
BIOGRAPHICAL SKETCH

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NAME Mark M. Rasenick		POSITION TITLE Distinguished UIC Professor of Physiology & Biophysics and Psychiatry	
eRA COMMONS USER NAME MARKRASENICK			
EDUCATION/TRAINING <i>(Begin with baccalaureate or other initial professional education, such as nursing, and include postdoctoral training.)</i>			
INSTITUTION AND LOCATION	DEGREE <i>(if applicable)</i>	YEAR(s)	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

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, Biomedical Neuroscience Training Program, UIC 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)
9/2005- Director, UIC Interdisciplinary Neuroscience Program

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 (various), 1984-; Pharmacology Study Section (Ad Hoc) 1994-;
Mol. Cell., Devel. Neurosci (Ad Hoc) 1995-; Member, USAMC Breast Cancer Panels (Mol. Biol, Pathophysiol) 1998- (Chair, Mol. Biol/Genetics 2006) Member, NSF Cellular Neurosci. Panel, 1989-1992 .
Editorial Boards: Neuropsychopharmacology 2002-2008 , Current Psychiatry Reviews, 2004- , Biochemica et Biophysica Acta-, 2005-, Psychopharmacology, 2006-2009, Translational Research 2006-, Open Psychiatry, 2008-, Open Pharmacology, 2008-
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 Policy Fellowship-U.S. National Academy of the Sciences, 1999-2000
Distinguished UIC professor 2006- Paul Rodgers Global Health Research Ambassador 2009

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 Cmte., 1997-2001; Gov./Public Affairs Cmte. (vice chair) 2001-2004, International Affairs Cmte. 2002-2008; American Society for Cell Biology; Union of Concerned Scientists, American Col. Neuropsychopharmacology, Liason Cmte., 2003-2007, Advocacy Cmte, 2008-

Selected Publications:

- 1981 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. PMID: 7312044
- 1982 Bitensky, M.W., Wheeler, M.A., RASENICK, M.M., Yamazaki, A., Stein, P.J., Halliday, K. and Wheeler, G.L. Functional exchange of components between light activated photoreceptor phosphodiesterase and hormone activated adenylate cyclase systems. Proc. Natl. Acad. Sci., 79:3408-3412. PMID: 6285349
- 1983 Menkes, D.B., RASENICK, M.M., Wheeler, M.A. and Bitensky, M.W. Chronic anti-depressant treatment enhances GTP dependent activation of brain adenylate cyclase. Science, 219:65-67. PMID: 6849117
- 1985 Stein, P.J., Halliday, K. and RASENICK, M.M. Photoreceptor GTP binding protein mediates. Fluoride activation of phosphodiesterase. J. Biol. Chem., 260:9081-9084. PMID: 2991235
- 1986 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. PMID: 3090543
- 1989 Hamm, H.E., Deteric, D., Takahashi, J., Moore, C. and RASENICK, M.M. A monoclonal antibody against the rod outer segment guanyl nucleotide-binding protein, transducin, blocks the stimulatory and inhibitory G-proteins of adenylate cyclase. J. Biol. Chem., 264: 11475-11482. PMID: 2544596
- 1989 Ozawa, H. and RASENICK, M.M. Coupling of the stimulatory GTP-binding protein, G_s to rat synaptic membrane adenylate cyclase is enhanced subsequent to chronic antidepressant treatment. Molec. Pharmacol., 36:803-808. PMID: 2511428
- 1990 Wang, N., Yan, K. and RASENICK, M.M. Tubulin binds specifically to the signal transducing G proteins, G_s and G_i1. J. Biol. Chem., 265:1239-1242. PMID: 2104835
- 1991 Ozawa, H. and RASENICK, M.M. Chronic electroconvulsive treatment augments coupling of the GTP binding protein, G_s, to the catalytic moiety of adenylate cyclase in a manner similar to that seen with chronic antidepressant drugs. J. Neurochem., 56:330-338. PMID: 1898967
- 1991 Wang, N. and RASENICK, M.M. Tubulin-G protein interactions involve microtubule polymerization domains. Biochemistry, 30:10957-10965. PMID: 1932021
- 1992 RASENICK, M.M. G_s (a poem). Trends in Biochem. Sci., 17:71.
- 1993 Roychowdhury, S., Wang, N. and RASENICK, M.M. G protein binding and G protein activation by nucleotide transfer include distinct domains on tubulin: Regulation of signal transduction by cytoskeletal elements. Biochemistry, 32:4955-4961. PMID: 8490031
- 1994 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, 237:100-110. PMID: 7934988
- 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. PMID: 8188665
- 1994 Popova, J.S., Johnson, G.L. and RASENICK, M.M. Chimeric G_{αs}/G_{αi2} proteins define domains on G_{αs} which interact with tubulin for the β-adrenergic activation of adenylate cyclase. J. Biol. Chem., 269:21748-21754. PMID: 8063818
- 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_{αs} peptides mimic G_s and evoke high-affinity agonist binding to β-adrenergic receptors. J. Biol. Chem., 269:21519-21525. PMID: 8063788
- 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. PMID: 8068660
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- 1995 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. PMID: 7830066
- 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. PMID: 7562593
- 1996 Yan, K., Green, E., Belga, F. and RASENICK, M.M. Synaptic membrane G proteins are complexed with tubulin in situ. J. Neurochem. 66:1849-1495, 1996. PMID: 8627303
- 1997 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. PMID: 9045709
- 1997 Roychowdhury, S. and RASENICK, M.M. G-protein $\beta\gamma$ subunits regulate microtubule assembly. J. Biol. Chem., 50:31576-31581. PMID: 9395495
- 1999 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. PMID: 10224115
- 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. PMID: 10461902
- 2000 Popova, J.S. and RASENICK, M.M. Muscarinic receptor activation promotes the membrane association of tubulin for the regulation of Gq-mediated phospholipase C β 1 signaling. J. Neuroscience, 20(8):2774-2782. PMID: 10751428 .
- 2001 Donati, R., Thukral, C., and RASENICK, M.M. Chronic treatment of C6 glioma cells with antidepressant drugs results in a redistribution of G α . Mol. Pharmacol. 59:1426-1432. PMID: 11353802 [PubMed]
- 2002 Yu, J.Z. and RASENICK, M.M. "Real-time visualization of a fluorescent G α : dissociation of the activated G protein from the plasma membrane" Mol. Pharmacol 61: 352-359. PMID: 11809860
- 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. 67:625-633. PMID: 11891775
- 2002 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 22:1668-1678. PMID: 11880496
- 2003 Donati, R.J. and RASENICK, M.M. G protein signaling and the molecular basis of antidepressant action (invited review) Life Sciences 73:1-17. PMID: 12726882
- 2003 Chen, N-F, Yu, J-Z, Skiba, N.P., Hamm, H.E. and RASENICK, M.M. A specific domain of G α required for the transactivation of G α by tubulin is implicated in the organization of cellular microtubules. J. Biol. Chem 278: 15285 – 15290. PMID: 12582171
- 2003 Sarma, T., Voyno-Yasenetskaya, T., Hope, T.J. and RASENICK, M.M. Heterotrimeric G-proteins associate with microtubules during differentiation in PC12 pheochromocytoma cells. FASEB J. 17: 848-859. PMID: 12724344
- 2003 Popova, J.S. and RASENICK, M.M. G $\beta\gamma$ mediates the interplay between tubulin dimers and microtubules in the modulation of Gq signaling. J. Biol.Chem 278:34299-34308. PMID: 15117940
- 2004 Yu, J-Z and RASENICK M.M. Basic Principles of Molecular Biology and Genomics in Textbook of Psychopharmacology A.F. Schatzberg and C.B. Nemeroff, Eds. pp 53-69 Am. Psych. Press NYC.
- 2004 RASENICK, M.M., Donati, R.J., Popova, J.S. and Yu, J-Z Tubulin as a Regulator of G protein signaling. Methods in Enzymology 390:389-403. PMID: 15488190
- 2004 Popova, J.S. and RASENICK, M.M. Clathrin-mediated endocytosis of m3 muscarinic receptors. Roles for G $\beta\gamma$ and tubulin J. Biol.Chem 279: 30410-30418. PMID: 15117940
- 2004 Samsonov, A, Yu, J-Z, RASENICK, MM and Popov, S.V. Tau interaction with microtubules in vivo. J Cell Sci 117: 6129-6141. PMID: 15564376
- 2005 Donati, R.J. and RASENICK, MM. Chronic antidepressant treatment prevents accumulation of G α in cholesterol-rich, cytoskeletal-associated plasma membrane domains (lipid rafts). Neuropsychopharmacology 30:1238-1245. PMID: 15726116
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- 2005 Allen, J, Yu, J-Z, Donati, R.J. and RASENICK, M.M. Beta Adrenergic Receptor Stimulation Promotes G α s Internalization Through Lipid Rafts: A Study in Living Cells. Mol. Pharmacol. 67:1493-1504. PMID: 15703379
- 2005 Freudzon, L., Norris, R.P., Hand, A.R., Tanaka, S., Saeki, Y., Jones, T.L.Z., RASENICK, M.M., Berlot, C.H., Mehlmann, L.M. and Jaffe, L.A. Regulation of meiotic prophase arrest in mouse oocytes by GPR3, a constitutive activator of the Gs G protein, J. Cell Biol. 171:255-265. PMID: 16247026
- 2006 Yu, J-Z and RASENICK, M.M. Tau associates with actin in differentiating PC12 cells FASEB J. 20:1-10. PMID: 16816120
- 2007 Allen J, Halvorsen, R and RASENICK M.M. Lipid Raft Microdomains and Neurotransmitter Signaling. Nature Reviews Neuroscience, 8:128-140. PMID: 17195035
- 2007 Sugama J, Yu JZ, RASENICK MM, Nakahata N. Mastoparan inhibits beta-adrenoceptor-G(s) signaling by changing the localization of G α (s) in lipid rafts. Cell Signal. 19:2247-54. PMID: 17692506
- 2007 Montoya V, Gutierrez C, Najera O, Leony D, Varela-Ramirez A, Popova J, RASENICK MM, Das S, Roychowdhury S. G protein betagamma subunits interact with alpha-beta- and gamma-tubulin and play a role in microtubule assembly in PC12 cells. Cell Motil Cytoskeleton 64:936-950. PMID: 17705289
- 2007 Hasbi A, Nguyen T, Fan T, Cheng R, Rashid A, Alijaniam M, RASENICK MM, O'Dowd BF, George SR. Trafficking of preassembled opioid mu-delta heterooligomer-Gz signaling complexes to the plasma membrane: coregulation by agonists. Biochemistry 46:12997-13009. PMID: 17941650
- 2008 Donati, RJ, Dwivedi, Y., Roberts, RC, Conley, RR, Pandey, GN and RASENICK, MM. Post-mortem Brain Tissue of Depressed Suicides Reveals Increased Gs Localization in Lipid Raft Domains Where it is Less Likely to Activate Adenylyl Cyclase. J. Neuroscience 28:3042-50. PMID: 18354007
- 2008 Layden, BT, Saengsawang, W, Donati, RJ, Yang, S, Mulhearn, DC, Johnson, ME and RASENICK MM, Structural model of a complex between the heterotrimeric G protein, Gs α and tubulin. Biochimica et Biophysica Acta-Molecular Cell Research 1783:964-973. PMID: 18373982
- 2009 Yu, J-Z, Dave, R.H., Allen, J.A., Sarma, T. and Rasenick, M.M. "Cytosolic G α s acts as an intracellular messenger to increase microtubule dynamics and promote neurite outgrowth." J. Biol. Chem. 284:10462-72
- 2009 Allen, JA, Yu, J-Z., Dave, R.H., Bhatnagar, J., Roth, B.L. and Rasenick, M.M. "Caveolin-1 and lipid microdomains regulate Gs trafficking and attenuate Gs/adenylyl cyclase signaling" Molecular Pharmacology (in press)

Ongoing and Completed Funding

Title: Cytoskeletal Control of Neuronal G Protein Signaling

Principal Investigator: M.M. Rasenick

Agency: NIMH

Type: RO1 MH 39595

Period: 12/01/84-11/30/07

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.

Title: Training in the Neuroscience of Mental Health

Principal Investigator: M. M. Rasenick

Agency, NIMH

Type: T32 MH067631

Period: 07/01/04-06/30/09

Title: Omega 3 fatty acids, lipid rafts and GPR30 in breast cancer

Principal Investigator: M.M. Rasenick

Agency: DOD

Period: 09/15/07-09/14/08

Title: Structural basis for reciprocal regulation of the GTPases tubulin and G α

Principal Investigator: M. M. Rasenick

Agency: NIDA

Type: R21 DA020568-01

Period: 09/30/2005 - 07/31/2008

This project is to determine and analyze the crystal structure of the G α /tubulin complex.

Title: Post-Synaptic Mechanisms for Depression and Antidepressants: Studies in Model Systems.

Principal Investigator: M.M. Rasenick

Agency: NIMH

Type: R01 MH0078200

Period: 1/31/08-1/30/10

This project is to explore altered Gs signaling resulting from chronic antidepressant treatment.
