

# Felice A. Dunn

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## CONTACT INFORMATION

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## APPOINTMENT

ASSISTANT PROFESSOR OF OPHTHALMOLOGY  
*University of California, San Francisco* *July 1, 2014-present*

- Member of Neuroscience Graduate Program

## EDUCATION

UNIVERSITY OF WASHINGTON  
*Seattle, Washington, USA* *Ph.D., August 2007*

- Program in Neurobiology and Behavior. Advisor: Fred Rieke

BROWN UNIVERSITY  
*Providence, Rhode Island, USA* *Sc.B., A.B., May 2002*

- Neuroscience, with honors. Advisor: David Berson
- Visual Arts, with honors. Advisor: Walter Feldman

## RESEARCH EXPERIENCE

POSTDOCTORAL FELLOW IN THE LAB OF RACHEL WONG, Ph.D.  
*Department of Biological Structure, University of Washington* *November 2008-2014*

- Demonstrated that different types of bipolar cells establish connections with photoreceptors according to different growth strategies and over varying time scales.
- Developed methods for stable live-imaging of *in vitro* retina for over a day.

POSTDOCTORAL FELLOW IN THE LAB OF MARK STOPFER, Ph.D.  
*NICHD, National Institutes of Health* *January 2008-November 2008*

- Determined the effect of noise in olfactory receptor neurons on secondary and tertiary neurons in the locust olfactory system.
- Established methods for *in vivo* patch-clamp recordings of olfactory neurons in the locust.

GRADUATE STUDENT IN THE LAB OF FRED RIEKE, Ph.D.  
*Department of Physiology & Biophysics, University of Washington* *September 2002-October 2007*

- Characterized the location, and kinetic, spatial, and functional properties of retinal gain control.
- Ph.D. thesis title: "Gain control of rod and cone vision in the mammalian retina"

GRADUATE ROTATION STUDENT IN THE LAB OF JAMES HURLEY, Ph.D.  
*Department of Biochemistry, University of Washington* *Winter 2003*

- Determined the phosphorylation kinetics of zebrafish cone photoreceptors using mass spectrometry coupled with liquid chromatography

UNDERGRADUATE STUDENT AND RESEARCH ASSISTANT IN THE LAB OF DAVID BERSON, Ph.D.  
*Department of Neuroscience, Brown University* *September 1999-July 2002*

- Identified a class of intrinsically photosensitive ganglion cells and characterized their light sensitivity, spectral tuning, receptive fields, adaptation properties, connection to retinal circuits, and morphology
- Honors thesis title: "Are intrinsically photosensitive retinal ganglion cells influenced by rods and cones?"

OTHER TRAINING

KAVLI MENTORING GROUP

*Kavli Neuroscience Institute*

*present*

- Faculty mentoring from Loren Frank, Michael Stryker, UCSF Office of Career and Professional Development

FACULTY SUCCESS PROGRAM

*National Center for Faculty Development*

*2016*

COLD SPRING HARBOR COURSE ON LEADERSHIP IN BIOSCIENCE

*Cold Spring Harbor, New York*

*March 2014*

FUTURE FACULTY FELLOWS WORKSHOP

*University of Washington-Howard Hughes Institute Science Education*

*August 2010*

COLD SPRING HARBOR COURSE ON COMPUTATIONAL VISION

*Cold Spring Harbor, New York*

*Summer 2004*

- Student in the lecture and computer lab course

MARINE BIOLOGICAL LABORATORY COURSE ON NEUROBIOLOGY

*Woods Hole, Massachusetts*

*Summer 2003*

- Student in the lecture and lab course

TEACHING EXPERIENCE

NEUROSCIENCE GRADUATE COURSE ON SYSTEMS NEUROSCIENCE

*University of California, San Francisco*

*Spring 2016, 2017, 2018, 2019*

- Lecture and discussion on retinal circuits and processing

NEUROSCIENCE GRADUATE COURSE ON GRANT-WRITING

*University of California, San Francisco*

*Fall 2014, 2015, 2016*

- Guiding first and second year graduate students through writing applications for the National Science Foundation Graduate Research Fellowship

DISCUSSION LEADER FOR SYSTEMS NEUROSCIENCE COURSE

*University of California, San Francisco*

*Winter 2017*

- Discussion leader for core neuroscience graduate course

LECTURER FOR VISION COURSE

*Cold Spring Harbor Laboratory*

*Summer 2015, 2017*

- Invited lecturer

TEACHING ASSISTANT FOR AN UNDERGRADUATE NEUROBIOLOGY COURSE

*University of Washington*

*Spring 2005*

- Introduction to systems and behavioral neurobiology taught by Professor David Perkel

TEACHING ASSISTANT FOR AN UNDERGRADUATE NEUROBIOLOGY COURSE

*University of Washington*

*Winter 2004*

- Neuropathophysiology taught by Professor Wayne Crill

PUBLICATIONS

Peer Reviewed

Care RA, Kastner DB, De la Huerta I, Pan S, Khoche A, Della Santina L, Gamlin C, San Tomas C, Ngo J, Chen A, Kuo YM, Ou Y, Dunn FA. (2019) Partial cone loss triggers synapse-specific remodeling and spatial receptive field rearrangements in a mature retinal circuit. *Cell Reports*. 27(7): 2171-2183.

Yu WQ, El-Danaf RN, Okawa H, Pacholec JM, Matti U, Schwarz K, Odermatt B, Dunn FA, Lagnado L, Schmitz F, Huberman AD, Wong ROL. (2018) Synaptic convergence patterns onto retinal ganglion cells are pre-

served despite topographic variation in pre- and postsynaptic territories. *Cell Reports*. 25(8): 2017-2026.

Anastassov IA, Wang WW, Dunn FA (2019) Synaptogenesis and synaptic protein localization in the postnatal development of rod bipolar cell dendrites in mouse retina. *Journal of Comparative Neurology*. 527(1): 52-66. Epub on May 25, 2017.

FA Dunn (2015) Photoreceptor ablation initiates the immediate loss of glutamate receptors in postsynaptic bipolar cells in retina. *Journal of Neuroscience*. 35(6): 2423-2431.

- Comment: Pottackal J (2015) Early events of synapse disassembly in the damaged retina. *Journal of Neuroscience*. 35(26): 9539-9541.

FA Dunn, L Della Santina, ED Parker, ROL Wong (2013) Sensory experience shapes the development of the visual system's first synapse. *Neuron*. 80(5): 1159-1166.

- Cover

Schwartz, GW, H Okawa, FA Dunn, JL Morgan, D Kerschensteiner, ROL Wong, F Rieke (2012) The spatial structure of a nonlinear receptive field. *Nature Neuroscience*. 15: 1572-1580.

Dunn FA, ROL Wong (2012) Diverse strategies engaged in establishing stereotypic wiring patterns among neurons sharing a common input at the visual system's first synapse. *Journal of Neuroscience*. 32: 10306- 10317.

- Highlighted in "This Week in The Journal" for *Journal of Neuroscience*

Joseph J, FA Dunn, M Stopfer (2012) Spontaneous olfactory receptor neuron activity determines follower cell response properties. *Journal of Neuroscience*. 32: 2900-2910.

- Cover

Dunn FA, F Rieke (2008) Single-photon absorptions evoke synaptic depression in the retina to extend the operational range of rod vision. *Neuron*. 57: 894-904.

- Comment: Demb JB, von Gersdorff H. (2008) Ultraweak signals can cause synaptic depression and adaptation. *Neuron*. 57(6): 802-804.

Dunn FA, MJ Lankheet, F Rieke (2007) Light adaptation in cone vision involves switching between receptor and post-receptor sites. *Nature* 449: 603-606.

Dunn FA, T Doan, AP Sampath, F Rieke (2006) Controlling the gain of rod-mediated signals in mammalian retina. *Journal of Neuroscience*. 26: 3959-3970.

- Highlighted in "This Week in The Journal" for *Journal of Neuroscience*

- Cover

Wong KY, FA Dunn, DM Graham, DM Berson (2007) Synaptic influences on rat ganglion cell- photoreceptors. *Journal of Physiology*. 582: 279-296.

Wong KY, FA Dunn, DM Berson (2005) Photoreceptor adaptation in intrinsically photosensitive retinal ganglion cells. *Neuron*. 48: 1001-1010.

Kennedy MJ, FA Dunn, JB Hurley (2004) Visual pigment phosphorylation but not transducin translocation can contribute to light adaptation in zebrafish cones. *Neuron*. 41: 915-928.

Berson DM, FA Dunn, M Takao (2002) Phototransduction by retinal ganglion cells that set the circadian clock. *Science*. 295: 1070-1073.

- Comment: Barinaga M. (2002) Circadian clock. How the brain's clock gets daily enlightenment. *Science*. 295: 955-957.

#### Invited Review

Dunn FA, ROL Wong (2014) Wiring patterns in the mouse retina: collecting evidence across the connectome, physiology and light microscopy. *Journal of Physiology*. 592: 4809-4823.

Dunn FA, F Rieke (2006) The impact of photoreceptor noise on retinal gain controls. *Current Opinions in Neurobiology*. 16: 363-370.

#### ABSTRACTS & PRESENTATIONS

Care RA, de la Huerta I, Della Santina L, Pan S, Khoche A, Santo Tomas C, Gamlin C, Kastner DB, Dunn FA (2018) Resilience of mature retina to photoreceptor loss. Presentation. FASEB: Retinal neurobiology and visual processing.

Care RA, Anastassov I, Della Santina L, Dunn FA (2018) Compensation in the primary rod bipolar pathway following partial rod loss in mature retina. Poster. FASEB: Retinal neurobiology and visual processing.

Dunn FA, Kastner DB (2016) Diversification of cone bipolar cell types. Poster. FASEB: Retinal neurobiology and visual processing.

Care RA, de la Huerta I, Pan S, Gamlin C, Dunn FA (2016) Bipolar cell morphology after selective cone ablation in adult mouse retina. Poster and short talk. FASEB: Retinal neurobiology and visual processing.

Anastassov IA, Dunn FA (2016) Postnatal protein expression and development of rod bipolar dendritic tips in mouse retina. Poster. FASEB: Retinal neurobiology and visual processing.

Dunn FA (2014) Signal and noise properties of different bipolar cells in the mouse retina. Poster at *Janelia Signal Transforms in the Early Vision System* meeting.

Dunn FA, ROL Wong (2014) Rapid changes in glutamate receptor distribution following targeted ablation of cone photoreceptors. Poster at *FASEB Retinal Neurobiology and Visual Processing* meeting.

Dunn FA, AW Azevedo, ROL Wong (2013) Development of the cone-to-cone bipolar cell synapse depends on visual activity. Poster and Data Blitz at *ARVO* meeting.

Dunn FA, ROL Wong (2012) Developmental allocation of glutamate receptors at the cone-to-cone bipolar synapse. Presentation at *FASEB Retinal Neurobiology and Visual Processing* meeting.

Dunn FA, ROL Wong (2010) Development of connectivity patterns between cone photoreceptors and subtypes of ON cone bipolar cells. Poster at *FASEB Retinal Neurobiology and Visual Processing* meeting.

Joseph J, FA Dunn, M Stopfer (2008) Spontaneous odor receptor neuron activity determines follower cell response properties. Poster at *Society for Neuroscience* meeting, program 66.5.

Dunn FA, F Rieke (2008) Temporal filtering of cone signals in primate retina. Poster at *FASEB Retinal Neurobiology and Visual Processing* meeting.

Dunn FA, MJ Lankheet, F Rieke (2007) Cooperative mechanisms serve light adaptation for cone vision. Poster at *Society for Neuroscience* meeting, program 391.17.

Dunn FA, F Rieke (2006) Functional properties of gain control at the rod bipolar-to-AII amacrine synapse. Poster at *Society for Neuroscience* meeting, program 47.17.

Dunn FA, MJ Lankheet, TA Doan, F Rieke (2006) Adaptation of cone-mediated signals in the primate retina. Poster at *FASEB Retinal Neurobiology and Visual Processing* meeting.

Dunn FA, TA Doan, AP Sampath, F Rieke (2005) Changes in signal, noise, and threshold with mean light in the mammalian retina. Poster at *Society for Neuroscience* meeting, program 976.12

Dunn FA, AP Sampath, TA Doan, F Rieke (2004) Adaptation of rod signals in the mouse retina. Poster at *Society for Neuroscience* meeting, program 750.6. Presentation at *FASEB Retinal Neurobiology and Visual Processing* meeting.

Dunn FA and Berson DM (2002) Are intrinsically photosensitive retinal ganglion cells influenced by rods or cones. Presentation 2982 at the *Association for Research in Vision and Ophthalmology* meeting. Poster at *FASEB Retinal Neurobiology and Visual Processing* meeting.

Berson DM, FA Dunn, M Takao (2001) Phototransduction by ganglion cells innervating the circadian pacemaker. *Investigative Ophthalmology and Visual Science* 42, S113.

#### HONORS & AWARDS

McKnight Scholar Award Award, 2018-2021

Weill Neuroscience Award, 2017

Klingenstein-Simons Fellow Award, 2015-2017

Research to Prevent Blindness Career Development Award, 2015-2018

E. Matilda Ziegler Foundation for the Blind Award, 2014-2016

Karl Kirchgessner Foundation Vision Research Grant, 2014

University of Washington Postdoctoral Mentor Award, 2014

- Award to recognize postdoctoral fellows who contribute to education

NIH Pathway to Independence K99-R00 Award, started January 2013

Helen Hay Whitney Postdoctoral Fellowship, 2009-2012

Pharmacology Research Associate Training Program Fellowship of the National Institute of General Medical Sciences, October 2008

- postdoctoral fellowship to pursue research at a laboratory at the NIH
- awarded but not used to join Rachel Wong's lab

Achievement Reward for College Scientists: ARCS Seattle Chapter, 2002-2004

- scholar award for graduate students

Howard Hughes Medical Institute Predoctoral Fellowship, 2002-2007

National Science Foundation Graduate Research Fellowship, 2002

- awarded but not used

Brown Neuroscience Scholarly and Basic Research Achievement Award for Neuroscience honors thesis, 2002

Richard E. Whalen Award in Psychology, Brown University, 2002

- award for undergraduate research excellence in neuroscience and behavioral biology

Brown University: graduated Magna Cum Laude, Phi Beta Kappa, Sigma Xi, honors thesis in Neuroscience, honors thesis in Visual Arts, 2002

Barry M. Goldwater National Scholarship, 2001-2002

Undergraduate Teaching and Research Assistant Fellowship, Brown University, 2000

#### SERVICE

Organizer of poster session for annual department research meeting

Peer reviewer for *Journal of Neuroscience*, *Visual Neuroscience*, *Vision Research*, *Neuron*, *Journal of Comparative Neurology*, *Journal of Physiology*, *Journal of Neurophysiology*

Co-organizer for HHMI Janelia meeting: Signal Transforms in the Early Visual System (2014)

Reviewed abstracts for Cosyne meeting (2010)

Speaker for UCSF Women in Science brown bag lunch series (2015)