BARRY MATTHEW WILLARDSON

**EDUCATION**

Purdue University, West Lafayette, Indiana

Aug. 1984 to Jan. 1990; Ph. D. degree in Biological Chemistry January 1990.

Brigham Young University, Provo, Utah

Sept. 1978 to April 1979 and Oct. 1981 to Aug. 1984; B.A. degree in Chemistry, minor in French.

**EMPLOYMENT**

Brigham Young University

Professor: Sept. 2006 - present

Associate Professor: Sept. 2002-Sept. 2006

Assistant Professor: July 1996-Sept. 2002.

University of California/Los Alamos National Laboratory

Staff Member: March 1992-June 1996.

Post Doctoral Fellow: Jan 1990-March 1992.

Purdue University

Graduate Research Assistant: May 1985-Dec. 1989.

Graduate Teaching Assistant: Aug. 1984-Dec. 1987.

Brigham Young University

Undergraduate Research Assistant: Jan. 1984-Aug. 1984.

Undergraduate Teaching Assistant in French: Jan. 1982-Aug. 1984.

**HONORS**

David Ross Graduate Student Fellowship Purdue University 1989

College Junior Faculty Teaching Award Brigham Young University 1999

John A. Widtsoe Fellowship Brigham Young University 2005

Sponsored Research Achievement Award Brigham Young University 2010

Wesley P. Lloyd Distinction in Graduate Education Award Brigham Young University 2014

Izatt/Christensen Faculty Excellence in Research Award Brigham Young University 2016

**ADMINISTRATIVE EXPERIENCE**

Associate chair, BYU Department of Chemistry and Biochemistry 2016 – present.

Biochemistry area chair, BYU Department of Chemistry and Biochemistry 2004 – 2012.

BYU Institutional biosafety committee chair 2006 – 2008.

**CRITICALLY REVIEWED JOURNAL PUBLICATIONS**

43. Cuellar, J., Vallin, J., Svanström, A., Maestro-López, M., Bueno-Carrasco, T.M., Ludlam,W.G, Willardson, B.M., Valpuesta, J.M. and Grantham, J. (2021) “The molecular chaperone CCT sequesters gelsolin and protects it from cleavage by caspase-3” *J. Mol. Biol.* 434(5):167399.

42. Ludlam, W.G., Aoba, T., Cuéllar, J., Bueno-Carrasco, M.T., Makaju, A., Moody, J.D., Franklin, S., Valpuesta, J.M., Willardson, B.M. (2019) “Molecular architecture of the Bardet-Biedl Syndrome protein 2-7-9 complex” *J. Biol. Chem.* 294, 16385-16399.

41. Cuéllar, J., Ludlam, W.G., Tensmeyer, N.C., Aoba, T., Dhavale, M., Santiago, C., Bueno-Carrasco, M.T., Mann, M.J., Plimpton, R.L., Makaju, A., Franklin, S., Willardson, B.M., and Valpuesta, J.M (2019)“Structural and functional analysis of the role of the chaperonin CCT in mTOR complex assembly” *Nature Comm.* 10, 2865.

40. Lord, N. P., Plimpton, R. L., Sharkey, C. R., Suvorov, A., Lelito, J. P., Willardson, B. M. and Bybee, S. M. (2016) “A cure for the blues: opsin duplication and subfunctionalization for short-wavelength sensitivity in jewel beetles (Coleoptera: Buprestidae)” BMC Evol. Biol. 16, 107.

39. Xie, K., Masuho, I., Shih, C. C., Cao, Y., Sasaki, K., Lai, C. W., Han, P. L., Ueda, H., Dessauer, C. W., Ehrlich, M. E., Xu. B., Willardson, B.M., Martemyanov, K. A. (2015) “[Stable G protein-effector complexes in striatal neurons: mechanism of assembly and role in neurotransmitter signaling.](http://www.ncbi.nlm.nih.gov/pubmed/26613416)” eLife 10.7554/eLife.10451.

38. Plimpton, R. L.\*,Cuéllar, J.\*, Lai, C. W. J., Aoba, T., Makaju, A., Franklin, S., Mathis, A. D., Prince, J. T., Carrascosa, J. L., Valpuesta, J. M. and Willardson, B. M. (2015) “Structures of the Gβ‑CCT and PhLP1‑Gβ‑CCT Complexes Reveal a Molecular Mechanism for G protein  Subunit Folding and β Dimer Assembly”. *Proc. Natl. Acad. Sci. U.S.A.* 112, 2413-2418 \*Equal contribution of these two authors

37. Tracy, C. M.\*, Kolesnikov A. V.\*, Blake D. R., Chen, C.-K., Baehr, W., Kefalov, V. J. and Willardson B. M. (2015) “Retinal cone photoreceptors require phosducin-like protein 1 for G protein complex assembly and signaling.” *PLOS ONE* in press \*Equal contribution of these two authors

36. Tracy, C.M., Gray A. J., Cuellar, J., Shaw, T.S., Howlett, A.C., Taylor, R.M., Prince, J.T., Ahn, N.G., Valpuesta, J.M. and Willardson, B.M. (2014) “Programmed cell death protein 5 interacts with the chaperonin CCT to regulate β-tubulin folding.” *J. Biol. Chem.* **289**, 4490-4502.

35. Lai, C. W. J., Kolesnikov, A. V., Frederick, J. M., Blake, D. R., Jiang, L., Stewart, J. S., Chen, C. K., Barrow, J. R., Baehr, W., Kefalov, V. J. and Willardson, B. M. (2013) “Phosducin-like protein 1 is essential for G protein assembly and signaling in retinal rod photoreceptors.” *J. Neurosci.* **33**, 7941-7951.

34. Javadi, M., Pitt, W.G., Tracy, C.M., Barrow, J.R., Willardson, B.M., Hartley, J.M. and Tsosie, N.H. (2013) “Ultrasonic gene and drug delivery using eLiposomes” *J. Control. Release* **167**, 92-100.

33. Zhou X., Shapiro L., Fellingham G., Willardson B.M. and Burton G.F. (2011) “[HIV Replication in CD4+ T Lymphocytes in the Presence and Absence of Follicular Dendritic Cells: Inhibition of Replication Mediated by a-1-Antitrypsin through Altered IkBa Ubiquitination.](http://www.ncbi.nlm.nih.gov/pubmed/21263074)” *J. Immunol.* **186**, 3148-3155.

32. Smrcka, A. V., Kichik, N., Tarrago, T., Burroughs, M., Park, M., Stern, H., Itoga, N. K. Willardson, B. M. and Giralt, E. (2010) “NMR Analysis of G Protein  Subunit Complexes Reveals a Dynamic G-G Subunit Interface and Multiple Protein Recognition Modes” *Proc. Natl. Acad. Sci. U. S. A.* 107, 639-644.

31. Howlett, A. C., Gray, A. J., Hunter, J. M. and Willardson, B. M. (2009) “Role of Molecular Chaperones in G protein 5/Regulator of G protein Signaling Dimer Assembly and G protein  Dimer Specificity” *J. Biol. Chem.* 284, 16386-16399.

30. Willardson, B. M. and Howlett, A. C. (2007) “Function of phosducin-like proteins in G protein signaling and chaperone-assisted protein folding” *Cell Signal.* 19, 2417-2427.

29. Becerril, H. A., Ludtke, P., Willardson, B. M., Woolley, A. T. (2006) “DNA-templated nickel nanostructures and protein assemblies*” Langmuir* 22, 10140-10144.

28. Lukov, G. L., Baker, C. M., Ludtke, P. J., Hu, T., Carter, M. D., Hackett, R. A., Thulin, C. D. and Willardson, B. M. (2006) “Mechanism of Assembly of G Protein  subunits by Protein Kinase CK2-phosphorylated Phosducin-like Protein and the Cytosolic Chaperonin Complex” *J. Biol. Chem.* 281, 22261-22274.

1. Lukov, G. L., Hu, T., McLaughlin, J. N., Hamm, H. E. and Willardson, B. M. (2005) “Phosducin-like protein acts as a molecular chaperone for G protein  dimer assembly” *EMBO J.* 24, 1965-1975.
2. Carter, M.D., Southwick, K., Lukov, G., Willardson, B. M. and Thulin, C. D. (2004) “Identification of phosphorylation sites on phosducin-like protein by QTOF mass spectrometry” *J. Biomol. Tech.* 15, 257-264.

25. Martin-Benito, J., Bertrand, S., Hu, T., Ludtke, P., McLaughlin, J.N., Willardson, B.M., Carrascosa, J. L. and Valpuesta, J.M. (2004) “Structure of the complex between phosduin-like protein and the cytosolic chaperonin complex” *Proc. Natl. Acad. Sci.* 101, 17410-17415.

24. Lee, B.Y., Thulin, C. D. and Willardson B. M. (2004) "Site-specific phosphorylation of phosducin in intact retina -- dynamics of phosphorylation and effects on G protein  dimer binding" *J. Biol. Chem.* 279, 54008-54017.

23. Lukov, G.L., Myung, C.-S., McIntire, W.E., Shao, J., Zimmerman, S.S., Garrison, J.C. and Willardson, B.M. (2004) “Role of the Isoprenyl Pocket of the G protein  Subunit Complex in the Binding of Phosducin and Phosducin-like Protein” *Biochemistry* 43, 5651-5660.

22. Obin, M., Lee, B.Y., Meinke, G., Bohm, A., Lee, R.H., Gaudet, R., Hopp, J.A., Arshavsky, V.Y. Willardson, B.M. and Taylor, A. (2002) “Ubiquitylation of the transducin beta gamma subunit complex: Regulation by phosducin”*J Biol Chem* 277, 44566-44575.

21. McLaughlin J.N., Thulin C.D., Bray S.M., Martin M.M., Elton T.S., and Willardson, B.M. (2002)

“Regulation of Angiotensin II-induced G Protein Signaling by Phosducin-like Protein” *J Biol Chem* **277**, 34885-95.

20. J.N. McLaughlin, C.D. Thulin, S.J. Hart, K.A. Resing, N.G. Ahn and B.M. Willardson (2002) “Regulatory Interaction of Phosducin-like Protein with the Cytosolic Chaperonin Complex” *Proc. Natl. Acad. Sci. U.S.A.* **99**, 7962-7967.

19. C.D. Thulin, J.R. Savage, J.N. McLaughlin, S.M. Truscott, W.M. Old, N.G. Ahn, K.A. Resing, H.E. Hamm, M.W. Bitensky and B.W. Willardson (2001) “Modulation of the G Protein Regulator Phosducin by Calcium/Calmodulin-Dependent Protein Kinase II Phosphorylation and 14-3-3 Protein Binding” *J. Biol. Chem.* **276**, 23805-23815.

18. M. M. Martin, B.M. Willardson, G.F. Burton, C.R. White, J.N. McLaughlin, S.M. Bray, J.W. Ogilvie, Jr. and T.S. Elton (2001) “Human angiotensin II type 1 receptor isoforms resulting from alternatively spliced mRNAs are functionally distinct.” *Mol. Endocrin.* **15**, 281-293.

17. J.R. Savage, J.N. McLaughlin, N. Skiba, H.E. Hamm and B. M. Willardson (2000) “Functional Roles of the Two Domains of Phosducin and Phosducin-like Protein” *J. Biol. Chem*. **275**, 30399-30407.

16. M.E. Lazarov, M. M. Martin, B. M. Willardson and T.S. Elton (2000) “Molecular Cloning and Characterization of the Human Phosducin-like Protein Promoter” *Biochim. Biophys. Act,* **1492**, 460-464.

15. C.D. Thulin, K. Howes, C.D. Driscoll, J.R. Savage, T.A. Rand, W. Baehr and B. M. Willardson. (1999) “The Localization and Divergent Roles of Phosducin and Phosducin-like Protein in the Retina” *Mol. Vision*, 5, 40. http://www.molvis/v5/p40/

14. M.E. Lazarov, M. M. Martin, B. M. Willardson and T.S. Elton (1999) “Human Phosducin-like Protein Messenger RNA Stability is Regulated by cis-Acting Instability Elements Present in the 3’-Untranslated Region” *Biochim. Biophys. Acta* **1446**, 253-264.

13. R. Gaudet, J. R. Savage, J. N. McLaughlin, B. M. Willardson and P. B. Sigler (1999) “A Molecular Mechanism for the Phosphorylation-Dependent Regulation of Heterotrimeric G-Proteins by Phosducin” *Mol. Cell* **3**, 649-660.

12. C. Li, L. P. Budge, C. D. Driscoll, B.M. Willardson, G. W. Allman and P. B. Savage (1998) “Incremental Conversion of Outer-Membrane Permeabilizers into Potent Antibiotics for Gram-Negative Bacteria” *J. Am. Chem. Soc.* **121**, 931-940.

11. B.M. Willardson, J.F. Wilkins, T.A. Rand, J.M. Schupp, K.K. Hill, P. Keim, and P.J. Jackson (1998) “Development and Testing of a Bacterial Biosensor for Toluene-based Environmental Contaminants” *Appl. Environ. Microbiol.* **64**, 1006-1012.

10. J.F. Wilkins, M.W. Bitensky and B.M. Willardson (1996) "Regulation of the Kinetics of Phosducin Phosphorylation in Retinal Rods" *J. Biol. Chem.* **271**, 19232-19237.

9. B.M. Willardson, J.F. Wilkins, T. Yoshida and M.W. Bitensky (1996) "Regulation of Phosducin Phosphorylation in Retinal Rods by Ca2+/Calmodulin-Dependent Adenylyl Cyclase" *Proc. Natl. Acad. Sci. USA*, **93**, 1475-1479.

8. T. Yoshida\*, B.M. Willardson\*, J.F. Wilkins, G.J. Jensen, B. D. Thornton, and M.W. Bitensky (1994) "The Phosphorylation State of Phosducin Determines its Ability to Block Transducin Subunit Interactions and Inhibit Transducin Binding to Activated Rhodopsin" *J. Biol. Chem.* **269**, 24050-24057. \*equal contribution of these two authors.

7. B. M. Willardson, B. Pou, T. Yoshida, and M. W. Bitensky (1993) "Cooperative Binding of the Retinal Rod G-protein, Transducin, to Light-activated Rhodopsin" *J. Biol. Chem.* **268**, 6371-6382.

6. C. R. Lombardo, B. M. Willardson, P. S. Low (1992) "Localization of the Protein 4.1-binding Site on the Cytoplasmic Domain of Erythrocyte Membrane Band 3" *J. Biol. Chem.*, **267**,9540-9546.

5. P. S. Low, B. M. Willardson, N. Mohandas, M. Rossi, and S. Shohet (1991) "Contribution of the Band 3-Ankyrin Interaction to Erythrocyte Membrane Mechanical Stability" *Blood*, **77**, 1581-1586.

4. B. J.-M. Thevenin, B. M. Willardson, and P. S. Low (1989) "The Redox State of Cysteines 201 and 317 of the Erythrocyte Anion Exchanger is Critical for Ankyrin Binding",  *J. Biol. Chem.*, **264**, 15886-15892.

3. B. M. Willardson, B. J.-M. Thevenin, M. L. Harrison, W. H. Kuster, M. D. Benson, and P. S. Low (1989) "Localization of the Ankyrin Binding Site on Erythrocyte Membrane Protein, Band 3"  *J. Biol. Chem.*, **264**, 15886-15892.

2. P. S. Low, D. P. Allen, T. F. Zioncheck, P. Chari, B. M. Willardson, R. L. Geahlen, and M. L. Harrison (1987) "Tyrosine Phosphorylation of Band 3 Inhibits Peripheral Protein Binding" *J. Biol. Chem.*, **262**, 4592-4596.

1. S. M. Waugh, B. M. Willardson, R. Kannan, R. Labotka, and P. S. Low (1986) "Heinz Bodies Induce Clustering of Band 3, Glycophorin, and Ankyrin in Sickle Cell Erythrocytes" *J. Clin. Invest*.,  **78** 1155-1160.

**EXTERNALLY AWARDED FUNDING**

“Structural basis for chaperone-dependent folding of beta-propeller proteins essential for vision” National Eye Institute, National Institutes of Health R01 continuation. 9/2020 – 6/2023, $907,000 plus indirect.

“Mechanisms of assembly of photoreceptor G protein complexes” National Eye Institute, National Institutes of Health R01 continuation. 1/2016 – 12/2019, $1,000,000 plus indirect.

“Mechanisms of assembly of photoreceptor G protein complexes” National Eye Institute, National Institutes of Health R01 continuation. 4/2011 – 3/2016, $1,000,000 plus indirect.

“Co-chaperone Role of Phosducin-like Protein in G Protein Subunit Assembly” National Institute of General Medical Sciences. R01 ARRA supplement 9/2009-6/2011. $135,000 plus indirect.

“Co-chaperone Role of Phosducin-like Protein in G Protein Subunit Assembly” National Institute of General Medical Sciences. R01 9/2007-6/2011. $780,000 plus indirect.

“Physiological Role of Phosducins in the Retina” National Eye Institute, National Institutes of Health. R01 continuation. 5/2004-4/2008, $600,000 plus indirect.

"LC/quadrupole ion trap mass spectrometer" National Center for Research Resources, National Institutes of Health. Shared Instrument award. 4/2002-3/2003 $245,940.

"Regulation of the Cytoplasmic Chaperonin Complex by Phosducin-like Protein" National Science Foundation, Molecular and Cellular Biosciences 4/2002 to 3/2005, $219,000 plus indirect.

“Regulation of Visual Signal Transduction by Phosducin” National Eye Institute, National Institutes of Health. RO1 Award. 1999-2004, $566,000 plus indirect.

“Regulation of Ang II-Mediated Cell Growth by Phosducin, a Potent G-Protein Signaling Pathway Modulator” American Heart Association Affiliate Award. 7/1997 to 6/1998, $30,000.

“Light-Regulated retinal enzymes” National Eye Institute, National Institutes of Health subcontract from Mark W. Bitensky. 1996-1998, $80,000 plus indirect.

# BOOK CHAPTERS

8. R.L. Plimpton, J.M. Valpuesta and B.M. Willardson (2018) “Mechanism of Folding by Type II Chaperonins” In: Frontiers in Structural Biology – Role of Molecular Chaperones in Structural Folding, Biological Functions, and drug interactions of client proteins. 1, 190-213. Ed. M. D. Galigniana, Bentham Science.

7. B.M. Willardson and N.C. Tensmeyer (2017) “G proteins”. In: eLS. John Wiley & Sons, Ltd: Chichester. DOI: 10.1002/9780470015902.a0027195.

6. Willardson, B.M. and Tracy, C.M. (2012) Subcell. Biochem. “Chaperone-Mediated Assembly of G Protein Complexes” 63, 131-153.

5. B.M. Willardson (2002) “Phosducin” In “Encylcopedia of Molecular Medicine” Wiley, New York. pp. 2462-2465.

4. B.M. Willardson, J.F. Wilkins, Tatsuro Yoshida and Mark W. Bitensky (1997) “Regulation of G-protein Activation in Retinal Rods by Phosducin” In “Structure and Function of Interacting Protein Domains in Signal and Energy Transduction” Ed. L. M. G. Heilmeyer, Springer-Verlag, Berlin-Heidelberg- New York- Tokyo. pp. 223-226.

3. B.M. Willardson, T. Yoshida and M. W. Bitensky (1995) "Measuring the Cooperative Binding of the Retinal Rod G-protein, Transducin, to Light Activated Rhodopsin" *Methods in Neurosci.* **29**, 264-279.

2. B.M. Willardson, T. Yoshida and M.W. Bitensky (1995) "Cyclic Nucleotides as Regulators of Light-Adaptation in Photoreceptors" *Behavioral and Brain Sciences* **18**, 493-494.

1. P. S. Low, B. M. Willardson, B. J.-M. Thevenin, R. Kannan, E. Melher, R. L. Geahlen, and M. Harrison (1989) "The Other Functions of Erythrocyte Membrane Band 3" In *Anion Transport Protein of the Red Blood Cell Membrane*, pp. 103-118. eds. N. Hamasaki, and M. Jennings, Elsevier Press, Amsterdam.

**PRESENTATIONS**

**Invited speaker**

Willardson, B.M. (June 2020) “Investigating chaperone-mediated assembly of signaling complexes by high-resolution cryo-electron microscopy” ASBMB Virtual Symposium on Emerging Technologies.

Willardson, B.M. (Dec 2017) “Chaperone-mediated assembly of cell signaling complexes” Case Western University, Cleveland, OH.

Willardson, B.M. (Dec 2017) “Chaperone-mediated assembly of cell signaling complexes” University of Akron, Akron, OH.

Willardson, B.M. (September 2016) “Chaperone-mediated assembly of cell signaling complexes” Izatt/Christensen distinguished faculty lecture, Brigham Young University, Provo, UT.

Willardson, B.M. (June 2016) “Chaperone-mediated assembly of cell signaling complexes” Phosphorylation and G-protein mediated signaling networks, Gordon Research Conference, University of New England, Biddeford, ME.

Willardson, B.M. (December 2015) “Chaperone-mediated assembly of G protein complexes.” Seminar series in the Department of Biochemistry, University of Utah Medical School, Salt Lake City, UT.

Willardson, B.M. (November 2014) “Chaperone-mediated assembly of G protein complexes.” Scripps Research Institute Florida, Dept. of Neuroscience seminar. Jupiter, FL.

Willardson, B. M. (May 2014) “Structure of the Gβ-CCT and PhLP1-Gβ-CCT complexes reveal a molecular mechanism for G protein β subunit folding and βγ dimer assembly.” Cold Spring Harbor Symposium Molecular Chaperones and Stress Responses. Cold Spring Harbor, NY.

Willardson, B. M. (September 2013) “Chaperone-mediated assembly of G protein complexes.” University of Rochester, Dept. of Pharmacology seminar. Rochester, NY.

Willardson, B. M. (July 2013) “Structural analysis of G protein complex assembly.” LDS Life Science Research Symposium. Salt Lake City, UT.

Willardson, B. M. (June 2013) “Structure of the Gβ-CCT and PhLP1-Gβ-CCT complexes reveal a molecular mechanism for G protein β subunit folding and βγ dimer assembly.” FASEB Summer Research Conference. The Biology and Chemistry of Vision. Steamboat Springs, CO.

Willardson, B. M. (May 2013) “Chaperone-mediated assembly of G protein complexes.” University of Utah, Moran Eye center seminar, Salt Lake City, UT.

Plimpton, R. L., Lai, C. W., Cuellar, J., Stowell, C. J., Valpuesta, J. M. and Willardson, B. M. (June 2012) “Structure of the Gβ-CCT and PhLP1-Gβ-CCT complexes reveal a molecular mechanism for G protein β subunit folding and βγ dimer assembly.” Gordon Research Conference – Phosphorylation and G protein-mediated Signaling Networks, Biddleford, ME.

Willardson, B. M. (June 2011) “What does it take to assemble a signaling complex? The role of molecular chaperones in G protein signaling” FASEB Summer Research Conference, The Biology and Chemistry of Vision, Carefree, AZ.

Willardson, B. M. (May 2011) “What does it take to assemble a signaling complex? The role of molecular chaperones in G protein signaling” Seminar speaker Universidad Autonoma de Madrid, Centro Nacional de Biotecnologia, Madrid, Spain

Willardson, B. M. (August 2008) “What does it take to assemble a signaling complex? The role of molecular chaperones in G protein signaling” Speaker at the Philip S. Low Symposium, Purdue University

Willardson, B.M. (August 2007) “Overturning a paradigm – a new role of phosducin-like proteins as molecular

chaperones in protein folding” Speaker at the LDS life science research symposium, Snowbird, Utah

Willardson, B.M. (April 2006) “A molecular matchmaker -- the role of phosducin-like protein in the assembly of the nascent G protein  subunit dimer” Seminar speaker Universidad Autonoma de Madrid, Centro Nacional de Biotecnologia, Madrid, Spain

Willardson, B.M. (June 2006) “A molecular matchmaker -- the role of phosducin-like protein in the assembly of the nascent G protein  subunit dimer” Seminar speaker Universite Libre de Bruxelles, Institut de Recherche en Biologie Humaine et Moleculaire, Brussels, Belgium.

Willardson, B.M. (Oct 2005) “A molecular matchmaker -- the role of phosducin-like protein

in the assembly of the nascent G protein  subunit dimer” Seminar speaker University of Arizona Department of Pharmacology and Toxicology

Lukov, G., Carter, M., Thulin, C. and Willardson, B. (June 2004) “Effect of casein kinase II phosphorylation of phosducin-like protein on its binding to the cytosolic chaperonin complex and G protein  subunit dimer” ASBMB annual meeting 2004. Boston, MA. USA

Hu. T., Martin-Benito, J., Bertrand, S. Carrascosa, J., Ludtke, P., McLaughlin, J. Willardson B. and Valpuesta, J. (June 2004) “Structural characterization of the interaction between phosducin-like protein and the cytosolic chaperonin complex” ASBMB annual meeting 2004. Boston, MA. USA

Willardson, B.M. “A tale of two proteins: role of phosducin and phosducin-like protein in regulating G protein signaling in photoreceptors and other cell types” (Sept. 2001) University of Kansas Medical School Kansas City, KS. USA.

Willardson, B.M. “Phosphorylation-state dependent regulation of phosducin binding partners – implications on the physiological role of phosducin in photoreceptor cells” (Aug. 2001) University of Utah, Moran Eye Institute, Salt Lake City, UT. USA.

Willardson, B.M. “Regulation of G-protein Signaling in Vision by Phosducin” Guest speaker for The Purdue University Biochemistry and Molecular Biology Program Seminar Series (Sept. 1997) West Lafayette, IN. USA.

Willardson, B.M. “Regulation of G-protein function in retinal rods by phosducin, a phosphorylation state dependent modulator of G-protein  subunits” (Oct. 1996) American Society of Biochemistry and Molecular Biology Fall Symposium, Keystone, CO. USA.

Willardson, B.M. “Regulation of G-protein Activation by Phosducin” (Sept. 1996) NATO/FEBS Advanced Study Institute, Acquafredda di Maratea, Italy.

Willardson, B.M. “Localization of the ankyrin binding site on erythrocyte band 3 cytoplasmic domain” (Feb. 1989) UCLA Symposia on Molecular and Cellular Biology, Taos, NM. USA.

Willardson, B.M. “Role of Band 3 Anion Channel in the Attachment of the Erythrocyte Membrane Cytoskeleton to the Plasma Membrane” (Sept. 1988) International Symposium on Membrane Proteins, Frankfort, Germany.

#### Poster presentations

Ludlam, W.G., Bohman, J., Carter, E., Zocca, S., Wang, S., Cuéllar, J., Bueno-Carasco, M.T, Valpuesta, J. M., Shen, P.S. and Willardson, B. M. (April 2021) “Structural Determination of CCT-Gβ5 folding intermediate” Experimental Biology Virtual Meeting

Smith, T.M. Stewart, M.G., Shen, P.S., Willardson, B.M. (April 2021) “Structural and functional analysis of RPE65 folding by the cytosolic chaperonin CCT” Experimental Biology Virtual Meeting

Ludlam, W.G., Bohman, J., Carter, E., Zocca, S., Wang, S., Cuéllar, J., Bueno-Carasco, M.T, Valpuesta, J. M., Shen, P.S. and Willardson, B. M. (Feb 2021) “Structural Determination of CCT:β-propeller protein folding intermediates” Keystone Symposium Virtual Meeting

Cuéllar, J., Ludlam, W.G., Tensmeyer, N.C., Aoba, T., Dhavale, M., Santiago, C., Bueno-Carrasco, M.T., Mann, M.J., Plimpton, R.L., Makaju, A., Franklin, S., Willardson, B.M., and Valpuesta, J.M (June 2019)“Structural and functional analysis of the role of the chaperonin CCT in mTOR complex assembly” FASEB research conference “Biology and Chemistry of Vision” Steamboat Springs, CO.

Smith, T.M., Stewart, M.G., Shen, P.S., Willardson, B.M. (June 2019) “Structural and functional analysis of RPE65 folding by the cytosolic chaperonin CCT” FASEB research conference “Biology and Chemistry of Vision” Steamboat Springs, CO.

Cuéllar, J., Ludlam, W.G., Tensmeyer, N.C., Aoba, T., Dhavale, M., Santiago, C., Bueno-Carrasco, M.T., Mann, M.J., Plimpton, R.L., Makaju, A., Franklin, S., Willardson, B.M., and Valpuesta, J.M (June 2018)“Structural and functional analysis of the role of the chaperonin CCT in mTOR complex assembly” “Phosphorylation and G-protein mediated signaling networks”, University of New England, Biddeford, ME.

Cuéllar, J., Ludlam, W.G., Tensmeyer, N.C., Aoba, T., Dhavale, M., Santiago, C., Bueno-Carrasco, M.T., Mann, M.J., Plimpton, R.L., Makaju, A., Franklin, S., Willardson, B.M., and Valpuesta, J.M (April 2018)“Structural and functional analysis of the role of the chaperonin CCT in mTOR complex assembly” Cold Spring Harbor Laboratory Meeting, “Protein homeostasis in health and disease” Cold Spring Harbor, NY.

Cuéllar, J., Ludlam, W.G., Tensmeyer, N.C., Aoba, T., Dhavale, M., Santiago, C., Bueno-Carrasco, M.T., Mann, M.J., Plimpton, R.L., Makaju, A., Franklin, S., Willardson, B.M., and Valpuesta, J.M (Feb 2018)“Structural and functional analysis of the role of the chaperonin CCT in mTOR complex assembly” Keystone Symposium 2018 “From Cells to Molecules” Granlibakken, CA.

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“Kinetics of Light-Regulated Phosphorylation of Phosducin at Sites Controlling G Protein  Subunit and 14-3-3 Binding in Intact Retina” (2004) Gordon Research Conference on the Biology of 14-3-3 Proteins, Ventura, CA. USA

“Role of Site-specific Phosphorylation of Phosducin in G protein  Subunit Binding and Subcellular Localization in Intact Retina” (2003) FASEB Summer Research Conference on the Biology and Chemistry of Vision, Tuscon, AZ. USA.

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“Phosducin-like protein regulation of serum-induced degradation of the Gβγ subunit complex by the 26S proteasome” (2003) Federation of European Biochemical Societies Meeting on Signal Transduction, Brussels, Belgium.

“Ubiquitylation of the transducin beta gamma subunit complex: Regulation by phosducin” (2002) Experimental Biology 2002 ASBMB Annual Meeting, New Orleans, LA. USA.

“Regulatory Interaction of Phosducin-like Protein with the Cytosolic Chaperonin Complex” (2002) FASEB Summer Research Conference on Cellular Signal Transduction, Salt Lake City, UT. USA

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Cell Signaling, Transcription and Translation as Therapeutic Targets, Luxembourg.

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“Potential role of phosducin-like protein as a regulatory link between G protein signaling and protein folding” (2001) Experimental Biology 2001 ASBMB Annual Meeting, Orlando, FL. USA.

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“Structural Mechanism of Inactivation of Phosducin by Phosphorylation” (1998) American Society of Biochemistry and Molecular Biology Fall Symposium, Lake Tahoe, CA. USA

“Kinetics of Phosducin Phosphorylation in Retinal Rods” (1996) American Society of Biochemistry and Molecular Biology Fall Symposium, Keystone, CO. USA.

“Regulation of G-protein Activation by Phosducin” (1996) NATO/FEBS Advanced Study Institute, Acquafredda di Maratea, Italy.

“Ca2+ Regulation of Phosducin Phosphorylation in Retinal Rods via a Ca2+/Calmodulin Dependent Adenylyl Cyclase” (1995) FASEB Summer Research Conference on the Biology and Chemistry of Vision, Copper Mountain, CO. USA

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“Binding of the Retinal Rod G-protein to Rhodopsin Exhibits Positive Cooperativity and Regulation by Phosducin” (1993) Gordon Research Conference on Second Messengers and Protein Phosphorylation, Meridan, NH. USA.

“Localization of the ankyrin binding site on erythrocyte band 3 cytoplasmic domain” (1989) UCLA Symposia on Molecular and Cellular Biology, Taos, NM. USA.