

# Soojin Yi

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## Education and Employment

Professor, School of Biology, Georgia Tech	2015-
Associate Professor, School of Biology, Georgia Tech	2010-2014
Assistant Professor, School of Biology, Georgia Tech	2004-2009
Postdoctoral Research Associate, University of Chicago (mentor: Wen-Hsiung Li)	2000-2004
Ph.D., Ecology and Evolution, University of Chicago (mentor: Brian Charlesworth)	2000
Visiting Graduate Student, Edinburgh University (mentor: Brian Charlesworth)	1999
M.S., Ecology and Evolution, University of Chicago	1996
B.S., Biology, Seoul National University, Seoul, Korea	1992

## Research Interests

Genomics, Epigenomics, Molecular Evolution, Neuroscience, Systems Biology

## Honors and Awards

2014-2015	Brainpool Fellowship, Korean Federation of Science & Technology, Korea
2013	Abell Faculty Fellow, School of Biology, Georgia Tech
2007-2009	Alfred P. Sloan Research Fellow, Alfred P. Sloan Foundation
2007	Sigma Xi Young Faculty Award, Sigma Xi Foundation, Georgia Tech
2005-2007	Blanchard-Milliken Faculty Fellowship, Blanchard-Milliken Foundation
1997-2000	Doctoral Dissertation Improvement Grant, NSF
1999	Committee on Evolutionary Biology Research Grant, University of Chicago
1997	Hinds Fund for Research, Division of Biological Sciences, University of Chicago
1997	Sigma Xi Grant, Sigma Xi Foundation
1994-1999	Grants for Abroad Studies, Korean Foundation for Advanced Studies, Korea
1992	B.S. with the highest honor, Seoul National University
1989-1992	Seoul National University Full Scholarship

## Peer-Reviewed Publications

Complete list of publications in NCBI My Bibliography:

<http://www.ncbi.nlm.nih.gov/sites/myncbi/soojin.yi.1/bibliography/49240351/public/?sort=date&direction=descending>

78. Mendizabal, I., Shi, L., Keller, T. E., Konopka, G., Preuss, T. M., Hsieh, T.-F., Hu, E., Zhang, Z., Su, B., and **Yi, S. V.** 2016. Comparative Methylome Analyses Identify Epigenetic Regulatory Loci of Human Brain Evolution. *Molecular Biology and Evolution*, doi: 10.1093/molbev/msw176
77. Yin, H., Wang, G., Ma, L., **Yi, S. V.**, and Zhang, Z. 2016. What signatures associate with gene age in human? *Genome Biology and Evolution*, doi: 10.1093/gbe/evw216.
76. Galbraith, D. C., **Yi, S. V.**, and Grozinger, C. M. 2016. Evaluation of possible proximate mechanisms underlying the kinship theory of intragenomic conflict in social insects. *Integrative and Comparative Biology*, *accepted*.

75. Keller, T. E., Lasky, J. R., and **Yi, S. V.** 2016. The multivariate association between genome-wide DNA methylation and climate across the range of *Arabidopsis thaliana*, *Molecular Ecology*, **25**: 1823-1837.
74. Keller, T. E., Han, P. and **Yi, S. V.** 2016. Evolutionary Transition of Promoter and Gene Body DNA Methylation across Invertebrate-Vertebrate Boundary. *Molecular Biology and Evolution*, **33**: 1019-1028
73. Glastad, K., Goodisman, M. A. D. and **Yi, S. V.** and Hunt, B. G. 2015. The effects of DNA methylation and chromatin states on rates of molecular evolution in insect genomes. *G3*: 357-363. doi:10.1534/g3.115.023499
72. Mendizabal, I. and **Yi, S. V.** 2016. Whole-genome bisulfite sequencing maps from multiple human tissues reveal novel CpG islands associated with tissue-specific regulation, *Human Molecular Genetics* **25**: 69-82. doi: 10.1093/hmg/ddv449.
71. Zinzow-Kramer, W. M., Horton, B. M., McKee, C. D., Michaud, J. M., Tharp, G. K., Thomas, J. W., Tuttle, E. M., **Yi, S. V.**, and Maney, D. L. 2015. Genes located in a chromosomal inversion are correlated with territorial song in white-throated sparrows. *Genes, Brain and Behavior*, **14**: 641-654. 10.1111/gbb.12252.
70. Sun, D., and **Yi, S. V.** 2015. Impacts of chromatin states and long-range genomic segments on aging and DNA methylation, *PLoS One*, **10(6)**: e0128517.
69. Galbraith, D. A., Yang, X., Niño, E. L., **Yi, S. V.**, and Grozinger, C. M. 2015. Dual genomic response pathways to systemic viral infection in honey bees (*Apis mellifera*), *PLoS Pathogens*, **11**: e1004713.
68. Zeng, J., and **Yi, S. V. (corresponding author)** 2014. Specific modifications of histone tails, but not DNA methylation, mirror the temporal variation of mammalian recombination hotspots. *Genome Biology and Evolution*, **6**: 2918-2929.
67. Akhshabi, S., Sarda, S., Dovrolis, C., and **Yi, S. V.** 2014. An Explanatory evo-devo model for the developmental hourglass. *F1000 Research*, **3**: 156.
66. Huh, I., Yang, X., Park, T. and **Yi, S. V. (corresponding author)**, 2014. Bis-Class: New and Improved Identification of DNA Methylation from Methyl-C Seq Data. *BMC Genomics*, **15**: 608.
65. Mendizabal, I., Keller, T. E., Zeng, J., and **Yi, S. V. (corresponding author)**, 2014. Epigenetics and Evolution. *Integrative and Comparative Biology*. **54**: 31-42. DOI: 10.1093/icb/icu040
64. Jameson Kiesling, N. M., **Yi, S. V.** Xu, K., Sperone, F. G., and Wildman, D. E. 2015. The tempo and mode of New World monkey evolution and biogeography in the context of phylogenomic analysis. *Molecular Phylogenetics and Evolution*, **82 Pt B**: 386-399. DOI: 10.1016/j.ympev.2014.03.027
63. Keller, T. E., and **Yi, S. V. (corresponding author)** 2014. DNA Methylation and Evolution of Duplicate Genes. *Proceedings of the National Academy of Sciences USA*, **111**: 5932-5937. DOI: 10.1073/pnas.1321420111.
62. Glastad, K., Hunt, B. G., **Yi, S. V.**, and M. Goodisman. 2014. Epigenetic inheritance and genome regulation: Is DNA methylation linked to ploidy in haplodiploid insects? *Proceedings of the Royal Society, Series B*. **281**: 1785. DOI: 10.1098/rspb.2014.0411
61. Zeng, J., Nagrajan, H. K., **Yi, S. V. (corresponding author)** 2014. Fundamental Diversity of CpG Islands at Multiple Biological Levels. *Epigenetics*, **9**: 483-491. DOI: 10.4161/epi.27654
60. Kocher, S. D., Li, C., Yang, W., Tan, H., **Yi, S. V.**, Yang, X., Hoekstra, H. E., Zhang, G., Pierce, N. E., Yu, D. W. 2013. The Draft Genome of a Socially Polymorphic Halictid Bee, *Lasioglossum albipes*. *Genome Biology*, **14** (12): R142. DOI: 10.1186/gb-2013-14-12-r142
59. Xiao, J. H. et al. (**Yi, S. V.**, Yang, X. members) 2013. Obligate mutualism within a host drives the extreme specialization of a fig wasp genome. *Genome Biology*, **14**: R141.

58. Hall, D., Yi, S. V., and Goodisman, M. A. D. 2013. Kin Selection, Genomics, and Caste-Antagonistic pleiotropy. *Biology Letters*, 9: 20130309. DOI: 10.1098/rsbl.2013.0309
57. Xu, K., Wang, J., Elango, E., Yi, S. V. (corresponding author), 2013. The evolution of lineage-specific clusters of single nucleotide substitutions in the human genome. *Molecular Phylogenetics and Evolution*, 69: 276-285.
56. Huh, I.-S., Zeng, J., Park, T., and Yi, S. V. (corresponding author), 2013. DNA methylation and transcriptional noise. *Epigenetics and Chromatin*, 6: 9.
- 'Highly Accessed' article
55. Yi, S. V. 2013. Neutrality and Molecular Clocks. *Nature Education Knowledge*, 4: 3.
54. Hunt, B. G., Glastad, K. M., Yi, S. V., and M. A. D. Goodisman. 2013. Patterning and regulatory associations of DNA methylation are mirrored by histone modifications in insects. *Genome Biology and Evolution*, 5: 591-598. DOI: 10.1093/gbe/evt030
53. Hunt, B. G., Glastad, K. M., Yi, S. V., and M. A. D. Goodisman. 2013. The function of intragenic DNA methylation: insights from insect epigenomes. *Integrative and Comparative Biology*, 53: 319-328. DOI: 10.1093/icb/ict003
52. Yi, S. V. (corresponding author), 2013. Morris Goodman's Hominoid Rate Slowdown: The Importance of Being Neutral. *Molecular Phylogenetics and Evolution*, 66: 569-574.
51. Yi, S. V. (corresponding author) 2012. Birds do it, bees do it, worms and ciliates do it too: DNA methylation from unexpected corners of the tree of life. *Genome Biology*, 13: 174.
- *Special Podcast Interview by Genome Biology*
50. Zeng, J., Konopka, G., Hunt, B. G., Preuss, T. M., Geschwind, D., and Yi, S. V. (corresponding author), 2012. Divergent whole-genome methylation maps of human and chimpanzee brains reveal epigenetic basis of human regulatory evolution. *American Journal of Human Genetics*, 91: 455-465.
49. Jjingo, D., Conley, A. B., Yi, S. V., Lunyak, V. V., Jordan, I. K. 2012. On the presence and role of human gene-body DNA methylation. *Oncotarget*, 3: 462-474.
48. Jameson, N., Xu, K., Yi, S. V. (corresponding author), and Wildman, D. E. 2012. Development and Annotation of Molecular Markers from New World Monkeys. *Molecular Ecology Resources*, 12: 950-955.
47. Sarda, S., Zeng, J., Hunt, B. G., and Yi, S. V. (corresponding author), 2012. The Evolution of Invertebrate Gene Body Methylation. *Molecular Biology and Evolution*, 29: 1907-1916.
46. Xu, K., Oh, S., Park, T., Presgraves, D., and Yi, S. V. (corresponding author). 2012. Lineage-specific variation in slow- and fast-X evolution in primates. *Evolution*, 66: 1751-1761.
45. Park, J., Xu, K., Park, T., and Yi, S. V. (corresponding author). 2012. What are the determinants of gene expression levels and breadths in the human genome? *Human Molecular Genetics*, 21: 46-56.
44. Grbic et al. (Yi, S. V., Zeng, J. members). 2011. The genome of the two-spotted spider mite *Tetranychus urticae*: a model for plant-herbivore interactions. *Nature*, 479: 487-492.
43. Hunt, B. G., Ometto, L., Wurm, Y., Shoemaker, D, Yi, S. V., Keller, L., Goodisman, M. A. D. 2011. Relaxed selection is a precursor to the evolution of phenotypic plasticity. *Proc. Natl. Acad. Sci. USA*. 108: 15936-15941.
42. Park, J., Peng, Z., Zeng, J. Elango, N., Park, T., Wheeler, D., Werren, J. H., and Yi, S. V. (corresponding author) 2011. Comparative analyses of DNA methylation and sequence evolution using *Nasonia* genomes. *Molecular Biology and Evolution*, 28: 3345-3354.
41. Glastad, K., Hunt, B. G., Yi, S. V., and Goodisman, M. A. D. 2011. DNA methylation in insects: on the brink of the epigenomic era. *Insect Mol. Biol.*, 20: 553-565.

40. Elango, N., and **Yi, S. V. (corresponding author)** 2011. Functional relevance of CpG island length for regulation of gene expression. *Genetics*, **187**: 1077-1083.
39. Xu, K., Bezakova, I., Bunimovich, L., and **Yi, S. V. (corresponding author)** 2011. Path lengths in protein-protein interaction networks and biological complexity. *Proteomics*, **11**: 1857-1867.
38. Loh, E. Y.-H., **Yi, S. V.**, and J. T. Streebman. 2011. Evolution of microRNAs and the diversification of species. *Genome Biology and Evolution*, **3**: 55-65.
37. Wurm et al. (**Yi, S. V.** a member of the Fire Ant Genome Consortium) 2011. The genome of the fire ant *Solenopsis invicta*. *Proc. Natl. Acad. Sci. USA*. **108**: 5679-5684.
36. Zeng, J. and **Yi, S. V. (corresponding author)** 2010. DNA methylation and genome evolution in honeybee: gene length, expression, functional enrichment co-vary with the evolutionary signature of DNA methylation. *Genome Biology and Evolution* **2**: 770-780.
35. Hunt, B. G., Brisson, J., **Yi, S. V. (corresponding author)** and M. Goodisman. 2010. Functional conservation of DNA methylation in the pea aphid and the honeybee. *Genome Biology and Evolution* **2**: 719-728.
34. Hunt, B., Stefan, W., Elango, N., Werren, J., Zdobnov, E., **Yi, S. V. (corresponding author)** and Goodisman, M. A. D. 2010. Sociality is linked to rates of protein evolution in a highly social insect. *Molecular Biology and Evolution*. **27**: 497-500.
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33. *Nasonia* Genome Sequencing and Analysis Consortium (**Yi, S. V. – member**). 2010. Functional and evolutionary insights from the genomes of three parasitoid *Nasonia* species. *Science* **327**: 343-348
32. **Yi, S. V. (corresponding author)** and Goodisman, M. A. D. 2009. Computational approaches for understanding the evolution of DNA methylation in animals. *Epigenetics* **4**: 551-556.
31. Presgraves, D. and **Yi, S. V.** 2009. Doubts about complex speciation between humans and chimpanzees. *Trends in Ecology & Evolution* **24**: 533-540.
- Featured in Nature magazine, Nature News (August 28, 2009 article by Elie Dolgin, 'Human-chimp interbreeding challenged')
  - Faculty of 1000 'must read'
30. Wildman, D. E., Jameson, N. M., Opazo, J. C. and **Yi, S. V. (corresponding author)** 2009. A fully resolved genus level phylogeny of neotropical primates (Platyrrhini), *Molecular Phylogenetics and Evolution* **53**: 694-702.
29. Elango, N., Hunt, B. G., Goodisman, M. A. D. and **Yi, S. V. (corresponding author)** 2009. DNA methylation is widespread and associated with differential gene expression in castes of the honeybee *Apis mellifera*. *Proc. Natl. Acad. Sci. USA*. **106**: 11206-11211.
28. Peng, Z., Elango, N., Wildman, D. E., and **Yi, S. V. (corresponding author)** 2009. Primate Phylogenomics: developing numerous nuclear non-coding, non-repetitive markers for ecological and phylogenetic applications and analysis of evolutionary rate variation. *BMC Genomics* **10**: 247.
27. Elango, N., Lee, J., Peng, Z., Loh, Y.-H. E., and **Yi, S. V. (corresponding author)** 2009. Evolutionary rate variation in Old World monkeys. *Biology Letters* **5**: 405-408.
26. Hazen, T.H., Kennedy, D.K., Chen, S., **Yi, S. V.**, and P.A. Sobecky. 2009. Inactivation of mismatch repair increases diversity of *Vibrio parahaemolyticus*. *Environmental Microbiology* **5**: 1254-1266.
25. Loh, Y-H. E., Katz, L. S., Mims, M. C., Kocher, T. D., **Yi, S. V.**, and J. T. Streebman. 2008. Comparative analysis reveals signatures of differentiation amid genomic polymorphism in Lake Malawi cichlids. *Genome Biology*. R113.
24. Elango, N., and **Yi, S. V. (corresponding author)** 2008. DNA methylation and structural and functional bimodality of vertebrate promoters. *Molecular Biology and Evolution*. **25**: 1602-1608.

23. Elango, N., Kim, S.-H., NISC Comparative Sequencing Group, E. Vigoda and **Yi, S. V. (corresponding author)** 2008. Mutations of different molecular origins exhibit contrasting patterns of regional substitution rate variation. *PLoS Computational Biology* **4(2)**: e1000015.
22. Warden, C. D., Kim, S.-H., and **Yi, S. V. (corresponding author)** 2008. Predicted functional RNAs within coding regions constrain evolutionary rates of yeast proteins. *PLoS One* **3(2)**: e1559.
21. Kim, S.-H., and **Yi, S. V. (corresponding author)** 2008. Mammalian nonsynonymous sites are not overdispersed: comparative genomic analysis of index of dispersion of mammalian proteins. *Molecular Biology and Evolution*, **25**: 634-642.
20. **Yi, S. V. (corresponding author)** 2007. Understanding neutral genomic molecular clocks. *Evolutionary Biology*, **34**: 144-151.
19. **Yi, S. (corresponding author)**, and W.-H. Li. 2007. Episodic molecular evolution of some protein hormones in primates and its implications for primate adaptation. pp. 739-773 *In*, Ravosa, M. J. and M. Dagosto. Eds. *Developments in Primatology: Progress and Prospects*. Kluwer Academic/Plenum Publishers. New York, NY, USA.
18. Kim, S.-H., and **Yi, S. V. (corresponding author)** 2007. Understanding relationship between sequence and functional evolution in yeast proteins. *Genetica*, **131**: 151-156.
17. Kim, S.-H., N. Elango, C. Warden, E. Vigoda, and **Yi, S. V. (corresponding author)** 2006. Heterogeneous genomic molecular clocks in primates. *PLoS Genetics*, **2(10)**: e163.
16. **Yi, S. V. (corresponding author)** 2006. Non-adaptive evolution of genome complexity. *BioEssays*, **28**: 979-982.
15. Kim, S.-H., and **Yi, S. V. (corresponding author)** 2006. Correlated asymmetry between sequence and functional divergence of duplicate proteins in *Saccharomyces cerevisiae*. *Molecular Biology and Evolution*, **23**: 1068-1075.
14. Elango, N., J. W. Thomas, NISC Comparative Sequencing Group, and **Yi, S. V. (corresponding author)** 2006. Variable molecular clocks in hominoids. *Proc. Natl. Acad. Sci. USA*. **103**: 1370-1375.
- Featured in Science magazine, Science Now (January 23, 2006 article by Michael Balter, 'Tick, Tock: Humans Have a Slow Molecular Clock')
  - Media coverage including, *Atlanta Journal Constitution*, the *Guardian*, *MS NBC*
  - Invited for a special presentation in a joint event by PNAS and the Koshland Science Museum in Washington, D.C.
13. **Yi, S. (corresponding author)**, and J. T. Streebman. 2005. Genome size is negatively correlated with effective population size in ray-finned fishes. *Trends in Genetics*, **21**: 643-646.
12. **Yi, S. (corresponding author)**, and W.-H. Li. 2005. Molecular evolution of recombination hotspots and highly recombining pseudoautosomal regions in hominoids. *Molecular Biology and Evolution*, **22**: 1223-1230.
11. Bartolomé, C., Masidé, X. **Yi, S.**, Grant, A. L., and B. Charlesworth. 2005. Patterns of selection on synonymous and non-synonymous variants in *Drosophila miranda*. *Genetics*, **169**: 1495-1507.
10. **Yi, S.**, Summers, T. J., Pearson, N. M., and W.-H. Li. 2004. Recombination has little effect on the rate of sequence divergence in pseudoautosomal boundary 1 among humans and great apes. *Genome Research*, **14**: 37-43.
- Special commentary by N. Galtier in *Trends in Genetics* **20**: 347-349 (2004)
9. **Yi, S. (corresponding author)** 2003. Synonymous and nonsynonymous rates. *In*, Cooper, D. N. et al. Eds. *Encyclopedia of the Human Genome*. Nature Publishing Group Reference. New York, NY, USA.
8. **Yi, S. (corresponding author)**, and B. Charlesworth. 2003. Unusual pattern of single nucleotide polymorphisms at the *exuperantia2* locus of *Drosophila pseudoobscura*. *Genetical Research*. **82**: 101-106.

7. **Yi, S. (corresponding author)**, Bachtrog, D., and B. Charlesworth. 2003. A survey of chromosomal and nucleotide sequence variation in *Drosophila miranda*. *Genetics*. **164**: 1369-1381.
6. **Yi, S.**, Ellsworth, D., and W.-H. Li. 2002. Slow molecular clocks in Old World monkeys, apes, and humans. *Molecular Biology and Evolution*. **19**: 2192-2198.
5. Li, W.-H., **Yi, S.**, and K. D. Makova. 2002. Male-driven evolution. *Current Opinions in Genetics and Development*. **12**: 650-656.
4. Li, W.-H., and **Yi, S.** 2002. Molecular evolution. pp. 750-756 *In*, Pagel, M. at al. Eds. *Encyclopedia of Evolution*. Vol II. Oxford University Press. New York, NY. USA.
3. **Yi, S.**, Bernat, B., Pál, G., Kossiakoff, A., and Li, W.-H. 2002. Functional promiscuity of squirrel monkey growth hormone receptor toward both primate and nonprimate growth hormones. *Molecular Biology and Evolution*. **19**: 1083-1092.
  - Faculty of 1000
  - Special commentary by N. Saitou in *Trends in Genetics* **18**: 240 (2002)
2. **Yi, S. (corresponding author)**, and B. Charlesworth. 2000. A selective sweep associated with a recent gene transposition in *Drosophila miranda*. *Genetics*. **156**: 1753-1763.
1. **Yi, S. (corresponding author)**, and B. Charlesworth. 2000. Contrasting patterns of molecular evolution of genes on the new and old sex chromosomes of *Drosophila miranda*. *Molecular Biology and Evolution*. **17**: 703-717.

## Selected Service

### Editorial Board

- Genome Biology and Evolution, 2012-
- Biology Direct, 2013-
- Scientific Reports, 2015-

### Society Service

- Chair, SMBE Nomination Committee, 2016
- Council Member (elected), Society for Molecular Biology and Evolution. 2011-2013

## Selected Institute Contributions at Georgia Tech

- Member, College of Science Diversity Council, 2013-present
- Member, Graduate Committee, Core faculty, Quantitative Bioscience Program, 2013-present
- Advisory Board, School of Biology, 2013-present
- Core faculty, Center for Bioinformatics and Computational Biology, Georgia Tech ([http://www.biology.gatech.edu/gt\\_bioinfo](http://www.biology.gatech.edu/gt_bioinfo)). August 2004 – present.