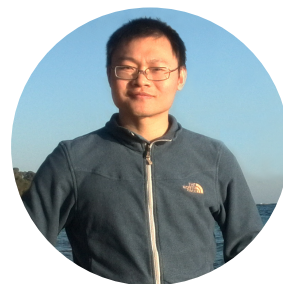# Shengwei **Hou**

COMPUTATIONAL BIOLOGIST · BIOINFORMATICIAN

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Education

FuhrmanLab, Marine Microbial Ecology, University of Southern California   *Los Angeles, United States*

POSTDOC - RESEARCH ASSOCIATE IN BIOINFORMATICS   *Api. 2018 - present*

- *"Computational Biogeochemical Modeling of Marine Ecosystems (CBIOMES)"* supervised by   **Prof. Jed A. Fuhrman**

Freiburg Institute for Advanced Studies (FRIAS), Freiburg University   *Freiburg, Germany*

POSTDOCTORAL RESEARCHER IN BIOINFORMATICS   *Oct. 2017 - Feb. 2018*

- *"Genome-Wide Map Pairwise sRNA-RNA Interactions in Staphylococcaceae aureus"* supervised by   **Prof. Wolfgang R. Hess**

Cyanolab, Freiburg University   *Freiburg, Germany*

PH.D. IN BIOINFORMATICS   *Sep. 2013 - Apr. 2018*

- *"Genomic and transcriptomic Analyses of Marine Microorganisms"* supervised by   **Prof. Wolfgang R. Hess**
- *Ph.D. Defense Grading:* Dissertation: 1.0, Examination: 1.0, Overall: 1.0 (scale 5.0-1.0).

XuLab, Institute of Hydrobiology, Chinese Academy of Sciences   *Wuhan, China*

MASTER OF MOLECULAR GENETICS   *2009.09-2013.06*

- *"HetR Binding Site Upstream of patA Is Required for Heterocyst Patterning"* supervised by   **Prof. Xudong Xu**
- *Master Defense Grading:* 93.4 (scale 0.0-100.0).
- *GPA:* 3.38/4.0

Southwest University, China   *Chongqing, China*

BACHLOR OF BIOLOGY, MAJORING IN BIOLOGY AND BIOTECHNOLOGY   *2005.09-2009.07*

- *"Cloning of IFN—γ from Newcastle Disease Virus(NDV) Stimulated Swine Lymphocytes"* supervised by   **Prof. Huamao Du**
- *GPA (overall):* 3.55/4.0
- *GPA (major):* 3.74/4.0

Conferences & Workshops

2019 CBIOMES Annual Meeting at Simons Foundation   *New York, United States*

UNPOSTER: "GENOME-RESOLVED MICROBIAL DYNAMICS DURING A COASTAL PHYTOPLANKTON BLOOM"   *29th - 31st May. 2019*

- Attended the second annual meeting of CBIOMES project
- Described the microbial succession during a coastal phytoplankton bloom

2019 "Speeding Up Science" in Environmental-Omics: a hackathon for compiling reproducible Jupyter/Binder workflows   *Davis, United States*

SELECTED PARTICIPANT FOR DEVELOPING REPRODUCIBLE BINDER WORKFLOWS   *8th - 10st May. 2019*

- **MAGstats** - an example binder project for visualizing basic information of metagenome assembled genomes (MAGs)
- **DE Analysis** - an example binder project for doing exploratory and differential expression analysis using DESeq2

2018 CBIOMES Annual Meeting at Simons Foundation   *New York, United States*

UNPOSTER: "COMPARATIVE METAGENOMICS AND METATRANSCRIPTOMICS OF MARINE MICROBIAL COMMUNITIES" *21st - 23rd May. 2018*

- Attended the first annual meeting of CBIOMES project
- Introduced a draft metagenomic and metatranscriptomic data analysis pipeline

2017 ELIXIR-IIB Training Programme on Machine Learning   *San Michele all'Adige, Italy*

PARTICIPANT: "MACHINE LEARNING FOR BIOLOGISTS"   *4th - 7th Sept. 2017*

- Adopted basic machine learning skills for genomic and transcriptomic data analyses

2016 MaCuMBA "Marine Microbiome: Discovery & Innovation" International Conference   *Berlin, Germany*

POSTER: TAXONOMIC AND TRANSCRIPTIONAL DYNAMICS OF THE MICROBIAL COMMUNITY DURING A TRICHODESMIUM BLOOM   *27th - 30th Jun. 2016*

- Presented the primary analysis results of metagenomic and metatranscriptomic data sets

2015 Black Forest Summer School on "NGS data for phylogenetics"   *Feldberg, Germany*

POSTER: DIFFERENTIAL RNA-SEQ ANALYSIS OF MICROBIAL POPULATIONS (META-DRNA-SEQ)   *14th - 17th Sept. 2015*

- Presented the mdRNA-Seq results

2014 EU MaCuMBA Project General Assembly   *Cadiz, Spain*

PRESENTATION: METATRANSCRIPTOME ANALYSIS OF MARINE MICROBIAL POPULATIONS USING dRNA-SEQ APPROACH   *21ˢᵗ - 27ᵗʰ Sept. 2014*

- Introduced the dRNA-Seq method and its potential application in marine microbial communities

2013 Training Course of Bernstein Center Freiburg, Department of Neurobiology and Neurotechnology   *Freiburg, Germany*

PARTICIPANT: "SCIENTIFIC PROGRAMMING IN PYTHON"   *14ᵗʰ Oct. - 1ˢᵗ Nov. 2013*

- Learned basic Python syntax and scientific libraries

2013 International PHOTO.COMM Training Workshop   *Freiburg, Germany*

PARTICIPANT: "BIOINFORMATIC ANALYSIS OF TRANSCRIPTOMIC AND GENOMIC DATASETS IN METABOLIC CONTEXT"   *8ᵗʰ - 12ᵗʰ Sept. 2013*

- Adopted basic bioinformatics data analysis skills

Teaching Assistantships

"Genetics" and "Microbiology" given by Prof. Wolfgang R. Hess at Freiburg University   *Freiburg, Germany*

TEACHING ASSISTANT   *2016 - 2017 semester*

- Assisted students in finding homolog search using BLAST Suite during the hands on session

"Bioinformatics" for Bachelor Students given by Dr. Wolfgang Maier at Freiburg University   *Freiburg, Germany*

TEACHING ASSISTANT   *Jun. 20ᵗʰ - Jul. 15ᵗʰ 2016*

- Prepared course materials for image processing module
- Gave one-day lecture on image processing using CellProfiler
- Answered questions and solved problems during the hands on session

"Python Crash Course" for Biologists given by Dr. Björn Grüning at Freiburg University   *Freiburg, Germany*

TEACHING ASSISTANT   *15ᵗʰ - 18ᵗʰ Dec. 2015*

- Prepared the Jupyter notebooks for this course
- Answered questions and solved problems during the hands on session

Publications

*Note: $^\$$Co-First Author, * Corresponding Author*

Jens Georg$^\$$, David Lalaouna$^\$$, **Shengwei Hou**, Steffen C. Lott, Isabelle Caldelari, Stefano Marzi, Wolfgang R. Hess*, Pascale Romby*. The power of cooperation: Experimental and computational approaches in the functional characterization of bacterial sRNAs. (***under review***)

Andrew M. Long$^{\$*}$, **Shengwei Hou**$^\$$, J. Cesar Ignacio-Espinoza1, Jed A. Fuhrman. Benchmarking metagenomic marine microbial growth prediction from codon usage bias and peak-to-trough ratios. (***under review***)

Jin-Long Shang, Min Chen, **Shengwei Hou**, Tao Li, Yi-Wen Yang, Qi Li, Hai-Bo Jiang, Guo-Zheng Dai, Zhong-Chun Zhang, Wolfgang R. Hess and Bao-Sheng Qiu. Survival strategies of the free-living desiccation-tolerant cyanobacteria: Insights from comparative genomic and transcriptomic analyses. ***Environ Microbiol***. 2019 Feb;21(2):845-863.

Jonna E. Teikari, Rafael V. Popin, **Shengwei Hou**, Matti Wahlsten, Wolfgang R. Hess and Kaarina Sivonen*. Insight into the genome and brackish water adaptation strategies of toxic and bloom-forming Baltic Sea *Dolichospermum* sp. UHCC 0315. ***Sci Rep***. 2019 Mar 20;9(1):4888.

Shengwei Hou, Manuel Brenes, Alicia M. Muro-Pastor, Wolfgang R. Hess*. CRISPR-Cas systems in multicellular cyanobacteria. ***RNA Biol***. 2018 Aug 15:1-12.

Xiaoming Tan$^\$$, **Shengwei Hou**$^\$$, Kuo Song, Jens Georg, Stephan Klähn, Xuefeng Lu*, Wolfgang R. Hess*. The Primary Transcriptome of the Fast-Growing Cyanobacterium *Synechococcus elongatus* UTEX 2973. ***Biotechnol Biofuels***. 2018 Aug 4;11:218.

Weichao Huang*, Ilka Haferkamp, Bernard Lepetit, Carolina Río Bártulos, **Shengwei Hou**, Wolfgang Jeblick, Peter G. Kroth. Reduced vacuolar β-1,3-glucan synthesis affects carbohydrate metabolism, plastid homeostasis and structure in *Phaeodactylum tricornutum*. ***Proc. Natl. Acad. Sci.*** April 18, 2018, ahead of print

Jonna E. Teikari, David P. Fewer, Rashmi Shrestha, **Shengwei Hou**, Niina Leikoski, Minna Hämäläinen, Asko Simojoki, Wolfgang R. Hess, and Kaarina Sivonen*. Strains of the toxic and bloom-forming *Nodularia spumigena* (cyanobacteria) can degrade methylphosphonate and release methane. ***The ISME J*** 2018 Feb 14:1.

Shengwei Hou$^\$$, Mario López-Pérez$^\$$, Ulrike Pfreundt, Natalia Belkin, Kurt Stüber, Bruno Huettel, Richard Reinhardt, Ilana Berman-Frank, Francisco Rodriguez-Valera and Wolfgang R. Hess*. Benefit from decline: The primary transcriptome of *Alteromonas macleodii* str. Te101 during *Trichodesmium* demise. ***The ISME J*** 2018 Jan 15:1

Dan Miller, Ulrike Pfreundt, **Shengwei Hou**, Steffen Lott, Wolfgang R Hess and Ilana Berman-Frank*. Winter Mixing Induces Reshuffling and Impacts Gene Expression of Marine Microbial Populations in the Gulf of Aqaba. ***Aquat Microb Ecol*** 80:223-242.

Jonna E. Teikari$^\$$, **Shengwei Hou**$^\$$, Matti Wahlsten, Wolfgang R. Hess* and Kaarina Sivonen*. Comparative genomics of the Baltic Sea toxic cyanobacteria *Nodularia spumigena* UHCC 0039 and its response on varying salinity. ***Frontiers in microbiology*** 2018 Mar 8;9:356

Tao Zhu[$], **Shengwei Hou[$]**, Xuefeng Lu*, Wolfgang R. Hess*. Draft Genome Sequences of Nine Cyanobacterial Strains from Diverse Habitats. *Genome Announc.* 2017 Mar 2;5(9). pii: e01676-16.

Ulrike Pfreundt[$], Dina Spungin[$], **Shengwei Hou**, Björn Voß, Ilana Berman-Frank, Wolfgang R. Hess*. Genome of a giant bacteriophage from a decaying *Trichodesmium* bloom. *Marine Genomics* 2017 Feb 22. pii: S1874-7787(17)30033-8.

Shengwei Hou, Ulrike Pfreundt, Dan Miller, Ilana Berman-Frank, Wolfgang R Hess*. mdRNA-Seq analysis of microbial communities. *Sci. Rep.* 2016 Oct 19;6:35470.

Shengwei Hou, Fang Zhou, Shan Peng, Hong Gao and Xudong Xu*. The HetR-binding site that activates expression of *patA* in vegetative cells is required for normal heterocyst patterning in *Anabaena* sp. PCC 7120. *Sci. Bull.* 2015 Jan;60(2):192-201.

Yun Wang, **Shengwei Hou**, Fei Ke and Hong Gao*. Bibliometric analysis of research on microcystins in China and worldwide from 1991 to 2011. *Desalination and water treatment* 53(1):1-12

Zhiwei Hou, Yun Wang, Hong Gao* and **Shengwei Hou***. The principle of dRNA-seq and its applications in prokaryotic transcriptome analyses. *Yi Chuan* 2013 Aug;35(8):983-91 (**in Chinese**).

Ye Du, Yan Cai, **Shengwei Hou** and Xudong Xu*. Identification of the HetR-recognition sequence upstream of hetZ in *Anabaena* sp. Strain PCC 7120. *J. Bacteriol.* 2012 May;194(9):2297-306.

Professional Service

I'm a frequent reviewer of *Microbiome*, and occasional reviewer of *Nature Microbiology*, *ISME J.*, *Freshwater Biology* and *Marine Genomics*. I collaborated with Prof. Jed A. Fuhrman in several peer review services under the permission of journal editors. Please check my publon profile for a summary of recorded peer review activities.