



Anti-Angiogenesis Compounds and Discovery

Dr. Robishaw's past faculty appointments include:

- 1983-1985 Fellow, Pharmacology, University of Texas Health Science Center, Dallas, TX
- 1986-1987 Research Assistant Professor, University of Texas Health Science Center, Dallas, TX
- 1987-1996 Staff Scientist, Weis Center for Research, Geisinger Clinic, Danville, PA
- 1996-1997 Senior Scientist, Weis Center for Research, Geisinger Clinic, Danville, PA
- 1997-2000 Professor with Tenure, Cellular and Molecular Physiology, Pennsylvania State University, College of Medicine, Henry Hood Research Program, Danville, PA
- 2000-present Senior Scientist, Weis Center for Research, Geisinger Clinic, Danville, PA
- 2003-present Director of Research Education and Training, Weis Center for Research, Geisinger Clinic, Danville, PA
- 2005 Associate Director, Weis Center for Research, Geisinger Clinic, Danville, PA

Dr. Robishaw's past board appointments include:

- 1989-1994 Established Investigator, American Heart Association.
- 1993-1998 Editorial Board Member, Journal of Biological Chemistry.
- 1993 Member, Advisory Panel for Neuroscience Research, National Institute of Health.
- 1991-1995 Regular Member, Pharmacology Study Section, National Institutes of Health.
- 1996-1999 Regular Member, Molecular Signaling Study Section, National American Heart Association.
- 1996-1997 Ad hoc Member, Cardiovascular Study Section, National Institutes of Health.
- 1996 Chairperson, ASPET Symposium, Experimental Biology '96 Meeting.
- 1999-2003 Regular Member, Pharmacology Study Section, National Institutes of Health.
- 2001-2004 Executive Committee, Cardiovascular Physiology Division, American Society of Pharmacology and Therapeutics

Selected publications includes (From a total of >90 papers):

1. Robishaw JD, Russell DW, Harris BA, Smigel MD and Gilman AG: Deduced primary structure of the "subunit of the G stimulatory protein of adenylate cyclase. Proc. Natl. Acad. Sci. USA 83: 1251-1255, 1986.
2. Robishaw JD, Smigel MD and Gilman AG: Molecular basis for two forms of the G-protein that stimulates adenylate cyclase. J. Biol. Chem. 261: 9587-9590, 1986.
3. Gao B, Gilman AG and Robishaw JD: A second form of the G protein β subunit. Proc. Natl. Acad. Sci. 84: 6122-25, 1987.

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Selected publications includes (cont'd):

4. Robishaw JD, Kalman VK, and Slaughter CA: Two (subunits of G proteins in brain. *J. Biol. Chem.* 264: 15758-61, 1989.
5. Maltese WA and Robishaw JD: Isoprenylation of a G-protein (subunit. *J. Biol. Chem.* 265(30): 18071-18074, 1990.
6. Graber S, Figler R, Kalman-Maltese V, Robishaw JD and Garrison JC: Expression of functional (dimmers of defined subunit composition using a baculovirus expression system. *J. Biol. Chem.* 267: 13123-13126, 1992.
7. Iniguez-Lluhi JA, Simon M, Robishaw JD and Gilman AG: G protein \$ (subunits synthesized in Sf9 cells: Functional characterization and significance of prenylation of). *J. Biol. Chem.*, 267: 23409-23417, 1992.
8. Cali JJ, Balcueva EA, Rybalkin I and Robishaw JD: Selective tissue distribution of G protein (subunits including a new form identified by cDNA cloning. *J. Biol. Chem.*, 267: 24023-24027, 1992.
9. Peng YW, Robishaw JD, Levine MA, and Yau KW: Retinal rods and cones have distinct \$ and (subunits. *Proc. Natl. Acad. Sci. USA*, 89: 10882-10886, 1992.
10. Rahmatullah M, and Robishaw JD: Direct interaction of the " and (subunits of the G proteins: Purification and analysis by limited proteolysis. *J. Biol. Chem.*, 269: 3574-3580, 1994.
11. Ueda N, Iniguez-Lluhi JA, Lee E, Smrcka AV, Robishaw JD, and Gilman AG: G protein (subunits: Simplified purification and properties of novel isoforms. *J. Biol. Chem.*, 269: 4388-4395, 1994.
12. Robishaw JD and Balcueva EA: Preparation, characterization and use of antibodies with specificity for the G protein (subunits. *Meth. Enzymol.*, 237: 498-507, 1994.
13. Hansen CA, Schroering AG, Carey DJ, and Robishaw JD: Localization of a heterotrimeric G Protein (subunit to regions of focal adhesion and associated stress fibers. *J. Cell Biol.*, 126: 811-819, 1994.
14. Ray K, and Robishaw JD: Cloning of cDNA encoding heart G protein \$ subunit. *Gene*, 149: 337-40, 1994.
15. Hansen CA, Schroering AG, and Robishaw JD: Expression of signal transducing G proteins in cardiac tissue: Implications for phospholipase C-\$ regulation. *J. Mol. Cell. Cardiol.*, Silver Jubilee Issue, 27: 471- 484, 1995.
16. Rahmatullah M, Ginnan R, and Robishaw JD: Specificity of G protein "- (subunit interactions: N-terminal region of (confers specificity. *J. Biol. Chem.*, 270: 2946-2951, 1995.
17. Wilcox MD, Dingus J, Balcueva EA, McIntire WE, Mehta ND, Schey KL, Robishaw JD, and Hildebrandt JD: Bovine brain Go isoforms have distinct (subunit compositions. *J. Biol. Chem.*, 270: 4189-4192, 1995.
18. Iiri T, Homma Y, Ohoka Y, Robishaw JD, Katada T, and Bourne HR: Potentiation of Gi-mediated PLC activation by retinoic acid in HL-60 cells: possible role of G(2, *J. Biol. Chem.*, 270: 5901-5908, 1995.
19. Kalman VK, Erdman R, Maltese WA, and Robishaw JD: Regions outside of the CAAX motif influence of the specificity of prenylation of G protein (subunits, *J. Biol. Chem.*, 270: 14835-14841, 1995.
20. Ray K, Kunsch C, Bonner LM, and Robishaw JD: Isolation of cDNA clones

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Selected publications includes (cont'd):

encoding eight different human G protein (subunits. J. Biol. Chem. 270: 21765-21771, 1995.

21. Robishaw JD: Analysis of the G protein (subunits, using the baculovirus expression system: Requirement for post-translational processing. Methods in Neuroscience 29: 227-245, 1996.

22. Ray K, Hansen CA, and Robishaw JD: G β -mediated signaling in the heart. Trends in Cardiovascular Medicine 6: 7-13, 1996.

23. Daaka Y, Pitcher JA, Richardson M, Stoffel RH, Robishaw JD, and Lefkowitz RJ: Receptor and isoform-specific interactions with G protein-coupled receptor kinases. Proc. Natl. Acad. Sci. USA 94: 2180-2185, 1997.

24. Wang Q, Mullah B, Hansen C, Asundi J, and Robishaw JD: Ribozyme-mediated suppression of G protein (γ subunit suggests role in hormone regulation of adenylylcyclase. J. Biol. Chem. 272: 26040-48, 1997.

25. Pomerantz KB, Summers P, Lander HM, Robishaw JD, Balcueva EB, and Hajjar DP: G protein mediated signaling in cholesterol-enriched arterial smooth muscle cells. Biochemistry 36: 9523-9531, 1997.

26. Wenham D, Rahmatullah R, Rahmatullah M, Hansen CA, and Robishaw JD: Differential coupling of α 1-adrenergic receptor subtypes to phosphatidylinositol turnover and MAP kinase cascades in neonatal rat cardiac myocytes. Eur. J. Pharm. 339: 77-86, 1997.

27. Ivanova-Nikolova TT, Nikolov EN, Hansen C, and Robishaw JD. Muscarinic K $^{+}$ channel in the heart: Modal regulation by G protein β subunits. J. Gen. Physiol., 112: 199-210, 1998.

28. Richardson M, and Robishaw JD: The α 2A-adrenergic receptor discriminates between Gi heterotrimers of different β subunit composition in Sf9 cells. J. Biol. Chem. 274: 13525-13533, 1999.

29. Wang Q, Mullah BK, and Robishaw JD. Ribozyme approach identifies a functional association between the G protein β 1(γ subunits in the adrenergic receptor signaling pathway. J. Biol. Chem. 274: 17365-17371, 1999.

30. McWhinney C, Wenham D, Kanwal S., Kalman V, Hansen C, and Robishaw JD: Constitutively active mutants of the α 1a- and α 1b-adrenergic receptors reveal coupling to different signaling pathways and physiological responses in rat cardiac myocytes. J. Biol. Chem. 275: 2087-2097, 2000.

31. Balcueva EA, Wang Q, Hughes H, Kunsch C, Yu Z, and Robishaw JD: Human G protein (β 11 and (β 14 subtypes define a new functional subclass. Exp. Cell Res. 257: 310-319, 2000

32. McWhinney C, Hansen C, Robishaw JD. Alpha-1 Adrenergic Signaling in A Cardiac Murine Atrial Myocyte (HL-1) Cell Line. Molecular and Cellular Biochemistry 214: 111-119, 2000.

33. Klein C, Schilling K, Saunders-Pullman, Robishaw JD, and Ozelius L. A major locus for myoclonusdystonia maps to chromosome 7q in eight families. Amer. J. Hum. Genet. 67: 1314-9, 2000.

34. Robishaw JD, Wang W, and Schwindinger WF. Ribozyme mediated suppression of G protein β subunits. Methods in Enzymology 344: 435-451, 2001.

35. Schwindinger WF, and Robishaw JD. Role of G protein β dimers in growth

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Selected publications includes (cont'd):

and differentiation. *Oncogene* 20: 1653-60, 2001.

36. Wang Q, Jolly JP, Surmeier JD, Mullah BK, Lidow MS, Bergson CM, and Robishaw JD. Differential dependence of the D1 and D5 dopamine receptors on the G protein g7 subunit for activation of adenylyl cyclase. *J. Biol. Chem.* 276: 39386-93, 2001.

37. Schwindinger W, Betz KS, Giger KE, Sabol A, Bronson SK, and Robishaw JD. Loss of G protein g7 alters behavior and reduces striatal aolf level and cAMP production. *J. Biol. Chem.* 278: 6575-79, 2003.

38. Robishaw JD, Schwindinger WF, and Hansen CA. Specificity of G protein bg dimer signaling. *Handbook of Cellular Signaling 2*: 623-629, 2003.

39. Cheng KC, Levenson R, Robishaw JD. Functional genomic dissection of multimeric protein families in zebrafish. *Dev Dyn* 228:555-67, 2003.

40. Robishaw JD, Guo ZP, Wang Q. Ribozymes as tools for suppression of G protein g subunits. *Methods Mol Biol* 237: 169-80, 2004.

41. Robishaw JD, Berlot CH. Translating G protein subunit diversity into functional specificity. *Curr Opin Cell Biol* 16: 206-9, 2004.

42. Schwindinger WF, Giger KE, Betz KS, Stauffer AM, Sunderlin EM, Sim-Selley LJ, Selley DE, Bronson SK, Robishaw JD. Mice with deficiency of G protein g3 are lean and have seizures. *Mol Cell Biol* 24: 7758-68, 2004.

43. Chen H, Humbert JE, Leung TC, Sinha S, Giger KE, Stauffer AM, Horstick EJ, Hansen CA, and Robishaw JD. Expression of the G protein gT1 subunit during zebrafish development. Submitted to *Gene Expression Patterns*.

44. Leung TC, Chen H, Stauffer AM, Giger KE, Sinha S, Horstick EJ, Humbert JE, Hansen CA, and Robishaw JD. Zebrafish G protein g2 is required for VEGF signaling during angiogenesis. Submitted to *Blood*.

45. Schwindinger WF, Borrell BM, Waldman L, and Robishaw JD. Female mice lacking the G protein g3-subunit show resistance to diet induced obesity. Submitted to *American Journal of Physiology*.

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