Isabelle Stévant, Ph.D.

French
39 years-old (28/02/1985)
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Education

2018 **Doctorat ès science in bioinformatics, University of Geneva, Switzerland**.

2011 **M.Sc. in bioinformatics, Université de Rennes 1, France** Biological system modeling, NGS, Proteomics, Statistics and Probabilities, Evolution.

2009 **B.Sc. in biology, Université de Rennes 1, France** Biology of the cell, Molecular Genetics, Animal Physiology, Development, Metabolism, Enzymology.

Trainings

2020 Team management

2017 10X Genomics Chromium single-cell system

Certifications

2022 Maître de conférence qualification - Section 65 - Cell biology

2013 Laboratory animal science FELASA accreditation (module 1, Switzerland)

Employment History

June 2022-... **Post-doctoral fellow.** *Reconstruction of the gene regulatory network driving mouse gonadal sex determination through multi-omics data integration.*
Dr. Nitzan Gonen Lab, Bar Ilan University, Ramat Gan, Israel

2019-2021 **Post-doctoral fellow.** (3 years) *High-resolution spatiotemporal enhancer-reporter assay during Drosophila melanogaster embryonic development.*
Dr. Yad Ghavi-Helm Team, CNRS UMR 5242, IGFL-ENS Lyon, France

2013–2018 **Ph.D. student.** (5 years) *Monitoring gonadal somatic cell differentiation during sex determination using single-cell RNA sequencing.*
Prof. Serge Nef Lab, Department of Genetics Medicine and Development, University of Geneva, Switzerland

2011–2013 **Front-end developer.** (18 months) *European project EHR4CR (Electronic Health Record for Clinical Research).* Conception and implementation of a web-service centralised platform to recruite and monitor patients for European scale clinical trials.
Medical informatics team, UMR 936, Université de Rennes 1, France

2011 **Master 2 Studentship.** (8 months) *Deciphering the molecular mechanisms of splicing regulation by hnRNP C on humans via protein-RNA interaction assays (iCLIP).*
Luscombe Group - EMBL-EBI, Hinxton, UK

2010 **Master 1 Studentship.** (4 months) *Discovering transposable element sequences from the MITE family in the human genome using a logical model approach.*
Symbiose Team - IRISA, Rennes, France

2008 & 2009 **Teaching.** (48 hours) *Training for the French Computational and Internet Certificate (C2I) to first year bachelor students in biology.*
Université de Rennes I, France

2009 **Voluntary Studentship.** (2 months) *Comparative study of copy number variations among 19 dog breeds by aCGH (Array-Comparative Genome Hybridization).*
Dog genetics Team - Université de Rennes I, France

2008 **Voluntary Studentship.** (2 months) *Conception and development of a graphical user interface of the inCERT training platform for GNU-Linux operating systems (International Certificates of Excellence in Selected Areas of Information and Communication Technologies).*
IMT Atlantique École Mines-Télécom - Rennes, France

Fundings/Awards

2020 **Postdoc en France FRM fellowship**, 2 years, Fondation pour la Recherche Médicale (France).

2018 **ISA and EAA travel grant**, International Society of Andrology and European Academy of Andrology, for the European Testis Workshop 2018 conference, Obidos, Portugal.

2017 **SFBI travel grant**, Société Française de Bioinformatique, for the JOBIM conference, Lille, France.

2016 **INYRMF travel grant**, International Network for Young Researcher in Male Fertility, for the annual meeting, Rennes, France.

2014 **iGE3 PhD Salary Award**, Institute of Genetics and Genomics of Geneva, Switzerland.

2011 **International internship travel grant**, Région Bretagne, France.

Skills

Languages
- French: Native language,
- English: Reading, writing and speaking competencies,
- Spanish: secondary school level.

Programming
- R, Shiny, Bash, Python, Git, LaTeX, Markdown, HTML, CSS3, SQL, JavaScript.

Bioinfomatics
- GNU/Linux & UNIX environments
- High performance computing
- Snakemake pipeline development
- High-throughput omics data analysis (RNA-seq, ATAC-seq, ChIP-seq, CUT&RUN)
- Single-cell RNA-seq data analysis
- Machine learning
- Data visulization

Biology
- Mouse and Drosophila transgenic colony management, breeding and genotyping
- Tissue sampling, microdissection, and cell dissociation
- Organotypic tissue culture
- Paraffin embedded tissue histology
- Confocal and fluorescent microscopy
- Flow cytometry and FACS
- PCR, RT-PCR, qPCR, RACE-PCR
- Single-cell RNA-seq (Fluidigm C1 Autoprep system and 10X Chromium Single Cell 3')
- Illumina sequencing library preparation

Miscellaneous
- LibreOffice, Microsoft Office, advanced graphism with Inkscape (figures, logos, posters, prints, web design), photography

Responsibilities

Equipment
- SONY SH800S cell sorter (training and maintenance)
  10X Genomics Chromium system (training, planning, kit ordering)

Supervision
- Bachelor students (2), Master 1 students (2), Master 2 students (3)

Training
- Introduction to Inkscape to draw scientific schemes and figures
- Introduction to GNU/Linux, Bash, R, and basic bulk and single-cell RNA-seq analysis for biologists
- Single-cell RNA-seq with 10X Genomics Chromium system (cell preparation, machine and kit handling)

Peer-review
- Nature Communications, Frontiers in Molecular and Cellular Reproduction, Genes.

Community

2011– · · · · Co-founder, co-administrator, web-designer, and author for bioinfo-fr.net, a French speaking and collaborative blog about bioinformatics.

2016–2017 Board member of NYRA, the Network for Young Researcher in Andrology (a.k.a. INYRMF).

2006–2012 Co-founder and board member of a Free and Open Source Software User Group "Actux" (successively secretary, vice-president, president), Rennes, France.

Publications

23 research articles (4 as first author); **2 preprint** (1 as first author), **5 review articles** (4 as first author); 2,039 citations, h-index 18 (from Google Scholar, 03/01/2025).

Master 1

Research article

[§] indicates authors ordered alphabetically

1. Antoine-Lorquin, A., Arensburger, P., Arnaoty, A., Asgari, S., Batailler, M., Beauclair, L., Belleannée, C., Buisine, N., Coustham, V., Guyetant, S., Helou, L., Lecomte, T., Pitard, B., **Stevant**, **I.**[§], & Bigot, Y. (2021). Two repeated motifs enriched within some enhancers and origins of replication are bound by SETMAR isoforms in human colon cells. *Genomics*, *113*(3), 1589–1604. https://doi.org/10.1016/j.ygeno.2021.03.032

Master 2

Research article

1. Zarnack, K., König, J., Tajnik, M., Martincorena, I., Eustermann, S., **Stevant**, **I.**, Reyes, A., Anders, S., Luscombe, N. M., & Ule, J. (2013). Direct competition between hnRNP C and U2AF65 protects the transcriptome from the exonization of Alu elements. *Cell*, *152*(3), 453–66. https://doi.org/10.1016/j.cell.2012.12.023

PhD

Research articles

[†] indicates equal contributions

1. Callier, P., Calvel, P., Matevossian, A., Makrythanasis, P., Bernard, P., Kurosaka, H., Vannier, A., Thauvin-Robinet, C., Borel, C., Mazaud-Guittot, S., Rolland, A., Desdoits-Lethimonier, C., Guipponi, M., Zimmermann, C., **Stevant**, **I.**, Kuhne, F., Conne, B., Santoni, F., Lambert, S., Huet, F., Mugneret, F., Jaruzelska, J., Faivre, L., Wilhelm, D., Jégou, B., Trainor, P. A., Resh, M. D., Antonarakis, S. E., Nef, S., et al. (2014). Loss of function mutation in the palmitoyl-transferase HHAT leads to syndromic 46, XY disorder of sex development by impeding Hedgehog protein palmitoylation and signaling. *PLoS genetics*, *10*(5), e1004340. https://doi.org/10.1371/journal.pgen.1004340

2. Zimmermann, C., **Stevant**, **I.**, Borel, C., Conne, B., Pitetti, J.-L., Calvel, P., Kaessmann, H., Jégou, B., Chalmel, F., & Nef, S. (2015). *Molecular Endocrinology*, *29*(4), 627–642. https://doi.org/10.1210/me.2014-1356

3. Telley, L., Govindan, S., Prados, J., **Stevant**, **I.**, Nef, S., Dermitzakis, E., Dayer, A., & Jabaudon, D. (2016). Sequential transcriptional waves direct the differentiation of newborn neurons in the mouse neocortex. *Science*, *351*(6280), 1443–1446. https://doi.org/10.1126/science.aad8361

4. **Stevant**, **I.**, Neirijnck, Y., Borel, C., Escoffier, J., Smith, L. B., Antonarakis, S. E., Dermitzakis, E. T., & Nef, S. (2018). Deciphering Cell Lineage Specification during Male Sex Determination with Single-Cell RNA Sequencing. *Cell Reports*, *22*(6), 1589–1599. https://doi.org/10.1016/j.celrep.2018.01.043

5. Harris, A., Siggers, P., Corrochano, S., Warr, N., Sagar, D., Grimes, D. T. D. D. T., Suzuki, M., Burdine, R. R. D., Cong, F., Koo, B.-K. B.-K., Clevers, H., **Stevant**, **I.**, Nef, S., Wells, S., Brauner, R., Rhouma, B., Belguith, N., Eozenou, C., Bignon-Topalovic, J., Bashamboo, A., McElreavey, K., & Greenfield, A. (2018). ZNRF3 functions in mammalian sex determination by inhibiting canonical WNT signaling. *Proceedings of the National Academy of Sciences*, *115*(21), 5474–5479. https://doi.org/10.1073/pnas.1801223115

6. Neirijnck, Y., Calvel, P., Kilcoyne, K. R., Kühne, F., **Stevant**, **I.**, Griffeth, R. J., Pitetti, J.-L., Andric, S. A., Hu, M.-C., Pralong, F., Smith, L. B., & Nef, S. (2018). Insulin and IGF1 receptors are essential for the development and steroidogenic function of adult Leydig cells. *The FASEB Journal*, *32*(6), 3321–3335. https://doi.org/10.1096/fj.201700769RR

7. Gregoire, E. P., **Stevant**, **I.**, Chassot, A.-A., Martin, L., Lachambre, S., Mondin, M., de Rooij, D. G., Nef, S., & Chaboissier, M.-C. (2018). NRG1 signalling regulates the establishment of Sertoli cell stock in the mouse testis. *Molecular and Cellular Endocrinology*, *478*, 17–31. https://doi.org/10.1016/j.mce.2018.07.004

8. Darde, T. A., Lecluze, E., Lardenois, A., **Stevant**, **I.**, Alary, N., Tüttelmann, F., Collin, O., Nef, S., Jégou, B., Rolland, A. D., & Chalmel, F. (2019). The ReproGenomics Viewer: A multi-omics and cross-species resource compatible with single-cell studies for the reproductive science community. *Bioinformatics*. https://doi.org/10.1093/bioinformatics/btz047

9. **Stevant**, **I.**, Kühne, F., Greenfield, A., Chaboissier, M.-C. C., Dermitzakis, E. T., & Nef, S. (2019). Dissecting Cell Lineage Specification and Sex Fate Determination in Gonadal Somatic Cells Using Single-Cell Transcriptomics. *Cell Reports*, *26*(12), 3272–3283.e3. https://doi.org/10.1016/j.celrep.2019.02.069

10. Livermore, C., Simon, M., Reeves, R., **Stevant**, **I.**, Nef, S., Pope, M., Mallon, A.-M., Wells, S., Warr, N., & Greenfield, A. (2020). Protection Against XY Gonadal Sex Reversal by a Variant Region on Mouse Chromosome 13. *Genetics*, *214*(2), 467–477. https://doi.org/10.1534/genetics.119.302786

11. Chassot, A.-A., Le Rolle, M., Jolivet, G., **Stevant**, **I.**, Guigonis, J.-M., Da Silva, F., Nef, S., Pailhoux, E., Schedl, A., Ghyselinck, N. B., & Chaboissier, M.-C. (2020). Retinoic acid synthesis by ALDH1A proteins is dispensable for meiosis initiation in the mouse fetal ovary. *Science Advances*, *6*(21), eaaz1261. https://doi.org/10.1126/sciadv.aaz1261

12. Escoffier, J., Arnaud, B., Kaba, M., Hograindleur, J. P., Le Blévec, E., Martinez, G., **Stevant**, **I.**, Ray, P. F., Arnoult, C., & Nef, S. (2020). Pantoprazole, a proton-pump inhibitor, impairs human sperm motility and capacitation in vitro. *Andrology*, *8*(6), 1795–1804. https://doi.org/10.1111/andr.12855

13. Mayère, C., Neirijnck, Y., Sararols, P., Rands, C. M., **Stevant**, **I.**, Kühne, F., Chassot, A.-A., Chaboissier, M.-C., Dermitzakis, E. T., & Nef, S. (2021). Single-cell transcriptomics reveal temporal dynamics of critical regulators of germ cell fate during mouse sex determination. *The FASEB Journal*, *35*(4), e21452. https://doi.org/10.1096/fj.202002420R

14. Sararols, P.†, **Stevant**, **I.**†, Neirijnck, Y., Rebourcet, D., Darbey, A., Curley, M. K., Kühne, F., Dermitzakis, E., Smith, L. B., & Nef, S. (2021). Specific transcriptomic signatures and dual regulation of steroidogenesis between fetal and adult mouse leydig cells. *Frontiers in Cell and Developmental Biology*, *9*, 1726. https://doi.org/10.3389/fcell.2021.695546

15. Mayère, C., Regard, V., Perea-Gomez, A., Bunce, C., Neirijnck, Y., Djari, C., Bellido-Carreras, N., Sararols, P., Reeves, R., Greenaway, S., Simon, M., Siggers, P., Condrea, D., Kühne, F., Gantar, I., Tang, F., **Stevant**, **I.**, Batti, L., Ghyselinck, N. B., Wilhelm, D., Greenfield, A., Capel, B., Chaboissier, M.-C., & Nef, S. (2022). Origin, specification and differentiation of a rare supporting-like lineage in the developing mouse gonad. *Science Advances*, *8*(21), eabm0972. https://doi.org/10.1126/sciadv.abm0972

16. Ademi, H., Djari, C., Mayère, C., Neirijnck, Y., Sararols, P., Rands, C. M., **Stevant**, **I.**, Conne, B., & Nef, S. (2022). Deciphering the origins and fates of steroidogenic lineages in the mouse testis. *Cell Reports*, *39*(11). https://doi.org/10.1016/j.celrep.2022.110935

Review articles

1. **Stevant**, **I.**, & Nef, S. (2018). Single cell transcriptome sequencing: A new approach for the study of mammalian sex determination. *Molecular and Cellular Endocrinology*, *468*, 11–18. https://doi.org/10.1016/j.mce.2018.01.013

2. **Stevant**, **I.**, Papaioannou, M. D., & Nef, S. (2018). A brief history of sex determination. *Molecular and Cellular Endocrinology*, *468*, 3–10. https://doi.org/10.1016/j.mce.2018.04.004

3. Nef, S., **Stevant**, **I.**, & Greenfield, A. (2019). Characterizing the bipotential mammalian gonad. *134*, 167–194. https://doi.org/10.1016/bs.ctdb.2019.01.002

4. **Stevant**, **I.**, & Nef, S. (2019). Genetic Control of Gonadal Sex Determination and Development. *Trends in Genetics*, *35*(5), 346–358. https://doi.org/10.1016/j.tig.2019.02.004

Postdoc 1

Research articles

1. Nemoz-Billet, L., Balland, M., Gilquin, L., Gillet, B., **Stevant**, **I.**, Guillon, E., Hughes, S., Carpentier, G., Vaganay, E., Sohm, F., Misiak, V., Gonzalez-Melo, M.-J., Koch, M., Ghavi-Helm, Y., Bretaud, S., & Ruggiero, F. (2024). Dual topologies of myotomal collagen XV and Tenascin C act in concert to guide and shape developing motor axons. *Proceedings of the National Academy of Sciences*, *121*(13), e2314588121. https://doi.org/10.1073/pnas.2314588121

Review article

† indicates equal contributions

1. Moretti, C.†, **Stevant**, **I.**†, & Ghavi-Helm, Y. (2020). 3D genome organisation in Drosophila. *Briefings in Functional Genomics*. https://doi.org/10.1093/bfgp/elz029

Preprint

1. Alberti, B., Vincent, S., **Stevant**, **I.**, Lajoignie, D., Tarayre, H., Villoutreix, P., & Ghavi-Helm, Y. (2024). Spatial reconstruction of single-cell enhancer activity in a multicellular organism. https://doi.org/10.1101/2024.10.02.616294

Postdoc 2

Research articles

1. Gonen, N., Eozenou, C., Mitter, R., Elzaiat, M., **Stevant**, **I.**, Aviram, R., Bernardo, A. S., Chervova, A., Wankanit, S., Frachon, E., Commère, P.-H., Brailly-Tabard, S., Valon, L., Cano, L. B., Levayer, R., Mazen, I., Gobaa, S., Smith, J. C., McElreavey, K., Lovell-Badge, R., & Bashamboo, A. (2023). In vitro cellular reprogramming to model gonad development and its disorders. *Science Advances*, *9*(1). https://doi.org/10.1126/SCIADV.ABN9793
2. Gregoire, E. P., De Cian, M.-C., Migale, R., Perea-Gomez, A., Schaub, S., Bellido-Carreras, N., **Stevant**, **I.**, Mayère, C., Neirijnck, Y., Loubat, A., Rivaud, P., Sopena, M. L., Lachambre, S., Linssen, M. M., Hohenstein, P., Lovell-Badge, R., Nef, S., Chalmel, F., Schedl, A., & Chaboissier, M.-C. (2023). The -KTS splice variant of WT1 is essential for ovarian determination in mice. *Science*, *382*(6670), 600–606. https://doi.org/10.1126/science.add8831
3. Philibert, P., **Stevant**, **I.**, Déjardin, S., Girard, M., Sellem, E., Durix, Q., Messager, A., Gonzalez, A.-A., Mialhe, X., Pruvost, A., et al. (2023). Intergenerational effects on fertility in male and female mice after chronic exposure to environmental doses of NSAIDs and 17alpha-ethinylestradiol mixtures. *Food and Chemical Toxicology*, *182*, 114085. https://doi.org/10.1016/j.fct.2023.114085
4. **Stevant**, **I.**, Gonen, N., & Poulat, F. (2024). Transposable elements acquire time- and sex-specific transcriptional and epigenetic signatures along mouse fetal gonad development. *Frontiers in Cell and Developmental Biology*, *11*. https://doi.org/10.3389/fcell.2023.1327410

Preprint

† indicates equal contributions

1. **Stevant**, **I.**†, Abberbock, E.†, Ridnik, M.†, Weiss, R., Swisa, L., Futtner, C., Maatouk, D., Lovell-Badge, R., Malysheva, V., & Gonen, N. (2024). Divergent regulatory element programs steer sex-specific supporting cell differentiation along mouse gonadal development. https://doi.org/10.1101/2024.12.09.627451

Conference communications

Talks

1. Dynamic transcriptional profile of sertoli cells during the progression of spermatogenesis. (2014). *18th European Testis Workshop - European workshop on the Molecular and Cellular Endocrinology of the Testis*, Elsinore, Denmark.
2. Characterisation of the genetic programs during sex determination at a single cell level. (2014). *3rd iGE3 Annual Meeting*, Geneva, Switzerland.
3. Sertoli cell transcriptomics during sex determination at a single-cell resolution. (2016). *INYRMF annual meeting*, Rennes, France.
4. Revisiting testicular differentiation using single-cell rna-seq. (2016). *19th European Testis Workshop*, Saint Malo, France.
5. Revisiting male sex determination with single-cell rna-seq. (2016). *LS2/ Louis Jeantet Satellite Symposium*, Geneva, Switzerland.
6. Revisiting male sex determination with single-cell rna-seq. (2017). *1st European Symposium on Sex Determination in Vertebrates*, Dinard, France.
7. Reconstructing gonadal sex fate decision using single-cell rna-seq. (2018). *20th European Testis Workshop*, Obidos, Portugal.

8. Sex determination in a dish: In vitro mouse embryonic stem cell reprogramming into gonadal-like cells. (2022). *2nd European Symposium on Sex Determination in Vertebrates*, Presqu'île de Giens, France.
9. Sex and the TEs: How transposable elements could influence gonadal development? (2023). *Sex Determination in Vertebrates French Meeting*, Montpellier, France.
10. Mapping cis-regulatory elements in mouse gonadal cell differentiation. (2024). *3rd European Symposium on Sex Determination in Vertebrates*, La-Colle-sur–Loup, France.

Posters

1. Bioinfo-fr.net : Présentation du blog communautaire scientifique francophone. (2017). *JOBIM*, Lille, France.
2. Revisiting cell lineage specification during male sex determination with single-cell rna sequencing. (2017). *JOBIM*, Lille, France.
3. Sex determination in a dish: In vitro mouse embryonic stem cell reprogramming into gonadal-like cells. (2023). *9th International Symposium on the Biology of Vertebrate Sex Determination*, Kailua–Kona, Hawaii, USA.