

Arun R. Chavan

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EDUCATION

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| • Ph.D. , Yale University (Ecology and Evolutionary Biology / Adviser: Dr. Gunter Wagner) | 2012–2018 |
| • M.Sc. , Tata Institute of Fundamental Research (Biology / Adviser: Dr. Himanshu Sinha) | 2009–2012 |
| • B.Sc. , Fergusson College, University of Pune (Biotechnology) | 2006–2009 |

APPOINTMENTS

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|---|--------------|
| • Yale School of Medicine (Department of Immunobiology / Adviser: Dr. Ruslan Medzhitov) | 2024–Current |
| ▸ Associate Research Scientist | 2021–2024 |
| ▸ Postdoctoral Associate | 2019–2021 |
| ▸ CRI Irvington Postdoctoral Fellow | |

PUBLICATIONS

PEER-REVIEWED

1. Tissue Biology: In Search of a New Paradigm
Annual Review of Cell and Developmental Biology 39(1), 2023
Adler M*, **Chavan AR***, Medzhitov R
(*equal contribution)
2. SARS-CoV-2 infection in pregnancy is associated with robust inflammatory response at the maternal-fetal interface
Med 2(5), 591–610, 2021
Lu-Culligan A, **Chavan AR**, Vijayakumar P, Irshaid L, Courchaine EM, Milano KM, Tang Z, Pope SD, Song E, Vogels CBF, Lu-Culligan WJ, Campbell KH, Casanovas-Massana A, Bermejo S, Toothaker JM, Lee HJ, Liu F, Schulz W, Fournier J, Muenker MC, Moore AJ, Yale IMPACT Team, Konnikova L, Neugebauer KM, Ring A, Grubaugh ND, Ko AI, Morotti R, Guller S, Kliman HJ, Iwasaki A, Farhadian SF
3. Evolution of embryo implantation was enabled by the origin of decidual stromal cells in eutherian mammals
Molecular Biology and Evolution msaa274, 2020
Chavan AR, Griffith OW, Stadtmauer D, Maziarz J, Pavlicev M, Fishman R, Koren L, Romero R, Wagner GP
4. Endometrial recognition of pregnancy occurs in the grey short-tailed opossum (*Monodelphis domestica*)
Proc. R. Soc. B 286: 20190691, 2019
Griffith OW, **Chavan AR**, Pavlicev M, Protopapas S, Callahan R, Maziarz J, Wagner GP
5. The mammalian decidual cell evolved from a cellular stress response
PLOS Biology 16(8): e2005594, 2018
Erkenbrack EM, Maziarz JD, Griffith OW, Liang C, **Chavan AR**, Nnamani MC, Wagner GP
6. Reply to Liu: Inflammation before implantation both in evolution and development
PNAS 115(1):E3–E4, 2017
Griffith OW, **Chavan AR**, Protopapas S, Maziarz J, Romero R, Wagner GP
7. Genetic Associations with Gestational Duration and Spontaneous Preterm Birth
New England Journal of Medicine 377(12):1156–1167, 2017
Zhang G, Feenstra B, Bacelis J, Liu X, Muglia L.M., Juodakis J, Miller DE, Litterman N, Jiang PP, Russell L, Hinds DA, Hu Y, Weirauch MT, Chen X, **Chavan AR**, Wagner GP, Pavlicev M, Nnamani MC, Maziarz J, Karjalainen MK, Rämet M, Sengpiel V, Geller F, Boyd HA, Palotie A, Momany A, Bedell B, Ryckman KK, Huusko JM, Forney CR, Kottyan LC, Hallman M, Teramo K, Nohr EA, Davey Smith G, Melbye M, Jacobsson B, Muglia LJ
8. The inflammation paradox in the evolution of mammalian pregnancy: turning a foe into a friend
Current Opinion in Genetics & Development 47:24–32, 2017
Chavan AR, Griffith OW, Wagner GP

9. Embryo implantation evolved from an ancestral inflammatory attachment reaction
PNAS 114(32):E6566–E6575, 2017
 Griffith OW, **Chavan AR**, Protopapas S, Maziarz J, Romero R, Wagner GP
10. Evolution of gene expression in the uterine cervix related to steroid signaling: conserved features in the regulation of cervical ripening
Scientific Reports 7(1):4439, 2017
 Wagner GP, Nnamani MC, **Chavan AR**, Maziarz J, Protopapas S, Condon J, Romero R
11. Single-cell transcriptomics of the human placenta: inferring the cell communication network of the maternal-fetal interface
Genome Research 27:349–361, 2017
 Pavlicev M, Wagner GP, **Chavan AR**, Owens K, Maziarz J, Dunn-Fletcher C, Kallapur SG, Muglia L, Jones H
12. The transcriptomic evolution of mammalian pregnancy: gene expression innovations in endometrial stromal fibroblasts
Genome Biology & Evolution 8:2459–2473, 2016
 Kin K, Maziarz J, **Chavan AR**, Kamat M, Vasudevan S, Birt A, Emera D, Lynch VJ, Ott TL, Pavlicev M, Wagner GP
13. The fetal-maternal interface of the nine-banded armadillo: endothelial cells of maternal sinus are partially replaced by trophoblast
Zoological Letters 2:11, 2016
Chavan AR, and Wagner GP
14. What was the ancestral function of decidual stromal cells? A model for the evolution of eutherian pregnancy
Placenta 40:40–51, 2016
Chavan AR, Bhullar B-AS, and Wagner GP
15. Polygenic *cis*-regulatory adaptation in the evolution of yeast pathogenicity
Genome Research 22:1930–1939, 2012
 Fraser HB, Levy S*, **Chavan A***, Shah HB, Perez JC, Zhou Y, Siegal ML, Sinha H
 (*equal contribution)

DISSERTATIONS

1. *Evolutionary origin of cell types: a case study of decidual cells in mammalian pregnancy*
Chavan AR (2018). Yale University.
2. *Allelic variation in yeast: its role in cis-regulatory adaptation and its pleiotropic consequences*
Chavan AR (2012). Tata Institute of Fundamental Research.

FUNDING, FELLOWSHIPS, AND PRIZES

FELLOWSHIPS AND PRIZES

- CRI Irvington Postdoctoral Fellowship (Cancer Research Institute, New York) 2019–2021
- John Spangler Nicholas Prize (for doctoral dissertation, Yale University) 2019
- Finalist, Best Student Presentation Award (Society for Integrative and Comparative Biology; DEDB) 2018
- Student Poster Prize (Complex Traits Symposium, Society for Molecular Biology and Evolution) 2017

RESEARCH AND TRAVEL GRANTS

- Travel Award (Developmental Biology of Sea Urchin and other Marine Invertebrates) 2023
- Young Investigator Travel Award (Society for Molecular Biology and Evolution) 2017
- Chair's Fund, Ecology & Evolutionary Biology (Yale University) 2016
- Conference Travel Fellowship (Yale University) 2016
- Chair's Fund, Ecology & Evolutionary Biology (Yale University) 2014

GRADUATE SCHOOL FUNDING SOURCES

- Charles A. & June R. P. Ross Fellowship (Yale University) 2016–2017
- Leo F. Rettger Fellowship (Yale University) 2014–2015
- Robert W. Carle Scholarship (Yale University) 2013–2014
- Junior Research Scholarship (Tata Institute of Fundamental Research, Government of India) 2009–2012

MEDIA COVERAGE

- Coverage for talk at SICB, San Francisco 2018 (now published as Chavan et al, *Mol Biol Evol* 2020)
 - Tamed immune reaction aids pregnancy, Elizabeth Pennisi, *Science* 359(6373):260
 - Armadillo and rabbit genes reveal how pregnancy evolved, Amy Maxmen, *Nature* (Republished by *Scientific American*)
 - When bad things become good: was inflammation modified to become implantation in placental mammals?, Ashley Booth, *SICB Press Release*
- Coverage for Griffith et. al, *PNAS* 2017
 - Evolution of pregnancy may be key to better reproductive technologies today, Jon Atherton, *Yale News* on July 24th, 2017
- Coverage for Pavlicev et al, *Genome Res.* 2017
 - What's in a placenta? A transcriptomic view, *PLOS Blogs* by Ricki Lewis on March 30, 2017
- Coverage for Lu-Culligan et al, *Med* 2021
 - Immune response to COVID virus may pose greater risk to pregnant women than virus itself, *Yale News* by Bill Hathaway on April 22, 2021

TEACHING

TEACHING FELLOW, YALE UNIVERSITY

- EEB 290: Comparative Vertebrate Anatomy 2014 & 2015 Spring
- EEB 291L: Comparative Vertebrate Anatomy Lab 2014 & 2015 Spring
- EEB 210: Introduction to Statistics: for Life Sciences 2013 Fall
- EEB 225: Introduction to Evolution 2013 Spring

STUDENTS MENTORED

- Meena Ambati, Yale College, New Haven CT 2022–2023
- Ben Nikitin, Yale College, New Haven CT 2021–2022
- Mita Kale, Glastonbury High School, Glastonbury CT 2016 Summer
- Haleigh Larson, Yale College, New Haven CT 2016
- Minnah Thomas, Tata Institute of Fundamental Research, Mumbai 2011 Summer

ACADEMIC SERVICE

JOURNAL REFEREE

- BMC Genomics
- Frontiers in Cell and Developmental Biology
- Integrative and Comparative Biology
- Journal of Experimental Zoology Part B: Molecular and Developmental Evolution
- The Journal of Maternal-Fetal & Neonatal Medicine
- Scientific Reports

GRANT REVIEWER

- Yale Institute for Biospheric Studies Doctoral Pilot Grants 2019 & 2020
- Yale Institute for Biospheric Studies Doctoral Dissertation Improvements Grants 2019 & 2020

PRESENTATIONS

TALKS (INVITED)

- International Tunicate Meeting, Santa Cruz, CA, USA 2024
- Interaction and Evolution of Organisms Seminar Series, University of Vienna, Vienna, Austria 2024
- European Society for Evolutionary Developmental Biology, Uppsala, Sweden 2016

TALKS (CONTRIBUTED)

- Amphioxus Satellite Meeting, European Society for Evolutionary Developmental Biology, Helsinki, Finland 2024
- Yale Single Cell Symposium, New Haven, CT, USA 2023
- Developmental Biology of Sea Urchin and other Marine Invertebrates, Woods Hole, MA, USA 2023
- Amphioxus Satellite Meeting, European Society for Evolutionary Developmental Biology, Naples, Italy 2022
- 3rd Yale Devo-Evo Congress, New Haven, CT, USA 2022
- Indian Society of Developmental Biology, IIT Kanpur, India 2018

- Evo-Devo Symposium, Yale University, West Haven, CT, USA 2018
- Society for Integrative and Comparative Biology, San Francisco, CA, USA 2018
- West Campus Seminar Series, Yale University, West Haven, CT, USA 2017
- Evo-Devo Symposium, Yale University, West Haven, CT, USA 2017
- Graduate Student Symposium, Ecology & Evolutionary Biology, Yale University, New Haven, CT, USA 2017
- Graduate Student Symposium, Ecology & Evolutionary Biology, Yale University, New Haven, CT, USA 2016

POSTERS

- European Society for Evolutionary Developmental Biology, Helsinki, Finland 2024
- EMBO | EMBL Symposium: The identity and Evolution of Cell Types, Heidelberg, Germany 2021
- EMBO | EMBL Symposium: The identity and Evolution of Cell Types, Heidelberg, Germany 2019
- Society for Molecular Biology and Evolution, Austin, TX, USA 2017
- Systems Biology Institute Symposium, Yale University, West Haven, CT, USA 2017
- Gordon Research Conference on Mammalian Reproduction, Waterville Valley, NH, USA 2016
- Graduate Student Symposium, Ecology & Evolutionary Biology, Yale University, New Haven, CT, USA 2014
- International Conference on Yeast Biology, Mumbai, India 2011

OUTREACH

- eMediator at The School in the Cloud (weekly Skype sessions with school students in Phaltan, India) 2015–2016
- Represented the Department of Biological Sciences on Science Popularization and Public Outreach Committee, Tata Institute of Fundamental Research, India 2011–2012
- Volunteered fortnightly in organizing sessions of ‘Chai and Why?’, a forum for interactive scientific discussions outside the academic setting. (Organized by Tata Institute of Fundamental Research and held at Ruia College and Prithvi Theater, Mumbai, India) 2009–2011

ACADEMIC REFERENCES

- Dr. Ruslan Medzhitov (postdoctoral adviser): ruslan.medzhitov@yale.edu
- Dr. Gunter P. Wagner (doctoral thesis adviser): gunter.wagner@yale.edu
- Dr. Mihaela Pavlicev (doctoral thesis committee member): mihaela.pavlicev@univie.ac.at
- Dr. Richard O. Prum (doctoral thesis committee member): richard.prum@yale.edu
- Dr. Himanshu Sinha (master's thesis adviser): sinha@iitm.ac.in