

Parker William de Waal

Doctoral Candidate

Laboratory of Structural Sciences
Van Andel Research Institute
333 Bostwick Ave NE
Grand Rapids, 49503, USA
☎ +1 (616) 822 3314
✉ parker.dewaal@vai.edu
🌐 ParkerdeWaal

Education

- 2014–Current **Cellular and Molecular Genetics Ph.D.**, *Van Andel Research Institute*, Grand Rapids, MI, USA, Laboratory of Structural Biology.
Thesis: G protein–coupled receptor signaling.
Advisor: Dr. H. Eric Xu
- 2012 **Certificat pratique de langue française**, *Université de Strasbourg*, Strasbourg, France.
- 2009–2013 **Biology B.A.**, *Kalamzoo College*, Kalamazoo, MI, USA.
Undergraduate thesis: Continuous directed evolution of the human androgen receptor
Advisors: Drs. H. Eric Xu and Karsten Melcher, Van Andel Research Institute, USA

languages

Fortran, C++, CUDA, PHP, JavaScript, Python, Bash
Conversational French

Research Experience

- 2012 **Undergraduate Research Assistant**, *Van Andel Research Institute*, Grand Rapids, MI, USA, Laboratory of Structural Biology.
Continuous directed evolution of the human androgen receptor
Advisors: Drs. H. Eric Xu and Karsten Melcher
- 2011 **Undergraduate Research Assistant**, *Smithsonian Institution National Museum of Natural History*, Washington D.C., Department of Botany and Entomology.
Documenting the entomofauna of tropical rain forest canopies
Advisors: Gary Hevel and Dr. Terry Erwin

Grants and Fellowships

- 2012 Howard Hughes Medical Institute Undergraduate Research Grant for the Development of Phage Assisted Continuous Evolution of the Human Androgen Receptor (\$4,000)
- 2011 Howard Hughes Medical Institute Undergraduate Research Grant for Documenting the entomofauna of tropical rain forest canopies (\$4,000)

Publications

* indicates a co-first author, # indicates a co-second author

Li-Hua Zhao, Shanshan Ma, Ieva Sutkeviciute, Dan-Dan Shen, X. Edward Zhou, **Parker W de Waal**, Chen-Yao Li, Yangyong Kang, Lisa J. Clark, Frederic G. Jean-Alphonse, et al. [Structure and Dynamics of the Active Human Parathyroid Hormone Receptor-1](#). *Science*, In Press.

Xin Gu, Michael D Bridges, Yan Yan, **Parker W de Waal**, X Edward Zhou, Kelly M Suino-Powell, H Eric Xu, Wayne L Hubbell, and Karsten Melcher. [Conformational heterogeneity of the allosteric drug and metabolite \(ADaM\) site in AMP-activated protein kinase \(AMPK\)](#). *Journal of Biological Chemistry*, pages jbc-RA118, September 2018.

Shifan Yang*, Yiran Wu#, Ting-Hai Xu#, **Parker W de Waal**#, Yuanzheng He, Mengchen Pu, Yuxiang Chen, Zachary J DeBruine, Bingjie Zhang, Saheem A Zaidi, et al. [Crystal structure of the Frizzled 4 receptor in a ligand-free state](#). *Nature*, August 2018.

Yanyong Kang*, Oleg Kuybeda*, **Parker W de Waal***, Somnath Mukherjee, Ned Van Eps, Przemyslaw

Dutka, X. Edward Zhou, Alberto Bartesaghi, Satchal Erramilli, Takefumi Morizumi, et al. [Cryo-EM structure of human rhodopsin bound to an inhibitory G protein](#). *Nature*, June 2018.

Wanchao Yin, X Edward Zhou, Dehua Yang, **Parker W de Waal**, Meitian de Wang, Antao Dai, Xiaoqing Cai, Chia-Ying Huang, Ping Liu, Xiaoxi Wang, et al. [Crystal structure of the human 5-HT 1B serotonin receptor bound to an inverse agonist](#). *Cell discovery*, 4(1):12, March 2018.

X Edward Zhou*, Yuanzheng He*, **Parker W de Waal***, Xiang Gao*, Yanyong Kang, Ned Van Eps, Yanting Yin, Kuntal Pal, Devrishi Goswami, Thomas A White, et al. [Identification of Phosphorylation Codes for Arrestin Recruitment by G Protein-Coupled Receptors](#). *Cell*, 170(3):457–469, July 2017. **Cover article**.

Xin Gu, Yan Yan, Scott J Novick, Amanda Kovich, Devrishi Goswami, Jiyuan Ke, MH Eileen Tan, Lili Wang, Xiaodan Li, **Parker W de Waal**, et al. [Deconvoluting AMP-dependent kinase \(AMPK\) adenine nucleotide binding and sensing](#). *Journal of Biological Chemistry*, pages jbc–M117, June 2017.

Yanting Yin, **Parker W de Waal**, Yuanzheng He, Li-Hua Zhao, Dehua Yang, Xiaoqing Cai, Yi Jiang, Karsten Melcher, Ming-Wei Wang, and H Eric Xu. [Rearrangement of a polar core provides a conserved mechanism for constitutive activation of class B G protein-coupled receptors](#). *Journal of Biological Chemistry*, pages jbc–M117, March 2017. **Cover article, JBC Editor's Pick, F1000 Recommended Article**.

Bradley M Dickson, **Parker W de Waal**, Zachary H Ramjan, H Eric Xu, and Scott B Rothbart. [A fast, open source implementation of adaptive biasing potentials uncovers a ligand design strategy for the chromatin regulator BRD4](#). *The Journal of Chemical Physics*, 145(15):154113, September 2016.

Ping Liu, Ming-zhu Jia, X Edward Zhou, **Parker W de Waal**, Bradley M Dickson, Bo Liu, Li Hou, Yan-ting Yin, Yan-yong Kang, Yi Shi, et al. [The structural basis of the dominant negative phenotype of the \$G\alpha i1\beta1\gamma2\$ G203A/A326S heterotrimer](#). *Acta Pharmacologica Sinica*, August 2016.

Lalit K Golani, Adrienne Wallace-Povirk, Siobhan M Deis, Jennifer Wong, Jiyuan Ke, Xin Gu, Sudhir Raghavan, Mike R Wilson, Xinxin Li, Lisa Polin, et al. [Tumor Targeting with Novel 6-Substituted Pyrrolo \[2, 3-d\] Pyrimidine Antifolates with Heteroatom Bridge Substitutions Via Cellular Uptake by Folate Receptor \$\alpha\$ and the Proton-coupled Folate Transporter and Inhibition of De Novo Purine Nucleotide Biosynthesis](#). *Journal of medicinal chemistry*, 59(17):7856–7876, July 2016.

X Edward Zhou, Xiang Gao, Anton Barty, Yanyong Kang, Yuanzheng He, Wei Liu, Andrii Ishchenko, Thomas A White, Oleksandr Yefanov, Gye Won Han, **Parker W de Waal**, et al. [X-ray laser diffraction for structure determination of the rhodopsin-arrestin complex](#). *Scientific data*, 3, April 2016.

Xiaodan Li, Lili Wang, X Edward Zhou, Jiyuan Ke, **Parker W de Waal**, Xin Gu, MH Eileen Tan, Dongye Wang, Donghai Wu, H Eric Xu, et al. [Structural basis of AMPK regulation by adenine nucleotides and glycogen](#). *Cell research*, 25(1):50–66, November 2015.

Li-Hua Zhao, X Edward Zhou, Wei Yi, Zhongshan Wu, Yue Liu, Yanyong Kang, Li Hou, **Parker W de Waal**, Suling Li, Yi Jiang, et al. [Destabilization of strigolactone receptor DWARF14 by binding of ligand and E3-ligase signaling effector DWARF3](#). *Cell research*, 25(11):1219–1236, October 2015.

Yanyong Kang, X Edward Zhou, Xiang Gao, Yuanzheng He, Wei Liu, Andrii Ishchenko, Anton Barty, Thomas A White, Oleksandr Yefanov, Gye Won Han, **Parker W de Waal**, et al. [Crystal structure of rhodopsin bound to arrestin by femtosecond X-ray laser](#). *Nature*, 523(7562):561–567, July 2015.

Parker W de Waal*, Kyle F Sunden, and Laura Lowe Furge. [Molecular dynamics of CYP2D6 polymorphisms in the absence and presence of a mechanism-based inactivator reveals changes in local flexibility and dominant substrate access channels](#). *PloS one*, 9(10):e108607, November 2014.

Poster Presentations

2017 31st Annual Symposium of The Protein Society: Structural Identification of Phosphorylation Codes for Arrestin Recruitment by G protein-Coupled Receptors (ABS271)