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Institute of Bioengineering
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Education

California Institute of Technology Pasadena, CA
Doctor of Philosophy, 2008
Biochemistry and Molecular Biophysics Option
Thesis Advisor: Prof. Stephen R. Quake
Thesis Topic: Microfluidic Large-Scale Integration and its Application to Systems Biology

Fairleigh Dickinson University Madison, NJ
Bachelor of Science, Biology, cum laude, 2001
Bachelor of Science, Chemistry, with Honors, cum laude, 2001

Professional Experience

École Polytechnique Fédérale de Lausanne Lausanne, Switzerland
Tenured Associate Professor 2015 - present
Institute of Bioengineering, School of Engineering

École Polytechnique Fédérale de Lausanne Lausanne, Switzerland
Tenure Track Assistant Professor 2008 - 2015
Institute of Bioengineering, School of Engineering

Howard Hughes Medical Institute Stanford, CA
Visiting Graduate Student 2005 - 2008
Department of Bioengineering, Stanford University

California Institute of Technology Pasadena, CA
Graduate Student 2001 - 2008
Biochemistry and Molecular Biophysics Option

California Institute of Technology Pasadena, CA
Co-Director, Microfluidic Foundry 2003 - 2005

BASF Bioresearch Corporation Worcester, MA
Intern Summer, 1999 and 2000

Peer Reviewed Publications

40. Bheda P., Aguilar-Gomez D., Becker N.B., Becker J., Stravrou E., Kukhtevich I., Höfer T., Maerkl S., Charvin G., Marr C., Kirmizis A. and Schneider R., "Single-cell tracing dissects maintenance and inheritance of transcriptional memory", **Molecular Cell**, DOI: 10.1016/j.molcel.2020.04.016 (2020) [paper link](#)
39. Wan X., Volpetti F., Petrova E., French C., Maerkl S.J. and Wang B., "Cascaded signal amplifying gene circuits enable ultrasensitive cellular sensors for arsenic and mercury", **Nature Chemical Biology**, DOI: 10.1038/s41589-019-0244-3 (2019) [paper link](#)

38. van der Linden A., Yelleswarapu M., Pieters P.A., Swank Z., Huck W.T.S., Maerkl S.J. and de Greef T.F.A., "A Multilayer Microfluidic Platform for the Conduction of Prolonged Cell-free Gene Expression", **JOVE**, DOI:10.3791/59655 (2019) [paper link](#)
37. Swank Z.*, Laohakunakorn N.* and Maerkl S.J., "Cell-free gene regulatory network engineering with synthetic transcription factors", **PNAS**, DOI: 10.1073/pnas.1816591116 (2019) [paper link](#)
36. Lavickova B. and Maerkl S.J., "A simple, robust, and low-cost method to produce the PURE cell - free system.", **ACS Synthetic Biology**, DOI: 10.1021/acssynbio.8b00427 (2019). Most Read Articles. [paper link](#)
35. Chang J., Swank Z., Keiser O., Maerkl S.J. and Amstad E., "Microfluidic device for on-chip mixing and encapsulation of lysates", **Scientific Reports**, DOI: 10.1038/s41598-018-26542-x (2018) [paper link](#)
34. Woodruff K. and Maerkl S.J., "A microfluidic module for real-time generation of complex multi-molecule temporal concentration profiles.", **Analytical Chemistry**, DOI: 10.1021/acs.analchem.7b04099 (2017) [paper link](#)
33. Volpetti F., Petrova E., and Maerkl S.J., "A microfluidic biodisplay.", **ACS Synthetic Biology**, DOI: 10.1021/acssynbio.7b00088 (2017) [paper link](#)
32. Bulushev R.D., Mrion S., Petrova K., James S.D., Maerkl S.J., and Radenovic A., "Single Molecule Localisation and Discrimination of DNA-Protein Complexes by Controlled Translocation Through Nanocapillaries.", **Nano Letters**, DOI: 10.1021/acs.nanolett.6b04165 (2016) [paper link](#)
31. De Maddalena L.L.,Niederholtmeyer H.,Turtola M.,Swank Z., Belogurov G.A., and Maerkl S.J., "GreA and GreB enhance Escherichia coli RNA polymerase transcription rate in a reconstituted transcription-translation system.", **ACS Synthetic Biology**, DOI: 10.1021/acssynbio.6b00017 (2016). [paper link](#)
30. Tatarova Z., Abbuehl J.P., Maerkl S.J., and Huelsken J., "Microfluidic co-culture platform to quantify chemotaxis of primary stem cells" **LOC**, DOI: 10.1039/C6LC00236F (2016) [paper link](#).
29. Woodruff K. and Maerkl S.J., "A High-Throughput Microfluidic Platform for Mammalian Cell Transfection and Culturing" **Scientific Reports**, DOI: 10.1038/srep23937 (2016) [paper link](#).
28. Piraino F.*, Volpetti F.*, Watson C., and Maerkl S.J., "A Digital-Analog Microfluidic Platform for Patient-Centric Multiplexed Biomarker Diagnostics of Ultra-Low Volume Samples", **ACS Nano**, DOI: 10.1021/acsnano.5b07939 (2016). Featured in: EurekaAlert, The Times of India, RTS, SwissInfo, EPFL News. [paper link](#).
27. Blackburn M.C.,Petrova E.,Correia B.E., and Maerkl S.J., "Integrating Gene Synthesis and Microfluidic Protein Analysis for Rapid Protein Engineering.", **Nucleic Acids Research**, DOI: 10.1093/nar/gkv1497 (2015). [paper link](#)
26. Niederholtmeyer H. *,Sun Z. *,Hori Y.,Yeung E.,Verpoorte A., Murray R.M. , and Maerkl S.J. , "Rapid cell-free forward engineering of novel genetic ring oscillators.", **eLife**, DOI:10.7554/eLife.09771 (2015). [paper link](#)
25. Volpetti F., Garcia-Cordero J.L., and Maerkl S.J., "A microfluidic platform for high-throughput multiplexed protein quantitation." **PLoS One**, DOI: 10.1371/journal.pone.0117744 (2015). [paper link](#)
24. Knight B., Kubik S., Ghosh B., Bruzzone M.J., Geertz M., Martin V., Denervaud N., Jacquet P., Ozkan B., Rougemont J., Maerkl S.J., Naef F., and Shore D., "Two distinct promoter architectures centered on dynamic nucleosomes control ribosomal protein gene transcription" **Genes & Development**, DOI: 10.1101/gad.244434.114 (2014). [paper link](#)
23. Acimovic S.S., Ortega M.A., Sanz V., Berthelot J., Garcia-Cordero J.L., Renger J., Maerkl S.J., Kreuzer M., and Quidant R. "LSPR Chip for Parallel, Rapid, and Sensitive Detection of Cancer Markers in Serum." **Nano Letters**, DOI:10.1021/nl500574n (2014). Featured in: Science Daily, Phys.org, EurekaAlert. [paper link](#)

*these authors contributed equally

22. Nobs J.B. and Maerkl S.J. "Long-term single cell analysis of *S. pombe* on a microfluidic microchemostat array." **PLoS One**, DOI: 10.1371/journal.pone.0093466 (2014). [paper link](#)
21. Garcia-Cordero J.L. and Maerkl S.J. "A 1,024-sample serum analyzer chip for cancer diagnostics." **Lab on a Chip**, DOI: 10.1039/C3LC51153G (2013). Featured in: LOC Top 10%, Chemistry World, LOC most downloaded articles, Lab on a Chip Blog. [paper link](#)
20. Niederholtmeyer H., Stepanova V., and Maerkl S.J. "Implementation of cell-free biological networks at steady-state." **PNAS**, DOI: 10.1073/pnas.1311166110 (2013). [paper link](#)
19. Denervaud N., Becker J., Delgado-Gonzalo R., Damay P., Rajkumar A.S., Unser M., Shore D., Naef F. and Maerkl S.J. "A chemostat array enables the spatio-temporal analysis of the yeast proteome." **PNAS**, DOI: 10.1073/pnas.1308265110 (2013). Featured in: LOC Research Highlights, Molecular Systems Biology Editor's Selection, GenomeWeb. [paper link](#)
18. Rajkumar A.S., Denervaud N., and Maerkl S.J. "Mapping the fine structure of a eukaryotic promoter input-output function." **Nature Genetics**, DOI:10.1038/ng.2729 (2013). Featured in: Nature Methods, EPFL News, Scicasts, MedicalExpress, Radio Canada [paper link](#)
17. Woodruff K., Fidalgo L.M., Gobaa S., Lutolf M.P., and Maerkl S.J. "Live Mammalian Cell Arrays." **Nature Methods**, DOI:10.1038/nmeth.2473 (2013). Featured in Faculty of 1000. [paper link](#)
16. Garcia-Cordero J.L., Nembrini C., Stano A., Hubbell J.A., and Maerkl S.J. "A high-throughput nanoimmunoassay chip applied to large-scale vaccine adjuvant screening." **Integrative Biology**, DOI: 10.1039/C3IB20263A (2013). Inside Front Cover, Most Read Articles, Top Ten Most Accessed Papers in Q2 2013. [paper link](#)
15. Niederholtmeyer H. and Maerkl S.J. "Real-time mRNA measurement during an in vitro transcription and translation reaction using binary probes." **ACS Synthetic Biology**, DOI:10.1021/sb300104f (2012). [paper link](#)
14. Rockel S., Hens K., Geertz M., Deplancke B. and Maerkl S.J. "iSLIM: a comprehensive approach to mapping and characterizing gene regulatory networks." **Nucleic Acids Research**, DOI:10.1093/nar/gks1323 (2012). [paper link](#)
13. Garcia-Cordero J.L. and Maerkl S.J. "Multiplexed surface micropatterning of proteins with a pressure-modulated microfluidic button-membrane." **Chem. Commun.**, DOI:10.1039/C2CC37740C (2012). Inside Front Cover, Special Issue on Microfluidics [paper link](#)
12. Geertz M., Shore D., and Maerkl S.J. "Massively parallel measurements of biomolecular interaction kinetics on a microfluidic device." **PNAS**, DOI:10.1073/pnas.1206011109 (2012). Covered by: Science Daily, ASBMB, Phys.org, Radio Canada. [paper link](#)
11. Schroeter C., Ares S., Morelli L.G., Isakova A., Hens K.J.I., Gajewski M., Juelicher F., Maerkl S.J., Deplancke B. and Oates A. C. "Ubiquitous dimerization and selective DNA binding determine the dynamics of the zebrafish segmentation clock's core circuit." **PLoS Biology**, 10(7): e1001364 (2012). Highlighted in: Nature Reviews Genetics. [paper link](#)
10. Rajkumar A.S. and Maerkl S.J., "Rapid Synthesis Of Defined Eukaryotic Promoter Libraries.", **ACS Synthetic Biology**, DOI:10.1021/sb300045j (2012). Top 5 most read articles in July. [paper link](#)
9. Schultzaberger R.K., Maerkl S.J., Kirsch J.F. and M.B. Eisen "Probing the Informational and Regulatory Plasticity of a Transcription Factor DNA-Binding Domain.", **PLoS Genetics**, 8(3): e1002614 (2012). [paper link](#)
8. He B., Holloway A., Maerkl S.J. and Kreitman M., "Does positive selection drive transcription factor binding site turnover? A test with *Drosophila* cis-regulatory modules.", **PLoS Genetics**, e1002053 (2011). [paper link](#)
7. Fidalgo L.M. and Maerkl S.J., "A software-programmable microfluidic device for automated biology.", **Lab on a Chip**, 11(9), 1612-9 (2011). Top 10 most accessed papers in March 2011. [paper link](#)
6. Maerkl S.J. and Quake S.R. "Experimental determination of the evolvability of a helix-loop-helix transcription factor.", **PNAS**, 106, 18650-5 (2009). Featured in: Faculty of 1000. [paper link](#)

5. Huang L, Maerkl S.J., and Martin O.J., "Integration of plasmonic trapping in a microfluidic environment.", **Optics Express**, **17**, 6018-24, (2009). [paper link](#)
4. Gerber D, Maerkl S.J. and Quake S.R."An in vitro microfluidic approach to generating protein interaction networks", **Nature Methods**, **6**, 71-4 (2009). [paper link](#)
3. Einav S., Gerber D., Bryson P., Sklan E.H., Elazar M., Maerkl S.J., Glenn J.S. and Quake S.R."Pharmacological Inhibitors of a New Hepatitis C Target Discovered by Microfluidic Affinity Analysis", **Nature Biotechnology**, **26**, 1019-27, (2008). Cover; Featured in: Chemistry World. [paper link](#)
2. Maerkl S.J. and Quake S.R."A Systems Approach to Measuring the Binding Energy Landscapes of Transcription Factors", **Science**, **315**, 233-7 (2007). Featured in: Scientific American, Chemical & Engineering News, HHMI News, Nature Methods. [paper link](#)
1. Thorsen T., Maerkl S.J. and Quake S.R."Microfluidic Large Scale Integration",**Science**, **298**, 580-4 (2002). Science Express, Cover; Featured in: Faculty of 1000, Chemical & Engineering News, Nature Science Update, Technology Research News, Science Watch Top 10, ESI-Topics: Microfluidic Devices Top 10 papers (2007). [paper link](#)

Preprints or submitted

4. Swank S., Michielin G., Yip H.M., Cohen P., Andrey D.O., Vuilleumier N., Kaiser L., Eckerle I.*, Meyer B.*, and Maerkl S.J.*, "A high-throughput microfluidic nano-immunoassay for detecting anti-SARS-CoV-2 antibodies in serum or ultra-low volume dried blood samples", medRxiv, DOI: 10.1101/2020.10.07.20208280 (2020) [paper link](#)
3. Giaveri S., Schmitt A.M., Julia L. R., Murello A., Menin L., Ortiz D., Patiny L., Bolisetty S., Mezzenga R., Maerkl S.J.*, and Stellacci F.*, "Nature-inspired Circular-economy Recycling (NaCRE) for Proteins: Proof of Concept", BioRxiv, DOI: 10.1101/2020.09.23.309799 (2020) [paper link](#)
2. Lavickova B., Laohakunakorn N., and Maerkl S.J., "A self-regenerating synthetic cell model", BioRxiv, DOI: 10.1101/2020.07.03.185900 (2020) [paper link](#)
1. Laohakunakorn N., Lavickova B., Swank Z., Laurent J., and Maerkl S.J., "Steady-state cell-free gene expression with microfluidic chemostats.", protocols.io, DOI: 10.17504/protocols.io.46wgzfe (2019) [paper link](#)

Reviews and Book Chapters (peer-reviewed)

10. Laohakunakorn N., Grasemann L., Lavickova B., Michielin G., Shahein A., Swank Z., and Maerkl S.J., "Bottom-up construction of complex biological systems with cell-free synthetic biology." **Frontiers in Biotechnology and Bioengineering**, DOI: 10.3389/fbioe.2020.00213 (2020) [paper link](#)
9. Jammes F. and Maerkl S.J., "How single-cell immunology is benefiting from microfluidic technologies." **Microsystems and Nanoengineering**, DOI: 10.5281/zenodo.3529331 (2020) [paper link](#)
8. Garcia-Cordero J.L. and Maerkl S.J., "Microfluidic systems for cancer diagnostics.", **Current Opinion in Biotechnology**, DOI: 10.1016/j.copbio.2019.11.022 (2019) [paper link](#)
7. Woodruff K. and Maerkl S.J., "Microfluidic Transfection for High-Throughput Mammalian Protein Expression", **Methods in Molecular Biology**, DOI: 10.1007/978-1-4939-8730-6_13 (2018) [paper link](#)
6. Garcia-Cordero J.L. and Maerkl S.J., "Mechanically Induced Trapping of Molecular Interactions and Its Applications.", **Journal of Laboratory Automation**, DOI: 10.1177/2211068215578586 (2014). [paper link](#)
5. Maerkl S.J., "Next generation microfluidic platforms for high-throughput protein biochemistry.", **Current Opinion in Biotechnology**, **22(1)**, 59-65 (2011). [paper link](#)
4. Geertz M. and Maerkl S.J., "Experimental strategies for studying transcription factor–DNA binding specificities.", **Briefings in Functional Genomics**, **9(5-6)**,362-73 (2010). [paper link](#)

3. Maerkl S.J., "Integration column: Microfluidic high-throughput screening.", **Integrative Biology**, **1(1)**, 19-29 (2009). [paper link](#)
2. Geertz M., Rockel S., and Maerkl S.J., "A high-throughput microfluidic method for generating and characterizing transcription factor mutant libraries.", **Methods in Molecular Biology**, **813**, 107-23 (2012). [paper link](#)
1. Rockel S., Geertz M., and Maerkl S.J., "MITOMI: A microfluidic platform for *in vitro* characterization of transcription factor–DNA interactions.", **Methods in Molecular Biology**, **786**, 97-114 (2012). [paper link](#)

Patents

6. Maerkl S.J., Piraino F., Volpetti F., "A system, device and method for multiplexed biomarker diagnostics of ultra-low volume whole blood samples", US Provisional Patent Application no. 62/267,959.
5. Maerkl S.J. and Garcia-Cordero J.L., "A High-throughput Nanoimmunoassay Chip.", WO 2014/060869 A1.
4. Fidalgo L.M. and Maerkl S.J., "A programmable, universally applicable microfluidic device platform.", patent application number EP10151515.3.
3. Maerkl S.J. and Quake S.R., "Programming Microfluidic Devices with Molecular Information", # 60/762,344.
2. Maerkl S.J. and Quake S.R., "Mechanically Induced Trapping of Molecular Interactions", US 9,329,179 B2.
1. Maerkl S.J., Thorsen T., Bao X., Quake S.R. and Studer V., "Microfluidic Large Scale Integration", # WO2004 028955.

Awards

2019 iGEM Grand Prize Winner (overgrad)

2016 ERC Consolidator Grant

2015 HFSP Program Grant

2012 Prix SSV - Ambition: EPFL prize for dedication to teaching and promotion of EPFL students and the school at large.

2008 Demetriades-Tsafka-Kokkalis Prize in Biotechnology or Related Fields: The prize honors annually the best Caltech Ph.D. thesis in the given category.

2005 1st place Innovator's Challenge. Category: Biotechnology. The I-Challenge is a joint technology contest amongst Stanford University, UC Berkeley and the California Institute of Technology.

Invited Conference Talks

59 Invited Conference Talks

2021 124th Titisee Conference "Life 2.0: From designing the molecules of life to designing life", Titisee, Germany.

2019 Cell-free Systems Conference, Boston, USA.

2019 Symposium on Synthetic and Systems Biology, Bordeaux, France. (Keynote)

2019 2nd Synthetic Biology UK Congress, London, UK. (Keynote)

2019 SynCell2019: Defining the Challenges, Madrid, Spain.

2019 NII Shonan Meeting on "Formal methods for the synthesis of biomolecular circuits", Shonan, Japan.

2019 IUPAC 2019, Paris, France.

2018 Key Challenges in Biophysics, Kloster Seeon, Germany.

2017 EPFL-ETHZ Summer School: Shaping the Future of Bioengineering, Davos, Switzerland (co-organizer).

2017 Open Plant Forum, University of Cambridge, England.

2017 HFSP Meeting, Lisbon, Portugal.

2017 Microfluidic Compartmentalization Workshop (OIST), Okinawa, Japan.

2017 1st European Congress on Cell-Free Synthetic Biology, Ascona, Switzerland (co-organizer).

2016 Frontiers in NanoBioEngineering and Medicine, EPFL, Switzerland.

2016 μ TAS, Dublin, Ireland
2016 All SystemsX.ch Day, Bern, Switzerland
2016 Prosense Winter School, EPFL, Switzerland.
2015 Microfluidics Congress, London, UK.
2015 EMBL Symposium: Biological Oscillators: Design, Mechanism, Function, Heidelberg, Germany.
2015 Dagstuhl Seminar 15352, Dagstuhl, Germany.
2015 EPFL-ETHZ joint Summer School in Translational Biology, Interlaken, Switzerland.
2015 VIB Conference: Next-Generation Antibodies and Protein Analysis: Tools and Technologies, Gent, Belgium.
2015 Lab on a Chip European Congress, Berlin, Germany.
2014 Synthetic Biology, Engineering, Evolution & Design, Manhattan Beach, USA.
2014 Workshop on Microfluidics and Microsystems, Ecole Polytechnique, France.
2014 Ludwig Cancer Research Center Minisymposium, CHUV, Switzerland.
2013 Annual Meeting of the National Doctoral Program in Informational and Structural Biology, Saariselka, Finland.
2013 Frontiers in Nanomedicine and Imaging, Lausanne, Switzerland.
2013 The Physical Biology of the Cell, Hawaii, USA.
2013 Microfluidics for Systems Biology and Bioprocess Development, Frankfurt, Germany.
2012 59th AVS International Symposium, Tampa, USA.
2012 MipTec 2012, Basel, Switzerland.
2012 Swiss Single Molecule Localisation Microscopy Symposium, EPFL, Switzerland.
2012 EMBL Conference: Microfluidics 2012, Heidelberg, Germany.
2012 GDR Microfluidique / Micro Nano Systems, Bordeaux, France.
2011 104th International Titisee Conference on “Genomic Regulation”, Titisee, Germany.
2011 1st International SystemsX.ch Conference, Basel, Switzerland.
2011 Bertinoro Computational Biology (BCB) Meeting, Italy.
2011 12th International Conference on Systems Biology (ICSB), Heidelberg/Mannheim, Germany.
2011 USGEB Meeting 2011, University of Zurich, Switzerland
2010 All SystemsX Day, University of Geneva, Switzerland.
2010 Swiss Image-Based Screening Conference, EPFL, Switzerland.
2010 NCCR Frontiers in Genetics Annual Meeting, Saas-Fee, Switzerland.
2010 NanoBio-Zurich 2010, Zurich, Switzerland.
2010 24th Annual Symposium of the Protein Society, San Diego, USA.
2010 Molecular Basis of Evolutionary Innovations, Marche-en-Famenne, Belgium.
2010 CMI Annual Review Meeting, EPFL, Switzerland.
2009 BioNano 2009, Aigle, Switzerland.
2009 Eurosensors School 2009, Lausanne, Switzerland.
2009 435. WE-Heraeus-Conference, Physics of Biological Function, Bad Honnef, Germany.
2009 Information Processing in Cells and Tissues (IPCAT 2009), Ascona, Switzerland.
2008 NCCR Frontiers in Genetics Annual Meeting, Saas-Fee, Switzerland.
2008 Synthetic Biology Workshop, University of Groningen, Netherlands.
2008 All-SystemsX.ch Day, Basel, Switzerland
2008 Union of the Swiss Societies of Experimental Biology, Lausanne, Switzerland.
2006 Genomes, Medicine and the Environment Conference, Hilton Head, SC.
2006 BioLSI-2, Caltech, CA.
2005 Biophysical Society Meeting, Long Beach, CA. (Poster)
2004 BioLSI-1, Aspen, CO.
2002 DARPA-BIOS Principal Investigator Kickoff Meeting, San Diego, CA.

Invited Seminars

44 Invited Seminars

- 2019 Institute for Molecules and Materials, Radboud University, Netherlands.
- 2019 Department of Chemistry, University of Rome Tor Vergata, Italy.
- 2016 Institut Pasteur, Paris, France.
- 2016 University of Bern, Switzerland.
- 2016 TU Darmstadt, Germany.
- 2016 Biozentrum, University of Basel, Switzerland.
- 2015 Yale University, USA.
- 2015 FAS Center for Systems Biology, Harvard University, USA.
- 2015 School of Biological Sciences, University of Edinburgh, UK.
- 2015 IGBMC, Strasbourg, France.
- 2015 KU Leuven, Leuven, Belgium.
- 2015 ICFO, Castelldefels, Spain.
- 2015 TU Eindhoven, Eindhoven, Netherlands.
- 2015 Utrecht University, Utrecht, Netherlands.
- 2014 Institute of Molecular Pathology, Vienna, Austria.
- 2014 Institute of Science and Technology Austria, Vienna, Austria.
- 2014 California Institute of Technology, Pasadena CA, USA.
- 2013 Department of Biosystems Science and Engineering, ETHZ, Switzerland.
- 2013 Department of Fundamental Microbiology, UNIL, Switzerland.
- 2013 Columbia University, New York, USA.
- 2013 University of British Columbia, Vancouver, Canada.
- 2013 Institute for Systems Biology, Seattle, USA.
- 2013 University of Washington, Seattle, USA.
- 2013 Lewis-Sigler Institute, Princeton University, USA.
- 2012 Institute of Chemical and Bioengineering, ETHZ, Switzerland.
- 2012 Institute of Biochemistry, ETHZ, Switzerland.
- 2011 Department of Information Technology and Electrical Engineering, ETHZ, Switzerland.
- 2011 Bio-Rad Laboratories, Hercules CA, USA.
- 2009 Life Technologies / Invitrogen, Carlsbad CA, USA.
- 2009 SystemsX.ch SME workshop, ETHZ, Switzerland.
- 2009 ICFO, Castelldefels, Spain.
- 2009 GeneArt AG, Regensburg, Switzerland.
- 2009 Zurich Research Laboratory, IBM, Switzerland.
- 2008 Institute of Biochemistry, ETHZ, Switzerland.
- 2008 Institute for Theoretical Physics, University of Cologne, Germany.
- 2008 Department of Biosystems Science and Engineering, ETHZ, Switzerland.
- 2008 Institute of Bioengineering Retreat, EPFL, Switzerland.
- 2008 CCMX Workshop, EPFL, Switzerland.
- 2008 Institute of Molecular Systems Biology, ETHZ, Switzerland.
- 2007 Department of Ecology & Evolution, University of Chicago, USA.
- 2007 Buck Institute, Novato CA, USA.
- 2007 Bioengineering Department, University of San Diego, USA.
- 2007 University of California San Francisco, USA.
- 2007 Lewis-Sigler Institute, Princeton University, USA.

Conferences Organized

- 2021** 2nd European Congress on Cell-free Synthetic Biology, Burghausen, Germany (co-organizer: Friedrich Simmel)
- 2019** EPFL-ETHZ Summer School: Quantitative Biology: Bridging the gap between computational and experimental approaches, Fiesch, Switzerland (co-organizers: Mustafa Khammash)
- 2017** EuroTech Winter School: Molecular Engineering of Synthetic Biological Systems, Eindhoven, Netherlands (co-organizers: Tom de Greef, Friedrich Simmel, Morten Norholm)
- 2017** EPFL-ETHZ Summer School: Shaping the Future of Bioengineering, Davos, Switzerland. (co-organizer: Andreas Hierlemann)
- 2017** 1st European Congress on Cell-free Synthetic Biology, Congressi Stefano Franscini, Ascona, Switzerland (co-organizers: Richard Murray and Paul Freemont)
- 2015** MRS Fall Meeting, Symposium K: Materials Science, Technology and Devices for Cancer Modeling, Diagnosis and Treatment, Boston, USA (co-organizers: Rong Fan, Sharon Gerech, Tony Dickherber, Miqin Zhang)
- 2013** Physical Biology of Transcription, University of Geneva, Switzerland (co-organizer: David Shore)
- 2012** Swiss Society of Biomedical Engineering Annual Meeting, EPFL, Switzerland

Professional Activities

2014 - 2015, Mentor for "Mentoring Deutschschweiz"

2008 - 2012, Executive Board Member, Swiss Society of Biomedical Engineering (SSBE)

Reviewer for

Funding Agencies:

Swiss National Science Foundation, Medical Research Council, A*STAR, ERC Consolidator Grant, Israel Science Foundation, BBSRC, NC3Rs, HFSP, NWO (Netherlands Organization for Scientific Research), Ile de France, United States - Israel Binational Science Foundation, ETHZ Research Grants, BRCCH (U. Basel / ETHZ), German Ministry of Education and Research (BMBF)

Journals:

Proceedings of the National Academy of Sciences, Nature Methods, PLoS ONE, Lab on a Chip, Sensors and Actuators B, Biomedical Microdevices, Aging Cell, ACS Chemical Biology, Journal of Biotechnology, Interface Focus, Journal of Laboratory Automation, RSC Advances, Biotechnology Journal, Analytical Chemistry, ACS Nano, ACS Synthetic Biology, Nature Communications, Scientific Reports, Nature Reviews Molecular Cell Biology, Nucleic Acids Research, Metabolic Engineering, Nature Nanotechnology, Cell, Scientific Data, Nature Microbiology, Biochemical Society Transactions, IEEE, HardwareX, Small, JoVE, Biotechnology and Bioengineering, ACS Sensors

Funding Sources

Research Grants:

2020 - 2022, Principal Investigator, NRP78 Covid-19 (4078P0.198412). "Large-scale serological profiling of SARS-CoV-2 and related human CoVs with high-throughput microfluidic nanoimmunoassays."

2020 - 2024, Co-Principal Investigator, SNSF Sinergia Grant (CRSII5.189910). "A quantitative approach to transcriptional network dynamics."

2019 - 2023, Principal Investigator, SNSF Grant (200021.182019). "Development of high-throughput microfluidic lab-on-a-chip technologies to enable rapid molecular engineering."

2017 - 2020, Principal Investigator, EPFL-Biltema Foundation Grant. "Microfluidic Single-cell T-cell Screening."

2017 - 2022, Principal Investigator, ERC Consolidator Grant. "RetroNets: Reverse Engineering Gene Regulatory Networks."

2015 - 2017, Principal Investigator, SystemsX.ch Special Opportunity Grant. "Development of a high-throughput platform for systems immunology and protein engineering."

2015 - 2018, Principal Investigator, HFSP Program Grant (RGP0032/2015). "Establishing microfluidic cell-free systems for the rapid characterization of genetic networks."

2015 - 2016, Co-Principal Investigator, EPFL Integrated Food and Nutrition Center Grant, "On-demand synthesis of vitamins."

2015 - 2018, Principal Investigator, SystemsX.ch IPhD Grant (SNF:51PHP0 157292 / SysX:2014/242). "Comprehensive analysis of transcription factor - promoter interaction in vitro and in vivo."

2012 - 2015, Principal Investigator, SNSF Grant (CR23I2 140697). "Development of a microfluidic platform for the high-throughput quantitation of proteins."

2011 - 2014, Co-Principal Investigator, ProDoc SNSF Grant (PDFMP3 137065). "Development of a microfluidics/biochip platform for high-throughput analysis of cellular chemoattraction."

2010 - 2012, Principal Investigator, Marie Curie Actions - Intra-European Fellowship (IEF) Grant. "Microfluidic device for high-throughput three-dimensional culture, mechanical stimulation and drug screening of stem cells."

2010 - 2013, Co-Principal Investigator, FP7 - SPEDOC Grant. "Surface Plasmon Early Detection & Treatment Follow-up of Circulating Heat Shock Proteins & Tumor Cells."

2009 - 2010, Co-Principal Investigator, SystemsX.ch, IPP Grant. "A computational high-throughput platform for characterizing transcription regulatory interactions."

2008 - 2013, Principal Investigator, SystemsX.ch, DynamiX RTD Grant. "A systems approach to characterizing and modeling the yeast transcriptional regulatory network."

2008 - 2009, Principal Investigator, Nano-Tera, NTF Grant. "A programmable, universally applicable microfluidic device platform."

Miscellaneous:

2019, Nikon Instruments, iGEM project sponsor

2018, Nikon Instruments, iGEM project sponsor

2018, Swiss Industry Science Fund, iGEM project sponsor

2017, Office of Naval Research Global, conference funding (ECCSB)

2017, KGF, iGEM project sponsor

2017, Nikon, iGEM project sponsor

2016, KGF, iGEM project sponsor

2015, KGF, iGEM project sponsor

2014, KGF, iGEM project sponsor

2014, Nikon Instruments, iGEM project sponsor

2013, KGF, Physical Biology of Transcription Meeting Sponsor

2013, KGF, iGEM project sponsor

2012, KGF, iGEM project sponsor

2011, Nikon Instruments, iGEM project sponsor

2011, KGF, iGEM project sponsor

2010, Nikon Instruments, iGEM project sponsor

2010, KGF, iGEM project sponsor

2009, Nikon Instruments, iGEM project sponsor

2009, KGF (Roche, Novartis, Merck, Syngenta), iGEM project sponsor

Teaching

2019

iGEM Project Course (Bachelor, Master), EPFL: Gold Medal, Grand Prize Winner (overgrad), Best Environment Project, Best Integrated Human Practices, Nominated for: Best Part Collection, Best Presentation, Best Wiki

2018

iGEM Project Course (Bachelor, Master), EPFL: Gold Medal, Nominated for: Best Therapeutics Project, Best Software

2017

iGEM Project Course (Bachelor, Master), EPFL: Gold Medal, Award for Best Education and Public Engagement Project, Nominated for: Best Diagnostics Project, Best Integrated Human Practices, Best New Basic Part, Best Software

Scientific project design in regenerative medicine and diagnostics (Masters), EPFL

2016

Scientific project design in regenerative medicine and diagnostics (Masters), EPFL

2015

Physical Biology of the Cell I (Bachelor), EPFL
iGEM Project Course (Bachelor, Master), EPFL: Silver Medal
Scientific project design in regenerative medicine and diagnostics (Masters), EPFL

2014

Physical Biology of the Cell I (Bachelor), EPFL
iGEM Project Course (Bachelor, Master), EPFL: Gold Medal
Scientific project design in regenerative medicine and diagnostics (Masters), EPFL

2013

Physical Biology of the Cell I (Bachelor), EPFL
iGEM Project Course (Bachelor, Master), EPFL: Silver Medal, Qualified for World Championship

2012

Physical Biology of the Cell I (Bachelor), EPFL
Genome and Network Architecture (Master), EPFL
iGEM Project Course (Bachelor, Master), EPFL: Gold Medal

2011

Genome and Network Architecture (Master), EPFL
iGEM Project Course (Bachelor, Master), EPFL: Gold Medal, Qualified for World Championship

2010

iGEM Project Course (Bachelor, Master), EPFL: Gold Medal, iGEMers prize (shared with Slovenia, Cambridge, Imperial College London, and MIT)

2009

iGEM Project Course (Bachelor, Master), EPFL: Gold Medal, Special Prize "Best New BioBrick or Device, Engineered" (shared with University of Freiburg)

2008

iGEM Project Course (Bachelor, Master), EPFL: Bronze Medal

1999-2003

Teaching Assistant, Intro. to the Design of Biol. Molecules and Systems, Caltech, 2002-2003
Teaching Assistant, Molecular Biology Laboratory, Caltech, 2002
Peer Tutor, Fairleigh Dickinson University, 1999-2000

Students and Collaborators

Post-Doctoral Fellows:

Evan Olson, 2017 -
Julia Tischler (Marie Heim-Vögtlin SNF Fellow), 2017 -

PhD Students:

Zoe Swank, 2015-
Ivan Istomin, 2015-
Barbora Lavickova, 2016-
Gregoire Michielin (SNF MD-PhD Fellow), 2016-
Fabien Jammes, 2017-
Ming Yip, 2017-
Cai Chun-Jie, 2018-
Shiyu Cheng, 2018 -
Amir Shahein, 2019 -
Laura Grasmann, 2019-

Co-Advised Students:

Simone Giaveri (Stellacci Lab), 2016-

Alumni

Post-Doctoral Fellows:

Nadanai Laohakunakorn, 2015-2019
Francesco Piraino, 2013-2017
Jose Garcia-Cordero, 2010-2013
Luis Miguel Fidalgo, 2009-2012
Marcel Geertz (Post-Doc, Shore Lab), 2008-2012

PhD Students:

Ekaterina Petrova, 2013-2018
Michael Crone, 2017-2018
Francesca Volpetti, 2012-2017
Kristina Woodruff, 2012-2017
Matthew Blackburn, 2010-2016
Henrike Niederholtmeyer, 2010-2015
Jean-Bernard Nobs, 2009-2014
Arun Rajkumar, 2008-2013
Sylvie Rockel, 2008-2013
Nicolas Denervaud, 2008-2012
Tatjana Petrov, 2009-2011

Co-Advised Students:

Amanda Verpoorte (McKinney Lab), 2012-2017
Zuzana Petrova (Huelsen Lab), 2012-2016
Johannes Becker (Naef Lab), 2012-2015
Meltem Elitas (McKinney Lab), 2008-2012
Bin He (Kreitman Lab, U. Chicago), 2008-2012
Lina Huang (Martin Lab), 2008-2010

Master Students (Thesis):

Thomas Simonet (external), 2015
Craig Watson, 2015
Adele Drame-Maigne (external), 2014
David Moi, 2014
Nicolas Gobet (external), 2010-11
Valoise Mendoh, 2010-11

Masters Students (semester projects):

Alaa Ahmed, Summer 2019
Julie Laurent, Fall 2018
Killian Choquet, Fall 2015
Pernille Rainer, Fall 2015
Thibaud Szymczak, Fall 2015
Lea de Maddalena, 2014-2015
Praneeth Karempudi, 2015
Alexander Belushkin, Spring 2014
Christophe Nell, Spring 2014
Steve Beguin, Fall Semester 2013
Sylvain Bernard, 2013

Undergraduate Students (Projects):

Justine Stoll, Summer 2019
Valere Meizoz, Summer 2018
Leo Sumi, Spring 2018
Golzar Mesbah, Summer 2015

Julien Delisle, Spring 2014
Stefano Tartini, Spring 2014
David Christe, Spring 2014
Astrid Kibleur, 2011
Viktoria Stepanova, 2009

Interns:

Mehdi Hicham (EPFL), Intern, 2019
Martha Carolina Elizondo Cantu (Tecnologico de Monterrey), SRP Intern, 2019
Asterios Arampatzis (Aristotle University of Thessaloniki), SRP Intern, 2018
Rohan Thakur (UC Berkeley), Whitaker International Fellow, August 2017 - May 2018
Ahmed Saadawi (Paris Descartes University), Intern, Summer 2017
Felix Faltings (EPFL), Intern, 2016
Stefan Bassler (University of Heidelberg), Intern, 2016
Malek Kabani (EPFL), Intern 2016
Evgenia Pankevich (Lomonosov Moscow State University), SRP Intern , 2016
Caroline Werlang (B.S. Caltech), Fulbright Scholar, September 2015 - 2016
Anna Olerinyova (Oxford University), SRP Intern, 2015
Emma Hemus (McGill University), ThinkSwiss Research Scholarship, 2015
Charlotte ter Haar (Northwestern University), Whitaker International Fellow, 2014-2015
Holly Rees (University of Cambridge), SRP Intern, 2014
Mathieu Quinodoz (EPFL), Intern, 2013
Florian Borse (EPFL), Intern, 2013
Dennis Zhou (Cornell University), SRP Intern, 2013
Vincent Zimmern (EPFL), Intern, 2012
Heidi Culver (Johns Hopkins University), SRP Intern, 2011
Arja Ray (IIT Kharagpur), Summer Intern, 2011
Kelli Xu (UCSD), SRP Intern, 2010
Bhaskar Ganesh Chennuri (IIT Guwahati), Summer Intern, 2010
Siddharth Gupta (IIT Guwahati), Summer Intern, 2009

Committees

2020 - present	EDBB Doctoral Program Vice-Director, EPFL
2018	Student Kreativity (SKIL) Task Force Committee, EPFL
2016	Synthetic and Systems Biology Search Committee, Istituto Italiano di Tecnologia, Italy
2016	Bioengineering Faculty Search Committee, EPFL
2015	Agora Lab and Facilities Design Team, Swiss Cancer Center
2015 - 2017	"Future Leaders in Bioengineering" Award Committee, Bioengineering EPFL
2015	Synthetic Biology Search Committee, UNIL
2014	Member, Immunoengineering Search Committee, STI EPFL
2010	CMI/CMI+ Committee, STI EPFL
2010 - present	EDBB Committee, SV EPFL
2009	Bureau de Recherche, STI EPFL
2008 - 2009	BioMEMS Search Committee, IBI EPFL
2008	BioE Curriculum Committee, IBI EPFL

PhD committees

Thesis Committees (19 total)

2019, David Taylor, Advisor: Govind Kaygala / Philippe Renaud
2019, Sonja Giger, Advisor: Matthias Lutolf
2019, Maaruthy Yelleswarapu, Advisor: Wilhelm Huck (Radboud University)
2017, Julien Cors, Advisor: Bradley Nelson (ETHZ)

2017, Roman Bulushev, Advisor: Aleksandra Radenovic
2016, Yoji Tabata, Advisor: Matthias Lutolf
2016, Nathalie Brandenburg, Advisor: Matthias Lutolf
2015, Arun Shivanandan, Advisor: Aleksandra Radenovic
2015, Laura Prochazka, Advisor: Kobi Benenson (ETHZ)
2015, Sowmya Balasubramanian, Advisor: Florian Wurm
2015, Simone Allazetta, Advisor: Matthias Lutolf
2014, Yuya Okawa, Advisor: Matthias Lutolf
2014, Alina Isakova, Advisor: Bart Deplancke
2014, Aline Roch, Advisor: Matthias Lutolf
2014, Philipp Lienemann, Advisor: Matthias Lutolf
2013, Nicolas Descharmes, Advisor: Romuald Houdre
2012, Steffen Cosson, Advisor: Matthias Lutolf
2012, Stefan Kobel, Advisor: Matthias Lutolf
2008, Elodie Dahan, Advisor: Yusuf Leblebici

Candidacy Committees (32 total)

2020, Bilge Sen Elci, Advisor: Matthias Lutolf
2020, Moritz Hofer, Advisor: Matthias Lutolf
2019, İçvara Barbier, Advisor: Yolanda Schaerli (UNIL, mid-thesis exam)
2019, Jiukai Tang, Advisor: Jing Wang (ETHZ)
2018, Sailan Shui, Advisor: Bruno Correia
2018, Saurabh Tomar, Advisor: Carlotta Guiducci
2017, Alice Gillen, Advisor: Ardemis Boghossian
2017, Margeaux Duchamp, Advisor: Philippe Renaud
2017, Thomas Simonet, Advisor: John McKinney
2015, Michael Graf, Advisor: Aleksandra Radenovic
2015, Oleg Mikhajlov, Advisor: John McKinney
2015, Vincent Trachsel, Advisor: Matthias Lutolf
2014, Daniel Strebinger, Advisor: David Suter
2014, Li Dong, Advisor: Martin Gijss
2014, Yannick R. Devaud, Advisor: Matthias Lutolf & Martin Ehrbar (USZ)
2014, Tian Qiu, Advisor: Jeffrey Hubbell
2014, Tabata Yoji, Advisor: Matthias Lutolf
2013, Laura Kolb, Advisor: Matthias Lutolf
2013, Katrin Schneider, Advisor: John McKinney
2013, Nathalie Brandenburg, Advisor: Matthias Lutolf
2013, Stefano Varricchio, Advisor: Dario Floreano
2012, Volodymyr Koman, Advisor: Olivier Martin
2012, Manuel Fankhauser, Advisor: Melody Swartz
2012, Michael Unger, Advisor: Heinz Koepl (ETHZ)
2012, Shourya Dutta Gupta, Advisor: Olivier Martin
2011, Mukul Girotra, Advisor: Matthias Lutolf
2011, Sagar Manoli, Advisor: Florian Wurm
2011, Aline Roch, Advisor: Matthias Lutolf
2010, Irina Krier, Advisor: Bart Deplancke
2010, Yuya Okawa, Advisor: Matthias Lutolf
2010, Alina Isakova, Advisor: Bart Deplancke
2009, Meltem Elitas, Advisor: John McKinney

Mentoring (4 total)

Sonja Giger, Advisor: Matthias Lutolf
Jake Yeung, Advisor: Felix Naef
Marco Pisano, Advisor: Melody Swartz

Andrea Negro, Advisor: Matthias Lutolf