Dr. Martin Hölzer

PERSONAL DATA

Name: Dr. rer. nat. Martin Hölzer

Gender: Male

Place and Date of Birth: Rudolstadt, Germany | 16 March 1988

Nationality: German

Address: Jansonstr. 11, 07745 Jena

Phone: +49 160 92675865

Family status: Married

Twitter: @martinhoelzer

Email: hoelzer.martin@gmail.com

Code: github.com/hoelzer Web: hoelzer-lab.github.io

SCIENTIFIC EDUCATION

01/2018 | Doctorate degree, Dr. rer. nat.

University of Jena

Grade: summa cum laude

Doctoral thesis: *The Dark Art of Next-Generation Sequencing: fundamental approaches for genomics, transcriptomics, and differential gene expression* Prof. Dr. Manja Marz, RNA Bioinformatics and High-Throughput Analysis

Faculty of Mathematics and Computer Sciences

since 06/2017

Leader of an associated bioinformatics research group at University of Jena

08/2013-06/2017 PhD student at University of Jena

12/2012 | Diploma in Bioinformatics

University of Jena

Grade: 1.4

Diploma thesis: Data management of mass spectra and fragmentation trees

with BExIS

Prof. Dr. Sebastian Böcker, Chair of Bioinformatics Faculty of Mathematics and Computer Sciences

10/2007-12/2012 | Studies of B

Studies of Bioinformatics at University of Jena

2006–2007 Civilian service, Diakonisches Altenhilfezentrum, Bad Blankenburg

1998–2006 University entrance qualification, Friedrich-Fröbel-Gymnasium, Bad Blankenburg, Grade 2.0

WORK EXPERIENCE

Current

Post-Doc & head of an associated research group

RNA Bioinformatics/High-Throughput Analysis, Prof. Dr. Manja Marz, University of Jena Supervision of Next-Generation Sequencing (NGS) projects including the automatization of workflows for assembly, annotation, variant calling, differential gene expression, metagenomics, and visualization of results. Development of novel applications for long-read sequencing data. Head of an associated and fresh bioinformatics group at the University of Jena.

since 06/2019

nanozoo GmbH

Co-founder and Co-managing director of nanozoo GmbH, Leipzig, Germany

Founded in mid-2019, nanozoo is a small bioinformatics company providing end-to-end services for the production and analysis of microbial data. *nanozoo* has set itself the goal of removing barriers in bioinformatic data analysis to provide up-to-date standards and analyses to a broad mass of researchers.

since 03/2017

EVBC member

Founding member of the "European Virus Bioinformatics Center" (EVBC), University of Jena The EVBC is intended to bring together virologists and bioinformaticians across Europe and provide a platform for interdisciplinary collaborative projects. My expertise covers sequencing, design and high-throughput analysis of virus-enriched and -infected biological samples.

08/2013-06/2017

PhD student

RNA Bioinformatics/High-Throughput Analysis, Prof. Dr. Manja Marz, University of Jena Management of various NGS projects comprising 1) experimental design, 2) selection of appropriate sequencing parameters, and 3) data analysis, visualization and interpretation. Development of pipelines for downstream bioinformatical analyses. Examination of (meta-)genomic/transcriptomic data with a special focus on *de novo* assembly, annotation, and identification of differential expressed protein- and non-coding genes. Contributions to the emerging field of virus bioinformatics.

09/2009-05/2012

Student assistant

Chair of Bioinformatics, Prof. Dr. Sebastian Böcker, University of Jena

Integration of algorithms, data management and visualization for phylogenetic analyses and clustering.

TASKS BEYOND OWN RESEARCH

Advisory board memberships

Member of the external advisory board of the EU project "Digital Skills on Computational Biology for Health Professionals" (BioS)

Supervision of practical works

Jannes Spangenberg (started 10/2018) Lasse Faber (completed spring 2019) Daria Meyer (completed winter 2018)

• Supervision of bachlor theses

Sandra Triebel (started 04/2019) Rebekka Köhl (started 07/2018)

Supervision of master theses

Lasse Faber (started 04/2019) Marie Lataretu (completed summer 2018) Ruman Gerst (completed fall 2017) Lisa-Marie Barf (started 10/2017)

• Organization of international conferences and meetings

 23^{rd} International Bioinformatics Workshop on Virus Evolution and Molecular Epidemiology (VEME), 2018: Supporting Organizer

Hackathon on aging-related data, *Stay Young or Die Trying*, 2017: Supporting Organizer First Meeting of the *European Virus Bioinformatics Centre*, 2017: Supporting Organizer Hackathon on virus infected RNA-Seq data, *Fight against Ebola – in silico*, 2014: Organizer

• Peer-reviews for international conferences

Annual International Conference on Research in Comp. Molecular Biology (RECOMB 2018) Annual International Conference on Intelligent Systems for Molecular Biology (ISMB 2017) German Conference on Bioinformatics (GCB 2014, 2015, 2017)

Peer-reviews for journals

Scientific Reports (2019), Frontiers in Microbiology (2019), Virus Research (2018), Molecular Ecology Resources (2018)

Publons: publons.com/author/1521002

• Third-party funding applications

Assistance in writing research grants for third-party funding (DFG, SPP, ERC)

SCHOLARSHIPS

DEC. 2018 – JAN. 2021 "Add-on Fellowship for Interdisciplinary Life Science" of €12,500 the Joachim Herz Stiftung

GRANTS

| 2020 - 2025 | "Digitisation of the life sciences: Ways into the future" We receive € 1.35 million from the <i>Thuringian Ministry of Science</i> to advance the digitization of life sciences. The project will start in 2020 and is initially scheduled for five years. I was jointly responsible for the application and significantly involved in the compilation of the contents and the writing. | Amount - |
|-----------------------|---|----------|
| DEC. 2018 - DEC. 2019 | Program of the University of Jena to support junior researchers in obtaining third-party funding | € 9,930 |

at the University of Jena

Teaching instructor

2018, 2019

Practical course: VIROINFORMATICS

Responsibilitites: Prepared, supervised, and assisted students in a two-week practical course on the topic of virus detection from meta-transcriptomic NGS data.

2017, 2017/18 2018 Lecture & Practical course: LETEX BASICS FOR NATURAL SCIENTISTS

Responsibilitites: Presented lectures on the document preparation system $\mathbb{E}_{L}X$. Supervised and assisted 30 undergraduate students in a one-week full-time course. Graded daily assignments, excercises, and exams.

2017/18

Practical course: High-Throughput Bioinformatics

Responsibilitites: Prepared, supervised, and assisted students in a two-week practical course on the topic of RNA-Seq data analysis.

Teaching assistant

2016/17, 2017/18 2018/19 Lecture: BASIC BIOINFORMATIC APPLICATIONS

Responsibilities: Prepared and taught four 1.5-hour lectures on the topic of high-throughput data analysis and assembly (From raw read data to differential expressed genes). Prepared and supervised practical examples. Graded assignments and course exams.

2014/15, 2015, 2016, 2017 Lecture: VIRUS BIOINFORMATICS

Responsibilitites: Developed and taught hour-long lessons on viral replication, assembly, and sequencing.

2014/15, 2015/16, 2016/17, 2017/18 Lecture: HIGH-THROUGHPUT BIOINFORMATICS

Responsibilitites: Developed and taught hour-long lessons on sequencing technologies and protocols, Next-Generation Sequencing design, quality control and data processing, de novo and reference-based assembly, read quantification, normalization, and differential gene expression analysis.

2015/16, 2018/19

Practical course: HIGH-THROUGHPUT BIOINFORMATICS

Responsibilitites: Prepared, supervised, and assisted students in a one-week practical course on the topic of RNA-Seq data analysis.

SCIENTIFIC POSTER PRESENTATIONS

| 03/2019 | 3rd annual meeting of the European Virus Bioinformatics Center (EVBC), Glasgow, Scotland |
|---------|--|
| | Virus- and interferon alpha-induced transcriptomes of the microbat Myotis |
| | daubentonii. |
| 03/2019 | 29th Annual Meeting of the Society for Virology, Düsseldorf, Germany |
| | Virus- and interferon alpha-induced transcriptomes of the microbat Myotis |
| | daubentonii. |
| 09/2018 | German Conference on Bioinformatics, Vienna, Austria |
| | Long reads matter: The advantages of nanopore long-read sequencing. |
| 05/2017 | Bioinformatics Mittelerde Meeting, Leipzig, Germany |
| - | PoSeiDon: a web server for the detection of evolutionary recombination events |
| | and positive selection. |
| 03/2017 | 27th Annual Meeting of the Society for Virology, Marburg, Germany |
| | PoSeiDon: a web server for the detection of evolutionary recombination events |
| | and positive selection. |
| 04/2016 | 26th Annual Meeting of the Society for Virology, Münster, Germany |
| • | A method pipeline for the detection of positively selected sites in silico - exemplar- |
| | ily shown for bat Mx1. |

SCIENTIFIC ORAL PRESENTATIONS

| 11/2018 | BioGeo-Colloquium, Jena, Germany |
|---------|--|
| ., | The advantages of nanopore sequencing: because long reads matter |
| 11/2018 | Institut für Mikrobiologie der Bundeswehr, Munich, Germany |
| , | A short and a long sequencing story about Ebola and Coronaviruses |
| 10/2018 | 16. Herbstseminar der Bioinformatik, Doubice, Czech Republic |
| | Session chair on virus bioinformatics |
| 07/2018 | 11th International Conference on Virology/Microbiology, Vancouver, Canada |
| | An Interface between Bioinformatics and Virology (KEYNOTE SPEAKER) |
| 06/2018 | CRC AquaDiva On Site Retreat, Vitaleum UG Hütten, Germany |
| | Viral diversity, viral de novo assembly, and viral decay in groundwater |
| 02/2018 | 33. Winterseminar der Bioinformatik, Bled, Slovenia |
| | PCAGO: An interactive web service to analyze RNA-Seq data with principal com- |
| | ponent analysis |
| 08/2017 | CRC AquaDiva Recruitment Symposium, Jena, Germany |
| | Next-Generation Sequencing meets viruses |
| 02/2017 | 32. Winterseminar der Bioinformatik, Bled, Slovenia |
| | PoSeiDon: A web server for the detection of evolutionary recombination events |
| 10/2016 | and positive selection 14. Herbstseminar der Bioinformatik, Doubice, Czech Republic |
| 10/2016 | Fun with PCA: Insights into RNA-Seq based principal component analysis |
| 02/2016 | 31. Winterseminar der Bioinformatik, Bled, Slovenia |
| 02/2010 | Evolutionary analyses of positively selected sites in the interferon-induced innate |
| | immunity factor Mx1 of bats |
| 03/2015 | 25th Annual Meeting of the Society for Virology, Bochum, Germany |
| 03/2013 | Differential transcriptional responses to Ebola and Marburg virus infection in cells |
| | from bats and humans |
| 02/2015 | 30. Winterseminar der Bioinformatik, Bled, Slovenia |
| , , | Fight against Ebola - in silico - |
| | |

CITATION ANALYSIS

Total number of publications:
No. of peer rev. publications:
No. of submissions & preprints:
No. of book chapters:
h-index:
Citations:
Average impact factor:

ORCID

OOO0-0001-7090-871

ORCID | 0000-0001-7090-8717 Google Scholar | goo.gl/CY4352

PUBLICATIONS

Peer-reviewed journal publications

 Ψ These authors contributed equally

- A. Viehweger, S. Krautwurst, K. Lamkiewicz, R, Madhugiri, J. Ziebuhr, M. Hölzer, and M. Marz. Direct RNA nanopore sequencing of full-length coronavirus genomes provides novel insights into structural variants and enables modification analysis. *Genome Research*, 2019. IF: 10.1
- M. Hölzer $^{\Psi}$, A. Schoen $^{\Psi}$, J. Wulle, MA. Müller, C. Drosten, M. Marz, and F. Weber. Virus- and interferon alpha-induced transcriptomes of cells from the microbat *Myotis daubentonii*. *ISCIENCE* 2019. IF: na
- 16 K. Laroucau, F. Vorimore, R. Aaziz, L. Solmonson, RC. Hsia, PM. Bavoil, P. Fach, M. Hölzer, A. Wuenschmann, and K. Sachse. *Chlamydia buteonis*, a new *Chlamydia* species isolated from a red-shouldered hawk. *Systematic and Applied Microbiology* 2019.
 IF: 3.2
- 15 R. Kallies, M. Hölzer, R. Brizola Toscan, U. Nunes da Rocha, J. Anders, M. Marz, and A. Chatzinotas. Evaluation of sequencing library preparation protocols for viral metagenomic analysis from pristine aquifer groundwaters. *Viruses* 11(6), 484, 2019.
 IF: 3.7
- 14 S. Peter, M. Hölzer, K. Lamkiewicz, P. Speroni di Fenizio, HA. Hwaeer, M. Marz, S. Schuster, P. Dittrich, and B. Ibrahim. Structure and hierarchy of influenza virus models revealed by reaction network analysis. *Viruses* 11(5), 2019. **IF: 3.7**
- 13 **M. Hölzer** and M. Marz. *De novo* transcriptome assembly: A comprehensive cross-species comparison of short-read RNA-Seq assemblers. *GigaScience* 8(5), 2019. IF: 7.3
- Z. Chen, E. Amro, F. Becker, M. Hölzer, S. Rasa, S. Njeru, B. Han, S. Di Sanzo, Y. Chen, D. Tang, S. Tao, R. Haenold, M. Groth, V. Romanov, J. Kirkpatrick, J. Kraus, H. Kestler, M. Marz, A. Ori, F. Neri, Y. Morita, and K. L. Rudolph. Cohesin-mediated NF-κB signaling limits hematopoietic stem cell self-renewal in aging and inflammation. J. Exp. Med. 216(1), 152–175, 2018.
 IF: 10.8

- D. Desirò, M. Hölzer, B. Ibrahim, and M. Marz. SilentMutations (SIM): a tool for analyzing long-range RNA-RNA interactions in viral genomes and structured RNAs. *Virus Res.*, 2018. IF: 2.5
- D. Steinbach, M. Hölzer, M. Marz, M. Gajda, F. C. Von Rundstedt, and M. O. Grimm. Analysis of molecular mechanism of progression of non-muscle-invasive bladder cancer (NMIBC) by genome-wide exome and UTR mutation analysis. *Eur Urol Suppl.* 17(2), e1523, 2018.
 IF: 3.5
- 9 P. Möbius, G. Nordsiek, M. Hölzer, M. Jarek, M. Marz, and H. Köhler. Complete Genome Sequence of JII-1961, a Bovine *Mycobacterium avium* subsp. *paratuberculosis* Field Isolate from Germany. *Genome Announc.* 5(34), 2017. IF: 1.2
- J. Fuchs, M. Hölzer, M. Schilling, C. Patzina, A. Schoen, T. Hoenen, G. Zimmer, M. Marz, F. Weber, M. A. Müller, and G. Kochs. Evolution and Antiviral Specificities of Interferon-Induced Mx Proteins of Bats against Ebola, Influenza, and Other RNA Viruses. J Virol. 12; 91(15), 2017.
 IF: 4.7
- P. Möbius, E. Liebler-Tenorio, **M. Hölzer**, and H. Koehler. Evaluation of associations between genotypes of *Mycobacterium avium* subsp. *paratuberculsis* and presence of intestinal lesions characteristic of paratuberculosis. *Veterinary microbiology*. 201, 188-194, 2017. **IF: 2.6**
- 6 K. Riege $^{\Psi}$, M. Hölzer $^{\Psi}$, T. Klassert, E. Barth, J. Bräuer, M. Collatz, F. Hufsky, N. Mostajo, M. Stock, B. Vogel, H. Slevogt, and M. Marz. Massive Effect on LncRNAs in Human Monocytes During Fungal and Bacterial Infections and in Response to Vitamins A and D. *Sci Rep.* 7:40598, 2017. IF: 4.8
- T. E. Klassert, J. Bräuer, M. Hölzer, M. Stock, K. Riege, C. Zubiría-Barrera, M. M. Müller, S. Rummler, C. Skerka, M. Marz, and H. Slevogt. Differential Effects of Vitamins A and D on the Transcriptional Landscape of Human Monocytes during Infection. Sci Rep. 7:40599, 2017.
- M. Hölzer^Ψ, V. Krähling^Ψ, F. Amman, E. Barth, S. H. Bernhart, V. A. O. Carmelo, M. Collatz, G. Doose, F. Eggenhofer, J. Ewald, J. Fallmann, L. M. Feldhahn, M. Fricke, J. Gebauer, A. J. Gruber, F. Hufsky, H. Indrischek, S. Kanton, J. Linde, N. M. Berrospi, R. Ochsenreiter, K. Rieger, L. Rivarola-Duarte, A. H. Sahyoun, S. J. Saunders, S. E. Seemann, A. Tanzer, B. Vogel, S. Wehner, M. T. Wolfinger, R. Backofen, J. Gorodkin, I. Grosse, I. Hofacker, S. Hoffmann, C. Kaleta, P. F. Stadler, S. Becker, and M. Marz. Differential transcriptional responses to Ebola and Marburg virus infection in bat and human cells. Sci Rep. 6:34589, 2016
- M. Hölzer, K. Laroucau, H. H. Creasy, S. Ott, F. Vorimore, P. M. Bavoil, M. Marz, and K. Sachse. Whole-genome sequence of *Chlamydia gallinacea* type strain 08-1274/3. *Genome Announc*. 4(4):e00708–16, 2016. IF: 1.2
- P. Möbius $^{\Psi}$, M. Hölzer $^{\Psi}$, M. Felder, G. Nordsiek, M. Groth, H. Köhler, K. Reichwald, M. Platzer, and M. Marz. Comprehensive insights in the *Mycobacterium avium* subsp. *paratuberculosis* genome using new WGS data of sheep strain JIII-386 from Germany. *Genome Biol Evol.* 7(9):2585-2601, 2015. **IF: 3.9**

A. H. Sahyoun, M. Hölzer, F. Jühling, C. Höner Zu Siederdissen, M. Al-Arab, K. Tout, M. Marz, M. Middendorf, P. F. Stadler, and M. Bernt. Towards a comprehensive picture of alloacceptor tRNA remolding in metazoan mitochondrial genomes. *Nucleic Acids Res.* 43(16):8044-8056, 2015. IF: 11.5

Submitted journal publications & preprints

N. Mostajo Berrospi, M. Lataretu, S. Krautwurst, F. Mock, D. Desirò, K. Lamkiewicz, M. Collatz, A. Schoen, F. Weber, M. Marz, and M. Hölzer. A comprehensive annotation and differential expression analysis of short and long non-coding RNAs in 16 bat genomes. *bioRxiv.* doi.org/10.1101/738526, 2019.

R. Gerst and M. Hölzer. PCAGO: An interactive web service to analyze RNA-Seq data with principal component analysis. *bioRxiv.* doi.org/10.1101/433078, 2018.

Book chapter

M. Hölzer and M. Marz. Chapter Nine – Software Dedicated to Virus Sequence Analysis "Bioinformatics Goes Viral". *Adv Virus Res.* (ed. M. Beer), 99:233-257, Academic Press, 2017.

Theses

M. Hölzer. The Dark Art of Next-Generation Sequencing: fundamental approaches for genomics, transcriptomics, and differential gene expression. *PhD thesis*, University of Jena, 2018.

M. Hölzer. Data management of mass spectra and fragmentation trees with BExIS. *Diploma thesis*, in German, University of Jena, 2012.

SOFT SKILLS

| 06/2019 | Managing a Bioinformatics Core Facility, European Bioinformatics Institute |
|------------|---|
| | (EMBL-EBI), Hinxton, UK |
| 07/2018 | Fördermöglichkeiten für exzellente Nachwuchswissenschaftler/innen, Dr. Mareile |
| | Knees, Jena |
| 05/2018 | Workshop "Drittmittel einwerben", Jana Dümmler, Graduate Academy, Jena |
| 02/2018 | Patente als Chance für meine Forschung, Dr. Christian Liutik, Patentinforma- |
| | tionszentrum FSU, Jena |
| 02/2018 | Pursuing an Academic Career in Germany: Pros and Cons, Dr. Hanna Kauhaus, |
| | Graduate Academy, Jena |
| 02/2018 | Proposal Writing Workshop, Frank Lauterbach, iRTG AquaDiva, Jena |
| 03/2014 | Mitteldeutscher Fundraisingtag, Crowdfunding: Chancen und Grenzen, |
| | FundraisingForum e.V., Jena |
| 04/2013 | Jugendgruppenleiter Card (JuLeiCa), nationwide uniform identity card for vol- |
| | untary people in youth work, VTPV e.V., Bad Blankenburg |
| 03/2012 | Mitteldeutscher Fundraisingtag, Fundraising und Freiwillige: wie passt das |
| | zusammen? FundraisingForum e.V., Jena |
| 09/2010 | Web 2.0 - für Vereine, Initiativen $\mathcal E$ Parteien, Thomas Mergen, Friedrich- |
| | Naumann-Stiftung für die Freiheit, Erfurt |
| | |
| since 2002 | Various workshops, seminars, and advanced trainings about time and group |
| | management, group dynamics, self-motivation, project planning, association |
| | and employment law, speech, presentation, administration, and building |
| | management. |
| | |

LEADERSHIP EXPERIENCES & NON-SCIENTIFIC ACTIVITIES

Scout association "Bund der Pfadfinderinnen und Pfadfinder" (BdP)

Management board member of "Scoutactive" registered society since 2012 Administrative tasks and writing of proposals for staff funding. since 2008 Assistant manager of BdP scouting center of Thuringia Administrative tasks, coordination of staff and volunteers, realization of adventure activities for kids and youths, technical support, web site and hardware supervision. since 2007 Assistant leader of BdP "Landesverband Thüringen e.V." Organization of scout activities in Thuringia and across national borders. Organized events, trainings, and elections. 2005-2015 Group leader of BdP scout tribe "Falken vom Greifenstein" Administration of the association. Active participation and mainly responsible for the management and organization of various scout camps, international cooperations, and regular meetings. Managed team conflict and morale, represented the association at national and international events.

since 1998 | Member of BdP

Water of Life

since 2017 | Co-Founder and organizer of the Bad Blankenburger "Kessel-Treffen" | Coordination of Scottish events and whisky tastings, www.kessel-treffen.de. | Whisky tastings | Preparation and execution of whisky tastings for beginner and advanced

Music

since 1999 | Piano

LANGUAGES

German Native language

English Written and spoken fluently

REFERENCES

Prof. Dr. Manja Marz

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Dr. Konrad K. W. Sachse

1992–2015
Head of Department
Friedrich Loeffler Institute
Institute of Molecular Pathogenesis
(Chlamydia and Mycoplasma)
Germany, Jena, Thuringia
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