

Sungsik Kong | Curriculum Vitæ

Wisconsin Institute for Discovery – University of Wisconsin-Madison
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Summary

- I am a **computational evolutionary biologist** with trainings in biology, statistics, and bioinformatics.
- My research focuses on **phylogenetic methods**, **phylogenetic networks**, and **reticulate evolution**.
- I am **adventurous** and **traveled** in Asia for a year on foot, bicycle, and motorbike.

Professional Experience

Wisconsin Institute for Discovery

University of Wisconsin-Madison, WI., USA

Mentor: Prof. Dr. Claudia Solís-Lemus

2023–Present

Postdoctoral research associate

Education

Ph.D. in Evolution, Ecology, and Organismal Biology

2018–2022

The Ohio State University, Columbus, OH., USA

Presidential fellow

2022

Dissertation: Towards the network of life: Phylogenetic networks as a tool to understand complex evolutionary histories

Advisor: Prof. Dr. Laura Kubatko

M.Sc. in Ecology and Evolutionary Biology

2013–2015

University of Toronto, Toronto, ON., Canada

Thesis: On the use of Median-Joining networks: A philosophical and empirical evaluation of its suitability in evolutionary biology

Advisor: Prof. Dr. Robert Murphy

B.Sc. in Zoology and Ecology and Evolutionary Biology

2006–2012

University of Toronto, Toronto, ON., Canada

Undergraduate thesis advisors: Profs. Drs. Robert Murphy and Deborah McLennan

Publications

Total number: 18

h-index: 7 [[Google scholar](#)]

*Correspondence; ‡Co-correspondence; †Equal contribution

Selected peer-reviewed journal articles.....

- [18] Kong S*, Sánchez-Pacheco SJ, and Murphy RW. (In Press) Median-Joining Networks and Bayesian phylogenies often do not tell the same story. *Bulletin of the Society of Systematic Biologists*. doi:10.18061/bssb.v2i-1.9625
- [17] Kong S (2022) Digest: Frequent hybridization in *Darevskia* rarely leads to the evolution of asexuality. *Evolution* 76:9 2216–2217 doi:10.1111/evo.14587
- [16] Kong S†, Pons JC†, Kubatko LS, and Wicke K. (2022) Classes of phylogenetic networks and their mathematical and biological significance. *Journal of Mathematical Biology* 84:47 doi:10.1007/s00285-022-01746-y
- [15] Kong S and Kubatko LS. (2021) Comparative performance of popular methods for hybrid detection using genomic data. *Systematic Biology* 70:5 891–907 doi:10.1093/sysbio/syaa092
- [14] Sánchez-Pacheco SJ‡, Kong S‡, Pulido-Santacruz P, Murphy RW, and Kubatko L. (2020) Median-joining network analysis of SARS-CoV-2 genomes is neither phylogenetic nor evolutionary. *Proc. Natl. Acad. Sci. U.S.A* 117:23 12518–12519 doi:10.1073/pnas.2007062117
- [13] Kong S†, Sánchez-Pacheco S†, and Murphy RW. (2016) On the use of Median-Joining Networks in evolutionary biology. *Cladistics* 32: 691–699 doi:10.1111/cla.12147

Collaborative peer-reviewed journal articles.....

- [12] Fu M, Eimes JA, Kong S, Lamichhaney S, Waldman B (2023) Identification of major histocompatibility complex genotypes associated with resistance to an amphibian emerging infectious disease. *Infection, Genetics and Evolution* 105470 doi:10.1016/j.meegid.2023.105470
- [11] Glon H, Häussermann V, Brewin P, Brickle P, Kong S, Smith M, and Daly M. (2023) There and back again: The unexpected journeys of *Metridium* de Blainville, 1824 between the old oceans and throughout the modern world. *Biological Bulletin* 244:1 doi:10.1086/723800
- [10] Nguyen HQ, Ho P-T, Kong S, Bae Y, Pham TH, and Jang Y. (2022) A time-calibrated mitogenomic phylogeny suggests that Korean *Hyalessa fuscata* is a bridge between Chinese and Japanese *H. maculaticollis*. *Journal of Genetics* 102:9 doi:10.1007/s12041-022-01405-7
- [9] Nguyen HQ, Kim E, Bae Y, Chae S, Ji S, Heo J, Kong S, Nguyen TK, Pham TH, and Jang Y. (2022) An effective method for accurate life-stage delimitation of cicadas. *Journal of Asia-Pacific Entomology* 101952 doi:10.1016/j.aspen.2022.101952
- [8] Glon MG, Broe MB, Crandall KA, Daly M, Kong S, Thoma RF, and Freudenstein JV. (2022) Anchored hybrid enrichment resolves the *Lacunicambarus* (Decapoda: Cambaridae) phylogeny. *Journal of Crustacean Biology* 42:1 ruab073 doi:10.1093/jcabi/ruab073
- [7] Kim M, Nguyen HQ, Yi Y, Ahn J, Kim YE, Jang S, Kim S, Kong S, and Borzée A. (2020) Policy recommendation on whaling, trade and watching of cetaceans in the Republic of Korea. *Biodiversity Journal* 11: 255–258 doi:10.31396/Biodiv.Jour.2020.11.1.255.258

- [6] Weiringa JG, Boot MR, Dantas-Queiroz MV, Duckett D, Fonseca EM, Glon H, Hamilton N, **Kong S**, Lanna FM, Mattingly KZ, Parsons DJ, Smith ML, Stone BW, Thompson C, Zuo L, and Carstens BC. (2020) Does habitat stability structure intraspecific genetic diversity? It's complicated... *Frontiers in Biogeography* e45377 doi:10.21425/F5FBG45377
- [5] Borzée A, Purevdorj Z, Kim YI, **Kong S**, Choe M, Yi Y, Kim K, Kim A, and Jang Y. (2020) Breeding preferences in the Treefrogs *Dryophytes japonicus* (Hylidae) in Mongolia, the northern limit of their range. *Journal of Natural History* 53: 2685-2698 doi:10.1080/00222933.2019.1704458
- [4] Bae Y, **Kong S**, Yi Y, Jang Y, and Borzée A. (2019) Additional new type of threat to *Hynobius* salamander eggs: predation by loaches (*Misgurnus* sp.) in agricultural wetlands. *Animal Biology* 69:4 451–461 doi:10.1163/15707563-20191070
- [3] Groffen J, **Kong S**, Jang Y, and Borzée A. (2019) The invasive American bullfrog (*Lithobates catesbeianus*) in the Republic of Korea: history and recommendation for population control. *Management of Biological Invasions* 10:3 517–535 doi:10.3391/mbi.2019.10.3.08
- [2] Borzée A, **Kong S**, Didinger C, Nguyen HQ, and Jang Y. (2018) A ring-species or a ring of species? Phylogenetic relationship between two treefrog species around the Yellow Sea: *Dryophytes suweonensis* and *D. immaculatus*. *The Herpetological Journal* 28: 160–170
- [1] Kim K, **Kong S**, Kim YI, Borzée A, Bae Y, and Jang Y. (2018) Japanese hard ticks (*Ixodes nipponensis*) parasitizing on the endangered leopard cat (*Prionailurus bengalensis euptilura*) in the Republic of Korea. *Animal Systematics, Evolution and Diversity* 34:1 23–26 doi:10.5635/ASED.2018.34.1.032

Policy recommendation.....

- [1] Borzée A, Nguyen HQ, Ahn J, Kim M, Kim S, Jang S, **Kong S**, Kim YE, and Yi Y. (2017) Policy recommendation on the negative impact of infrastructure development on the population of endangered Long-Tailed Goral in Oseck-Kkeutchong. *Society for Conservation Biology Korean Chapter*

Submitted.....

- [2] **Kong S**, Swofford DL, and Kubatko LS. (In Revision) Inference of phylogenetic networks from sequence data using composite likelihood. Preprint available on *bioRxiv* at 10.1101/2022.11.14.516468v1
- [1] Peng J, **Kong S**, and Kubatko L. (In Review) A likelihood ratio test for hybridization under the multispecies coalescent. Preprint available on *bioRxiv* at 10.1101/2023.06.20.545699

Talks and Presentations

*Virtual presentation

Invited talks.....

- [16] *Coming soon* Society for Industrial and Applied Mathematics,
New York-New Jersey-Pennsylvania Section (SIAM-NNP),
New Jersey Institute of Technology, Newark, NJ., USA 2023
Mathematics of Evolution Minisymposium
Title: Inferring phylogenetic networks from sequence data using composite likelihood
- [15] *Coming soon* University of Wisconsin-Madison, WI., USA 2023
UW-Madison Fall 2023 Evolution Seminar Series
Title: PhyNEST: Phylogenetic Network Estimation using SiTe patterns

- [14] **University of Wisconsin-Madison, WI., USA** 2023
UW-Madison Postdoctoral Research Symposium Blitz Talks Competition
 Title: Inferring phylogenetic networks from sequence data using composite likelihood
- [13] **Taming the BEAST, Squamish, BC., Canada** 2023
Squamish BEAST Tamers
 Title: Species network estimation
- [12] **Botany Meeting, Boise, ID., USA** 2023
Seeing the Network for the Trees: Methodological and Empirical Advances in Reticulate Evolution Symposium
 Title: Pitfalls of popular computational methods to understand reticulate evolution
- [11] **Algorithms and Complexity in Phylogenetics*** 2022
 Title: Inferring phylogenetic networks from sequence data using composite likelihood
 Video recording available on YouTube [\[link\]](#)
- [10] **Indiana University, Bloomington, IN., USA** 2022
 Title: Towards the network of life: Phylogenetic networks as a tool to understand complex evolutionary histories
- [9] **University of California San Diego, CA., USA*** 2022
 Title: Towards the network of life: Phylogenetic networks as a tool to understand complex evolutionary histories
- [8] **Evolution Meeting, Cleveland, OH., USA** 2022
Society of Systematic Biologists (SSB) Ernst Mayr award competition
 Title: Inferring phylogenetic networks using composite likelihood directly from sequence data
- [7] **Louisiana State University, Baton Rouge, LA., USA** 2022
Department of Biological Sciences
 Title: Inferring phylogenetic networks using composite likelihood directly from sequence data
- [6] **The Korean Association of Biological Sciences, Seoul, South Korea*** 2021
The Ecological Society of Korea Section
 Title: Comparative performance of popular methods for hybrid detection using genomic data
- [5] **Workshop in Mathematical and Computational Biology*** 2021
Bioinformatics Section
 Title: Comparative performance of popular methods for hybrid detection using genomic data
- [4] **Misericordia University, Dallas, PA., USA*** 2021
Biology Seminar Series
 Title: How my gap year changed my perspectives
- [3] **The Stone Laboratory, Gibraltar Island, OH., USA** 2019
EEOB 1930 Introduction to Biological Studies–Aquatic Biology
 Title: Phylogenetic networks and behavioral evolution of Primates
- [2] **Ewha Womans University, Seoul, South Korea** 2016
Eco-science/Eco-creative Graduate Seminar
 Title: On the use of Median-Joining network
- [1] **Ewha Womans University, Seoul, South Korea** 2013
Laboratory of Behavior and Ecology Weekly Seminar
 Title: The evolution of infanticide and male takeover in primates in a macroevolutionary framework

Regular talks.....

- [6] **Evolution Meeting*** 2021
Title: Comparative performance of popular methods for hybrid detection using genomic data
- [5] **The Ohio State University, Columbus, OH., USA*** 2021
Evolution, Ecology, and Organismal Biology (EEOB) Annual Darwin Series
Title: Comparative performance of popular methods for hybrid detection using genomic data
- [4] **The Ohio State University, Columbus, OH., USA** 2020
Title: Which tool to use to detect hybridization?
- [3] **SSB Standalone Meeting, Gainesville, FL., USA** 2020
Title: Comparison and evaluation on the accuracy of popular hybrid detection methods using simulated data
- [2] **The Ohio State University, Columbus, OH., USA** 2019
Title: The giving tree: how the branching pattern of a tree is used in evolutionary biology
- [1] **Ewha Womans University, Seoul, South Korea** 2017
Animal Communication Symposium
Title: Illustrating hybridization

Poster presentations.....

- [5] **Intelligent Systems for Molecular Biology (ISMB),
The International Society for Computational Biology (ISCB), Madison, WI., USA** 2022
Best Poster Award Winner
Title: Inference of phylogenetic networks from sequence data using composite likelihood
- [4] **Evolution Meeting, Providence, RI., USA** 2019
Title: Performance and accuracy of Median-Joining Networks and comparisons with Bayesian phylogenies
- [3] **The Korean Association of Biological Sciences, Yong-In, South Korea** 2017
Title: Performance and accuracy of Median-Joining Networks and comparisons with Bayesian phylogenies
- [2] **Korean-American Scientists and Engineers Association (KSEA)
Young Generation Technical and Leadership Conference (YGTLC), Houston, TX., USA** 2014
Title: Matrilineal relationships of green pitvipers with the description of a new species of the genus *Trimeresurus* (Squamata: Viperidae: Crotalinae) from the central highlands of Vietnam
- [1] **University of Toronto, Toronto, ON., Canada** 2012
Department of Ecology and Evolutionary Biology undergraduate research Fair
Title: The evolution of infanticide and male takeover in primates in a macro- evolutionary framework

Academic Experience

Academic visit.....

- University of Wisconsin–Madison, WI., USA** 2022
Wisconsin Institute for Discovery Visiting Ph.D. student
Mentor: Prof. Dr. Claudia Solís-Lemus

Louisiana State University, Baton Rouge, LA., USA
Department of Biological Sciences
Mentor: Prof. Dr. Jeremy Brown

2022
Visiting Ph.D. student

Research experience.....

Ewha Womans University, Seoul, South Korea
Division of Eco-science
Mentor: Prof. Dr. Yikweon Jang

2016–2017
Researcher

Ewha Womans University, Seoul, South Korea
Division of Eco-science
Mentor: Prof. Dr. Jae Chun Choe

2013
Student researcher

University of Toronto, ON., Canada
Faculty of Forestry
Mentor: Prof. Dr. Sandy Smith and Eric Davies

2011–2013
Work-study student
Biodiversity technician

Royal Ontario Museum, Toronto, ON., Canada
Centre for Biodiversity and Conservation Biology
Mentor: Prof. Dr. Robert Murphy

2012
Student researcher

University of Toronto, ON., Canada
Department of Ecology and Evolutionary Biology
Mentor: Prof. Dr. Deborah McLennan

2011–2012
Student researcher

University of Toronto, ON., Canada
Cities Centre, Department of Geography

2010
Student data collector

Fieldwork experience.....

- o Laos, Indonesia, Mongolia, China, and South Korea
- o Greater Toronto Area (GTA)

2016–2017
2010–2013

Teaching and Mentoring Experience

The Ohio State University.....

Teaching assistant

- o EEOB 3310 Evolution
- o EEOB 2520 Human Physiology
- o EEOB 1930 Introduction to Biological Studies–Aquatic Biology
- o BIOL 1113 Energy Transformation and Development

(Spring, Fall) 2021
(Spring, Summer, Fall) 2020
(Spring, Fall) 2019
(Summer) 2021
(Summer) 2019
(Fall) 2018

University of Toronto.....

Teaching assistant

- BIO 120 Adaptation and Biodiversity (Summer) 2015
(Summer) 2014
(Fall) 2013
- BIO 220 From Genomics to Ecosystems in a Changing World (Spring) 2015
- EEB 362 Macroevolution (Fall) 2014
- EEB 386 Avian Biology (Spring) 2014

Miscellaneous.....

- Daruma Eco-Farm, Bang Phra, Si Racha District, Chon Buri, Thailand 2016
- Cheong-Shim International English Camp, Ga-Pyeong, South Korea 2009

(Co-)supervision of undergraduate students.....

- Alanna Kong 2021–2022
Undergraduate student at University of Toronto
Mentored through University of Toronto Woodsworth Mentorship Program
- Devansh Pandey 2021–2022
Undergraduate student at Indian Institute of Technology Kharagpur
Currently a graduate student at University of Texas at Austin
Mentored through Científico Latino
- McKenna Molnar 2020–2021
Graduate student at The Ohio State University
EEOB Graduate Mentoring Program, The Ohio State University, OH., USA
- Shelby Jansens and Kimberly Wiles 2020
Co-supervised with Dr. Laura Kubatko
Mathematical Biosciences Institute Research Experiences for Undergraduates program
Title: Detecting shifts in the evolutionary process in SARS-CoV-2 genomes
- Tulio Soares and Ellen Southam 2014–2015
Co-supervised with Dr. Pedro Bernardo
University of Toronto and Royal Ontario Museum
- Shreeram Senthivasan 2014
Co-supervised with Drs. Pedro Bernardo, Santiago Sánchez-Pacheco, and Robert Murphy
University of Toronto and Royal Ontario Museum

Conference and Workshop Participation

*Virtual event

Participation with a role.....

- **Instructor** Methodological Advances in Reticulate Evolution, Botany Meeting, Boise, ID., USA 2023
- **SSB Mayr Award Abstract Reviewer & SSE Hamilton Award Judge**
Evolution Meeting, Albuquerque, NM., USA 2023
- **Teaching Assistant** Workshop on Molecular Evolution, Woods Hole, MA., USA 2023
- **Technical Moderator** ISMB, ISCB, Madison, WI., USA 2022
- **Symposium Organizer (co-organized with Md Rejuan Haque)** 2022
Evolution Meeting, Cleveland, OH., USA
Symposium title: Towards the network of life: Phylogenetic networks as a tool to understand complex evolutionary histories.
- **Chair/Moderator** in multiple Faux-Live Sessions, Evolution Meeting* 2021

Participant	
○ Midwest Machine Learning Symposium, University of Illinois Chicago, IL., USA	2023
○ Workshop in Mathematical and Computational Biology*	2022
○ Annual Conference of the Korean Association of Biological Sciences, South Korea*	2021
○ Workshop in Mathematical and Computational Biology*	2021
○ SMRT Leiden 2021 – Young Investigator Virtual Conference, hosted by Pacific Biosciences and Leiden University Medical Center*	2021
○ Virtual Asilomar 2021, American Society of Naturalists*	2021
○ Future of Systematics Workshop at SSB Standalone Meeting, funded by NSF, hosted by Dr. Emily Sessa, University of Florida, Gainesville, FL., USA	2020
○ Evolution Meeting, Providence, RI., USA	2019
○ Midwest Phylogenetics Workshop, Itasca Biological Station, funded by NSF, hosted by Dr. Emma Goldberg, University of Minnesota, MN., USA	2019
○ Annual Conference of the Korean Association of Biological Sciences, Yong-In, South Korea	2017
○ Society for Conservation Biology (SCB) Asia Section Workshop on Conservation policy, funded by SCB, Bangkok, Thailand	2017
○ World Congress of Herpetology, Hangzhou and Tonglu, China	2016
○ Phylogenomics Symposium and Software School hosted by Dr. Tandy Warnow at SSB Standalone Meeting, University of Michigan, Ann Arbor, MI., USA	2015

Diversity and Inclusion Activities

Participation with a role	
○ Moderator International Mixer, Evolution Meeting*	2021
○ Moderator Decolonizing Evolution Workshop, Evolution Meeting*	2021
○ Moderator Strategies for Responding to Harassment and Bullying: Improving Workplace Climate, Evolution Community Resources for Early Career Researchers 2020 (ECR ²)*	2020
○ Moderator Fireside ECR Chat, ECR ² *	2020

Participant	
○ International Mixer, Evolution Meeting, Cleveland, OH., USA	2022
○ Transformative Justice within Academia: A radical institutional reflection, The Centre for Criminology and Sociolegal Studies Graduate Student Conference, University of Toronto*	2021

Grants and Awards

All in US Dollars unless stated. †Canadian Dollar; ‡Approximately converted from South Korean Won
Total amount of funding received up to date ≈US\$50,000

Highlights	
○ The Presidential Fellowship, The Ohio State University [\$36,500]	2022
○ SSB Ad Hoc Funds [\$3,000]	2021
○ SSE Graduate Research Excellence Grant – R.C. Lewontin Award competition [\$1,800]	2020
○ University of Toronto Graduate Fellowship [Stipend with tuition waived for 18 months]	2013–2015
○ E.M. Walker Graduate Award in Biodiversity, University of Toronto [†\$2,615]	2014

Other grants.....

- EvolCompGen Best Poster Award, ISMB, ISCB [\$100] 2022
- EEOB Graduate Development Grant, The Ohio State University [Funded] 2022
- EEOB Graduate Evolution & Ecology Student Organization (GEES) Career Development Grant, The Ohio State University [\$200] 2022
- Council of Graduate Students (CGS) Career Development Grant, The Ohio State University [\$350] 2022
- EEOB Darwin Talk Society Membership Grant, The Ohio State University [\$70] 2021
- EEOB Graduate Development Grant, The Ohio State University [Funded] 2021
- Funding for participation in Future of Systematics Workshop, SSB Standalone Meeting (NSF) [\$500] 2020
- Funding for participation in Midwest Phylogenetics Workshop (NSF) [Funded] 2019
- EEOB Graduate Development Grant, The Ohio State University [Funded] 2019
- Major contribution to successful grant application to National Research Foundation of Korea PI: Dr. Yikweon Jang, Ewha Womans University, Seoul, South Korea [‡\$500,000] 2017
- University of Toronto Undergraduate Bursaries [†≈\$3,000] 2010–2012

Outreach and Service

- **Scientist** Junior science café, Morgridge Institute for Research, WI., USA 2023
- **Awardee** Graduate school awards ceremony, The Ohio State University 2022
- **Invited Panelist** EEOB 8894: EEOB Graduate eeminar, The Ohio State University 2020
- **Invited Guest** Translational Data Analytics Institute kickoff event, College of Arts and Sciences, The Ohio State University 2020
- **Volunteer** Museum of Biological Diversity's open house, The Ohio State University 2019
- **Graduate studies Committee** Department of EEOB, The Ohio State University 2020–2021
- **Admissions Committee** Department of EEOB, The Ohio State University 2019–2020
- **Communication Officer** Society for Conservation Biology (SCB), South Korean Chapter 2016–2017
- **Volunteer Biologist** Kuang Si Butterfly Park, Ban Thapene, Luang Prabang District, Laos 2016, 2022

Peer-Review Activities

- Systematic Biology, Molecular Biology and Evolution, Genome Biology and Evolution, Scientific Reports, Molecular Phylogenetics and Evolution, Infection, Genetics and Evolution, F1000Research

Professional Memberships

- Society of Systematic Biologists
- Society for Study of Evolution

Skills

Programming UNIX, R, Python, Julia, HTML, JavaScript

Typesetting L^AT_EX, R Markdown, Jupyter Notebook

Languages English (Fluent), Korean (Native), Japanese (Intermediate)

References

- [1] **Prof. Dr. Laura S. Kubatko (Ph.D. advisor)**
Department of Statistics and Department of Evolution, Ecology, and Organismal Biology
The Ohio State University
219 Cockins Hall, Columbus, OH., 43210, USA
lkubatko@stat.osu.edu
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- [2] **Prof. Dr. Claudia Solís-Lemus (Postdoc advisor)**
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Department of Plant Pathology
University of Wisconsin-Madison,
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- [3] **Prof. Dr. Robert W. Murphy (M.Sc. advisor)**
Department of Natural History-Royal Ontario Museum
And Professor of Ecology and Evolutionary Biology
University of Toronto
100 Queen's Park
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- [4] **Prof. Dr. Bryan C. Carstens**
Department of Evolution, Ecology, and Organismal Biology
And Tetrapod Division, Museum of Biological Diversity
The Ohio State University,
318 W. 12th Avenue,
Columbus, OH., 43210, USA
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- [5] **Prof. Dr. Jeremy M. Brown**
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Louisiana State University
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