

Christine Charvet-Curriculum vitae

Center for Neuroscience
Department of Psychology
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EDUCATION

University of California, Irvine (UCI)
Department of Neurobiology and Behavior
Ph.D. Biological Sciences, 2010.

University of California, Los Angeles (UCLA)
B.A. Psychology, 2005, Cum Laude.

Santa Monica College (SMC)
2000-2003, Scholars Program.

POSITIONS

2018-Present: Assistant Professor, Center for Neuroscience, Delaware State University.

I am an NIH COBRE-funded investigator at the Center for Neuroscience, jointly operated by the University of Delaware and Delaware State University. We use COBRE and other IDEA state funds to increase research opportunities for minority students at a Delaware State University.

2016-2018: Postdoctoral & Research Associate, Department of Molecular Biology and Genetics & Biomedical Sciences, Cornell University.

2014-2016: Postdoctoral Scientist, Boston Children's Hospital, Harvard Medical School & The George Washington University.

2010-2014: Postdoctoral Fellow, Department of Psychology, Cornell University.

2005-2010: Graduate Student Researcher, Department of Neurobiology and Behavior, University of California, Irvine.

F. ELLOWSHIPS AND GRANTS

2021-2023: Principal investigator– R21. NICHD, Co-PI: Emi Takahashi, Boston Children's Hospital, Harvard Medical School & Martinos Center for Biomedical Imaging. ~275,000-direct costs. Proposal scored in the top 6th percentile.

2019-2021: Principal Investigator-Delaware IDEa Network of Biomedical Research Excellence (INBRE) Research Independence Award, National Institute of Health, \$157,924-direct costs.

2021-2024: Co-Investigator, Targeted Infusion Project: Undergraduate Neuroscience Education To Engage Diverse Students in STEM and Prepare Them for Graduate School and STEM Careers. PI: Julian Wooltorton, Delaware State University.

- 2018-2022:** COBRE funds for recruited faculty, COBRE Neuroscience Center, Delaware State University, NIGMS ~\$410,000-direct costs.
- 2019-2021:** Delaware IDeA Network of Biomedical Research Excellence (INBRE) Core Access awards, NIGMS, \$26,570-direct costs.
- 2020-2022:** MRI COBRE grant (~to use the 9.4T scanner at the University of Delaware), NIGMS, \$10,800-direct costs.
- 2011-2014:** Principal Investigator-Postdoctoral Fellowship Ruth L. Kirschstein National Research Service Awards, National Institute of Child Health and Human Development, National Institute of Health, \$143,670-direct costs.
- 2009:** Principal Investigator- East-Asia and Pacific Summer Institutes (EAPSI) Graduate Fellowship, National Science Foundation, University of Auckland, New Zealand, \$5,678.
- 2008:** Principal Investigator- Graduate Research Grant, Humboldt University, DAAD (German Academic Exchange Services) Berlin, Germany ~\$1,500.

SELECTED LIST OF PUBLICATIONS (h index: 19)

Preprints & Manuscripts in review for publication:

- Charvet CJ.** Ofori K, Baucum C, Sun J, Modrell M, Hekmatyar K, Edlow BL, van der Kouwe, A. 2021. Tracing cortical circuits in humans and non-human primates from high resolution connectomic, transcriptomic, and temporal dimensions. Available on bioRxiv. <https://doi.org/10.1101/2021.04.30.442016>. In review for publication.
- Ding, Q, Edwards, MM, Hulke ML, Bracci AN, Hu Y, Tong Y, Zhu X, Hsiao J, **Charvet CJ**, Ghosh S, Handsaker RE, Eggan K, Merkle FT, Gerhardt J, Egli D, Clarke AG, Koren A. 2020. The Genetic Architecture of DNA Replication Timing in Human Pluripotent Stem Cells. Available on *BioRxiv*. <https://doi.org/10.1101/2020.05.08.085324>.

Published:

1. **Charvet CJ.** 2021. Cutting across structural and transcriptomic scales translates time across the lifespan in humans and chimpanzees. *Proceedings of the Royal Society Biological Sciences*. 288:20202987.
** News coverage for Academic Times (April, 2021).
2. Bonfanti L, **Charvet CJ.** Plasticity in humans and model systems: advances, challenges, and future directions. In review for publication.
3. **Hendy JP****, Takahashi E, van der Kouwe AJ, **Charvet CJ.** 2020. Brain wiring and supragranular-enriched genes linked to protracted human frontal cortex development. *Cerebral Cortex*. 30: 5654–5666.
4. **Charvet CJ.** 2020. Closing the gap from transcription to the structural connectome enhances the study of connections in the human brain. *Developmental Dynamics*. 249:1047-1061.
5. **Charvet CJ**, Das A, Song JW, **Tindal-Burgess DJ****, Kabaria P, Dai G, Kane T, Takahashi E.

2020. High angular resolution diffusion MRI reveals conserved and deviant programs in the paths that guide human cortical circuitry. *Cerebral Cortex*. 30: 1447-1464.
6. Charvet CJ, Palani A, Kabaria P, Takahashi E. 2019. Evolution of brain connections: integrating diffusion MR tractography with gene expression highlights increased cortico-cortical projections in primates. *Cerebral Cortex*. 17:5150-5165.
 7. Vasung L*, Charvet CJ*, Shiohama T, Gagoski B, Levman J, Takahashi E. 2019. *Ex vivo* fetal brain MRI: recent advances, challenges, and future directions. *Neuroimage*. 195:23-37. * These authors contributed equally.
 8. Charvet CJ, Finlay BL. 2018. Comparing adult hippocampal neurogenesis across species: Translating Time to Predict the Tempo in Humans. *Frontiers in Neuroscience*. 12:706.
 9. Charvet CJ, Šimić G, Kostović I, Kovačević V, Vukšić M, Babić LB, Takahashi E, Sherwood CC, Wolfe MD, Finlay BL. 2017. Coevolution in the timing of GABAergic and pyramidal neuron maturation in primates. *Proceedings of the Royal Society Biological Sciences*. 284:pii: 20171169.
 10. Charvet CJ, Hof PR, Raghanti MA, Van Der Kouwe AJ, Sherwood CC, Takahashi E. 2017. Combining diffusion magnetic resonance tractography with stereology highlights increased cross-cortical integration in primates. *Journal of Comparative Neurology*. 525:1075-1093.
 11. Charvet CJ, Cahalane DJ, Finlay BL. 2015. Systematic, cross-cortex variation in neuron numbers in rodents and primates. *Cerebral Cortex*. 25:147-60.
 12. Cahalane DJ, Charvet CJ, Finlay BL. 2014. Modeling local and cross-species neuron number variations in the cerebral cortex as arising from a common mechanism. *Proceedings of the National Academy of Sciences USA*. 111:17642-7.
 13. Charvet CJ, Finlay BL. 2014. Evo-devo and the primate isocortex: the central organizing role of intrinsic gradients of neurogenesis. *Brain Behavior and Evolution*. 84:81-92. ***
 14. Workman AD, Charvet CJ, Clancy B, Darlington RB, Finlay BL. 2013. Modeling transformations of neurodevelopmental sequences across mammalian species. *Journal of Neuroscience*, 33:7368-83.*
*F1000 Prime Recommended Article.
 15. Charvet CJ, Darlington RB, Finlay BL. 2013. Variation in human brains may facilitate evolutionary change toward a limited range of phenotypes. *Brain Behavior and Evolution*. 81:74-85. *
* Commentary in: Vallender EJ. 2013. How brains are built: genetics and evolution. *Brain Behavior and Evolution*. 81:71-3.
 16. Cahalane DJ, Charvet CJ, Finlay BL. 2012. Systematic, balancing gradients in neuron density and number across the primate isocortex. *Frontiers in Neuroanatomy*. 6:28.
 17. Charvet CJ, Finlay BL. 2012. Embracing covariation in brain evolution: large brains, extended development and flexible primate social systems. *Progress in Brain Research*. 195:71-87.
 18. McGowan LD, Alaama RA, Freise AC, Huang JC, Charvet CJ, Striedter GF. 2012.

Expansion, folding, and abnormal lamination of the chick optic tectum after intraventricular injections of FGF2. *Proceedings of the National Academy of Sciences USA*. 109 Suppl 1:10640-6.

19. Charvet CJ, Striedter GF, Finlay BL. 2011. Evo-devo and brain scaling: candidate developmental mechanisms for variation and constancy in vertebrate brain evolution. *Brain Behavior and Evolution*. 78:248-57. ***
20. Charvet CJ, Striedter GF. 2011. Developmental modes and developmental mechanisms can channel brain evolution. *Frontiers in Neuroanatomy*. 5:4. ***
21. Charvet CJ, Striedter GF. 2011. Causes and consequences of expanded subventricular zones. *European Journal of Neuroscience*. 34:988-93. ***
22. Charvet CJ, Striedter GF. 2010. Bigger brains cycle faster before neurogenesis begins: a comparison of brain development between chickens and bobwhite quail. *Proceedings of the Royal Society Biological Sciences*. 277:3469-75.
23. Charvet CJ, Sandoval AL, Striedter GF. 2010. Phylogenetic origins of early alterations in brain region proportions. *Brain, Behavior and Evolution*. 75:104-10.
24. Charvet CJ, Striedter GF. 2009. Developmental basis for telencephalon expansion in waterfowl: enlargement prior to neurogenesis. *Proceedings of the Royal Society Biological Sciences*. 276:3421-27.
25. Charvet CJ, Owerkowicz T, Striedter GF. 2009. Phylogeny of the telencephalic subventricular zone in sauropsids: evidence for the sequential evolution of pallial and subpallial subventricular zones. *Brain Behavior and Evolution*. 73:285-294.
26. Charvet CJ, Striedter GF. 2009. Developmental origins of mosaic brain evolution: morphometric analysis of the developing zebra finch brain. *Journal of Comparative Neurology*. 514:203-213.
27. Striedter GF, Charvet CJ. 2009. Telencephalon enlargement by the convergent evolution of expanded subventricular zones. *Biology Letters*. 5:134-137. ***
28. Charvet CJ, Striedter GF. 2008. Developmental species differences in brain cell cycle rates in the northern bobwhite quail (*Colinus virginianus*) and parakeets (*Melopsittacus undulatus*): implications for mosaic brain evolution. *Brain Behavior and Evolution*. 72:295-306.
29. Charvet CJ, Striedter GF. 2008. Spatiotemporal clustering of cell death in the avian forebrain proliferative zone. *International Journal of Developmental Biology*. 52:345-352.
30. Striedter GF, Charvet CJ. 2008. Developmental origins of species differences in telencephalon and tectum size: Morphometric comparisons between a parakeet (*Melopsittacus undulatus*) and a quail (*Colinus virginianus*). *Journal of Comparative Neurology*. 507:1663-1675.

**Student trainees from my laboratory

***Invited Contributions

INVITED BOOK CHAPTERS AND SYMPOSIUM PROCEEDINGS

1. **Charvet CJ**, Sherwood CC, Takahashi E. 2017. Developmental sequences predict increased connectivity in brain evolution: A comparative analysis of developmental timing, gene expression, neuron numbers, and diffusion MR tractography. In: Evolution of the Brain, Cognition, and Emotion in Vertebrates. (eds S. Watanabe, M. Hofman, T Shimizu). Chapter 4. Brain Science. Springer, Tokyo.
2. **Charvet CJ**, Krienen FM. 2016. Developmental programs and gene expression patterns yield insights into the evolution of primate cortical circuitry. In: Evolution of Nervous Systems 2nd edition. (eds L. Krubitzer and J. Kaas). pp.91-97. Elsevier. Academic Press, Oxford.
3. **Charvet CJ**, Finlay BL. 2016. Evolving the Developing Cortex. In: Developmental Approaches to Human Evolution (eds J. C. Boughner and C. Rolian), John Wiley & Sons, Inc, Hoboken, NJ.
4. **Charvet CJ**, Cahalane DJ, Finlay BL. 2013. Systematic variation in cytoarchitectural landscapes in the isocortex of primates and rodents. AAI Technical Report FS-13-02

TEACHING EXPERIENCE

- 2021-2022:** Consultant, NSF EAGER Award for the Creation of an Introduction to Behavioral Neuroscience textbook. Led by Dr. Elizabeth Kirby (Ohio State University). *My role is to contribute written material for the textbook.*
- 2019-2020:** Course Instructor, Behavioral Neuroscience (*Neuropsychology*), Delaware State University (two semesters).
- 2018-2021:** Course Instructor, Introduction to Psychology, Delaware State University (five semesters).
- 2018:** Course Instructor, Health Psychology, Delaware State University.
- 2018:** Workshop instructor, Workshop on the Embryology and Development of the Central Nervous System. The Teratology Society, Clearwater, FL.
- 2015:** Guest lecturer, Evolution of the Human Brain, Center for the Advanced Study of Human Paleobiology, The George Washington University.
- 2011:** Course Instructor, Introduction to Biopsychology, Cornell University.
- 2010-2013:** Teaching Aid, Cognitive Neuroscience, Cornell University (*My role was to lead review sessions. I guest lectured to graduate and undergraduate students*).
- 2008:** Teaching Assistant, Animal Behavior, School of Biological Sciences, UCI.
- 2008:** Teaching Assistant, Auditory Neuroscience, School of Biological Sciences, UCI.
- 2008:** Teaching Assistant, Organisms to Ecosystems, School of Biological Sciences, UCI.
- 2006-2007:** Lab instructor, Neurobiology Laboratory course, School of Biological Sciences, UCI (two semesters).

2005-2009: Teaching Committee, Neurobiology Laboratory Course, School of Biological Sciences, UCI.

MENTORING EXPERIENCE IN BIOLOGY

- 2019-:** Mentor for the PhD in Neuroscience, Department of Biology, Delaware State University.
- 2019-:** Co-mentor for the PhD in Neuroscience with concentration in molecular biology, Department of Biology, Delaware State University.
- 2019-2020:** Mentor, Bridges to Doctorate graduate program, Delaware State University.*
- 2020:** Mentor, IDeA Network of Biomedical Research Excellence program for Undergraduate students, Delaware State University.*
- 2020:** Mentor, Interdisciplinary studies, Undergraduate Practicum, Delaware State University.
- 2019:** Mentor, Summer Undergraduate Neuroscience Research Program, Department of Biology, Delaware State University.*
- 2019:** Mentor, Psychology Undergraduate Practicum, Department of Psychology, Delaware State University.
- 2006:** Mentor, Bridges to Baccalaureate undergraduate program, University of California, Irvine.*

*These are initiatives to enhance diversity in biomedical fields.

INVITED TALKS

- 2021:** Department of Anatomy and Neurobiology, Boston University.
- 2021:** Gradients of Brain Organization Workshop (Organization for Human Brain Mapping), Organized by the Montreal Neurological Institute, Montreal, Canada.
- 2020:** Montreal Neurological Institute, McGill University, Montreal, Canada.
- 2019:** Department of Psychological and Brain Sciences, University of Delaware, Newark, DE.
- 2019:** Nemours/Alfred I. duPont Hospital for Children, Newark, DE.
- 2018:** The Teratology Society. Embryology and Development of the Central Nervous System Workshop. Clearwater, FL.
- 2016:** Department of Human Genetics, Chicago University, Chicago, IL.
- 2015:** Department of Psychology, Vanderbilt University, Nashville, TE.
- 2014:** 83rd American Association of Physical Anthropologists. Alberta, Canada.
- 2013:** Karger Workshop in Evolutionary Neuroscience. San Diego, CA.

SYMPOSIUMS AND SEMINARS

- 2021:** Cells Webinar | Nervous System Development and Plasticity in Model Organisms III, Karlsruhe Institute of Technology, Germany.
- 2020:** Department of Ecology and Evolution, Cornell University, NY.
- 2020:** Department of Psychological and Brain Sciences, University of Delaware, Newark, DE.
- 2019:** Department of Psychological and Brain Sciences. University of Delaware, Newark, DE.
- 2017:** Department of Molecular Biology Genetics, Cornell University, Ithaca, NY.
- 2016:** Department of Biomedical Sciences. Cornell University, Ithaca NY.

CONFERENCE ABSTRACTS

- 2021:** The Society for Neuroscience Conference-Virtual. *
- 2021:** The JB Johnston Club for Evolutionary Neuroscience -Virtual. *
- 2021:** International Society for Developmental Neuroscience -Virtual.
- 2021:** Experimental Biology -Virtual. *Abstract selected for media coverage*
- 2021:** Comparative Cognition Society, Virtual.
- 2021:** Annual Delaware Neuroscience Symposium, Virtual.*
- 2020:** Neuromatch 3.0 conference -Virtual.
- 2020:** “Black in Neuro” Mini-conference -Virtual.*
- 2020:** J.B. Johnston Club for Evolutionary Neuroscience -Virtual.
- 2020:** Neurogenetics virtual conference, Nature Conferences -Virtual.
- 2020:** American Society for Human Genetics -Virtual.*
- 2020:** European Society for Study of Human Evolution -Podium talk -Virtual.
- 2020:** The Allied Genetics Conference -Virtual.
- 2020:** International Society for Computational Biology -Virtual.*
- 2020:** Annual International Spinal Muscular Atrophy Research and Clinical Care -Virtual.
- 2020:** Emerging Researchers National Conference in STEM. Washington, DC.*
- 2019:** Annual Delaware Neuroscience Symposium. Newark, DE. *
- 2019:** American Society for Human Genetics Conference. Houston, TX.
- 2019:** J.B. Johnston Club for Evolutionary Neuroscience. Chicago, IL.
- 2019:** Evolution in Philadelphia Conference. Philadelphia, PA. *
- 2019:** Anatomische Gesellschaft, Würzburg, Germany.
- 2019:** American Association of Physical Anthropologists. Cleveland, OH.
- 2018:** Annual Delaware Neuroscience Symposium. Newark, DE.*
- 2018:** Mid-Atlantic Society for Developmental Biology Regional Meeting. Charlottesville, VA
- 2018:** American Society for Human Genetics Conference. San Diego, CA.
- 2017:** Three Rivers Evolution. Pittsburgh, PA.
- 2017:** Eukaryotic DNA replication & Genome Maintenance. Cold Springs Harbor, NY.
- 2016:** American Society of Primatologists. Chicago, IL.
- 2016:** American Association of Physical Anthropologists. Atlanta, GA.
- 2015:** Society for Neuroscience Conference. Chicago, IL.
- 2014:** J.B. Johnston Club for Evolutionary Neuroscience. Washington, DC.
- 2014:** Society for Neuroscience Conference. Washington, DC.
- 2013:** American Association of Artificial Intelligence Fall Symposium. Washington, DC.
- 2013:** Canada-Israel Symposium on Brain Plasticity. London, Canada.
- 2013:** Society for Neuroscience Conference. San Diego, CA.
- 2013:** American Association of Anatomists Conference. Boston, MA.
- 2012:** Society for Neuroscience Conference. New Orleans, LA.
- 2011:** Society for Neuroscience Conference. Washington, DC.
- 2011:** J.B. Johnston Club for Evolutionary Neuroscience. Washington, DC.
- 2010:** European Conference on Comparative Neurobiology. Valencia, Spain.
- 2009:** J.B. Johnston Club for Evolutionary Neuroscience. Chicago, IL.
- 2009:** Society for Neuroscience Conference. Chicago, IL.
- 2009:** International Australasian Winter Conference. Queenstown, New Zealand.
- 2009:** Society for Integrative and Comparative Biology Conference. Boston, MA.
- 2008:** Society for Neuroscience Conference. Washington, DC.

2007: Society for Neuroscience Conference. San Diego, CA.
2007: International Society for the History of Neurosciences. Los Angeles, CA.
2006: Santa Cruz Conference for Developmental Biology. Santa Cruz, CA.0

* Presentations from graduate and undergraduate students in my laboratory

AWARDS AND HONORS

2010: Graduate Fellowship Award for outstanding PhD thesis, UCI.
2010: John Merck, Summer Institute Fund for the Biology of Developmental Disabilities, Cornell University.
2009: Fine Science Travel Award, UCI.
2008: Ralph Waldo Gerard Award, Department of Neurobiology and Behavior, UCI.
2006-2009: Dean's Travel Award, University of California, Irvine.
2005: Vice Provost's Recognition Award, School of Biological Sciences, UCLA.
2004-2005: Dean's Honor List, UCLA.
2003-2005: Provost's Honor List, UCLA.
2000-2003: Dean's Honor List, SMC.

ACADEMIC SERVICE

2010-Present: Reviewer for journals: Behavioral and Brain Sciences; Brain, Behavior, and Evolution; Brain Research; European Journal of Neuroscience; Folia Primatologica; Frontiers in Developmental Psychology; Frontiers in Human Neuroscience; Frontiers in Neuroanatomy; Genes, Brain and Behavior; Glia; International Journal of Developmental Neuroscience; Journal of Comparative Neurology; Journal of Neuroscience; Nature Ecology and Evolution; Nature Neuroscience; PLOS Computational Biology, Trends in Cognitive Sciences, Scientific Reports; Zoology.

Reviewer for grants: Leakey Foundation, National Science Foundation, Sigma Xi.

Reviewer for student thesis: Honors thesis program at Cornell University.

Ad hoc consultant for popular news: Science News, Scientific American.

2013-Present: Curator of a website (www.translatingtime.net) that enables researchers to find equivalent developmental time points across species.

OUR WORK IN THE NEWS

2021: Not so special: Our brains develop at the speed of other primates!. By: Howard Hardee for Academic Times.

<https://academictimes.com/not-so-special-our-brains-develop-at-the-speed-of-other-primates/>

2021: Brain development is surprisingly similar between humans and other primates. By: Experimental Biology.

<https://phys.org/news/2021-04-brain-surprisingly-similar-humans-primates.html>