prognostic biomarkers by whitening the design matrix (linear regression model).
  - PPLasso: simultaneously select prognostic and predictive biomarkers (ANCOVA-type model).
  - WLogit: extension of WLasso to binary classification.
- Project
  - Applied the methods above to projects of Sanofi (RNAseq and Olink data as examples)
- Supervision
  - supervised a graduate internship on the comparison of R package LIMMA and classical ANCOVA model.

Sanofi R&D

Biostatistician

2018 – 2019 Chilly-Mazarin, France

- Statistical modeling with Omics data (RNAseq, GWAS):
  - Preprocessing
  - Identification of associated biomarkers
  - Machine learning regression/classification

ENSAI & Sanofi R&D

Graduate internship

2018 Chilly-Mazarin, France

- Comparison of penalized regression and screening approaches for the identification of prognostic biomarkers
  - Compared and studied performance of different methods (Lasso, SCAD, Elastic-Net, Adaptive Ridge, Adaptive Lasso, univariate analysis) regarding the efficiency of selection and prediction.
- Investigated on pres-screening by SIS

INSEE (National Institute of Statistics and Economic Studies)

Summer internship

2017 Lyon, France

- Worked in the methodology department to define strategies for statistical analyse and model development in spatial analysis.
- Analyzed data from census and surveys for prediction, by using mixed model with spatial correlations.
- Tried different generalized models: Poisson, Zero-inflated model.

## EDUCATION

Ph.D. in Mathematics

University of Paris-Saclay

2022 Paris, France

M.Sc. in Biostatistics

ENSAI (National School for Statistics and Data Analyse)

2018 Rennes, France

M.Sc. in Bioinformatics

Faculty of Medicine, Rennes 1 University

2018 Rennes, France

M.Sc. in Mathematics

Department of Mathematics, Tongji University

2018 Shanghai, China

B.Sc. (major) in Mathematics

Department of Mathematics, Tongji University

2015 Shanghai, China

B.A. (minor) in Japanese

Department of Literature, Tongji University

2015 Shanghai, China

## IT SKILLS

R Python JAVA C++ R Shiny  
LaTeX SAS LINUX

## LANGUAGES

Mandarin  
English  
French  
Japanese  
German



## PUBLICATIONS

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### Journal Articles

- **Zhu, W.**, Lévy-Leduc, C., & Ternès, N. (2021). A variable selection approach for highly correlated predictors in high-dimensional genomic data. *Bioinformatics*, 37(16), 2238–2244.
- **Zhu, W.**, Adjakossa, E., Lévy-Leduc, C., & Ternès, N. (2021). Sign consistency of the generalized elastic net estimator. Undergoing peer review. (arXiv: 2106.05454 [math.ST])
- **Zhu, W.**, Lévy-Leduc, C., & Ternès, N. (2022). Identification of prognostic and predictive biomarkers in high-dimensional data with PPLasso. Undergoing peer review. (arXiv: 2202.01970 [stat.ME])
- **Zhu, W.**, Lévy-Leduc, C., & Ternès, N. (2022). Variable selection in high-dimensional logistic regression models using a whitening approach. Submitted. (arXiv: 2206.14850 [stat.ME])
- Liu, F., **Zhu, W.**, Shoaib, H., Chissey, A., Degrelle, S. A., & Fournier, T. (2020). Mining of combined human placental gene expression data across pregnancy, applied to PPAR signaling pathway. *Placenta*, 99, 157–165.
- Liu, F., Rouault, C., Guesnon, M., **Zhu, W.**, Clément, K., Degrelle, S. A., & Fournier, T. (2020). Comparative Study of PPAR Targets in Human Extravillous and Villous Cytotrophoblasts. *PPAR research*, 9210748.
- Liu, F., Simasotchi, C., Vibert, F., **Zhu, W.**, Gil, S., Degrelle, S. A., & Fournier, T. (2021). Age and Sex-Related Changes in Human First-Trimester Placenta Transcriptome and Insights into Adaptive Responses to Increased Oxygen. *International journal of molecular sciences*, 22(6), 2901.
- Liu, F., Rouault, C., Clément, K., **Zhu, W.**, Degrelle, S. A., Charles, M. A., Heude, B., & Fournier, T. (2021). C1431T Variant of PPAR Is Associated with Preeclampsia in Pregnant Women. *Life (Basel, Switzerland)*, 11(10), 1052.

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### Book

- **Zhu, W.**, Ardilly, P., Bouche, P (2018). Handbook of spatial analysis (Chapter 12. Small areas and spatial correlation). INSEE-Eurostat.

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### Package R

- **Zhu, W.** (2022). *WLogit: Whitening logistic regression with regularization*.
- **Zhu, W.**, Lévy-Leduc, C., & Ternès, N. (2022b). *PPLasso: Prognostic and predictive biomarker identification*.
- **Zhu, W.**, Lévy-Leduc, C., & Ternès, N. (2020). *WLasso: Whitening lasso for variable selection*.

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### Conference Communications (oral presentation)

- ISCB (International Society for Clinical Biostatistics) **Zhu, W.**, Lévy-Leduc, C., & Ternès, N. (2022). Identification of prognostic and predictive biomarkers in high-dimensional data with pplasso.
- JDS (Journées de Statistique) **Zhu, W.**, Lévy-Leduc, C., & Ternès, N. (2022). Identification of prognostic and predictive biomarkers in high-dimensional data with pplasso.
- SMPGD (Statistical Methods for Post Genomic Data) **Zhu, W.**, Lévy-Leduc, C., & Ternès, N. (2022). WLasso: Variable selection for highly correlated predictors (application to genomic data).
- ISCB (International Society for Clinical Biostatistics) **Zhu, W.**, Lévy-Leduc, C., & Ternès, N. (2020). A variable selection approach for highly correlated predictors in high-dimensional genomic data.

## REFEREES

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### Céline Lévy-Leduc (Professor)

@ AgroParisTech, INRAE, University of Paris-Saclay  
✉ ] celine.levy-leduc@agroparistech.fr

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### Nils Ternès (Statistical Biomarker Leader)

@ Sanofi R&D  
✉ ] nils.ternes@sanofi.com

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### Pascal Ardilly (Director)

@ Department of methodology, INSEE  
✉ ] pascal.ardilly@insee.fr

## FELLOWSHIP

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- Eiffel scholarship program of excellence, French Ministry for Europe and Foreign Affairs, 2016-2018