

## Marie E. Burns, Ph.D.

Clinical Interests Trained as a biochemist and electrophysiologist, Marie E. Burns studies the temporal regulation of

signal transduction mechanisms in neurons. Much of her work has investigated the deactivation of

the *G* protein cascade in photoreceptor cells of the retina. Her future studies will seek to understand the mechanisms by which different *G* protein cascades yield signals of varying

amplitude and durations, such as in the rod and cone photoreceptors in the retina.

Title Professor

**Specialty** Ophthalmology

Department Ophthalmology and Vision Science

**Division** Ophthalmology

Center/Program Affiliation Center for Neuroscience

Eye Center

Education Ph.D., Neurobiology and Cell & Molecular Biology, Duke University, Durham NC 1996

M.S., Neurobiology, Duke University, Durham NC 1994 B.S., Susquehanna University, Selinsgrove PA 1992

Fellowships Neurobilogy, Stanford University, Palo Alto CA 1996-2000

Professional Memberships American Society for Cell Biology

Association for Research in Vision and Ophthalmology

Association for the Advancement of Science

Biophysical Society

MBL Society

Society for Neuroscience

Honors and Awards Faculty Service Award, Neuroscience Graduate Group, 2015

Outstanding Graduate Mentor in Neuroscience, UC Davis Neuroscience Graduate Students, 2013

Select Recent Publications Burns ME, Levine ES, Miller EB, Zam A, Zhang P, Zawadzki RJ, Pugh EN Jr. New Developments in

Murine Imaging for Assessing Photoreceptor Degeneration In Vivo. Adv Exp Med Biol. 2016;854:

269-75.





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Zhang P, Zam A, Jian Y, Wang X, Li Y, Lam KS, Burns ME, Sarunic MV, Pugh EN Jr, Zawadzki RJ. In vivo wide-field multispectral scanning laser ophthalmoscopy-optical coherence tomography mouse retinal imager: longitudinal imaging of ganglion cells, microglia, and Müller glia, and mapping of the mouse retinal and choroidal vasculature. J Biomed Opt. 2015 Dec;20(12):126005.

Zawadzki RJ, Zhang P, Zam A, Miller EB, Goswami M, Wang X, Jonnal RS, Lee SH, Kim DY, Flannery JG, Werner JS, Burns ME, Pugh EN Jr. Adaptive-optics SLO imaging combined with widefield OCT and SLO enables precise 3D localization of fluorescent cells in the mouse retina. Biomed Opt Express. 2015 May 21;6(6):2191-210.

Gross OP, Pugh EN Jr, Burns ME. cGMP in mouse rods: the spatiotemporal dynamics underlying single photon responses. Front Mol Neurosci. 2015 Mar 4;8:6.

Fortenbach CR, Kessler C, Peinado Allina G, Burns ME. Speeding rod recovery improves temporal resolution in the retina. Vision Res. 2015 May;110(Pt A):57-67.

Levine ES, Zam A, Zhang P, Pechko A, Wang X, FitzGerald P, Pugh EN Jr, Zawadzki RJ, Burns ME. Rapid light-induced activation of retinal microglia in mice lacking Arrestin-1. Vision Res. 2014 Sep; 102:71-9.

Arshavsky VY, Burns ME. Current understanding of signal amplification in phototransduction. Cell Logist. 2014 Jun 4;4:e29390.

Kessler, C., Tillman, M., Burns, M.E., and Pugh, E.N., Jr. Rapid regeneration of rod photoreceptor surface rhodopsin measured with the early receptor potential in vivo. J. Physiol. 2014;592,2785-97.





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Zam, A., Zhang, P., Levine, E., Pugh, E.N., Jr., Burns, M.E. and Zawadzki, R.J. Evaluation of OCT for quantitative in-vivo measurements of changes in neural tissue scattering in longitudinal studies of retinal degeneration in mice. Proc. SPIE, 2014;8934, 893422-1-893422-6.

Long JH, Arshavsky VY, Burns ME. Absence of synaptic regulation by phosducin in retinal slices. PLoS One. 2013 Dec 20;8(12):e83970.

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