

## Education

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<b>Washington University in St. Louis</b> Ph.D. in Imaging Science M.S. in Electrical Engineering	2018-2023
<b>Washington University in St. Louis</b> B.A. in Biochemistry	2011-2015

## Experience

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<b>Washington University in St. Louis</b> Research assistant (PI: Tammie L.S. Benzinger) Developed a way to quantify anti-amyloid- $\beta$ drug effects by jointly analyzing PET and deep-learning-based microscopy	2017-2023
<b>University of Oxford</b> Visiting scholar (PI: Stamatios N. Sotiropoulos) Developed a way to quantify gyral bias in tractography by jointly analyzing diffusion MRI and digital microscopy	2015-2015
<b>Washington University in St. Louis</b> Research assistant (PI: David C. Van Essen) Developed a way to quantify gyral bias in tractography by jointly analyzing diffusion MRI and confocal microscopy	2012-2015

## Skills

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### Computational methods

Computer vision, High-performance computing, Image reconstruction, Machine learning, Statistics

### Experimental methods

Electrophysiology, Immunohistochemistry, Microscopy, MRI, PET, Tissue clearing

### Programming languages

Bash, Groovy, MATLAB, Python, R

### Team management

Mentored trainees in data acquisition, data analysis, programming, statistics, and manuscript writing

## Honors and awards

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2023	Poletsky Award	\$2,000
2021	McKelvey School of Engineering Dean's Scholarly Award	\$5,000
2020	Knight ADRC T32 Fellowship	\$25,836
2020	HAI Travel Scholarship Winner and Young Investigator Award Finalist	\$1,000
2018	NSF Graduate Research Fellowship Program	\$138,000
2013	HHMI Summer Undergraduate Research Fellowship	\$4,000
2011	National Merit Scholarship	\$2,500

## Teaching

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Summer 2022  
Fall 2019

Guest lecturer  
Teaching assistant

Publication Writing (Engr 4505)  
Mathematics of Imaging Science (BME 570)

## Mentoring

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2021-2022	Madison L. Candela, M.P.H.	Sales associate at H&M
2020-2023	Stephanie S. Doering, B.S.	Graduate student at Washington University in St. Louis
2020-2021	Rebecca Feldman, B.S.	Graduate student at Washington University in St. Louis
2020-2021	Farzaneh Rahmani, M.D.	Radiology resident at Washington University in St. Louis
2020-2021	Kristine Shady, B.S.	Medical student at University of Kentucky
2019-2020	Angela M. Paulick, B.S.	Research coordinator at University of Southern California
2018-2019	Kavya Hemmanur, M.S.	cGMP specialist at Houston Methodist Hospital
2017-2018	Leah A. Gilligan, M.D.	Radiology resident at Northwestern University

## Service

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2022-2023	Quantitative Imaging Biomarkers Alliance (QIBA) Tau Profile Committee	Assistant to the co-chairs
2022-2023	Diversity, Equity, and Inclusion (DEI) and Well-being Steering Committee	
2022-2023	Imaging Science Student Council Executive Board	Co-founder
2020-2023	International Society to Advance Alzheimer's Research and Treatment (ISTAART)	
2020-2021	<i>Nature Reviews Neurology</i>	<i>Ad hoc</i> reviewer
2019-2023	Society for Industrial and Applied Mathematics (SIAM)	
2017-2023	Dominantly Inherited Alzheimer Network (DIAN)	
2017-2023	Pathology And Imaging Neurodegeneration and Tau (PAINT) Meeting	Co-founder

## Publications

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2023	<b>Charles Chen*</b> , Maria Rosana Ponisio*, Jordan Lang, Shaney Flores, Suzanne Schindler, Anne Fagan, John Morris, and Tammie Benzinger. Comparing tau PET visual interpretation with tau PET quantification, CSF biomarkers, and longitudinal clinical assessment. <i>Journal of Alzheimer's Disease</i>
2023	<b>Charles D Chen*</b> , Austin McCullough*, Brian A Gordon*, Nelly Joseph-Mathurin, Shaney Flores, Nicole S McKay, Diana Hobbs, Russ Hornbeck, Anne M Fagan, Carlos Cruchaga, Alison M Goate, Richard J Perrin, Guoqiao Wang, Yan Li, Xinyu Shi, Chengjie Xiong, Michael J Pontecorvo, Gregory Klein, Yi Su, William E Klunk, Clifford Jack, Robert Koeppe, B Joy Snider, Sarah B Berman, Erik D Roberson, Jared Brosch, Ghulam Surti, Ivonne Z Jiménez-Velázquez, Douglas Galasko, Lawrence S Honig, William S Brooks, Roger Clarnette, David Wallon, Bruno Dubois, Jérémie Pariente, Florence Pasquier, Raquel Sanchez-Valle, Sergey Shcherbinin, Ixavier Higgins, Ilke Tunalı, Colin L Masters, Christopher H van Dyck, Mario Masellis, Robin Hsiung, Serge Gauthier, Steve Salloway, David B Clifford, Susan Mills, Charlene Supnet-Bell, Eric McDade, Randall J Bateman, Tammie LS Benzinger, and for the DIAN-TU Study Team. Longitudinal head-to-head comparison of PiB and florbetapir PET in a Phase 2/3 clinical trial of anti-amyloid- $\beta$ monoclonal antibodies in dominantly inherited Alzheimer disease. <i>European Journal of Nuclear Medicine and Molecular Imaging</i>
2023	Nicole S McKay, Brian A Gordon, Russ C Hornbeck, Aylin Dincer, Shaney Flores, Sarah Keefe, Nelly Joseph-Mathurin, Clifford R Jack, Robert Koeppe, Peter R Millar, Beau M Ances, <b>Charles D Chen</b> , Alisha Daniels, Diana A Hobbs, Kelley Jackson, Deborah Koudelis, Parinaz Massoumzadeh, Austin McCullough, Michael L Nickels, Farzaneh Rahmani, Laura Swisher, Qing Wang, Ricardo F Allegri, Sarah B Berman, Adam M Brickman, William S Brooks, David M Cash, Jasmeer P Chhatwal, Gregg Day, Martin R Farlow, Christian laFougère, Nick C Fox, Michael Fulham, Bernardino Ghetti, Neill Graff-Radford, Takeshi Ikeuchi, William Klunk, Jae-Hong Lee, Ralph Martins, Colin L Masters, Jonathan McConathy, Hiroshi Mori, James M Noble, Gerald Reischl, Christopher Rowe, Stephen Salloway, Raquel Sanchez-Valle, Peter R Schofield, Hiroyuki Shimada, Mikio Shoji, Yi Su, Kazushi Suzuki, Jonathan Vöglein, Igor Yakushev, Carlos Cruchaga, Jason Hassenstab, Celeste Karch, Eric McDade, Richard J Perrin, Chengjie Xiong, John C Morris, Randall J Bateman, Tammie LS Benzinger, and for the Dominantly Inherited Alzheimer Network. Positron emission tomography and magnetic resonance imaging methods and datasets within the Dominantly Inherited Alzheimer Network (DIAN). <i>Nature Neuroscience</i>

- 2023 Farzaneh Rahmani, Saurabh Jindal, Cyrus A Raji, Wei Wang, Arash Nazeri, Gloria Guzman Perez-Carillo, Michelle M Miller-Thomas, Philipp Garner, Benedicte Marechal, Amit Shah, Mathis Zimmermann, **Charles D Chen**, Sarah Keefe, Pamela LaMontagne, and Tammie LS Benzinger. Validity assessment of an automated brain morphometry tool using patients with a de novo memory complaint. *American Journal of Neuroradiology*. <https://doi.org/10.3174/ajnr.A7790>
- 2023 Anna H Boerwinkle, Brian A Gordon, Julie Wisch, Shaney Flores, Rachel L Henson, Omar H Butt, Nicole McKay, **Charles D Chen**, Tammie LS Benzinger, Anne M Fagan, Benjamin L Handen, Bradley T Christian, Elizabeth Head, Mark Mapstone, Michael S Rafii, Sid O'Bryant, Florence Lai, H Diana Rosas, Joseph H Lee, Wayne Silverman, Adam M Brickman, Jasmeer P Chhatwal, Carlos Cruchaga, Richard J Perrin, Chengjie Xiong, Jason Hassenstab, Eric McDade, Randall J Bateman, Beau M Ances, on behalf of the Alzheimer's Biomarker Consortium-Down Syndrome, and the Dominantly Inherited Alzheimer Network. Amyloid PET in genetic causes of Alzheimer disease: Down syndrome versus autosomal dominant. *The Lancet Neurology*. [https://doi.org/10.1016/S1474-4422\(22\)00408-2](https://doi.org/10.1016/S1474-4422(22)00408-2)
- 2022 Aylin Dincer, **Charles D Chen**, Nicole S McKay, Lauren N Koenig, Austin McCullough, Shaney Flores, Sarah J Keefe, Stephanie A Schultz, Rebecca L Feldman, Nelly Joseph-Mathurin, Russ C Hornbeck, Carlos Cruchaga, Suzanne E Schindler, David M Holtzman, John C Morris, Anne M Fagan, Tammie LS Benzinger, and Brian A Gordon. APOE  $\epsilon$ 4 genotype, amyloid- $\beta$ , and sex interact to predict tau in regions of high APOE mRNA expression. *Science Translational Medicine*. <http://doi.org/10.1126/scitranslmed.abl7646>
- 2022 Guoqiao Wang\*, Yan Li\*, Chengjie Xiong, Eric McDade, David B Clifford, Susan L Mills, Anna M Santacruz, Andrew J Aschenbrenner, Jason Hassenstab, Tammie LS Benzinger, Brian A Gordon, Anne M Fagan, Kelley A Coalier, Jorge J Libre-Guerra, Austin McCullough, Nelly Joseph-Mathurin, **Charles Chen**, Catherine Mummery, Barbara A Wendelberger, Serge Gauthier, Mario Masellis, Karen C Holdridge, Roy Yaari, Saptarshi Chatterjee, John Sims, Paul Delmar, Geoffrey A Kerchner, Tobias Bittner, Carsten Hofmann, Randall J Bateman, and for the DIAN-TU Study Team. Evaluation of dose-dependent treatment effects after mid-trial dose escalation in biomarker, clinical, and cognitive outcomes for gantenerumab or solanezumab in dominantly inherited Alzheimer's disease. *Alzheimer's & Dementia: Diagnosis, Assessment & Disease Monitoring*. <http://doi.org/10.1002/dad2.12367>
- 2022 Nelly Joseph-Mathurin\*, Jorge J Llibre-Guerra\*, Yan Li, Austin A McCullough, Carsten Hofmann, Jakub Wojtowicz, Ethan Park, Guoqiao Wang, Gregory M Preboske, Qing Wang, Brian A Gordon, **Charles D Chen**, Shaney Flores, Neelum Aggarwal, Sarah B Berman, Thomas D Bird, Sandra E Black, Bret Borowski, William S Brooks, Jasmeer P Chhatwal, Roger Clarnette, Carlos Cruchaga, Anne M Fagan, Martin Farlow, Nick C Fox, Serge Gauthier, Jason Hassenstab, Diana A Hobbs, Karen C Holdridge, Lawrence S Honig, Russ C Hornbeck, Ging-Yuek R Hsiung, Clifford R Jack Jr, Ivonne Z Jimenez-Velazquez, Mathias Jucker, Gregory Klein, Johannes Levin, Michele Mancini, Mario Masellis, Nicole S McKay, Catherine J Mummery, John M Ringman, Hiroyuki Shimada, Joy Snider, Kazushi Suzuki, David Wallon, Chengjie Xiong, Roy Yaari, Eric McDade, Richard J Perrin, Randall J Bateman, Stephen P Salloway, Tammie LS Benzinger, David B Clifford, and for the Dominantly Inherited Alzheimer Network Trials Unit. Amyloid-related imaging abnormalities in the DIAN-TU-001 trial of gantenerumab and solanezumab: lessons from a trial in dominantly inherited Alzheimer disease. *Annals of Neurology*. <https://doi.org/10.1002/ana.26511>
- 2022 Shaney Flores, **Charles D Chen**, Yi Su, Aylin Dincer, Sarah J Keefe, Nicole S McKay, Angela M Paulick, Gloria Guzman Perez-Carillo, Russ C Hornbeck, Manu S Goyal, Andrei G Vlassenko, Sally W Schwarz, Michael L Nickels, Dean F Wong, Zhude Tu, Jonathan McConathy, John C Morris, Tammie Benzinger, and Brian A Gordon. Off-target skull binding in tau and amyloid PET studies of Alzheimer disease. *Journal of Nuclear Medicine*. <https://doi.org/10.2967/jnumed.122.263948>
- 2022 Patrick H Luckett, **Charlie Chen**, Brian A Gordon, Julie Wisch, Sarah B Berman, Jasmeer P Chhatwal, Carlos Cruchaga, Anne M Fagan, Martin R Farlow, Nick C Fox, Mathias Jucker, Johannes Levin, Colin L Masters, Hiroshi Mori, James M Noble, Stephen Salloway, Peter R Schofield, Adam M Brickman, William S Brooks, David M Cash, Michael J Fulham, Bernardino Ghetti, Clifford R Jack, Jonathan Vöglein, William Klunk, Robert Koeppe, Yi Su, Michael Weiner, Qing Wang, Dan Marcus, Deborah Koudelis, Nelly Joseph-Mathurin, Lisa Cash, Russ Hornbeck, Chengjie Xiong, Richard J Perrin, Celeste M Karch, Jason Hassenstab, Eric McDade, John C Morris, Tammie LS Benzinger, Randall J Bateman, Beau M Ances, and for the Dominantly Inherited Alzheimer Network (DIAN). Biomarker clustering in autosomal dominant Alzheimer disease. *Alzheimer's & Dementia*. <https://doi.org/10.1002/alz.052149>
- 2022 Farzaneh Rahmani, Marina Nguyen, **Charles D Chen**, Nicole McKay, Aylin Dincer, Nelly Joseph-Mathurin, Gengsheng Chen, Jingxia Liu, Hilary LP Orlowski, John C Morris, and Tammie Benzinger. Intracranial internal carotid artery calcification is not predictive of future cognitive decline. *Alzheimer's Research & Therapy*. <https://doi.org/10.1186/s13195-022-00972-2>

- 2021 **Charles D Chen**, Nelly Joseph-Mathurin\*, Namita Sinha\*, Aihong Zhou\*, Yan Li, Karl Friedrichsen, Austin McCullough, Erin E Franklin, Russ Hornbeck, Brian Gordon, Vijay Sharma, Carlos Cruchaga, Alison Goate, Celeste Karch, Eric McDade, Chengjie Xiong, Randall J Bateman, Bernardino Ghetti, John M Ringman, Jasmeer Chhatwal, Colin L Masters, Catriona McLean, Tammelyn Lashley, Yi Su, Robert Koeppe, Clifford Jack, William Klunk, John C Morris, Richard J Perrin, Nigel J Cairns\*\*, and Tammie LS Benzinger\*\*. Comparing amyloid- $\beta$  plaque burden with antemortem PiB PET in autosomal dominant and late-onset Alzheimer disease. *Acta Neuropathologica*. <https://doi.org/10.1007/s00401-021-02342-y>
- 2021 Anna H Boerwinkle\*, Julie K Wisch\*, **Charles D Chen**, Brian A Gordon, Omar H Butt, Suzanne E Schindler, Courtney Sutphen, Shaney Flores, Aylin Dincer, Tammie LS Benzinger, Anne M Fagan, John C Morris, and Beau M Ances. Temporal correlation of CSF and neuroimaging in the Amyloid-Tau-Neurodegeneration model of Alzheimer disease. *Neurology*. <https://doi.org/10.1212/WNL.00000000000012123>
- 2020 **Charles D Chen**, Timothy R Holden, Brian A Gordon, Erin E Franklin, Yan Li, Dean W Coble, Hongbo Luo, Randall J Bateman, for the Dominantly Inherited Alzheimer Network (DIAN), for the Dominantly Inherited Alzheimer Network Trials Unit (DIAN-TU), Beau M Ances, Richard J Perrin, Tammie LS Benzinger, Nigel J Cairns, and John C Morris. Ante- and postmortem tau in autosomal dominant and late-onset Alzheimer disease. *Annals of Clinical and Translational Neurology*. <https://doi.org/10.1002/acn3.51237>
- 2019 Brian A Gordon, Tyler M Blazey, Jon Christensen, Aylin Dincer, Shaney Flores, Sarah Keefe, **Charles Chen**, Yi Su, Eric M McDade, Guoqiao Wang, Yan Li, Jason Hassenstab, Andrew Aschenbrenner, Russ Hornbeck, Clifford R Jack, Jr, Beau M Ances, Sarah B Berman, Jared R Brosch, Douglas Galasko, Serge Gauthier, James J Lah, Mario Masellis, Christopher H van Dyck, Mark Mintun, Gregory Klein, Smiljana Ristic, Nigel J Cairns, Daniel S Marcus, Chengjie Xiong, David M Holtzman, Marcus E Raichle, John C Morris, Randall J Bateman, and Tammie LS Benzinger. Tau PET in autosomal dominant Alzheimer's disease: relationship with cognition, dementia and other biomarkers. *Brain*. <https://doi.org/10.1093/brain/awz019>
- 2019 Qing Wang, Yong Wang, Jingxia Liu, Courtney L Sutphen, Carlos Cruchaga, Tyler Blazey, Brian A Gordon, Yi Su, **Charlie Chen**, Joshua S Shimony, Beau M Ances, Nigel J Cairns, Anne M Fagan, John C Morris, and Tammie LS Benzinger. Quantification of white matter cellularity and damage in preclinical and early symptomatic Alzheimer's disease. *NeuroImage: Clinical*. <https://doi.org/10.1016/j.nicl.2019.101767>
- 2019 Kaining Zhang, **Charles D Chen**, and Ilya E Monosov. Novelty, salience, and surprise timing are signaled by neurons in the basal forebrain. *Current Biology*. <https://doi.org/10.1016/j.cub.2018.11.012>
- 2018 Michiel Cottaar, Matteo Bastiani, **Charles Chen**, Krikor Dikranian, David Van Essen, Timothy E Behrens, Stamatios N Sotiropoulos, and Saad Jbabdi. A gyral coordinate system predictive of fibre orientations. *NeuroImage*. <https://doi.org/10.1016/j.neuroimage.2018.04.040>
- 2016 Noah M Ledbetter, **Charles D Chen**, and Ilya E Monosov. Multiple mechanisms for processing reward uncertainty in the primate basal forebrain. *Journal of Neuroscience*. <https://doi.org/10.1523/jneurosci.1123-16.2016>

## Book chapters

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- 2014 David C Van Essen, Saad Jbabdi, Stamatios N Sotiropoulos, **Charles Chen**, Krikor Dikranian, Tim Coalson, John Harwell, Timothy EJ Behrens, and Matthew F Glasser. Mapping connections in humans and non-human primates: aspirations and challenges for diffusion imaging. *Diffusion MRI: From Quantitative Measurement to In vivo Neuroanatomy*. <https://doi.org/10.1016/B978-0-12-396460-1.00016-0>

## Conference talks

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- 2021 **Charles D Chen**, Jordan A Lang, Shaney Flores, Suzanne E Schindler, Anne M Fagan, John C Morris, Tammie LS Benzinger, and Maria Rosana Ponisio. Concordance of PET tau visual reads with PET tau quantification and CSF pTau. *Radiological Society of North America*
- 2020 **Charles D Chen**, Timothy R Holden, Brian A Gordon, Erin E Franklin, Richard J Perrin, John C Morris, Randall Bateman, Tammie LS Benzinger, Nigel J Cairns, and for the Dominantly Inherited Alzheimer Network (DIAN). Tauopathy in autosomal dominant and late-onset Alzheimer disease. *Alzheimer's Association International Conference*
- 2013 Stamatios N Sotiropoulos, **Charlie Chen**, Krikor Dikranian, Saad Jbabdi, Timothy EJ Behrens, David C Van Essen, and Matthew F Glasser. Comparison of diffusion MRI predictions and histology in the macaque brain. *International Society for Magnetic Resonance in Medicine*

## Invited talks

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- 2023 **Charles D Chen.** Evaluating PET imaging with visual reads, neuropathology, and longitudinal head-to-head comparisons. *Martinos Center SuperGroup Talk*
- 2021 **Charles D Chen.** Longitudinal PET amyloid- $\beta$  shows radiotracer-specific drug effects in the DIAN-TU-001 trial. *Knight ADRC Tuesday Seminar*
- 2020 **Charles D Chen.** Ante- and postmortem tau in autosomal dominant and late-onset Alzheimer disease. *DIAN-Obs Chalk Talk*