Shota Shibasaki (柴崎祥太)

Curriculum Vitae. last update: Sept. 1st, 2023

PERSONAL DETAILS

Birth	April 20, 1993
Address	Greensboro, USA
Nationality	Japanese
Mail 1	shibasaki.sh[at]gmail.com
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EMPLOYMENT

Post-doctoral researcher — Sep. 2023 -

National Institution of Genetics, Japan

Center for Frontier Research

Supervisor: Prof. Masato Yamamichi

Post-doctoral researcher — Sep. 2022 - Aug. 2023

University of North Carolina Greensboro, USA

Department of Biology.

Supervisor: Prof. Akira Terui

Graduate Assistant — Sep. 2018 - Aug. 2022

University of Lausanne, Switzerland

Department of Fundamental Microbiology, Faculty of Biology and Medicine.

Supervisor: Prof. Sara Mitri

EDUCATION

PhD, Life science — Sep. 2018 - Aug. 2022

University of Lausanne, Switzerland

Department of Fundamental Microbiology, Faculty of Biology and Medicine.

Ph.D. thesis: "Two design frameworks for optimizing microbial community functions". This thesis summarizes the results of Shibasaki and Mitri (2020), Shibasaki et al (2021), and two unpublished projects. See PUBLICATIONS with ¶.

The thesis is available online. The abstract is here: officially in English and French, but I also provide an unofficial Japanese one

Supervisor: Prof. Sara Mitri

PhD (Incomplete) — Apr. 2018 - Aug. 2018

[1] receiving only

[2] receiving only

The University of Tokyo, Japan

Department of general system studies, Graduate School of Arts and Sciences.
I moved to Lausanne in August 2018 to start my Ph.D. there.

Master, Multidisciplinary science — Apr. 2016 - Mar. 2018

The University of Tokyo, Japan

Department of general system studies, Graduate School of Arts and Sciences.
MS thesis: "Cyclic dominance emerges from the two cooperative behaviors in the social amoeba" The thesis is written in Japanese but based on Shibasaki et al, (2017), Shibasaki and Shimada (2017), and Shibasaki and Shimada (2018). See PUBLICATIONS with †.
Supervisor: Prof. Masakazu Shimada

Bachelor, Arts and Sciences — Apr. 2012 - Mar. 2016

The University of Tokyo, Japan

Department of Integrated sciences, College of Arts and Sciences.
Major: Integrated life sciences (incl. molecular biology, cellular biology, mathematical biology, systems biology, etc).
Minor: Cognitive and behavioral sciences.

High School — Apr. 2009 - Mar. 2012

Shibaura Institute of Technology Senior High School

SKILLS

Languages	Japanese (mother tongue)
	English (fluent)
	Italian (better than French) and French (A1)
Programming	Python 3, R, C, Matlab, Scilab
Software	LaTeX, Illustrator

PUBLICATIONS

Original paper (peer-reviewed)

*: corresponding author. **: co-corresponding author.

1. **S. Shibasaki**** and A. Terui** (under review) Food web complexity modulates environmental impacts on food chain length preprint
2. **S. Shibasaki***, R. Nakadai, and Y. Nakawake. (under review) "Biogeographical distributions of trickster animals". preprint
3. ¶ **S. Shibasaki**, and S. Mitri. (2023) A spatially-structured mathematical model of the gut microbiome reveals factors that increase community stability. *iScience*. DOI:doi.org/10.1016/j.isci.2023.107499 preprint
4. A. Yamauchi, K. Ito, and **S. Shibasaki** (2023). Competition model explains trends of long-term fertilization in plant communities. *Ecol. Evol.* DOI: 10.1002/ece3.9832
5. A. Yamauchi, K. Ito, **S. Shibasaki**, and T. Namba (2023). Continuous irregular dynamics with multiple neutral trajectories permit species coexistence in competitive communities. *Theor. Pop. Biol.* DOI: 10.1016/j.tpb.2022.12.003

6. ¶ **S. Shibasaki****, M, Mobilia, and S. Mitri**. (2021). Exclusion of the fittest predicts microbial community diversity in fluctuating environments [3] *J. R. Soc. Interface*. DOI: 10.1098/rsif.2021.0613 preprint

7. A. Yamauchi, K. Ito, and **S. Shibasaki** (2021). Colonization process determines species diversity via competitive quasi-exclusion. *Ecol. Evol.* DOI:10.1002/ece3.7342

8. ¶ **S. Shibasaki** and S. Mitri (2020). Controlling evolutionary dynamics to optimize microbial bioremediation. *Evol. Appl.* 2020;13:2460–2471.. preprint DOI: 10.1101/2020.07.22.216010

9. **S. Shibasaki*** (2019). The evolutionary game of interspecific mutualism in the multi-species model. *J. Theo. Biol.* (471), 51-58. preprint. DOI: 10.1016/j.jtbi.2019.03.026

10. † **S. Shibasaki*** and M. Shimada. (2018). Cyclic dominance emerges from the evolution of two inter-linked cooperative behaviours in the social amoeba. *Proc. R. Soc. B.* 285. 20180905. preprint. DOI: 10.1098/rspb.2018.0905

11. † **S. Shibasaki***, Y. Shirokawa, and M. Shimada. (2017). Cooperation Induces Other Cooperation: Fruiting Bodies Promote the Evolution of Macrocysts in *Dictyostelium discoideum*. *J. Theo. Biol.* (421), 136-145. DOI: 10.1016/j.jtbi.2017.04.002

Review, Opinion, etc (peer-reviewed)

*: corresponding author.**: co-corresponding author.

1. **S. Shibasaki***, and A. Terui. (working manuscript) Toward the comprehensive understanding of food chain length. preprint.

2. A. Picot‡, **S. Shibasaki**‡, O. Peacock J., and S. Mitri (2023) Microbial interactions in theory and practice: when are measurements compatible with models? *Curr. Opin. in Microbiol.* 75:102354 DOI: 10.1016/j.mib.2023.102354 ‡ Equal contribution

3. R. Nakadai**, Y. Nakawake**, and **S. Shibasaki**** (2023) AI language tools risk scientific diversity and innovation. *Nat. Hum. Behav.* DOI: 10.1038/s41562-023-01652-3. All authors equally contributed.

Conference proceedings (peer-reviewed)

1. † **S. Shibasaki*** and M. Shimada. (2017). Stochastic sexual interaction facilitates the evolution of asexual cooperation in the social amoeba. *Proceedings of European Conference of Artificial Life 2017*. 372-379. DOI:10.7551/ecal_a_064

¶: relates to Ph.D. thesis. †: relates to M.S. thesis

PRESENTATIONS

*: presenter

[3] renamed from older preprint: "Microbial species interactions determine community diversity in fluctuating environments"

Contributed talks

- **S. Shibasaki*** and A. Terui (2023) "Species richness modifies how environments change food chain length." Annual meeting of Ecological Society of America, Aug. 6 -11. Portland, USA.
- A. Yamauchi, K. Ito, **S. Shibasaki**, and T. Namba (2021). "Continuous irregular dynamics with multiple neutral trajectories permit species coexistence in competitive communities" Annual meeting of Japanese Society of Mathematical Biology. 2021, Sept. 14-16. online.
- **S. Shibasaki***, M. Mobilia, and S. Mitri (2021). "Exclusion of the fittest predicts microbial community diversity in fluctuating environments" Mathematical Population Dynamics, Ecology and Evolution. 2021, April 26-30. Online. recorded talk
- A. Yamauchi, K. Ito, and **S. Shibasaki** (2020). "Species diversity resulted from colonization process with trade-off - Test in rank-abundance relationship" Annual meeting of Japanese Society of Mathematical Biology. 2020, Sept. 20-22. Nagoya, Japan.
- A. Yamauchi, K. Ito, and **S. Shibasaki** (2019). "Theory of evolution of programmed cell death in unicellular organisms" The 67th Annual Meeting of the Ecological Society of Japan. 2020, Mar. 4-8. Nagoya, Japan.[4]
- A. Yamauchi, K. Ito, and **S. Shibasaki** (2019). "Mathematical model of programmed cell death of unicellular organisms" Annual Meeting of Japanese Society of Mathematical Biology. 2019, Sept. 14-16. Tokyo, Japan.
- **S.Shibasaki*** and S. Mitri (2019). "Microbial public goods games in a toxic environment: to degrade or to resist?" The 2019 Congress of the European Society for Evolutionary Biology. 2019. Aug. 19-24. Turku, Finland.
- **S.Shibasaki*** and S. Mitri (2019). "Microbial public goods games in a toxic environment: to degrade or to resist?" Mathematical Models in Ecology and Evolution. 2019, Jul. 16-19 Lyon, France.
- **S.Shibasaki*** and S. Mitri (2019). "Microbial public goods game in a toxic environment; to degrade or to be resistant?" The 66th Annual Meeting of the Ecological Society of Japan. 2019, Mar. 15-19. Kobe, Japan.
- **S. Shibasaki*** (2018). The complex effect of the evolutionary rates on generalized mutualistic communities. 2018 Annual Meeting of the Society for Mathematical Biology and the Japanese Society of Mathematical Biology. 2018, Jul. 8 – 12. Sydney, Australia.
- **Shibasaki*** and M. Shimada. (2018). Cyclic dominance emerges from the two cooperative behaviors in the social amoeba. Game Theory Work shop 2018. Mar. 2-4. Osaka, Japan.
- **S. Shibasaki*** and M. Shimada. (2017). Stochastic sexual interaction facilitates the evolution of asexual cooperation in the social amoeba. European Conference on Artificial Life 2017. 2017, Sep. 4-9. Lyon, France.

[4] cancelled conference because of COVID-19, but the abstract is available

Invited talks

- **S. Shibasaki*** "Two design frameworks for optimizing microbial community functions". Komaba seminar 41st, 2023, January 24th. Hybrid link (Japanese)
- **S. Shibasaki***, M. Mobilia, and S. Mitri "Environmental and demographic stochasticity together changes microbial interactions and diversity" mini-symposium of "Predicting ecological dynamics in fluctuating environments" at SMB2021 (USA). 2021, June 15th. Online.
- **S. Shibasaki***, "Finding the best spatial structures to maximize microbial community functions", Curiosity Seminars, Centre de Biologie Intégrative (France), 2021, May 26th. Online

Contributed poster presentations

- **S. Shibasaki***, R. Nakadai, and Y. Nakawake (2023). "What determines animal distributions in folklore and myth?" 70th Annual Meeting of the Ecological Society of Japan.March 17-20, online.
- **S. Shibasaki***, M. Sudário, A.Dos. Santos, and S. Mitri. (2021) "Finding the best spatial structures to maximize microbial community functions" Annual meeting of Japanese Society of Mathematical Biology. 2021, Sept. 14-16. online.
- **S. Shibasaki***, M. Mobilia, and S, Mitri. (2020). "Fluctuating environments affect the strength of species interactions and diversity in microbial communities similarly", 17-20, Aug., eSMB. (SMB Poster prize) Available here
- **S. Shibasaki***, M. Mobilia, and S, Mitri. (2019). "Intermediate Environmental Switching Rate Maximizes Competitive Exclusion", Kick-off of the Theoretical Biology Network in Western Switzerland, Nov. 26, Lausanne, Switzerland.
- **S. Shibasaki*** and M. Shimada. (2017). "Evolution of cooperation with the multigame dynamics in the social amoeba". Annual Meeting of Japanese Society of Mathematical Biology. 2017, Oct. 6-8. Hokkaido, Japan. (best poster award)
- **S. Shibasaki***, Y. Shirokawa, and M. Shimada. (2017). "The Evolutionary Game in Sexual Reproduction of the social amoeba." Annual Meeting of Japanese Society of Mathematical Biology. 2016, Sept. 7-9. Fukuoka, Japan.
- **S. Shibasaki***, Y. Shirokawa, and M. Shimada. (2017). "Cooperation in the sexual reproduction of *Dictyostelium discoideum*." Annual Meeting of Society of Evolutionary Studies, Japan. Aug. 25-28. Tokyo, Japan.

GRANTS, PRIZES, ETC.

Grants and/or Fellowships to S.S.

- Supportive grant from Foundation for the Fusion Of Science and Technology (FOST). 2022. 240,000 JPY
- PhD fellowship abroad by Nakajima foundation (Sep. 2018- Aug. 2022). 10,100,000 JPY.
- PhD fellowship in Life Science by University of Lausanne (Sep. 2018- Aug. 2022) Roughly, 166,080.00 CHF.

- DC1 by JSPS (Apr. 2018 - Aug. 2018). 1,000,000 JPY for salary plus a research grant of 800,000 JPY.
- Division of Multi-Disciplinary Sciences 2017 International Conference Travel Grants, 2017, the University of Tokyo.

Grants as a collaborator

- Asahi Glass Foundation (2023) to Dr. Yo Nakawake (1400,000 JPY)

Prizes

- SMB Poster Prize: Population dynamics Ecology and Evolution. 2020 Annual meeting of Society for Mathematical Biology (SMB).
- Outstanding Master's Thesis Award (2018), Department of Multidisciplinary Sciences, the University of Tokyo
- Best poster award, 27th (2017) Annual meeting of Japanese Society of Mathematical Biology (JSMB)

SUPERVISION

Master students

- Two master students at UNIL

Non-academic

- (Sub) Mentor for writing Statement of Purpose (SOP). XPLANE (only Japanese). 2021 (Main mentor $\times 2$), 2022 (Main mentor $\times 1$, Sub-mentor $\times 1$). I advised people how to write strong SOPs for applying to graduate schools in the USA and/or European countries.

REVIEW

See my ORCID or Web of Science account

MEMEBERSHIP

- Japanese Society for Mathematical Biology (JSMB)
- European Society for Mathematical and Theoretical Biology (ESMTB)
- Ecological Society of Japan (ESJ)
- European Society for Evolutionary Biology (ESEB)

OUTREACH

- Doing PhD abroad, available on Youtube (start from 35min, in Japanese). See also this related interview by UmeeT (in Japanese)

MISC

- 微生物群集の動態を理解し、制御し、利用する@ ローザンヌ大学.日本進化学会ニュース. 23(2): 11-14. (an essay about my Ph.D. life in Lausanne, published in a newsletter from the Society of Evolutionary Studies, Japan. Only available in Japanese)

REFERENCES

- Dr. Sara Mitri. Supervisor during my Ph.D. Department of Fundamental Microbiology, University of Lausanne, Switzerland. E-mail: sara.mitri@unil.ch. Tel: +41(0)21 692 56 12
- Dr. Mauro Mobilia. Collaborator during my Ph.D. Department of Applied Mathematics, School of Mathematics, University of Leeds, United Kingdom. E-mail: M.Mobilia@leeds.ac.uk. Tel: +44(0)113 343 1591
- Dr. Masakazu Shimada. Supervisor during my master. Department of general system studies, Graduate School of Arts and Sciences, the University of Tokyo. E-mail: mshimada@system.c.u-tokyo.ac.jp. Tel: +81 (0)3 5454 6052

Upon request, I can also provide other references.