

Dr. Michael J. Ziller

Personal Data

Date of birth: 17/07/1983

Place of birth: Hamm (Germany)

Nationality: German

Research Experience

2016-present	Principal Investigator and Independent Group Leader, Max-Planck Institute of Psychiatry, Germany
2014-2015	Postdoctoral Fellow in the Department of Stem Cell and Regenerative Biology, Harvard University, USA
2009-2015	Graduate Research Assistant, The Broad Institute of Harvard and MIT, USA
2010-2014	Visiting PhD student in the Department of Stem Cell and Regenerative Biology, Harvard University and the Broad Institute of Harvard and MIT, USA
2009-2010	Visiting student in the Department of Stem Cell and Regenerative Biology, Harvard University and the Broad Institute, USA

First author publications

- Galonska C*, **Ziller MJ***, Karnik R, Meissner A, Ground state conditions induce rapid reorganization of core pluripotency factor binding that precede global epigenetic reprogramming, *Cell Stem Cell*, 2015
- Cacchiarelli D*, Trapnell C*, **Ziller MJ***, Soumillon M, Cesana M, Smith ZD, Karnik R, Ratanasirintrao S, Zhang X, Wu Z, Akopian V, Gifford CA, Rinn JL, Daley GQ, Meissner A, Lander ES, Mikkelsen TS, A scalable cellular reprogramming system and integrative genomic approaches reveal ordered transitions towards pluripotency in human cells, *Cell*, 2015
- Roadmap Epigenomics Consortium - **Co-leader integrative analysis**, Integrative analysis of 111 reference human epigenomes, *Nature*, 2015 – Featured as cover story
- Ziller MJ**, Reuven E, Yaffe Y, Donaghey J, Pop R, Mallard W, Issner R, Gifford CA, Goren A, Xing J, Gu H, Cacchiarelli D, Tsankov A, Epstein C, Rinn JL, Mikkelsen TS, Kohlbacher O, Gnirke A, Bernstein BE, Elkabetz Y, Meissner A, Dissecting neural differentiation regulatory networks through epigenetic footprinting, *Nature*, 2014 – Featured in News & Views, Nature 518, p.314-316 and the Economist, Feb 18th 2015
- Ziller MJ**, Hansen KD, Meissner A, Aryee MJ, Coverage and replicate requirements for whole genome bisulfite sequencing, *Nature Methods*, 2014
- Ziller MJ**, Gu H, Müller F, Donaghey J, Tsai LT, Kohlbacher O, De Jager PL, Rosen ED, Bennett DA, Bernstein BE, Gnirke A, Meissner A, Charting a dynamic DNA methylation landscape of the human genome, *Nature*, 2013 – Featured as cover story
- Gifford CA*, **Ziller MJ***, Gu H, Trapnell C, Donaghey J, Tsankov A, Shalek AK, Kelley DR, Shishkin AA, Issner R, Zhang X, Coyne M, Fostel JL, Holmes L, Meldrim J, Guttman M,

Epstein C, Park H, Kohlbacher O, Rinn J, Gnirke A, Lander ES, Bernstein BE, Meissner A, Transcriptional and epigenetic dynamics during specification of human embryonic stem cells, *Cell*, 2013

8. **Ziller MJ***, Müller F*, Liao J, Zhang Y, Gu H, Bock C, Boyle P, Epstein CB, Bernstein BE, Lengauer T, Gnirke A, Meissner A, Genomic Distribution and Inter-Sample Variation of non-CpG Methylation Across Human Cell Types, *PLoS Genetics*, 2011 – Featured as research highlight by *Nature Reviews in Genetics*, 13,75 2012

* Equal contribution

Co-Authored Publications

12. **Ziller MJ**, Stamenova EK, Gu H, Gnirke A, Meissner A, Targeted bisulfite sequencing of the dynamic DNA methylome, *Epigenetics Chromatin*, 2016

13. Hoffmann A, **Ziller MJ**, Spengler D, The Future is The Past: Methylation QTLs in Schizophrenia, *Genes*, 2016

14. Yu VW, Yusuf RZ, Oki T, Wu J, Saez B, Wang X, Cook C, Baryawno N, **Ziller MJ**, Lee E, Gu H, Meissner A, Lin CP, Kharchenko PV, Scadden DT, Epigenetic Memory Underlies Cell-Autonomous Heterogeneous Behavior of Hematopoietic Stem Cells, *Cell*, 2016

15. Libertini E, Heath SC, Hamoudi RA, Gut M, **Ziller MJ**, Herrero J, Czyz A, Ruotti V, Stunnenberg HG, Frontini M, Ouwehand WH, Meissner A, Gut IG, Beck S, Saturation analysis for whole-genome bisulfite sequencing data, *Nat Biotechnol.*, 2016

16. Libertini E, Heath SC, Hamoudi RA, Gut M, **Ziller MJ**, Czyz A, Ruotti V, Stunnenberg HG, Frontini M, Ouwehand WH, Meissner A, Gut IG, Beck S, Information recovery from low coverage whole-genome bisulfite sequencing, *Nat Commun.*, 2016

17. Shea JM, Serra RW, Carone BR, Shulha HP, Kucukural A, **Ziller MJ**, Vallaster MP, Gu H, Tapper AR, Gardner PD, Meissner A, Garber M, Rando OJ, Genetic and Epigenetic Variation, but Not Diet, Shape the Sperm Methylome, *Developmental Cell*, 2016

18. Jing L*, Karnik R*, Gu H, **Ziller MJ**, Clement K, Tsankov A, Akopian V, Gifford CA, Donaghey J, Galonska C, Gnirke A, Meissner A, Targeted disruption of DNMT1, 3A and 3B in human embryonic stem cells, *Nature Genetics*, 2015

19. Edri R*, Yaffe Y*, **Ziller MJ**, Ziv O, Mashenko D, Zaritski A, David E, Jacob-Hirsch J, Rechavi G, Gat-Vics I, Wolf L, Meissner A, Elkabetz Y, Prospective isolation of distinct human ES cell derived neural progenitor cells provides a cell culture model for CNS establishment and cerebral development, *Nature Communications*, 2015

20. Tsankov A, Gu H, Akopian A, **Ziller MJ**, Amit I, Meissner A, Modular and context dependent rewiring of transcription factor networks during human ESC differentiation, in *Nature*, 2015

21. Landau DA*, Clement K*, **Ziller MJ**, Boyle P, Gu H, Stevenson K, Sougnez C, Zhang W, Ghandi M, Garraway L, Kiezun A, Fernandes SM, Tesar B, Gabriel S, Gnirke A, Lander ES, Brown JR, Neuberg D, Hacohen D, Getz G, Meissner A, Wu CJ, Locally disordered DNA methylation contributes to intraleukemic epigenetic heterogeneity and clonal evolution, *Cancer Cell*, 2014

22. Ichida JK*, TCW J*, Williams, LA*, Carter AC, Shi Y, Moura MT, **Ziller MJ**, Singh S, Amabile G, Bock C, Umezawa A, Rubin LL, Bradner JE, Akutsu H, Meissner AM, Eggan, K, Notch inhibition allows oncogene-independent generation of iPS cells, *Nature Chemical Biology*, 2014

23. Kiskinis E*, Sandoe J*, Williams LA, Boulting GL, Moccia R, Wainger BJ, Han S, Peng T, Thams S, Mikkilineni S, Mellin C, Merkle FT, Davis-Dusenbery BN, **Ziller MJ**, Oakley D, Ichida J, Di Costanzo S, Atwater N, Maeder ML, Goodwin MJ, Nemesh J, Handsaker RE, Paull D, Noggle S, McCarroll SA, Joung JK, Woolf CJ, Brown RH, Eggan K, Pathways disrupted in human ALS motor neurons identified through genetic correction of mutant SOD1, *Cell Stem Cell*, 2014
24. Kearns NA, Genga RM*, **Ziller MJ***, Kapinas K, Peters H, Brehm MA, Meissner A, Maehr R, Generation of organized anterior foregut epithelia from pluripotent stem cells using small molecules, *Stem Cell Res*, 2013
25. Keller R, Dörr A, Tabira A, Funahashi A, **Ziller MJ**, Adams R, Rodriguez N, Novère NL, Hiroi N, Planatscher H, Zell A, Dräger A, The systems biology simulation core algorithm, *BMC Syst Biol* 2013
26. Akopian V, Chan MM, Clement K, Galonska C, Gifford CA, Lehtola E, Liao J, Samavarchi-Tehrani P, Sindhu C, Smith ZD, Tsankov AM, Webster J, Zhang Y, **Ziller MJ**, Meissner A, Epigenomics and chromatin dynamics, *Genome Biology*, 2012
27. Boyle P*, Clement K*, Gu H, Smith ZD, **Ziller MJ**, Fostel JL, Holmes L, Meldrim J, Kelly F, Gnirke A, Meissner A, Gel-free multiplexed reduced representation bisulfite sequencing for large-scale DNA methylation profiling, *Genome Biology* 2011
28. Bock C*, Kiskinis E*, Verstappen G*, Gu H, Boulting G, Smith ZD, **Ziller MJ**, Croft GF, Amoroso MW, Oakley DH, Gnirke A, Eggan K, Meissner A., Reference Maps of human ES and iPS cell variation enable high-throughput characterization of pluripotent cell lines, *Cell*, 2011
29. Zhang F, Weggler S, **Ziller MJ**, Ianeselli L, Heck BS, Hildebrandt A, Kohlbacher O, Skoda MW, Jacobs RM, Schreiber F., Universality of protein reentrant condensation in solution induced by multivalent metal ions, *Proteins*, 2010
30. Dräger A, Kronfeld M, **Ziller MJ**, Supper J, Planatscher H, Magnus JB, Oldiges M, Kohlbacher O, Zell A, Modeling Metabolic Networks in *C. glutamicum*: A Comparison of Rate Laws in Combination with Various Parameter Optimization Strategies, *BMC Sys Biol*, 2009

Education

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| 2010-2014 | <i>Dr. rer .nat. in Bioinformatics, summa cum laude University of Tuebingen (2014)</i>
Advisors: Prof. Alex Meissner (Harvard University, USA)
Prof. Oliver Kohlbacher (University of Tuebingen, Germany) |
| 2003-2010 | Diplom in Physics and Diplom in Bioinformatics, University of Tuebingen, Germany - <i>with honors</i>
Majors: Mathematical/Computational Physics, Molecular Biology/Genetics
Theses: <i>Simulation of Protein Charge Distributions Under the Influence of Salt</i> (Physics);
<i>Automated Mathematical Modeling of Biochemical Reaction Networks</i> (Bioinformatics) |
| 2003 | Abitur (A-Levels) - <i>with distinction</i> (1.0), Archigymnasium Soest, Germany |

Additional Scientific Training and Work Experience

- 2011-2012 Instructor *DRB Bootcamp* for first year PhD students, Harvard University
- 2007-2009 Research Assistant, Computer Architecture Group, University of Tuebingen, Germany: Conducted independent research in Systems Biology focusing on mathematical modeling of biochemical reaction networks using stochastic differential equations
- 2008-2009 Teaching Assistant for *Mathematical Methods for Biology*, Mathematics Department, University of Tuebingen, Germany
- 2008 International Summer School on Emergence, Tuebingen, Germany
- 2004-2008 Teaching Assistant for Graduate Level Courses in *Algorithms and Advanced Algorithms and Complexity*, Computer Science Department, University of Tuebingen, Germany
- 2003 Internship at Circuit Technology Group, Heinz Nixdorf Institute, Paderborn, Germany: Research on the dynamic interaction of micro robots

Awards and Fellowships

- 2010-2013 PhD fellowship by Studienstiftung des Deutschen Volkes
- 2009 DAAD Master Thesis Fellowship for Conducting Research Abroad
- 2002 2nd place in German Young Scientists (*Jugend Forscht*), Dortmund, Germany: *Molecular modeling based on quantum mechanical ab initio calculations*
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