Florian **Wünnemann**

Postdoc in the group of Denis Schapiro

Im Neuenheimer Feld 130, 69120 Heidelberg, Germany

flowuenne@gmail.com

florianwuennemann.com | flowuenne | florian-wünnemann-322357189 | flowuenne

***Research and scientific interests**: Spatial OMICS, Cardiovascular disease, Human genetics, Bioinformatics, Machine Learning, Computer vision*

Research experience

University Hospital Heidelberg
Heidelberg, Germany

Postdoc in the Schapiro Lab — *22-Jan-22 - ongoing*

- Investigation of cellular neighbourhoods and tissue architecture in myocardial infarction models using spatial OMICS technologies

Montreal Heart Institute
Montreal, Canada

Postdoc in the Lettre lab — *18-Aug-22 - 21-Aug-22*

- Projects focused on high-throughput CRISPR screens, polygenic risk scores, genetics of heart valve disease and development of single-cell screens to investigate human cellular traits.

Universite de Sherbrooke
Remote work

Professionnel recherche niv. II — *19-Jan-22 - 16-Jan-22*

- Part of the GenAP initiative (www.genap.ca) as single-cell expert, to include single-cell tools into the GenAP2 platform. Development of Galaxy tools, Rshiny applications and docker containers for single-cell analysis.

IEB, University of Münster
Münster, Germany

Student Research assistant — *11-Sep-22 - 12-Jul-22*

- Acquisti group: Analysis of genomes and metagenomes in the context of nutrient limitation and fertilization.

IEB, University of Münster
Münster, Germany

Student assistant — *11-Mar-22 - 11-May-22*

- Bornberg-Bauer group

Education

University of Münster / CHU Sainte Justine Research Center
Münster, Germany / Montreal, Canada

Ph.D. (Dr.rer.nat) - Life sciences — *Apr.2014 - Apr.2018*

- Thesis title: The role of genetic factors in pathogenesis and progression of cardiac malformations

University of Münster
Münster, Germany

MSc in Life sciences — *Oct.2011 - Feb.2014*

- Thesis title: Functional and genetic characterization of a novel arrhythmic syndrome

University of Münster
Münster, Germany

BSc in Life sciences — *Oct.2008 - Sep.2011*

- Thesis title: Impact of nutrient limitation in insects: Comparative genomics of the pea aphid and the human body louse

Funding History

Postdoctoral Training (Canadian citizens and permanent residents) scholarship, Fonds de recherche Québec santé (FRQS) — *2019 - 2021*

Achievements and Awards

2021/06	Poster prize: Prix Fonds de recherche du Québec (FRQS) (Recherche fondamentale doctorale / Postdoc)	*Montreal,Canada*
2019/10	Abstract prize: Semifinalist 2019 Charles J. Epstein Trainee Awards for Excellence in Human Genetics Research	*Houston, Texas, USA*
2019/06	Best oral presentation award, 22nd Montreal Heart Institute research day	*Montreal,Canada*
2017/05	Best oral presentation award, 32nd student congress at the CHU Sainte-Justine	*Montreal, Canada*
2016/05	Markwald award for best oral presentation, Weinstein Cardiovascular Development and Regeneration Conference 2016	*Durham, USA*

Presentations

American Society of Human Genetics (ASHG) Meeting 2019 — *Houston, Texas, USA*

Prioritization of genomic loci for coronary artery disease using targeted CRISPR screens for endothelial dysfunction — *15.10.2019 - 19.10.2019*

XXIIe Journée de la recherche ICM — *Montreal, Canada*

Validation of genome-wide polygenic risk scores for coronary artery disease in French Canadians — *06.06.2019 - 06.06.2019*

7th annual MGSE Symposium — *Münster, Germany*

Single cell landscape of mammalian heart maturation — *21.03.2018 - 22.03.2018*

American Society of Human Genetics (ASHG) Meeting 2017 — *Orlando, Florida, USA*

Identification of a novel marker for valve maturation: Loss of ADAMTS19 function causes progressive valve disease in mice and men — *18.10.2017 - 18.10.2017*

Congrès de la recherche des étudiantes des cycles supérieurs et des post-doctorants en recherche au CHU Sainte-Justine — *Montreal, Canada*

Heart valve dysfunction in men and mice is caused by loss of function mutations in Adamts19, a novel marker for valvular interstitial cells — *26.05.2017 - 26.05.2017*

Weinstein Cardiovascular Development and Regeneration Conference 2016 — *Durham, North Carolina, USA*

Loss of Adamts19, a novel marker for valvular interstitial cell populations during valve maturation, causes aortic valve dysfunction — *18.05.2016 - 21.05.2016*

Evolgen, collaborative meeting on genome evolution — *Ciążeń, Poland*

ACTransDB: An online database for Acanthamoeba castellani transcripts, — *27.06.2012 - 28.06.2012*

2nd Muenster graduate school evolution symposium — *Münster, Germany*

Biogeochemistry meets molecular evolution via metagenomics: tracing nitrogen fluxes from ecosystems to genomes in microbial communities — *18.06.2012 - 19.06.2012*

Poster presentations

XXIIIe Journée de la recherche ICM — *Montreal, Canada*

CRISPR perturbations at many coronary artery disease loci impair vascular endothelial cell functions — *17.06.2021 - 17.06.2021*

Cold Spring Harbor Laboratories: The Biology of Genomes — *Virtual*

CRISPR perturbations at many coronary artery disease loci impair vascular endothelial cell functions — *11.05.2021 - 14.05.2021*

Weinstein Cardiovascular Development and Regeneration Conference — *Nara, Japan*

A single-cell perspective on growth and maturation pathways in the mouse heart. — *16.05.2018 - 18.05.2018*

American Society of Human Genetics (ASHG) 2014 — *San Diego, California, USA*

De novo mutation in SOX18 causes a novel form of Hypotrichosis-Lymphedema-Telangiectasia with severe vascular defects — *18.10.2014 - 22.10.2014*

42nd Annual Meeting of the Ecological Society of Germany, Austria and Switzerland 2012 — *Lueneburg, Germany*

Soil metagenomics to unravel the signature of fertilizers on the molecular composition of the bacterial ribosome — *10.09.2012 - 14.09.2012*

Publications

Biermann, Jana, Johannes C Melms, Amit Dipak Amin, Yiping Wang, Lindsay A Caprio, Alcida Karz, Somnath Tagore, Irving Barrera, Miguel A Ibarra-Arellano, Massimo Andreatta, Benjamin T Fullerton, Kristjan H Gretarsson, Varun Sahu, Vaibhav S Mangipudy, Trang T T Nguyen, Ajay Nair, Meri Rogava, Patricia Ho, Peter D Koch, Matei Banu, Nelson Humala, Aayushi Mahajan, Zachary H Walsh, Shivem B Shah, Daniel H Vaccaro, Blake Caldwell, Michael Mu, Florian Wünnemann, Margot Chazotte, Simon Berhe, Adrienne M Luoma, Joseph Driver, Matthew Ingham, Shaheer A Khan,

Suthee Rapisuwon, Craig L Slingluff, Thomas Eigentler, Martin Röcken, Richard Carvajal, Michael B Atkins, Michael A Davies, Albert Agustinus, Samuel F Bakhoum, Elham Azizi, Markus Siegelin, Chao Lu, Santiago J Carmona, Hanina Hibshoosh, Antoni Ribas, Peter Canoll, Jeffrey N Bruce, Wenya Linda Bi, Praveen Agrawal, Denis Schapiro, Eva Hernando, Evan Z Macosko, Fei Chen, Gary K Schwartz, and Benjamin Izar. 2022. "Dissecting the Treatment-Naive Ecosystem of Human Melanoma Brain Metastasis." *Cell* 185 (14): 2591–2608.e30.

Chetaille, Philippe, Christoph Preuss, Silja Burkhard, Jean-Marc Côté, Christine Houde, Julie Castilloux, Jessica Piché, Natacha Gosset, Séverine Leclerc, Florian Wünnemann, and others. 2014. "Mutations in Sgol1 Cause a Novel Cohesinopathy Affecting Heart and Gut Rhythm." *Nature Genetics* 46 (11). Nature Publishing Group: 1245.

Gillis, Elisabeth, Ajay A Kumar, Ilse Luyckx, Christoph Preuss, Elyssa Cannaerts, Gerarda Van De Beek, Björn Wieschendorf, Maaike Alaerts, Nikhita Bolar, Geert Vandeweyer, and others. 2017. "Candidate Gene Resequencing in a Large Bicuspid Aortic Valve-Associated Thoracic Aortic Aneurysm Cohort: Smad6 as an Important Contributor." *Frontiers in Physiology* 8. Frontiers: 400.

Gould, Russell A, Hamza Aziz, Courtney E Woods, Manuel Alejandro Seman-Senderos, Elizabeth Sparks, Christoph Preuss, Florian Wünnemann, Djahida Bedja, Cassandra R Moats, Sarah A McClymont, and others. 2019. "Robo4 Variants Predispose Individuals to Bicuspid Aortic Valve and Thoracic Aortic Aneurysm." *Nature Genetics* 51 (1). Nature Publishing Group: 42–50.

Luyckx, Ilse, Ajay A Kumar, Edwin Reyniers, Emily Dekeyser, Kathleen Vanderstraeten, Geert Vandeweyer, Florian Wünnemann, Christoph Preuss, Jean-Michaël Mazzella, Guillaume Goudot, and others. 2019. "Copy Number Variation Analysis in Bicuspid Aortic Valve-Related Aortopathy Identifies Tbx20 as a Contributing Gene." *European Journal of Human Genetics* 27 (7). Nature Publishing Group: 1033–43.

Preuss, Christoph, Melanie Capredon, Florian Wünnemann, Philippe Chetaille, Andrea Prince, Beatrice Godard, Severine Leclerc, Nara Sobreira, Hua Ling, Philip Awadalla, and others. 2016. "Family Based Whole Exome Sequencing Reveals the Multifaceted Role of Notch Signaling in Congenital Heart Disease." *PLoS Genetics* 12 (10). Public Library of Science San Francisco, CA USA: e1006335.

Wünnemann, Florian, Victor Kokta, Séverine Leclerc, Maryse Thibeault, Catherine McCuaig, Afshin Hatami, Chantal Stheneur, Jean-Christophe Grenier, Philip Awadalla, Grant A Mitchell, and others. 2016. "Aortic Dilatation Associated with a de Novo Mutation in the Sox18 Gene: Expanding the Clinical Spectrum of Hypotrichosis-Lymphedema-Telangiectasia Syndrome." *Canadian Journal of Cardiology* 32 (1). Elsevier: 135–e1.

Wünnemann, Florian, Ken Sin Lo, Alexandra Langford-Avelar, David Busseuil, Marie-Pierre Dubé, Jean-Claude Tardif, and Guillaume Lettre. 2019. "Validation of Genome-Wide Polygenic Risk Scores for Coronary Artery Disease in French Canadians." *Circulation: Genomic and Precision Medicine* 12 (6). Lippincott Williams & Wilkins Hagerstown, MD: e002481.

Wünnemann, Florian, Thierry Fotsing Tadjo, Melissa Beaudoin, Simon Lalonde, Ken Sin Lo, and Guillaume Lettre. 2021. "CRISPR Perturbations at Many Coronary Artery Disease Loci Impair Vascular Endothelial Cell Functions." *bioRxiv*. Cold Spring Harbor Laboratory.

Wünnemann, Florian, Asaf Ta-Shma, Christoph Preuss, Severine Leclerc, Patrick Piet van Vliet, Andrea Oneglia, Maryse Thibeault, Emily Nordquist, Joy Lincoln, Franka Scharfenberg, and others. 2020. "Loss of Adamts19 Causes Progressive Non-Syndromic Heart Valve Disease." *Nature Genetics* 52 (1). Nature Publishing Group: 40–47.

Computational skills

- **General**: GWAS analysis, Exome/Genome variant calling, Plink, bedtools, Image analysis (Fiji, Napari, QuPath)
- **R**: Rshiny application development, Rmarkdown, Package development, OMICS data analysis (RNA-seq, single-cell OMICS), reticulate
- **Python**: Jupyter notebooks, basic computer vision applications, single-cell OMICS analysis
- **Containers**: Docker container creation, Singularity usage, Nextflow workflow creation and execution
- **Galaxy project**: Creation of galaxy tools and wrappers

Languages

- German (mother-language)
- English (fluent)
- French (fluent)