

# Yoshinari Yoshida – Curriculum Vitae

Section for History and Philosophy of Science  
Department of Science Education  
University of Copenhagen  
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[Personal Website](#)

## ACADEMIC APPOINTMENTS

2025–2027 Marie Skłodowska-Curie postdoctoral fellow, University of Copenhagen

2023–2025 Postdoctoral fellow, University of Exeter  
(based on an international postdoctoral fellowship from the Japan Society for the  
Promotion of Science)

## EDUCATION

Ph.D. Philosophy, University of Minnesota - Twin Cities, May 2023

- Dissertation:  
“Generalizations in Practice: Investigating Generality and Specificity  
in Developmental Biology”  
(An abstract is attached at the end of this CV.)
- Committee:  
Alan C. Love (advisor)  
Samuel C. Fletcher  
Michael Bennett McNulty  
Michael Travisano (Ecology, Evolution and Behavior, University of Min-  
nesota)  
Jamie A. Davies (Experimental Anatomy, University of Edinburgh)

M.A. Philosophy, University of Minnesota - Twin Cities, December 2018

M.A. Philosophy and History of Science, Kyoto University, March 2016

B.A. Philosophy and History of Science, Kyoto University, March 2013

## AOS

Philosophy of Biology, Philosophy of Science

## AOC

Scientific Reasoning, Biomedical Ethics, History of Biology, History of Science

## PUBLICATIONS, PEER-REVIEWED

Yoshida Y (2025) “Generalizing while embracing differences: Configurations of repre-  
sentations and cross-fertilization.” *Synthese* 206: 9  
<https://link.springer.com/article/10.1007/s11229-025-05083-7>

Love AC, Yoshida Y (2025) “Measuring cell movement: Concepts and quantification.”  
*Developmental Biology* 525: 172–184  
<https://www.sciencedirect.com/science/article/abs/pii/S0012160625001605>

Yoshida Y, Love AC (2025) “Mechanisms and principles: Two approaches to scientific

generalization.” *European Journal for Philosophy of Science* 15(2): 1–19  
<https://link.springer.com/article/10.1007/s13194-025-00650-8>

Yoshida Y (2023) “Joint representation: Modeling a phenomenon with multiple biological systems.” *Studies in History and Philosophy of Science* 99: 67–76  
<https://www.sciencedirect.com/science/article/abs/pii/S0039368123000705>

Yoshida Y (2021) “Multiple-models juxtaposition and trade-offs among modeling desiderata.” *Philosophy of Science* 88(1): 103–123  
<https://www.journals.uchicago.edu/doi/abs/10.1086/710054?journalCode=phos>

Yoshida Y, and Nakao H (2015) “EvoDevo as a motley aggregation: Local integration and conflicting views of genes during the 1980s.” *Biological Theory* 10(2): 156–166  
<https://link.springer.com/article/10.1007/s13752-014-0197-4>

BOOK CHAPTERS Love AC, Yoshida Y (2019) “Reflections on model organisms in evolutionary developmental biology.” In: W Tworzydło, S Bilinski (eds) *Evo-devo: Non-model species in cell and developmental biology*, pp. 3–20, Springer, Berlin  
[https://link.springer.com/chapter/10.1007/978-3-030-23459-1\\_1](https://link.springer.com/chapter/10.1007/978-3-030-23459-1_1)

MANUSCRIPTS IN PREPARATION Yoshida Y, Leonelli S “Specialization of stem cell biology and its downside: Three case studies.”

Yoshida Y. “Varying protocols to generate comparable models.”

BOOK REVIEWS Yoshida Y (2016) Review of *Towards a theory of development*, by A. Minelli and T. Pradeu (eds.) *Philosophy and History of Science Studies* 10: 92–95 (in Japanese)

OTHER PUBLICATIONS Yoshida Y (2021) “Multiple model systems and representation of biological phenomena.” *Integrated HPS Conference Proceedings*

Yoshida Y, Saitoh H, Anzai N, Fujimoto H, Hirai M (2014) Review of *Annals of Science* special issue: “The representation of animals in the early modern period.” *The Journal of the Japanese Society for the History of Chemistry* 41(3): 160–162 (in Japanese)

Sakamoto K, Ito K, Yoshida Y, Fujimoto H (2013) Review of *Isis* special issue: “Science, history, and modern India.” *The Journal of the Japanese Society for the History of Chemistry* 40(4): 220–222 (in Japanese)

Yoshida Y, Takao K, Nakao H (2013) “Evo-devo and eco-evo-devo.” Critical review of *Evolution: A developmental approach*, by Wallace Arthur, and *Ecological developmental biology: Integrating epigenetics, medicine, and evolution*, by S. F. Gilbert and D. Epel, *Philosophy and History of Science Studies* 7: 67–77 (in Japanese)

TRANSLATIONS Kampourakis K, Tobias U, eds (2020) *Philosophy of Science for Biologists*. Cambridge: Cambridge University Press.

— Translated into Japanese, co-translation with Daichi Suzuki, Ryota Morimoto, Nobuhiro Minaka, and Yusaku Ohkubo. Keiso Shobo Publishing, February 16, 2023.

PRESENTATIONS,  
PEER-REVIEWED

Yoshida Y. “Protocol adjustments in cross-species comparisons of *in vitro* models: A conceptual discussion.” Developmental timing across species: From mechanisms to evolutionary insights. Paris Brain Institute, Paris, France, May 8, 2025

Yoshida Y. “Comparing inaccessible targets through biological modeling: The case of ape iPS cells.” German Society for Philosophy of Science, Friedrich-Alexander-Universität Erlangen-Nürnberg (FAU), Erlangen, Germany, March 24, 2025

Yoshida Y. “Comparing inaccessible targets through biological modeling: The case of ape iPS cells.” British Society for Philosophy of Science, University of York, York, UK, July 19, 2024

Yoshida Y, Leonelli S. “Specialization of stem cell biology and its downside: Three case studies.” Society for Philosophy of Science in Practice, University of South Carolina, Columbia, South Carolina, USA, May 18, 2024

Yoshida Y. “Great ape iPS cells as a model system for human Evo-Devo.” Society for Philosophy of Science in Practice, University of South Carolina, Columbia, South Carolina, USA, May 18, 2024

Yoshida Y. “Epistemology of non-human stem cell models: The case of ape iPS cells.” Understanding life in a changing planet: 20+ years of Egenis, the Centre for the Study of the Life Sciences. Exeter, UK, April 18, 2024

Yoshida Y. “Cell culture systems and model organisms: Articulating the relationship.” Symposium—Model organisms: Materiality, history and politics, Berlin Institute for Cultural Inquiry, Berlin, Germany, March 22, 2024

Yoshida Y, Love AC. “Mechanisms and principles: Two kinds of scientific generalization.” European Philosophy of Science Association, University of Belgrade, Belgrade, Serbia, September 22, 2023

Yoshida Y. “Mechanisms and principles: Two kinds of scientific generalization.” Philosophy of Science Association, Pittsburgh, USA, November 11, 2022

Yoshida Y. “Generalizations, visual representations, and mechanistic explanations.” Philosophy of Science Association, Pittsburgh, USA, November 11, 2022

Yoshida Y. “Generalizations, visual representations, and mechanistic explanations.” Society for Philosophy of Science in Practice, Ghent, Belgium, July 2, 2022

Yoshida Y. “Collective representation: Modeling a phenomenon with multiple biological systems.” Philosophy of Science Association, Baltimore, USA, November 12, 2021

Yoshida Y. “Representing a phenomenon with multiple biological systems.” European Philosophy of Science Association, online, September 15, 2021

Yoshida Y. “Roles of scientific generalizations beyond explanation: The case of collective cell migration.” International Society for the History, Philosophy, and Social Studies of Biology, online, July 19, 2021

Yoshida Y. “Roles of generalizations beyond explanation: A case from the research of collective cell migration.” Integrated History and Philosophy of Science, Virginia Polytechnic Institute and State University, Blacksburg, USA, July 15–17, 2020 [accepted][conference canceled]

Yoshida Y. “How scientific generalizations facilitate investigations.” Society for Philosophy of Science in Practice, Michigan State University, East Lansing, USA, July, 2020 [accepted][conference canceled]

Yoshida Y. “Epistemic values, trade-offs, and multiple-models juxtaposition.” International Society for the History, Philosophy, and Social Studies of Biology, University of Oslo, Oslo, Norway, July 8, 2019

Yoshida Y, Love AC. “Mechanisms and principles: Two kinds of scientific generalization.” Philosophy of Science Association, Seattle, USA, November 2, 2018

Yoshida Y. “Characterizing and evaluating a rationalist approach to biology.” International Society for the History, Philosophy, and Social Studies of Biology, University of São Paulo, São Paulo, Brazil, July 21, 2017

Yoshida Y, Atsuta Y, Takahashi Y. “Melanocyte localization in the urogenital systems of chicken embryos.” Japanese Society of Developmental Biologists, Tsukuba, Japan, June 2–5, 2015

Yoshida Y. “‘Emerging concept’ in developmental biology.” International Society for the History, Philosophy, and Social Studies of Biology, Université du Québec à Montréal, Montréal, Canada, July 8, 2015

Yoshida Y. “Eco-evo-devo as a recovery of diversity.” Philosophy of Science Society, Japan, Hosei University, Chiyoda, Japan, November 24, 2013 (in Japanese)

Yoshida Y. “Theoretical and methodological diversity in the 1980s: Early development of evo-devo.” International Society for the History, Philosophy, and Social Studies of Biology, Université Montpellier 3, Montpellier, France, July 11, 2013

Yoshida Y. “An origin of evo-devo as an ‘extended’ synthesis: Morphological evolution independent of genetic changes.” Philosophy of Science Society, Japan, University of Miyazaki, Miyazaki, Japan, November 11, 2012 (in Japanese)

PRESENTATIONS,  
INVITED

Yoshida Y. “Interdisciplinarity and integration in Evo-Devo.” Japanese Society for Young Evo-Devo Researchers, Mishima Lodge, Kawasaki, Japan, March 12, 2025

Yoshida Y. “Evo-Devo seen from philosophy of science.” Japanese Society for Young Evo-Devo Researchers, October 6, 2024. Online

Brunet T, Currie A, Yoshida Y. “Counterfactual natural history: Speculative evolution and the minimal rewrite rule.” Paleoscience Roadshow, July 2, 2024. Online

Yoshida Y. “How are diverse biological mechanisms generalized? The case of collective cell migration.” Tsukuba University, Tsukuba, Japan, June, 20, 2023 (in Japanese)

Yoshida Y. “Scientific generalizations seen through biological practices.” Philosophy Online Seminar, April, 26, 2020 (in Japanese)

Yoshida Y. “Where might developmental biology go?” Summer Symposium of Japanese Society of Developmental Biologists, Japan Amphibian Laboratory, Nikko, Japan, September, 2019 (in Japanese)

Yoshida Y. “Is evolutionary developmental biology a theoretical synthesis?” The Japan

Association for Philosophy of Science, Saitama University, Saitama, Japan, June 18, 2016 (in Japanese)

Yoshida Y. “Philosophy of developmental biology: From a historical perspective.” Meeting for young scholars of philosophy of science in Japan, Kyoto University, Kyoto, Japan, September 27, 2014 (in Japanese)

Yoshida Y, Nakao H. “Evo-devo as a motley aggregation: Interdisciplinary studies during the 1980s.” Japan-Taiwan Philosophy and History of Biology Workshop, National Chung Cheng University, Chia-Yi, Taiwan, March 7, 2014

Yoshida Y, Nakao H. “Overlooked elements in the history of evo-devo: Studies of epigenetics in the 80s.” IHPST Paris-CAPE Kyoto, philosophy of biology workshop, Kyoto University, Kyoto, Japan, November 4, 2012 (in Japanese)

TEACHING  
EXPERIENCE

University of Minnesota

*Primary Instructor*

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Spring 2023	Philosophy of Biological Sciences
Fall 2022	Scientific Reasoning
Fall 2020, Spring 2022	Medical Ethics

*Teaching Assistant*

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Fall 2021	History of Philosophy: Ancient Period
Spring 2020	Introduction to Ethics
Spring 2019	Philosophy of Psychology
Fall 2018	Medical Ethics

*Grader*

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Summer 2020	Philosophy and Cultural Diversity
Fall 2019	Scientific Thought

WORKSHOPS,  
SUMMER  
SCHOOLS, &  
ACADEMIC  
EXPERIENCE

“Paleoscience Retreat,” retreat organized by Adrian Currie, Kingcombe Meadows Nature Reserve, UK, August 14–17, 2024

“Representation in Art and Science,” summer school organized by the University of Vienna and the Institute Vienna Circle, Vienna, Austria, July 4–13, 2022

“American Association of Philosophy Teachers Workshop on Pedagogy,” workshop held at the University of Minnesota, Twin Cities, August 25, 2018

“The conceptual legacy of On Growth and Form: Interdisciplinary perspectives,” workshop held at the University of Saint Andrews, St Andrews, Scotland, June 14–16, 2018.

“The life cycles of microscopic imaging in biology,” workshop held at the Marine Biological Laboratory, Woods Hole, Massachusetts, USA November 13–17, 2017

“Practices of Individuation and Classification in Science,” summer school held in Banff, Canada, June 18–July 1, 2017

“A century of engineering life: Cells and organisms,” summer seminar held at the Marine Biological Laboratory, Woods Hole, Massachusetts, USA, May 17–24, 2017

Visiting student, Department of Zoology, Kyoto University, 2014–2015

AWARDS &  
HONORS

## University of Minnesota

- Department Research Partnership Program Fellowship, Department of Philosophy, 2018, 2019, 2021, 2022
- Swenson-Kierkegaard Fellowship, Department of Philosophy, 2021
- Norman Olav Dahl Graduate Fellowship, Department of Philosophy, 2020
- Douglas Lewis Publication Fellowship, Department of Philosophy, 2020
- Baruch Spinoza Travel Award, Minnesota Center for Philosophy of Science, 2019
- Travel Grant, University of Minnesota Council of Graduate Students, 2017, 2022

## Others

- Travel Grant, International Society for the History, Philosophy, and Social Studies of Biology, 2015, 2017, 2019
- Travel Grant, Philosophy of Science Association, 2018, 2021
- Fellowship for studying abroad, Japan Student Services Organization, 2016–2019
- JSPS Research Fellow (DC1), Japanese Society for the Promotion of Science, 2016
- The highest award, Kyoto University Interdisciplinary Research Idea Contest, Center for the Promotion of Interdisciplinary Education and Research, 2015 (Members: S. Tojima, S. Yamada, Y. Takase, Y. Muto, Y. Yoshida, and R. Kure)
- Travel Grant, Philosophy of Science Society, Japan, 2015
- Travel Grant, The Kyoto University Foundation, 2013

## REVIEWING & JOURNAL REFEREE

- *Philosophy of Science*
- *Biology and Philosophy* (3x)
- *Studies in History and Philosophy of Science*
- Book draft, Cambridge University Press

## PROFESSIONAL SERVICE

### Department of Philosophy, University of Minnesota

- Department Representative for the Council of Graduate Students – 2022–2023
- Awards Committee – 2021–2022
- Co-organized “Cultivating a web presence,” webinar for graduate students, Department of Philosophy, University of Minnesota. September 21, 2020
- Social Media Committee – 2020–2023
- Placement Committee – 2019–2020
- Graduate Student Lounge Committee – 2018–2019
- Tutor for an international graduate student – 2017–2018
- Diversity Committee – 2017–2018
- Reception Committee – 2016–2017

## Others

- Coordinator for Egenis weekly seminar series, June 2024–present.
- Co-organizing an online reading group: “Philosophy of Cancer Reading Group” since October 2023.
- Chair for “Evolution 1” session at Philosophy of Science Association, Baltimore, USA, November 12, 2021
- Indexer for *Beyond the Meme: Development and Structure in Cultural Evolution*, edited by A. C. Love and W. Wimsatt, Minneapolis: University of Minnesota Press, 2019
- Tutor for an international graduate student, University of Minnesota, 2017–2018
- Co-organized “Meeting for Young Scholars of Philosophy of Science in Japan,” Kyoto University, Kyoto, Japan, September 27-28, 2014
- Tutor for an international student, Kyoto University, 2013

## OUTREACH

- Lecture to high school students, “Three conditions for evolution to occur,” Kyoto, Japan, April 18, 2015 (in Japanese)
- Lecture to junior high school students, “Three conditions for evolution to occur,” Kyoto University, Kyoto, Japan, March 4, 2015 (in Japanese)

## MEMBERSHIPS

- American Philosophical Association
- European Philosophy of Science Association
- International Society for the History, Philosophy and Social Studies of Biology
- Society for Developmental Biology
- Philosophy of Science Association

## REFERENCES

### **Sara Green**

Associate Professor  
Department of Science Education, University of Copenhagen  
[sara.green@ind.ku.dk](mailto:sara.green@ind.ku.dk)

### **Sabina Leonelli**

Professor  
School of Social Sciences and Technology, Technical University of Munich  
[sabina.leonelli@tum.de](mailto:sabina.leonelli@tum.de)

### **Alan C. Love**

Professor  
Winton Chair in the Liberal Arts  
Director of the Minnesota Center for Philosophy of Science  
Department of Philosophy, University of Minnesota  
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+1 612-625-4510

### **Samuel C. Fletcher**

Professor  
Faculty of Philosophy, University of Oxford  
[sam.fletcher@merton.ox.ac.uk](mailto:sam.fletcher@merton.ox.ac.uk)

**Michael Bennett McNulty**  
Associate Professor  
McKnight Land-Grant Professor 2022–2024  
Department of Philosophy, University of Minnesota  
[mcnu0074@umn.edu](mailto:mcnu0074@umn.edu)  
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**Michelle Mason Bizri**  
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Department of Philosophy, University of Minnesota  
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## Dissertation Abstract

Although there is a consensus that pursuits of general knowledge are crucial in almost all fields of science, the majority of philosophical analyses of generalizations have focused narrowly on universal generalizations or laws of nature and what role generalizations play in scientific explanations. This narrow focus has limited the scope of philosophical discussion about scientific generalizations. This dissertation proposes and exemplifies a broader inquiry into scientific generalizations that is motivated by the question: how do scientists pursue, formulate, revise, reason about, utilize, and communicate generalizations? In other words, how are generalizations *practiced* in science? To address this broad set of questions, I focus on a particular field—developmental biology—and examine investigative, modeling, and representational practices surrounding generalizations. Like many scientists in other fields, developmental biologists are interested in both widely shared regularities and the details of causal processes peculiar to specific systems. My analyses show how this dual interest in generality and specific details is interconnected and mutually contribute to each other.

This dissertation is organized as follows. Chapter 2 analyzes two approaches to generalizations in developmental biology: mechanisms and principles. These are distinguished based on the relevance of abstraction. I show that the two approaches are associated with different investigative practices. This analysis provides a picture of what forms of non-universal generalizations developmental biologists seek and formulate, which serves as a basis for discussions of the following chapters.

Chapter 3 explores generalizations from the perspective of modeling desiderata. I offer a characterization of what I call multiple-models juxtaposition (MMJ), a strategy that is often employed to manage a trade-off between generality and detail in scientific models. MMJ displays models of distinct phenomena together and fulfills different desiderata both in the individual models and by a comparison of those models. I also clarify the distinction between MMJ and Michael Weisberg’s notion of multiple-models idealization (MMI), which also uses multiple models to manage trade-offs among desiderata.

Chapter 4 focuses on another crucial aspect of generalization practice in biology: the use of model systems. Biologists often study particular biological systems as models of a phenomenon of interest, even if they already know that the phenomenon is produced by diverse mechanisms and hence none of those systems alone can sufficiently represent it. This chapter provides an account that tells us why. Even if generalizability of results from a single model system is significantly limited, generalizations concerning specific

aspects of mechanisms often hold across certain ranges of biological systems. This enables multiple model systems to jointly represent such a phenomenon.

Chapter 5 considers the question “how and why do scientists generalize?” by challenging three influential assumptions: (1) generalizations are expressed linguistically; (2) scientists generalize by formulating a single representation with wide applicability; and (3) generalizations are valuable because they enable scientific explanations. My analysis of a concrete example illustrates roles that visual representations play in generalizations. It also shows that formulating a single, unified representation is not the only way to generalize; scientists often generalize by configuring multiple representations. Finally, I argue that generalizations serve to facilitate cross-fertilization among studies of different target systems, which complements the explanation-centered view.