

BIOGRAPHICAL SKETCH

Provide the following information for the key personnel in the order listed on Form Page 2.
Photocopy this page or follow this for each person.

NAME	POSITION TITLE
Mark M. Rasenick	Professor of Physiology and Biophysics and Psychiatry

EDUCATION (*Begin with baccalaureate or other initial professional education, such as nursing, and include postdoctoral training.*)

INSTITUTION AND LOCATION	DEGREE	YEAR CONFERRED	FIELD OF STUDY
Case Western Reserve University, Cleveland Ohio	B.A.	1971	Biology/Political Sci.
Wesleyan University, Middletown Connecticut	Ph.D.	1977	Developmental Biol.
Yale University School of Medicine New Haven, Connecticut	Post-doc	1981	Membrane Biology

RESEARCH AND PROFESSIONAL EXPERIENCE: Concluding with present position, list, in chronological order, previous employment, experience, and honors. Include present membership on any Federal Government public advisory committee. List, in chronological order, the titles, all authors, and complete references to all publications during the past three years and to representative earlier publications pertinent to this application. If the list of publications in the last three years exceeds two pages, select the most pertinent publications. DO NOT EXCEED TWO PAGES.

Professional Experience:

8/77-12/81 Post Doctoral Fellow, Yale Medical School: Research on the biochemical and cellular basis of hormone action with Mark W. Bitensky
1/82-4/82 Research Associate, Dept. of Pathology, Yale Medical School
5/82-6/83 Associate Research Scientist, Dept. of Neurology, Yale Medical School
7/83-8/88 Assistant Professor, Dept. of Physiology & Biophysics, University of Illinois College of Medicine
9/88-8/93 Associate Professor, Dept. of Physiology & Biophysics, University of Illinois College of Medicine
9/93- Professor - Dept. of Physiology and Biophysics, University of Illinois College of Medicine
6/95- Professor - Dept. of Psychiatry, University of Illinois College of Medicine
6/98- Director, Neuroscience Training Program, Univ. of Illinois at Chicago College of Medicine
9/99-10/00 Robert Wood Johnson Health Policy Fellow: Senate Committee on Health Education, Labor and Pensions; Senator Edward M. Kennedy (D. Mass)

Other Work Experience:

8/71-9/72 Program Director, U.S. Nat'l Student Association, Washington, D.C.

Awards and Scientific Service

Student Body President, Case Western Reserve University, 1970-1971
Sigma Xi Grant in Aid of Research, 1976
Wesleyan University Graduate Research Fellowship, 1976-1977
Yale Membrane Center Fellow, 1977-1979
NIH/NIAMDD Individual National Research Service Award, 1979-1981
NIH/NIMH Special Study Section Member, 1984-; Pharmacology Study Section (Ad Hoc) 1994-; Mol. Cell. Devel. Neurosci (Ad Hoc) 1995-; USAMC Breast Cancer Panels (Mol. Biol, Pathophysiol) 1998-
Member, NSF Cellular Neuroscience Panel, 1989-1992. Editorial Board, Neuropsychopharmacology 2002-
Chicago Community Trust Fellow, Outstanding Junior Faculty Award, 1984-1986
Research Scientist Development Award (level II) National Institute for Mental Health, 1987-1997
University Scholar Award - University of Illinois, 1989
Philip L. Hawley Award for Outstanding Graduate Education, UIC, 1995
Society for Neuroscience - Chicago Chapter, Councillor 1990-1992; President 1997-1998
1998 Distinguished Faculty Award, University of Illinois College of Medicine
Robert Wood Johnson Health/Science Policy Fellowship-U.S. National Academy of the Sciences, 1999-2000

Professional Societies Membership:

American Association for the Advancement of Science; American Society for Biological Chemistry; Sigma Xi; Society for Neuroscience, President, Chicago Chapter, 1997; Chapters Committee, 1997-2001; Gov./Public Affairs Comm. 2001-2004; American Society for Cell Biology; Union of Concerned Scientists

Research Projects Ongoing or Completed During the Last 3 Years

Title: Cytoskeletal Control of Neuronal G Protein Signaling

Principal Investigator: M.M. Rasenick

Agency: NIMH

Type: RO1 MH 39595

Period: 12/01/84-12/31/06

This project is designed to explore the molecular interactions between tubulin and G proteins so that the relationship between neuronal form and function can be better understood. The focus of the project is a determination of the molecular interface between tubulin and G proteins and how receptors and effectors (eg. adenylyl cyclase) might alter the ability of tubulin to activate G protein.

Title: Regulation of G-Protein-Mediated Phospholipid Signaling by Tau

Principal Investigator: M.M. Rasenick

Agency: NIH-NIA

Type: RO1 AG 15482

Period: 09/01/97-06/30/02

This proposal, focuses on the interactions between phospholipase C signaling and Tau in the Alzheimer brain. Various Tau constructs are being expressed in PC12 cells to examine how this alters muscarinic receptor/G /PLC signaling.

Title: G Protein Coupling in Antidepressant Drug Action

Principal Investigator: M.M. Rasenick

Agency: NIH

Type: RO1 MH 57391

Period: 07/01/99-06/30/02

Various neuronal and glial cells are being treated chronically with antidepressants and alterations of the cytoskeleton and G protein signaling pathways are being determined

Selected Publications:

RASENICK, M.M., Stein, P.J. and Bitensky, M.W. Evidence that the regulatory subunit of adenylate cyclase interacts with cytoskeletal components. Nature, 294:560-562, 1981.

Menkes, D.B., RASENICK, M.M., Wheeler, M.A. and Bitensky, M.W. Chronic antidepressant treatment enhances GTP dependent activation of brain adenylate cyclase. Science, 219:65-67, 1983.

Stein, P.J., Halliday, K. and RASENICK, M.M. Photoreceptor GTP binding protein mediates, fluoride activation of phosphodiesterase. J. Biol. Chem., 260:9081-9084, 1985.

Hatta, S., Marcus, M.M. and RASENICK, M.M. Exchange of Guanine nucleotide between GTP-binding proteins which regulate neuronal adenylate cyclase. Proc. Nat. Acad. Sci. USA, 83:5439-5443, 1986.

RASENICK, M.M. and Wang, N. Exchange of nucleotides between tubulin and GTP-binding protein which regulate adenylate cyclase: Cytoskeletal modification of neuronal signal transduction. J. Neurochem. 51:3401-3413, 1988.

Wang, N., Yan, K., and RASENICK, M.M. Tubulin binds specifically to the signal transducing G proteins, G α and G α 1. J. Biol. Chem. 265:1239-1242, 1990.

Warpeha, K.M., Hamm, H.E., RASENICK, M.M. and Kaufmann, L.S. A light-activated G protein in plants. Proc. Nat. Acad. Sci. USA 88:8925-8929, 1991.

Wang, N. and RASENICK, M.M. Tubulin-G protein interactions involve microtubule polymerization domains. Biochemistry 30:10957-10965, 1991.

RASENICK, M.M. Gs (a poem). Trends in Biochem. Sci. 17:71, 1992.

Roychowdhury, S., Wang, N. and RASENICK, M.M. G protein binding and G protein activation by nucleotide transfer include distinct domains on tubulin: Biochemistry 32:4955-4961, 1993.

RASENICK, M.M., Talluri, M. and Dunn, W.J. III. Photoaffinity GTP analogs as a tool for the study of GTP-binding proteins. Methods in Enzymology Vol. 237, 100-110, 1994.

Liu, Y.F., Jakobs, K.H., RASENICK, M.M. and Albert, P.R. G protein specificity in receptor-effector coupling. Analysis of the roles of G $_o$ and G $_{i2}$ in GH4C1 pituitary cells. J. Biol. Chem. 269:13880-13886, 1994.

Popova, J.S., Johnson, G.L. and RASENICK, M.M. Chimeric Gas/G α i2 proteins define domains on G α s which interact with tubulin for the β -adrenergic activation of adenylyl cyclase. J. Biol. Chem. 269:21748-21754, 1994.

Roychowdhury, S. and RASENICK, M.M. Tubulin-G protein association stabilizes GTP binding and activates GTPase: cytoskeletal participation in neuronal signal transduction. Biochemistry 33:9800-9805, 1994.

RASENICK, M.M., Watanabe, M., Lazarevic, M.B., Hatta, S. and Hamm, H.E. Synthetic peptides as a probe for G protein function: Carboxyl terminal G α s peptides mimic Gs and evoke high-affinity agonist binding to β adrenergic receptors. J. Biol. Chem. 269:21519-21525, 1994.

- Chen, J. and RASENICK, M.M. Chronic treatment of C6 glioma cells with antidepressant increases functional coupling between a G protein (Gs) and adenylyl cyclase. *J. Neurochem.* 64:724-732, 1995.
- Chen, J., and RASENICK, M.M. Chronic antidepressant treatment facilitates G protein activation of adenylyl cyclase without altering G protein content. *J. Pharm. Expt. Ther.* 275:509-517, 1995.
- Yan, K., Green, E., Belga, F. and RASENICK, M.M. Synaptic membrane G proteins are complexed with tubulin in situ. *J. Neurochem.* 66:1849-1895, 1996.
- RASENICK, M.M., Chaney, K.A. and Chen, J. G protein-mediated signal transduction as a target of anti-depressant and antibipolar drug action: Evidence from model systems. *J. Clin. Psych.* 57:13:49-55, 1996.
- Popova, J.S., Garrison, J.C., Rhee, S.G. and RASENICK, M.M. Tubulin, Gq and phosphatidylinositol 4,5-bisphosphate interact to regulate phospholipase C β 1 signaling. *J. Biol. Chem.*, 272:6760-6765, 1997.
- Roychowdhury, S. and RASENICK, M.M. G-protein subunits regulate microtubule assembly. *J. Biol. Chem.* 272:31576-31581, 1997.
- Rajagopalan-Gupta, R.M., Lamm, M.L., Mukherjee, S., RASENICK, M.M. and Hunzicker-Dunn, M. Luteinizing hormone/choriogonadotropin receptor-mediated activation of heterotrimeric guanine nucleotide binding proteins in ovarian follicular membranes. *Endocrinology*, 139:4547-4555, 1998.
- Roychowdhury, S., Panda, D., Wilson, L., and RASENICK, M.M. G protein α subunits activate tubulin GTPase and modulate microtubule polymerization dynamics. *J. Biol. Chem.* 274:13485-13490, 1999.
- Liu, Y.F., Ghahremani, M.H., RASENICK, M.M., Jakobs, K.H., and Albert, P.R. Stimulation of cAMP synthesis by Gi-coupled receptors upon ablation of distinct G α i protein expression. Gi subtype specificity of the 5-HT1A receptor. *J. Biol. Chem.* 274:16444-16450, 1999.
- Toki, S., Donati, R.J. and RASENICK, M.M. Treatment of C6 Glioma cells and rats with antidepressant drugs increases the detergent extraction of G α from plasma membrane. *J. Neurochem.* 73:1114-1120, 1999.
- RASENICK, M.M. U.S. and Cuban scientific exchange. *Science* 286(5449):2449-2450, 2000.
- Popova, J.S. and RASENICK, M.M. Muscarinic receptor activation promotes the membrane association of tubulin for the regulation of G-q mediated phospholipase C β 1 signaling. *J. Neurosci.* 20:2774-2782, 2000.
- RASENICK, M.M., Chen, J. and Ozawa, H. "Effects of antidepressant treatments on the G-protein/ Adenylyl cyclase axis as the possible basis of therapeutic action". In: *Bipolar Medications: Mechanisms of Action*. Edited by H.K. Manji, C.L. Bowden and R.H. Belmaker. American Psychiatric Press, Inc., Washington, DC, Pages 87-108, 2000.
- RASENICK, M.M. and Jaffe, R. Molecular mechanisms of hormone action: Biology of Signal transduction. In: *Endocrinology and Metabolism*, 4th ed. Edited by P. Felig and L.A. Frohman, pp 49-90 McGraw Hill, NY, 2000.
- Dziarski, R., RASENICK, M.M. and Gupta, D. Bacterial peptidoglycan binds to tubulin. *Biochem. Biophys. Acta* 1524:17-26, 2000.
- Yan, K., Popova, J.S., Moss, A., Shah, B. and RASENICK, M.M. Tubulin stimulates adenylyl cyclase activity in C6 glioma cells by bypassing the beta-adrenergic receptor: a potential mechanism of G protein activation. *J. Neurochem.* 76:182-190, 2001.
- Venkatasubramanian, J., Selvaraj, N., Carlos, M., Skaluba, S., RASENICK, M.M. and Rao, M.C. Differences in Ca²⁺ signaling underlies age-specific differences in regulation of colonic chloride transport by bile acids and secretagogues. *Am. J. Physiol.:Cell Physiol.*, 280:646-658, 2001.
- Donati, R., Thukral, C., RASENICK, M.M. Chronic treatment of C6 cells with antidepressant drugs result in a redistribution of G α . *Mol. Pharm.* 59:1426-1432, 2001.
- Salvador, L.M., Mukherjee, S., Kahn, R.A., Lamm, M.L., Fazleabas, A.T., Maizels, E.T., Bader, M-F., Hamm, H.E., RASENICK, M.M., Casanova, J.E. and Hunsicker-Dunn, M. Activation of the luteinizing hormone/choriogonadotropin hormone receptor promotes ADP ribosylation factor (ARF) 6 activation in porcine ovarian follicular membranes *J. Biol. Chem.* 276: 33773-33781, 2001.
- Yu, J.Z. and RASENICK, M.M. Real-time visualization of a fluorescent G α s: dissociation of the activated G protein from the plasma membrane. *Mol. Pharmacol.* 61: 352-359, 2002.
- Yu, J-Z and RASENICK, M.M. Transient expression of fluorescent tau proteins promotes process formation in PC12 cells: Contributions of the tau C-terminus to this process. *J. Neurosci. Res.*, (in press).
- Popova, J.S., Greene, A. Wang, J. and RASENICK, M.M. Phosphatidylinositol 4,5 bisphosphate modifies tubulin participation in PLC β 1 signaling. *J. Neuroscience*, (in press).