Florian **Wünnemann**

Postdoc in the group of Denis Schapiro

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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

1. Biermann, J., Melms, J. C., Amin, A. D., Wang, Y., Caprio, L. A., Karz, A., Tagore, S., Barrera, I., Ibarra-Arellano, M. A., Andreatta, M., Fullerton, B. T., Gretarsson, K. H., Sahu, V., Mangipudy, V. S., Nguyen, T. T. T., Nair, A., Rogava, M., Ho, P., Koch, P. D., … Izar, B. (2022). Dissecting the treatment-naive ecosystem of human melanoma brain metastasis. *Cell*, *185*(14), 2591–2608.e30.

2.   Wünnemann, F., Tadjo, T. F., Beaudoin, M., Lalonde, S., Lo, K. S., & Lettre, G. (2021). CRISPR perturbations at many coronary artery disease loci impair vascular endothelial cell functions. *bioRxiv*.

3.   Wünnemann, F., Ta-Shma, A., Preuss, C., Leclerc, S., Vliet, P. P. van, Oneglia, A., Thibeault, M., Nordquist, E., Lincoln, J., Scharfenberg, F.others. (2020). Loss of ADAMTS19 causes progressive non-syndromic heart valve disease. *Nature Genetics*, *52*(1), 40–47.

4.   Gould, R. A., Aziz, H., Woods, C. E., Seman-Senderos, M. A., Sparks, E., Preuss, C., Wünnemann, F., Bedja, D., Moats, C. R., McClymont, S. A.others. (2019). ROBO4 variants predispose individuals to bicuspid aortic valve and thoracic aortic aneurysm. *Nature Genetics*, *51*(1), 42–50.

5.   Luyckx, I., Kumar, A. A., Reyniers, E., Dekeyser, E., Vanderstraeten, K., Vandeweyer, G., Wünnemann, F., Preuss, C., Mazzella, J.-M., Goudot, G.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), 1033–1043.

6.   Wünnemann, F., Sin Lo, K., Langford-Avelar, A., Busseuil, D., Dubé, M.-P., Tardif, J.-C., & Lettre, G. (2019). Validation of genome-wide polygenic risk scores for coronary artery disease in french canadians. *Circulation: Genomic and Precision Medicine*, *12*(6), e002481.

7.   Gillis, E., Kumar, A. A., Luyckx, I., Preuss, C., Cannaerts, E., Van De Beek, G., Wieschendorf, B., Alaerts, M., Bolar, N., Vandeweyer, G.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*, 400.

8.   Wünnemann, F., Kokta, V., Leclerc, S., Thibeault, M., McCuaig, C., Hatami, A., Stheneur, C., Grenier, J.-C., Awadalla, P., Mitchell, G. A.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), 135–e1.

9.   Preuss, C., Capredon, M., Wünnemann, F., Chetaille, P., Prince, A., Godard, B., Leclerc, S., Sobreira, N., Ling, H., Awadalla, P.others. (2016). Family based whole exome sequencing reveals the multifaceted role of notch signaling in congenital heart disease. *PLoS Genetics*, *12*(10), e1006335.

10. Chetaille, P., Preuss, C., Burkhard, S., Côté, J.-M., Houde, C., Castilloux, J., Piché, J., Gosset, N., Leclerc, S., Wünnemann, F.others. (2014). Mutations in SGOL1 cause a novel cohesinopathy affecting heart and gut rhythm. *Nature Genetics*, *46*(11), 1245.

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)