

Sungsik Kong

CONTACT INFORMATION

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SUMMARY

- I am a *computational evolutionary biologist* with training in biology, statistics, computer science, and data science.
- 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 **2023-present**
University of Wisconsin-Madison, Madison, Wisconsin, USA *Postdoctoral research associate*
Mentor: Dr. Claudia Solís-Lemus

EDUCATION

The Ohio State University, Columbus, Ohio, USA **2018-2022**
Ph.D. in Evolution, Ecology, and Organismal Biology
Presidential fellow 2022
Dissertation: Towards the network of life: Phylogenetic networks as a tool to understand complex evolutionary histories
Advisor: Dr. Laura Kubatko

University of Toronto, Toronto, Ontario, Canada **2013-2015**
M.Sc. in Ecology and Evolutionary Biology
Thesis: On the use of Median-Joining networks: A philosophical and empirical evaluation of its suitability in evolutionary biology
Advisor: Dr. Robert Murphy

University of Toronto, Toronto, Ontario, Canada **2006-2012**
B.Sc. in Zoology and Ecology and Evolutionary Biology
Undergraduate thesis advisors: Drs. Robert W. Murphy and Deborah A. 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. (2023) Median-Joining Networks and Bayesian phylogenies often do not tell the same story. *Bulletin of the Society of Systematic Biologists* 2:1 1–13 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/jcbiol/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

- [1] **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
- [2] 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

- [1] Institute for Computational and Experimental Research in Mathematics (ICERM), Brown University, Providence, RI., USA *From Phylogenetics to Phylogenomics: Mathematical and Statistical Challenges in the era of Big Data* *Scheduled in 2024*
- [2] The International Society for Computational Biology (ISCB), Society for Molecular Biology and Evolution (SMBE)* *EvolCompGen webinar series* 2023
- [3] Society for Industrial and Applied Mathematics, New York-New Jersey-Pennsylvania Section (SIAM-NNP), New Jersey Institute of Technology (NJIT), Newark, NJ., USA *Mathematics of Evolution Minisymposium* 2023
- [4] University of Wisconsin-Madison, WI., USA [\[video\]](#) *UW-Madison Fall 2023 Evolution Seminar Series* 2023
- [5] University of Wisconsin-Madison, WI., USA *UW-Madison Postdoctoral Research Symposium Blitz Talks Competition* 2023
- [6] Taming the BEAST, Squamish, BC., Canada *Squamish BEAST Tamers* 2023
- [7] Botany Meeting, Boise, ID., USA *Seeing the Network for the Trees Symposium* 2023
- [8] Algorithms and Complexity in Phylogenetics* [\[video\]](#) 2022
- [9] Indiana University, Bloomington, IN., USA 2022
- [10] University of California San Diego, CA., USA* 2022
- [11] Evolution Meeting, Cleveland, OH., USA *Society of Systematic Biologists (SSB) Ernst Mayr Award Competition* 2022
- [12] Louisiana State University, Baton Rouge, LA., USA *Department of Biological Sciences Seminar* 2022
- [13] The Korean Association of Biological Sciences, Seoul, South Korea* *The Ecological Society of Korea Section* 2021
- [14] Workshop in Mathematical and Computational Biology* [\[video\]](#) *Bioinformatics Section* 2021

- [15] Misericordia University, Dallas, PA., USA* 2021
Biology Seminar Series
- [16] The Stone Laboratory, Gibraltar Island, OH., USA 2019
EEOB 1930 Introduction to Biological Studies–Aquatic Biology
- [17] Ewha Womans University, Seoul, South Korea 2016
Eco-science/Eco-creative Graduate Seminar
- [18] Ewha Womans University, Seoul, South Korea 2013
Laboratory of Behavior and Ecology Weekly Seminar

Regular talks

- [1] University of Wisconsin-Madison, WI., USA 2023
Wisconsin Institute for Discovery Symposium
- [2] Evolution Meeting* 2021
- [3] The Ohio State University, Columbus, OH., USA* 2021
Evolution, Ecology, and Organismal Biology (EEOB) Annual Darwin Series
- [4] The Ohio State University, Columbus, OH., USA 2019, 2020
Evolution & Ecology Club
- [5] SSB Standalone Meeting, Gainesville, FL., USA 2020
- [6] Ewha Womans University, Seoul, South Korea 2017
Animal Communication Symposium

Poster presentations

- [1] Intelligent Systems for Molecular Biology (ISMB), ISCB, Madison, WI., USA 2022
Best Poster Award Winner
- [2] Evolution Meeting, Providence, RI., USA 2019
- [3] The Korean Association of Biological Sciences, Yong-In, South Korea 2017
- [4] Korean-American Scientists and Engineers Association (KSEA), 2014
Young Generation Technical and Leadership Conference (YGTLC), Houston, TX., USA
- [5] University of Toronto, Toronto, ON., Canada 2012
Department of Ecology and Evolutionary Biology undergraduate research Fair

ACADEMIC EXPERIENCE

Academic visit

- [1] University of Wisconsin–Madison, WI., USA 2022
Wisconsin Institute for Discovery
Mentor: Dr. Claudia Solís-Lemus *Visiting Ph.D. student*
- [2] Louisiana State University, Baton Rouge, LA., USA 2022
Department of Biological Sciences
Mentor: Dr. Jeremy Brown *Visiting Ph.D. student*

Research experience

- [1] Ewha Womans University, Seoul, South Korea 2013, 2016–2017
Division of Eco-science
Mentors: Drs. Jae Chun Choe and Yikweon Jang *Researcher*
- [2] University of Toronto, ON., Canada 2011–2013
Faculty of Forestry
Mentors: Dr. Sandy Smith and Eric Davies *Work-study student & Biodiversity technician*

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| [3] Royal Ontario Museum, Toronto, ON., Canada
<i>Centre for Biodiversity and Conservation Biology</i>
Mentor: Dr. Robert Murphy | 2012
<i>Student researcher</i> |
| [4] University of Toronto, ON., Canada
<i>Department of Ecology and Evolutionary Biology</i>
Mentor: Dr. Deborah McLennan | 2011–2012
<i>Student researcher</i> |
| [5] University of Toronto, ON., Canada
<i>Cities Centre, Department of Geography</i>
Mentor: Dr. Kristian Larsen | 2010
<i>Student data collector</i> |

Fieldwork experience

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| [1] Laos, Indonesia, Mongolia, China, and South Korea | 2016–2017 |
| [2] Indonesia, Laos, and South Korea | 2016 |
| [3] Greater Toronto Area (GTA) | 2010–2013 |

TEACHING AND MENTORING EXPERIENCE

International workshops

Instructor

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| [1] Methodological Advances in Reticulate Evolution, Botany Meeting, Boise, ID., USA | 2023 |
| [2] Squamish BEAST Tamers, Taming the BEAST, Squamish, BC., Canada | 2023 |

Teaching assistant

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| [1] Workshop on Molecular Evolution, Woods Hole, MA., USA† | <i>Scheduled in 2024</i> |
| [2] Workshop on Molecular Evolution, Woods Hole, MA., USA | 2023 |

The Ohio State University

Teaching assistant

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|---|---|
| [1] <i>EEOB 3310</i> Evolution | (Spring, Fall) 2021
(Spring, Summer, Fall) 2020
(Spring, Fall) 2019 |
| [2] <i>EEOB 2520</i> Human Physiology | (Summer) 2021 |
| [3] <i>EEOB 1930</i> Introduction to Biological Studies–Aquatic Biology | (Summer) 2019 |
| [4] <i>BIOL 1113</i> Energy Transformation and Development | (Fall) 2018 |

University of Toronto

Teaching assistant

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| [1] <i>BIO 120</i> Adaptation and Biodiversity | (Summer) 2015
(Summer) 2014
(Fall) 2013 |
| [2] <i>BIO 220</i> From Genomics to Ecosystems in a Changing World | (Spring) 2015 |
| [3] <i>EEB 362</i> Macroevolution | (Fall) 2014 |
| [4] <i>EEB 386</i> Avian Biology | (Spring) 2014 |

(Co-)supervision of undergraduate and graduate students

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| [1] | Alanna Kong (University of Toronto)
<i>Mentored through University of Toronto Woodsworth Mentorship Program</i> | 2021–2022 |
| [2] | Devansh Pandey (Indian Institute of Technology Kharagpur)
<i>Mentored through Científico Latino</i>
Currently a graduate student at University of Texas at Austin | 2021–2022 |
| [3] | McKenna Molnar (The Ohio State University)
<i>Mentored through OSU EEOB Graduate Mentoring Program</i> | 2020–2021 |
| [4] | Shelby Jansens and Kimberly Wiles
<i>Co-supervised with Dr. Laura Kubatko through Mathematical Biosciences Institute Research Experiences for Undergraduates program</i>
Project title: Detecting shifts in the evolutionary process in SARS-CoV-2 genomes | 2020 |
| [5] | Tulio Soares and Ellen Southam
<i>Co-supervised with Dr. Pedro Bernardo at University of Toronto and Royal Ontario Museum</i> | 2014–2015 |
| [6] | Shreeram Senthivasan
<i>Co-supervised with Drs. Pedro Bernardo, Santiago Sánchez-Pacheco, and Robert Murphy at University of Toronto and Royal Ontario Museum</i> | 2014 |

Miscellaneous

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| [1] | Daruma Eco-Farm, Bang Phra, Si Racha District, Chon Buri, Thailand | 2016 |
| [2] | Cheong-Shim International School English Camp, Ga-Pyeong, South Korea | 2009 |

CONFERENCE AND
WORKSHOP
PARTICIPATION * *Virtual event*

Participation with a role

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| [1] | Evolution Meeting, Albuquerque, NM., USA
<i>SSB Mayr Award Abstract Reviewer & Society of Study of Evolution (SSE) Hamilton Award Judge</i> | 2023 |
| [2] | ISMB, ISCB, Madison, WI., USA
<i>Technical Moderator</i> | 2022 |
| [3] | Evolution Meeting, Cleveland, OH., USA
<i>SSB Symposium Co-organizer (with Dr. Md Rejuan Haque)</i>
<i>Symposium title: Towards the network of life: Phylogenetic networks as a tool to understand complex evolutionary histories.</i> | 2022 |
| [4] | Evolution Meeting*
<i>Chair/Moderator in multiple Faux-Live Sessions</i> | 2021 |

Participant

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| [1] | Wisconsin Institute for Discovery Symposium,
University of Wisconsin-Madison, WI., USA | 2022, 2023 |
| [2] | Midwest Machine Learning Symposium, University of Illinois Chicago, IL., USA | 2023 |
| [3] | Workshop in Mathematical and Computational Biology* | 2022 |
| [4] | Annual Conference of the Korean Association of Biological Sciences, South Korea* | 2021 |
| [5] | iEvoBio (Informatics for Phylogenetics, Evolution and Biodiversity), Evolution Meeting* | 2021 |
| [6] | Workshop in Mathematical and Computational Biology* | 2021 |

[7]	SMRT Leiden 2021 – Young Investigator Virtual Conference*	2021
[8]	Virtual Asilomar 2021, American Society of Naturalists*	2021
[9]	Future of Systematics Workshop at SSB Standalone Meeting, University of Florida, Gainesville, FL., USA	2020
[10]	SSB Standalone Meeting, Gainesville, FL., USA	2020
[11]	Evolution Meeting, Providence, RI., USA	2019
[12]	Midwest Phylogenetics Workshop, Itasca Biological Station, University of Minnesota, MN., USA	2019
[13]	Annual Conference of the Korean Association of Biological Sciences, Yong-In, South Korea	2017
[14]	Society for Conservation Biology (SCB) Asia Section, Workshop on Conservation policy, Bangkok, Thailand	2017
[15]	World Congress of Herpetology, Hangzhou and Tonglu, China	2016
[16]	Phylogenomics Symposium and Software School at SSB Standalone Meeting, University of Michigan, Ann Arbor, MI., USA	2015

GRANTS AND AWARDS

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

Highlights

[1]	The Presidential Fellowship, The Ohio State University [\$36,500]	2022
[2]	SSB Ad Hoc Funds [\$3,000]	2021
[3]	SSE Graduate Research Excellence Grant [\$1,800] <i>R.C. Lewontin Award competition</i>	2020
[4]	University of Toronto Graduate Fellowship	2013–2015
[5]	E.M. Walker Graduate Award in Biodiversity, University of Toronto [\$2,615†]	2014

Other grants

[1]	EvoCompGen Best Poster Award, ISMB, ISCB [\$100]	2022
[2]	EEOB Graduate Development Grant, The Ohio State University [Funded]	2022
[3]	EEOB Graduate Evolution & Ecology Student Organization (GEES) Career Development Grant, The Ohio State University [\$200]	2022
[4]	Council of Graduate Students (CGS) Career Development Grant, The Ohio State University [\$350]	2022
[5]	EEOB Darwin Talk Society Membership Grant, The Ohio State University [\$70]	2021
[6]	EEOB Graduate Development Grant, The Ohio State University [Funded]	2021
[7]	Funding for participation in Future of Systematics Workshop, SSB Standalone Meeting (NSF) [\$500]	2020
[8]	Funding for participation in Midwest Phylogenetics Workshop (NSF) [Funded]	2019
[9]	EEOB Graduate Development Grant, The Ohio State University [Funded]	2019
[10]	University of Toronto Undergraduate Bursaries [†≈\$3,000]	2010–2012

DIVERSITY AND INCLUSION ACTIVITIES	Participation with a role	
	[1] International Mixer, Evolution Meeting* <i>Moderator</i>	2021
	[2] Decolonizing Evolution Workshop, Evolution Meeting* <i>Moderator</i>	2021
	[3] Strategies for Responding to Harassment and Bullying: Improving Workplace Climate, Evolution Community Resources for Early Career Researchers 2020 (ECR ²)* <i>Moderator</i>	2020
	[4] Fireside ECR Chat, ECR ² * <i>Moderator</i>	2020
	Participant	
	[1] International Mixer, Evolution Meeting, Cleveland, OH., USA	2022
	[2] Transformative Justice within Academia: A radical institutional reflection, The Centre for Criminology and Sociological Studies Graduate Student Conference, University of Toronto*	2021
OUTREACH AND SERVICE	[1] Junior science café, Morgridge Institute for Research, WI., USA <i>Scientist</i>	2023
	[2] EEOB 8894: EEOB Graduate seminar, The Ohio State University <i>Invited Panelist</i>	2020
	[3] Museum of Biological Diversity’s open house, The Ohio State University <i>Volunteer</i>	2019
	[4] Department of EEOB, The Ohio State University <i>Graduate studies Committee</i>	2020–2021
	[5] Department of EEOB, The Ohio State University <i>Admissions Committee</i>	2019–2020
	[6] SCB, South Korean Chapter <i>Communication Officer</i>	2016–2017
	[7] Kuang Si Butterfly Park, Ban Thapene, Luang Prabang District, Laos <i>Volunteer Biologist</i>	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; PLOS Computational Biology; F1000Research; Journal of Mathematical Biology; Bulletin of Mathematical Biology	
ACTIVE PROFESSIONAL MEMBERSHIPS	Society of Systematic Biologists; Society for Study of Evolution; International Society for Computational Biology	
SKILLS	Programming: UNIX, R, Python, Julia, HTML, JavaScript Typesetting: L ^A T _E X, R Markdown, Jupyter Notebook Languages: English (Fluent), Korean (Native), Japanese (Intermediate)	

REFERENCES

- [1] Dr. Laura S. Kubatko (Ph.D. advisor)
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The Ohio State University
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- [2] Dr. Claudia Solís-Lemus (Postdoc advisor)
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- [3] Dr. Robert W. Murphy (M.Sc. advisor)
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Professor of Ecology and Evolutionary Biology
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