

Date of birth: 15th February 1982

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[NIH BioSketch](#)

Github organization: github.com/IARCbioinfo

Website: www.rarecancersgenomics.com

Computational Cancers Genomics Team

Genomic Epidemiology Branch

International Agency for Research on Cancer (IARC-WHO)

25 avenue Tony Garnier, 69007 Lyon, France

Email: follm@iarc.who.int

Research Group: www.iarc.who.int/teams-ccg/

Professional Appointments

- 2021–on **Team Leader**, International Agency for Research on Cancer (IARC-WHO), Lyon, France
- 2014–2020 **Scientist**, International Agency for Research on Cancer (IARC-WHO), Lyon, France
- 2012–2014 **Staff Research Scientist**, Swiss Federal Institute of Technology, Lausanne, Switzerland
- 2007–2012 **Postdoctoral Researcher**, Institute of Ecology and Evolution, University of Berne, Switzerland

Honors and awards

- 2024–on **Member of the WHO classification of tumours 6th edition subcommittee on computational pathology**, International Agency for Research on Cancer (IARC-WHO), tumourclassification.iarc.who.int/
- 2023 **Young investigator award**, International Mesothelioma Interest Group (iMig), imig.org
- 2022–2024 **Chair of the of the Rare Cancers Working Group**, European Prospective Investigation into Cancer and Nutrition (EPIC), epic.iarc.who.int
- 2021–on **lung NET task force member**, European NEuroendocrine Tumors Society (ENETS), www.enets.org
- 2016–on **Scientific Committee member**, French MESOBANK (virtual mesothelioma national biobank), www.netmeso.fr/netmeso/mesopath-et-mesobank

Education

- 2004–2007 **PhD in Population Genetics and Evolution**, University of Grenoble, France. theses.hal.science/tel-00216192/
- 2001–2004 **MSc Computer science and Applied Mathematics, specialization in Bioinformatics**, Grenoble Institute of Technology ENSIMAG, Grenoble, France.

Personal Statement

After studying applied mathematics and computer science, I completed a Ph.D. in population genetics and bioinformatics in 2007. During this time I gained a strong expertise in statistical genetics and bioinformatics methods, and I wrote several software now widely used in the field. After my Ph.D., I moved to the University of Berne as a postdoctoral researcher where I started to work more specifically on large human genomic data. I developed in particular several Bayesian models to identify genetic variants associated with phenotypes observed in different human populations or ethnic groups, being the consequence of local adaptation. In 2012, I was recruited as a Staff Research Scientist in the Swiss Federal Institute of Technology of Lausanne where I worked on new statistical and bioinformatics methods for the analysis Next Generation Sequencing data. In 2014 I been recruited as a staff scientist to develop computation cancer genomics projects and to coordinate the bioinformatics efforts in the International Agency for Research on Cancer (IARC-WHO). I am particularly involved in the molecular characterisation of thoracic tumors like lung neuroendocrine neoplasms and malignant mesothelioma. In 2016, Dr. Lynnette Fernandez-Cuesta and I launched the Rare Cancers Genomics initiative, and and since 2021 we have been co-leading the IARC Computational Cancers Genomics team.

Publications

81 publications in international peer-reviewed scientific journals, including 9 publications as first/co-first author, and 15 publications as last/co-last/corresponding author.

14'125 total citations, h-index: 43 (source: [Google Scholar](#)).

Full list available at [Google Scholar](#) and [My NCBI Bibliography](#).

Current Research Support

- 2024–2027 **Understanding the spatiotemporal eco-evolutionary interactions in malignant pleural mesothelioma.**
Worldwide Cancer Research, 252,246 GBP. Alcala N (PI), Fernandez-Cuesta L, [Foll M](#) (co-Investigator), Jaehee Kim.
Award: www.worldwidecancerresearch.org
- 2023–2024 **Reconciling lung carcinoids histopathological and molecular classifications.**
Investigator Award, Neuroendocrine Tumor Research Foundation, 270,000 USD. [Foll M](#) (PI).
Award: netrf.org/research/reconciling-lung-carcinoids-histopathological-and-molecular-classifications/
- 2022–2024 **Intra-Tumour Heterogeneity of Pleural Mesothelioma at the Single-Cell Level.**
Concept Award, Congressionally Directed Medical Research Programs, 100,000 USD. [Foll M](#) (PI), Fernandez-Cuesta L (co-PI).
Award: app.dimensions.ai/details/grant/grant.13055977

Selected Open Science Projects

I have been advocating for open science since the beginning of my career, with a focus on open-source software and open data sharing.









- 2023 **HaloAE software** | GitHub: [IARCbioinfo/HaloAE](#)
A local transformer Auto-Encoder for anomaly detection and localization.
Role: Project co-founder, developer supervision.
- 2020 **Needlestack bioinformatics pipeline** | GitHub: [IARCbioinfo/needlestack](#)
An ultra-sensitive variant caller for multi-sample next generation sequencing data.
Role: Project founder, lead developer and supervision.
- 2019 **Medical Genomics Open Educational Resource** | GitHub: [IARCbioinfo/medica_genomics_course](#)
Medical Genomics course held annually at IARC and part of the INSA Lyon engineering school Master curriculum (French National Institute of Applied Sciences of Lyon). Includes all lecture slides and practicals for self-paced learning.
Role: Project co-founder, lecturer and supervision.
- 2014 **Cancer Genomics bioinformatics pipelines** | rarecancersgenomics.com/tools & github.com/IARCbioinfo
Best-practices pipelines for WGS, RNA-seq, and methylation data analysis and integration, mostly based on Nextflow.
Role: Project founder, developers supervision.
- 2014 **Rare Cancers Genomics data** | rarecancersgenomics.com/datasets
WGS, RNA-seq, and methylation data for rare cancers.
Role: Project co-founder.
- 2008 **BayeScan software** | GitHub: [mfoll/BayeScan](#) & GitHub: [mfoll/BayeScanHierachical](#)
Software to identify candidate loci under natural selection from genetic data. Publication cited >2,000 times, one of the most widely used method in the field.
Role: Project founder, developer.

Selected Oral Presentations

- 2024 **Understanding cancer biology through multi- omics genotype-phenotype tumour maps.**
Keynote speaker, BioSyl Computational Biology of Cancer 2024, Grenoble (France).
- 2024 **The Rare Cancers EPIC database: a gateway to rare cancer epidemiological research.**
Proffered Paper, ESMO Sarcoma and Rare Cancers Congress 2024, Lugano (Switzerland).
DOI: [10.1016/j.esmoop.2024.102440](https://doi.org/10.1016/j.esmoop.2024.102440)
- 2023 **Understanding cancer biology through multi-omics genotype-phenotype tumour maps: applications in rare cancers.**
Invited Speaker, EMBL conference Cancer Genomics, Heidelberg (Germany).

- 2023 **Malignant pleural mesothelioma: from inter- to intra-tumor heterogeneity.**
Young Investigator Award, 16th International Conference of the International Mesothelioma interest group (iMig), Lille (France).
- 2023 **Multi-omics characterization of rare heterogeneous tumors.**
Invited Presentation, 31st Annual Intelligent Systems For Molecular Biology (ISMB) / 22nd Annual European Conference on Computational Biology (ECCB), Lyon (France).
Video: youtu.be/BoeBCKxckLw
- 2023 **Biocomputational approaches for the study of rare endocrine cancers.**
Invited Speaker, European Congress of Endocrinology (ECE), Istanbul (Turkey).
- 2023 **The lungNENomics Project: a Comprehensive Multidisciplinary Characterisation of Pulmonary Carcinoids.**
Abstract presentation, Annual European Neuroendocrine Tumor Society (ENETS) annual conference, Vienna (Austria).
- 2023 **Molecular features of lung neuroendocrine tumors.**
Invited Speaker, European Association of Nuclear Medicine (EANM) annual congress, Barcelona (Spain).
- 2022 **Multi-omics characterization of heterogeneous tumors.**
Invited Speaker, European Meeting on Molecular Diagnostics (EMMD), Noordwijk (Netherlands).

Selected Publications

- 2024[#] **Assessment of the current and emerging criteria for the histopathological classification of lung neuroendocrine tumours in the lungNENomics project.** 
ESMO Open. DOI: <https://doi.org/10.1016/j.esmooop.2024.103591>; PMID: 38878324
Mathian E, Drouet Y, Sexton-Oates A, Papotti MG, Pelosi G, ..., Foll M.
GitHub: <https://github.com/IARCBioinfo/LNENBarlowTwins>.
- 2024[#] **Multi-omic dataset of patient-derived tumor organoids of neuroendocrine neoplasms.** 
Gigascience. DOI: [10.1093/gigascience/giae008](https://doi.org/10.1093/gigascience/giae008); PMID: 38451475
Alcala N, Voegelé C, Mangiante L, Sexton-Oates A, Clevers H, Fernandez-Cuesta L, Dayton TL, Foll M.
GitHub: [IARCBioinfo/MS_panNEN_organoids](https://github.com/IARCBioinfo/MS_panNEN_organoids).
- 2023 **Druggable growth dependencies and tumor evolution analysis in patient-derived organoids of neuroendocrine neoplasms from multiple body sites.** 
Cancer Cell. DOI: [10.1016/j.ccell.2023.11.007](https://doi.org/10.1016/j.ccell.2023.11.007); PMID: 38086335
Dayton TL, Alcala N, Moonen L, den Hartigh L, Geurts V, ..., Foll M, Fernández-Cuesta L, Clevers H.
- 2023 **Spotlight on Small-Cell Lung Cancer and Other Lung Neuroendocrine Neoplasms.** 
American Society of Clinical Oncology Educational Book. DOI: [10.1200/EDBK_390794](https://doi.org/10.1200/EDBK_390794); PMID: 37229617
Fernandez-Cuesta L, Sexton-Oates A, Bayat L, Foll M, Lau SCM, Leal T.
- 2023[#] **Multimic analysis of malignant pleural mesothelioma identifies molecular axes and specialized tumor profiles driving intertumor heterogeneity.**  24 citations 
Nature Genetics. DOI: [10.1038/s41588-023-01321-1](https://doi.org/10.1038/s41588-023-01321-1); PMID: 36928603
Mangiante L, Alcala N, Sexton-Oates A, Di Genova A, Gonzalez-Perez A, ..., Foll M[#], Fernandez-Cuesta L[#].
- 2023 **HaloAE: A Local Transformer Auto-Encoder for Anomaly Detection and Localization Based on HaloNet.** 
Proceedings of the 18th International Joint Conference on Computer Vision, Imaging and Computer Graphics Theory and Applications (VISIGRAPP 2023). DOI: [10.5220/0011865900003417](https://doi.org/10.5220/0011865900003417)
Mathian E, Liu H, Fernandez-Cuesta L, Samaras D, Foll M, Chen L.
GitHub: [IARCBioinfo/HaloAE](https://github.com/IARCBioinfo/HaloAE).
- 2022[#] **A molecular phenotypic map of malignant pleural mesothelioma.** 
Gigascience. DOI: [10.1093/gigascience/giac128](https://doi.org/10.1093/gigascience/giac128); PMID: 36705549
Di Genova A, Mangiante L, Sexton-Oates A, Voegelé C, Fernandez-Cuesta L, Alcala N, Foll M.
GitHub: [IARCBioinfo/MESOMICS_data](https://github.com/IARCBioinfo/MESOMICS_data).
- 2021[#] **Challenges in lung and thoracic pathology: molecular advances in the classification of pleural mesotheliomas.**
Virchows Archiv. DOI: [10.1007/s00428-020-02980-9](https://doi.org/10.1007/s00428-020-02980-9); PMID: 33411030
Fernandez-Cuesta L, Mangiante L, Alcala N, Foll M.

- 2020# **A molecular map of lung neuroendocrine neoplasms.** 
Gigascience. DOI: [10.1093/gigascience/giaa112](https://doi.org/10.1093/gigascience/giaa112); PMID: [33124659](https://pubmed.ncbi.nlm.nih.gov/33124659/)
 Gabriel AAG, Mathian E, Mangiante L, Voegelé C, Cahais V, ..., [Foll M](#).
 GitHub: [IARCbioinfo/DRMetrics](#).
- 2020# **Needlestack: an ultra-sensitive variant caller for multi-sample next generation sequencing data.** 
NAR Genomics and Bioinformatics. DOI: [10.1093/gigascience/giac128](https://doi.org/10.1093/gigascience/giac128); PMID: [36705549](https://pubmed.ncbi.nlm.nih.gov/36705549/)
 Delhomme TM, Avogbe PH, Gabriel AAG, Alcalá N, Leblay N, ..., [Foll M](#).
 GitHub: [IARCbioinfo/needlestack](#).
- 2020 **EURACAN/IASLC Proposals for Updating the Histologic Classification of Pleural Mesothelioma: Towards a More Multidisciplinary Approach.** 🏆 147 citations 
Journal of Thoracic Oncology. DOI: [10.1016/j.jtho.2019.08.2506](https://doi.org/10.1016/j.jtho.2019.08.2506); PMID: [31546041](https://pubmed.ncbi.nlm.nih.gov/31546041/)
 Nicholson AG, Sauter JL, Nowak AK, Kindler HL, Gill RR, ..., [Foll M](#), ..., Galateau-Salle F.
- 2019# **Molecular studies of lung neuroendocrine neoplasms uncover new concepts and entities.** 
Translational Lung Cancer Research. DOI: [10.21037/tlcr.2019.11.08](https://doi.org/10.21037/tlcr.2019.11.08); PMID: [32038931](https://pubmed.ncbi.nlm.nih.gov/32038931/)
 Fernandez-Cuesta L, [Foll M](#).
- 2019# **Redefining malignant pleural mesothelioma types as a continuum uncovers immune-vascular interactions.** 
EBioMedicine. DOI: [10.1016/j.ebiom.2019.09.003](https://doi.org/10.1016/j.ebiom.2019.09.003); PMID: [31648983](https://pubmed.ncbi.nlm.nih.gov/31648983/)
 Alcalá N, Mangiante L, Le-Stang N, Gustafson CE, Boyault S, ..., [Foll M](#)[#], Galateau-Salle F[#], Fernandez-Cuesta L[#].
- 2019# **Integrative and comparative genomic analyses identify clinically relevant pulmonary carcinoid groups and unveil the supra-carcinoids.** 🏆 141 citations 
Nature communications. DOI: [10.1038/s41467-019-11276-9](https://doi.org/10.1038/s41467-019-11276-9); PMID: [31431620](https://pubmed.ncbi.nlm.nih.gov/31431620/)
 Alcalá N, Leblay N, Gabriel AAG, Mangiante L, Hervas D, ..., [Foll M](#)[#], Fernandez-Cuesta L[#].
- 2019 **Linking a mutation to survival in wild mice.** 🏆 172 citations 
Science. DOI: [10.1126/science.aav3824](https://doi.org/10.1126/science.aav3824); PMID: [30705186](https://pubmed.ncbi.nlm.nih.gov/30705186/)
 Barrett RDH, Laurent S, Mallarino R, Pfeifer SP, Xu CCY, [Foll M](#), ..., Hoekstra HE.
- 2018 **Prediction of acute myeloid leukaemia risk in healthy individuals.** 🏆 778 citations 
Nature. DOI: [10.1038/s41586-018-0317-6](https://doi.org/10.1038/s41586-018-0317-6); PMID: [29988082](https://pubmed.ncbi.nlm.nih.gov/29988082/)
 Abelson S, Collord G, Ng SWK, Weissbrod O, Mendelson Cohen N, ..., [Foll M](#), ..., Shlush LI.
- 2017 **BAP1 Is Altered by Copy Number Loss, Mutation, and/or Loss of Protein Expression in More Than 70% of Malignant Peritoneal Mesotheliomas.** 
Journal of Thoracic Oncology. DOI: [10.1016/j.jtho.2016.12.019](https://doi.org/10.1016/j.jtho.2016.12.019); PMID: [28034829](https://pubmed.ncbi.nlm.nih.gov/28034829/)
 Leblay N, Leprêtre F, Le Stang N, Gautier-Stein A, Villeneuve L, ..., [Foll M](#), Fernandez-Cuesta L, Brevet M.
- 2016 **The past, present and future of genomic scans for selection.**
Molecular Ecology. DOI: [10.1111/mec.13493](https://doi.org/10.1111/mec.13493); PMID: [26745554](https://pubmed.ncbi.nlm.nih.gov/26745554/)
 Jensen JD, [Foll M](#), Bernatchez L.
- 2015* **WFABC: a Wright-Fisher ABC-based approach for inferring effective population sizes and selection coefficients from time-sampled data.**
Molecular Ecology Resources. DOI: [10.1111/1755-0998.12280](https://doi.org/10.1111/1755-0998.12280); PMID: [24834845](https://pubmed.ncbi.nlm.nih.gov/24834845/)
[Foll M](#), Shim H, Jensen JD.
 GitHub: [mfoll/WFABC](#).
- 2014* **Widespread signals of convergent adaptation to high altitude in Asia and America.** 
The American Journal of Human Genetics. DOI: [10.1016/j.ajhg.2014.09.002](https://doi.org/10.1016/j.ajhg.2014.09.002); PMID: [25262650](https://pubmed.ncbi.nlm.nih.gov/25262650/)
[Foll M](#), Gaggiotti OE, Daub JT, Vatsiou A, Excoffier L.
 GitHub: [mfoll/BayScanHierarchical](#).
- 2014* **Adaptive, convergent origins of the pygmy phenotype in African rainforest hunter-gatherers.** 
Proceedings of the National Academy of Sciences. DOI: [10.1073/pnas.1402875111](https://doi.org/10.1073/pnas.1402875111); PMID: [25136101](https://pubmed.ncbi.nlm.nih.gov/25136101/)
 Perry GH, [Foll M](#), Grenier JC, Patin E, Nédélec Y, ..., Barreiro LB.
- 2014* **Influenza virus drug resistance: a time-sampled population genetics perspective.** 
PLOS Genetics. DOI: [10.1371/journal.pgen.1004185](https://doi.org/10.1371/journal.pgen.1004185); PMID: [24586206](https://pubmed.ncbi.nlm.nih.gov/24586206/)
[Foll M](#), Poh YP, Renzette N, Ferrer-Admetlla A, Bank C, ..., Jensen JD.
- 2013# **Robust demographic inference from genomic and SNP data.** 🏆 1350 citations 
PLOS Genetics. DOI: [10.1371/journal.pgen.1003905](https://doi.org/10.1371/journal.pgen.1003905); PMID: [24204310](https://pubmed.ncbi.nlm.nih.gov/24204310/)
 Excoffier L, Dupanloup I, Huerta-Sánchez E, Sousa VC, [Foll M](#).

- 2013 **Approximate Bayesian computation.** 🏆 695 citations 🌱
PLOS Computational Biology. DOI: [10.1371/journal.pcbi.1002803](https://doi.org/10.1371/journal.pcbi.1002803); PMID: [23341757](https://pubmed.ncbi.nlm.nih.gov/23341757/)
 Sunnåker M, Busetto AG, Numminen E, Corander J, Foll M, Dessimoz C.
- 2012 **Genomic data reveal a complex making of humans.** 🌱
PLOS Genetics. DOI: [10.1371/journal.pgen.1002837](https://doi.org/10.1371/journal.pgen.1002837); PMID: [22829785](https://pubmed.ncbi.nlm.nih.gov/22829785/)
 Alves I, Srámková Hanulová A, Foll M, Excoffier L.
- 2011# **fastsimcoal: a continuous-time coalescent simulator of genomic diversity under arbitrarily complex evolutionary scenarios.** 🏆 419 citations 🌱
Bioinformatics. DOI: [10.1093/bioinformatics/btr124](https://doi.org/10.1093/bioinformatics/btr124); PMID: [21398675](https://pubmed.ncbi.nlm.nih.gov/21398675/)
 Excoffier L, Foll M.
 Code: cmpg.unibe.ch/software/fastsimcoal2.
- 2010# **Quantifying population structure using the F-model.**
Molecular Ecology Resources. DOI: [10.1111/j.1755-0998.2010.02873.x](https://doi.org/10.1111/j.1755-0998.2010.02873.x); PMID: [21565093](https://pubmed.ncbi.nlm.nih.gov/21565093/)
 Gaggiotti OE, Foll M.
- 2009 **Genetic consequences of range expansions.** 🏆 1330 citations
Annual Review of Ecology, Evolution, and Systematics. DOI: [10.1146/annurev.ecolsys.39.110707.173414](https://doi.org/10.1146/annurev.ecolsys.39.110707.173414); Full text
 L Excoffier, Foll M, RJ Petit
- 2009# **Detecting loci under selection in a hierarchically structured population.** 🏆 921 citations 🌱
Heredity (Edinb). DOI: [10.1038/hdy.2009.74](https://doi.org/10.1038/hdy.2009.74); PMID: [19623208](https://pubmed.ncbi.nlm.nih.gov/19623208/)
 Excoffier L, Hofer T, Foll M.
 Code: cmpg.unibe.ch/software/arlequin35/.
- 2008* **A genome-scan method to identify selected loci appropriate for both dominant and codominant markers: a Bayesian perspective.** 🏆 2867 citations 🌱
Genetics. DOI: [10.1534/genetics.108.092221](https://doi.org/10.1534/genetics.108.092221); PMID: [18780740](https://pubmed.ncbi.nlm.nih.gov/18780740/)
 Foll M, Gaggiotti O.
 GitHub: [mfoll/BayeScan](https://github.com/mfoll/BayeScan).
- 2006* **Identifying the environmental factors that determine the genetic structure of populations.** 🏆 418 citations 🌱
Genetics. DOI: [10.1534/genetics.106.059451](https://doi.org/10.1534/genetics.106.059451); PMID: [16951078](https://pubmed.ncbi.nlm.nih.gov/16951078/)
 Foll M, Gaggiotti O.
 Code: leca.osug.fr/-Genomique-des-populations-.

*: first/co-first author.

#: last/co-last/corresponding author.

🏆 : >20 citations/year.

🏆 : >50 citations/year (on average since publication, source: [Google Scholar](https://scholar.google.com)).

🌱 : Open Access publication.