

CURRICULUM VITAE

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Education:

1976-1980 Pharmacy Degree (M.Sc.), University of Buenos Aires, Argentina
1976-1983 Biochemistry Degree (M.Sc.), University of Buenos Aires, Argentina.
1985 Ph.D. in Pharmacy and Biochemistry, University of Buenos Aires, Argentina

Employment History:

1998-present Chief, Oral and Pharyngeal Cancer Branch, National Institute of Dental and Craniofacial Research, NIH, Bethesda, USA
1997-present Chief, Cell Growth Regulation Section and Molecular Carcinogenesis Unit, Oral and Pharyngeal Cancer Branch, National Institute of Dental and Craniofacial Research, NIH, Bethesda, USA
1996-1997 Acting Chief, Oral and Pharyngeal Cancer Branch, National Institute of Dental Research, NIH, Bethesda, USA
1993-1997 Chief, Molecular Signaling Unit, Laboratory of Cellular Development and Oncology, National Institute of Dental Research, NIH, Bethesda, USA.
1992-1993 Head, Molecular Signaling Group, Laboratory of Cellular Development and Oncology, National Institute of Dental Research, NIH, Bethesda, USA.
1989-1992 Visiting Associate, Laboratory of Cellular Development and Oncology, National Institute of Dental Research, NIH, Bethesda, USA.
1988-1989 Fogarty Visiting Fellow, Laboratory of Cellular Development and Oncology, National Institute of Dental Research, NIH, Bethesda, USA.
1987-1988 Fogarty Visiting Fellow, NIDR, Guest Researcher at the Laboratory of Cellular and Molecular Biology, National Cancer Institute, NIH, Bethesda, USA.

- 1986-1987 International Fogarty Fellow, Laboratory of Clinical Science, National Institute of Mental Health, NIH, Bethesda, USA.
- 1983-1986 Research Assistant, Department of Pharmacology, School of Pharmacy and Biochemistry, University of Buenos Aires, Argentina.
- 1981-1983 Part-time Instructor, Department of Pharmacology, School of Pharmacy and Biochemistry, University of Buenos Aires, Argentina.
- 1979-1980 Part-time Instructor, Department of Organic Chemistry, School of Pharmacy and Biochemistry, University of Buenos Aires, Argentina.

Honors and Awards:

- 2007 Frank Brook Memorial Lecture, American Pancreatic Association, Chicago, IL
- 2006 Elected, Co-chair, Gordon Research Conference, "Phosphorylation & G-Protein Mediated Signaling Networks", 2008
- 2006 Miguel Aleman Lecture, Miguel Aleman Foundation, Mexico DF, Mexico
- 2005 NIH Director's Award
- 2005 Elliot Osserman Award, Israel Cancer Research Foundation
- 2004 International Association of Dental Research (IADR) Distinguished Scientist Award, Oral Medicine and Pathology
- 2003 NIH Hispanic Heritage Month Celebration: Hispanic Contributions to Research in the United States, Lecture
- 2000 NIDCR Director's Exemplary Service Award
- 1999 EEO Special Achievement Award, NIDCR, NIH
- 1998 Appointment as member of the Senior Biomedical Research Services (SBRS)
- 1997 NIDR Director's Exemplary Service Award
- 1996 NIH Merit Award
- 1989 Funds for Young Scientists, Travel Award, Organizing Committee of the 7th International Conference on Protein Phosphorylation, Kobe, Japan
- 1986 International Fogarty Fellowship, National Institutes of Health, USA
- 1983 Gold Medal Award and Diploma of Honor, first rank student of the School of Pharmacy and Biochemistry, University of Buenos Aires, Argentina.

Editorial Responsibilities:

- 1998-2003 Member, Editorial Board, Journal of Biological Chemistry
- 1998-2000 Editor, Book on Signaling Networks and Cell Cycle Control, Humana Press
- 2000-2003 Co-Editor, Book on Head and Neck Cancer, Emerging Perspectives, Wiley & Co
- 2000-present Member, Editorial Board, Oral Oncology
- 2001-present Member, Editorial Board, Biochemistry
- 2001-2006 Member, Editorial Board, Revista de Oncologia, Mexico-Spain
- 2002-2003 Co-Editor, Book on Signal Transduction and Human Disease, Wiley & Co
- 2002-present Member, Faculty 1000, Reviewing Editor
- 2003-2005 Member, Editorial Board, Drug Discovery Today: Disease Mechanisms
- 2005-present Member, Editorial Board, Molecular Biology of the Cell
- 2006-present Member, Editorial Board, Current BioData Lipid Signalling

2008 Member, Editorial Board, Oncogene
2008 Member, Editorial Board, Cancer Prevention Research

Ad-hoc Reviewer:

Biochemical and Biophysical Acta; Blood; British Journal of Cancer; Cancer Cell; Cancer Research; Clinical Cancer Research; Cell; Cell Growth and Differentiation; Clinical Cancer Research; Current Biology; EMBO Journal; FEBS letters; Journal of Biological Chemistry; Journal of Cell Biology; Journal of Cell Physiology; Journal of Clinical Investigation; Journal of Immunology; Journal of Neurochemistry; Molecular and Cellular Biology; Molecular and Cellular Neurobiology; Molecular Cell; Molecular Pharmacology, Nature; Nature Cell Biology; Nature Medicine; Oncogene; Oral Oncology; Trends in Biological Science; Proceedings of the National Academy of Science, USA; Science

Membership and Activity in Professional Societies:

American Association for the Advancement of Science
American Society of Microbiology
American Association of Molecular Biology
International Association for Dental Research
American Association for Dental Research
Founding Member, International Academy of Oral Oncology
Washington DC Oral Cancer Workgroup

Extramural Activities:

NIH Extramural

1997 Ad-hoc member, Program Project Review Panel, DER, NCI
1999-2000 Member, Grant Review Panel, Division of Basic Science, NCI
2002 Ad-hoc Member, NIH Study Section, CDF-4
2002 Co-chair, FY2004 NIDCR Initiatives, Head and Neck Cancer, Molecular Anatomy of Head and Neck Cancer: A Genomic/Proteomic Approach
2003-2004 Member AIDS Malignancies Consortium, NIH
2003 Member, Biological Pathways and Networks Group, NIH Road Map Initiative
2004-2007 Member, NIH extramural Study Section, NDT
2005 Member, NIGMS, Special Emphasis Review Panel
2005 Member, Review Panel NRSA-NIH, Fellowships: Molecular and Cellular Mechanisms
2007 Ad-hoc Member, NIH extramural Study Section, Intercellular Interactions (ICI)

2008 Ad-hoc Member, NIH extramural Study Section, Tumor Microenvironment (TME)

Extramural

1995-2004 Reviewer, Wellcome Trust Foundation
1996-present Reviewer, The Israel Science Foundation
1997-present Reviewer, Italian Association for Scientific Research
1997-2002 Reviewer, German-Israeli Foundation for Scientific Research & Development
1997-2006 Reviewer, National Science Foundation
1997 Reviewer, Swiss National Science Foundation
1997-1999 Reviewer, Medical Research Council of Canada
1998-2001 Member, Cancer Genome Anatomy Program
1998-2004 Member, Reviewing Council, FONCYT, Argentina
1999-2002 Advisor, Howard Hughes Research Scholar Program
2002-2004 Member, External Advisory Board, The Johns Hopkins University, School of Medicine, Spore in Head and Neck Cancer
2002-present Member, External Advisory Panel, South Carolina COBRE for Oral Health in Vulnerable Populations, South Carolina
2002-2003 Member, Reviewing Panel, FAMRI. Flight Attendants Medical Research Institute, Young Clinical Scientist Awards Program
2003 Reviewer, Phillip Morris Research Grants
2003-2005 Member Reviewing Panel, The Israel Cancer Research Foundation
2005-present Adjunct Professor, University of Maryland, Dental School
2007 Reviewer, Phillip Morris Research Grants

Invited Presentations (since 2004)

2008- Clinical Ground Round, MD Anderson, Houston, TX
New York Academy of Science, New York, NY
2007- Frank Brook Memorial Lecture, American Pancreatic Association, Chicago, IL
First Meeting, "The Tumor Angiogenesis Interface", Kloster Seeon, Germany
Second Meeting "Signaling Complexes", Jena, Germany
NIH Research Festival, Angiogenesis Section, Bethesda, MD
Medical College of Georgia, Augusta, GA
Keynote Speaker, "Signal Transduction Meeting", Mexican Biochemical Society, Veracruz, Mexico
International Symposium on "G-protein Signaling", Tokyo, Japan
University of Kyoto, Japan
Cardiovascular Institute, Osaka, Japan
Center for Structural Molecular Biology, Brazilian Synchrotron Light Laboratory, Campinas, SP, Brazil

20th Chicago Signal Transduction Symposium, Chicago Illinois
 Gordon Research Conference on “Phosphorylation & G-Protein Mediated Signaling Networks”, Biddeford, Maine
 Medical University of South Carolina and Hollings Cancer Center, Charleston, SC
 Gordon Research Conference, “Molecular Pharmacology”, Ventura, CA
 2006- National Cancer Institute, Clinical Ground Rounds, NIH, Bethesda, MD
 Miguel Aleman Award Lecture, Miguel Aleman Foundation, Mexico DF, Mexico
 Center for Research and Advanced Studies (CINVESTA), Mexico DF, Mexico
 National Autonomous University of Mexico, Mexico DF, Mexico
 NEIHS, Durham, NC
 Carnegie Institute, Baltimore, MD
 IADR, Brisbane, Australia
 University of Sydney, Australia
 Centro de Biología Molecular Severo Ochoa, Madrid, Spain
 Annual symposium of the Membrane, Montreal Canada
 Gordon Research Conference, “Phosphorylation & G-Protein Mediated Signaling Networks”, Biddeford, ME
 Thammasat University, Bangkok, Thailand
 Naresuan University, Phitsanulok, Thailand
 University of North Carolina-Chapel Hill, NC
 2005- University of Buenos Aires, School of Exact Sciences, Buenos Aires, Argentina
 Keynote lecture, First Meeting of the Latin-American Chapter of the IADR, Mar del Plata, Argentina
 Keynote oration, International Congress on Oral Cancer, Crete, Greece
 Symposium on Clinical applications in Molecular Biology, International Congress on Oral Cancer, Crete, Greece
 Keynote lecture, Oral and Medicine Pathology, IADR and AADR meeting, Baltimore, MD
 MD Anderson Cancer Center, Austin, TX
 Institute of Materials Science, University of Connecticut, Storrs, CT
 Van Andel Research Institute, Grand Rapids, MI
 Symposium on MAP kinases and Cancer, CNIO, Madrid, Spain
 University of Michigan, Ann Arbor, MI
 2004- Keynote speaker, CSBMCB 47th Annual Meeting Cellular Signaling: From the Membrane to the Nucleus, Quebec, Canada
 Duke University, Signal Transduction Lecture Series, Durham, NC
 Keynote speaker, Korean Society of Medical Biochemistry and Molecular Biology, Seoul, Korea
 Catholic University of Korea, in Seoul, Korea
 Symposium on Signalling Pathways in Cellular Differentiation, Ulm, Germany
 Joint Scientific Meeting (JSM) held by the local Scientific Societies in Mar del Plata, Argentina
 FASEB Summer Research Conference on Regulation and Biological Function of Small GTPases, Snowmass, CO
 Lung and Aerodigestive Chemoprevention Retreat, NCI, NIH

ASBMB meeting, Symposium on Signal Transduction, Boston, MA
Keynote Speaker, 6th International Conference on Head and Neck Cancer,
Washington, DC
NCI-Sponsored Think Tank on Head and Neck Cancer Etiology and Biology:
Research Directions and Therapeutic Opportunities,
Washington, DC
MD Anderson Cancer Center, Houston, TX

Symposia Organized:

- 1995 Workshop on Signaling through G proteins, NIH
- 1996 Workshop on Signal Transduction from the Membrane to the Nucleus, NIH
- 1996 Third Annual Signal Transduction Therapy Conference, San Diego, California
- 1996 Symposium on Regulation of Protein Kinases Involved in Cell Division, Congress of the Pan American Association of Biochemistry and Molecular Biology, Pucon, Chile
- 1998 Workshop on G proteins, 10th International Conference on Second Messengers & Phosphoproteins, Jerusalem, Israel
- 1999 Workshop on “Head and Neck Cancer Priority Setting”, organizing committee, NIH
- 1999 Keystone Winter Symposia, “Oncogene Networks” and Session on “Cell Surface Receptors”
- 2002 Workshop on Exchange factors, Juan March Foundation, Madrid, Spain
- 2002 Symposium, Frontiers in Molecular Mechanisms in Cancer, Strategies and Application, Santander, Spain
- 2002 NCI, NIDCD, NIDCR, Trans-NIH Squamous Carcinogenesis Retreat
- 2002 International Oral Cancer Tissue Array Initiative, Organizing Meeting, NIDCR
- 2004 Tva-Animal Models Meeting, Bethesda, MD
- 2005 Advisory Organizing Committee, 10th International Congress on Oral Cancer (ICOOC), Crete, Greece
- 2006 “Oral Cancer”, Naresuan University, Phitsanulok, Thailand
- 2006 Organizing Committee, “Workshop on Biology and Treatment of Malignant Salivary Gland Cancers”, NIH, Bethesda, MD
- 2006 Elected, Co-chair, Gordon Research Conference, “Phosphorylation & G-Protein Mediated Signaling Networks”, 2008
- 2007 Advisory Committee, International Association of Oral Oncology, 1st World Congress, Amsterdam
- 2008 Co-chair, Gordon Research Conference, “Phosphorylation & G-Protein Mediated Signaling Networks”, Biddeford, Maine, upcoming
- 2008 Organizing Committee, International Conference on Frontiers of Dental and Craniofacial Research, Beijing, China, upcoming
- 2008 Program Committee, 7th International Conference on Head and Neck Cancer, San Francisco, CA, upcoming

Intramural Activities outside the NIDCR DIR

1996 Member, Search Committee for SBRS position, LCMB, NCI
1996 Chair, Search Committee for Tenure Track Scientist, NCI-Navy Clinical Oncology Branch
1996 Ad-hoc member, NIH Central Tenure Committee
1998-2000 Chair, Head and Neck Cancer Consortium, NIH
1998-2001 Member, NIH Central Tenure Committee
1999 Member, Search Committee, Director Division of Basic Sciences, NCI
2000 Member, Search Committee, Structural Biology, NIDDK
2000 Member, Grant Review Panel, Division of Basic Science, NCI
2001 Member, Search Committee, Structural Biology, NIDDK
2001 Member, Search Committee, Tenure Track Investigator, NIAID
2001-2004 Member, Steering Committee, NIH-NCI Upper Aerodigestive Track Cancer Intramural Faculty
2002-2003 Chair, Search Committee, Tenure Track Investigator, NIAMS
2002 Member, Search Committee, Structural Biology, NIDDK
2002 Co-Chair, Inter-Institute Head and Neck Cancer Consortium, NIH
2002 Member, Search Committee, Laboratory Chief, NCI
2002 Member, Search Committee, Deputy Director, DBS Frederick, NCI
2003 Member, Search Committee, Tenure Track Investigator, NHLBI
2003 Member, NIH Ethics Committee, review panel
2003-present Member, NIDCD, Title 42 Standing Committee
2004 Member, Search Committee, Tenure Track Investigator, NIA
2004 Ad-Hoc Member, NIAID, Tenure Review Panel
2004 Member, Search Committee, Tenure Track Investigator, NIA
2005 Ad-Hoc Member, NCI CCR Tenure Review Panel, NCI
2005 Ad-Hoc member, NIH Central Tenure Committee
2005 Member, Search Committee, Tenure Track Investigator, NIDDK
2005 Member, Search Committee, Laboratory Chief, DBS Frederick, NCI
2005 Member, Search Committee, Program Director, DBS Frederick, NCI
2006 Ad-Hoc Member, NCI CCR Tenure Review Panel, NCI, 2 reviews
2006 Ad-Hoc member, NIH Central Tenure Committee, 2 Tenure Track Reviews
2006 Member, Search Committee, Tenure Track Investigator, NIMH
2006 Member, Search Committee, Director, CCR, NCI
2006 Member, Search Committee, Tenure and Tenure Track investigator, NEI
2006 Co-chair, Group 1, Trans-NIH Intramural Research Initiatives
2007 Ad-Hoc Member, NIH Central Tenure Committee
2007 Ad-Hoc Member, NHGRI, Tenure Review Panel
2007 Member, Member, Search Committee, Scientific Director of the Center for Cancer Research, NCI
2007 Member, Search Committee, Tenure Track Investigator, Laboratory of Cellular and Molecular Biology, NCI
2007 Ad-Hoc member, NIH Central Tenure Committee, Tenure Track review

2008 Member, Search Committee, Tenure Track investigator, NHGRI
2008 Member, Search Committee, Tenure Track investigator, NICHD

Activities within NIDCR DIR

1995 Member, Search Committee for Chief, Gene Targeting Facility, NIDR
1995 Member, Search Committee for Tenure Track Scientist, Smell and Taste Unit, NIDR
1995-1997 Member, Gene Targeting Facility Oversight Committee, NIDR
1995-1996 Member, Sequencing Core Facility Oversight Committee, NIDR
1996 Member, Search Committee for Laboratory Chief, NAB, NIDR
1997 Member, Search Committee for Dental Officer, NIDR
1997-2006 Member, NIDCR Administrative Oversight Committee
1997-2006 Member, NIDCR Tenure and Promotion Committee
2002-2003 Member, Search Committee, Tenure Track Investigator, NIDCR
2005 Member, Search Committee, Tenure Track Investigator, NIDCR
2006 Member, two Search Committees, Tenure Track Investigator, NIDCR
2006-present Co-chair, Craniofacial Tissue Remodeling Initiative, NIDCR
2007 Member, Search Committee, Deputy Director, IRP, NIDCR
2007 Member, Search Committee, Associate Director for Management, NIDCR

Current Clinical Protocols

Pilot Project, the molecular anatomy of oral wound healing. NIDCR. PI: Gutkind J.S. Under review, NIDCR.

NIDCR, protocol 06-D-0144. PI: Jaime S. Brahim. Collaboration based on the development of primary cultures of oral epithelial cells.

Invention Reports and Patents:

- 5,384,243, issued January 24, 1995. J. Silvio Gutkind and Keith C. Robbins: Method for screening an agent for its ability to prevent cell transformation.
- Invention report “Use of monoclonal antibodies against Semaphorin 4D to inhibit tumor induced angiogenesis”. Filed, NIDCR, 2007.
- Invention report “PI3-kinase gamma inhibitor inhibits choroidal neovascularization formation”, with Xuri Li, NEI. Filed, NEI, 2007.
- Invention report “CXCR2 inhibitor (N-(2-Hydroxy-4-nitrophenyl)-N'-(2-bromophenyl)urea) inhibits choroidal neovascularization formation”, with Xuri Li, NEI. Filed, NEI, 2007.
- Invention report “Identification of DSG3 as a biomarker for the detection of occult metastasis in sentinel lymph nodes”. Filed, NIDCR, 2008.

Bibliography:

Peer Reviewed Research Articles

1. Gutkind J.S. and Enero M.A. Noradrenaline uptake inhibitors counteract the cardiovascular effects of clonidine but not those of guanabenz. *Commun. Biol.*, **1**:319-326, 1983.
2. Gutkind J.S. and Enero M.A. Treatment with clorgyline and pargyline differentially decreases clonidine-induced hypotension and bradycardia. *Naunyn Schmiedeberg's Arch. Pharmacol.*, **327**:189-192, 1984.
3. Gutkind J.S., Bogнар I., and Enero M.A. Pharmacological characterization of guanabenz, clonidine-like anti-hypertensive drug. *J. Cardiol. (Argentina)*, **53**:145-147, 1985.
4. Gutkind J.S., Kazanietz M.G., and Enero M.A. Cardiovascular effects of alpha-adrenergic drugs: differences between clonidine and guanabenz. *Naunyn Schmiedeberg's Arch. Pharmacol.*, **332**:370-375, 1986.
5. Gutkind J.S. and Enero M.A. Effects of desipramine on the cardiovascular responses to clonidine and guanabenz. *Hypertension*, **8**:184-186, 1986.
6. Kazanietz M.G., Gutkind J.S., and Enero M.A. Interaction between β_2 - and α_2 -adrenoceptor responses in the vascular system: effect of clenbuterol. *Eur. J. Pharmacol.*, **130**:119-124, 1987.
7. Castren E., Kurihara M., Gutkind J.S., and Saavedra J.M. Specific angiotensin II binding sites in the rat stellate and superior cervical ganglion. *Brain Research*, **422**:347-351, 1987.
8. Gutkind J.S. and Enero M.A. Different pharmacological interaction of clonidine and guanabenz with antidepressive drugs. *Clin. Exper. Hypertension*, **A9**:1531-1547, 1987.
9. Gutkind J.S., Kurihara M., Castren E., and Saavedra J.M. Atrial natriuretic peptide receptors in sympathetic ganglia: Biochemical response and alterations in genetically hypertensive rats. *Biochem. Biophys. Res. Commun.*, **149**:65-72, 1987.
10. Kurihara M., Castren E., Gutkind J.S., and Saavedra J.M. Lower number of atrial natriuretic peptide receptors in thymocytes and spleen cells of spontaneously hypertensive rats. *Biochem. Biophys. Res. Commun.*, **149**:1132-1140, 1987.
11. Saito K., Gutkind J.S., and Saavedra J.M. Angiotensin II binding sites in the conduction system of the rat heart. *Am. J. Physiol.*, **253**: (Heart Circ. Physiol. 22), H1618-H1622, 1987.
12. Gutkind J.S., Kurihara M., Castren E., and Saavedra J.M. Increased concentration of angiotensin II binding sites in selected brain areas of spontaneously hypertensive rats. *J. Hypertension*, **6**:79-84, 1988.
13. Kurihara M., Gutkind J.S., Saavedra J.M. Alteration of atrial natriuretic peptide binding sites in spontaneously hypertensive rats. *Am. J. Hypertension*, **1**:12S-14S, 1988.
14. Kurihara M., Castren E., Gutkind J.S., Saito K., and Saavedra J.M. Characterization of β -adrenergic receptors in sections from human blood lymphocyte pellets by quantitative auto-radiography. *Biological Psychiatry*, **23**:746-749, 1988.
15. Nazarali A.J., Gutkind J.S., and Saavedra J.M. Regulation of angiotensin II binding sites in discrete rat brain nuclei after water deprivation. *Cell. Molec. Neurobiol.*, **7**:447-455, 1988.

16. Gutkind J.S., Castren E., and Saavedra J.M. Decreased angiotensin II binding in the anterior pituitary gland of spontaneously hypertensive rats. *Life Science*, **43**:441-451, 1988.
17. Gutkind J.S., Kurihara M., Castren E., and Saavedra J.M. Autoradiographic quantification of vasoactive intestinal peptide binding sites in sections from human blood lymphocytes pellets. *Neuropsychopharmacol.*, **1**:251-255, 1988.
18. Gutkind J.S., Kurihara M., and Saavedra J.M. Increased angiotensin II receptors in brain nuclei of DOCA-salt hypertensive rats. *Am. J. Physiol.*, **255**: (Heart Circ. Physiol. 24), H646-H650, 1988.
19. Nazarali A.J., Gutkind J.S., Correa F.M.A., and Saavedra J.M. Effect of chronic administration of the converting enzyme inhibitor enalapril (MK 421) on brain atrial natriuretic peptide receptors in Wistar-Kyoto and spontaneously hypertensive rats. *Brain Research*, **475**:134-140, 1988.
20. Gutkind J.S., Kazanietz M.G., Armando I., Puyo A., and Enero M.A. Pressor response induced by clenbuterol treatment in immobilized normotensive rats. *J. Cardiovasc. Pharmacol.*, **13**:793-798, 1989.
21. Kazanietz M.G., Gutkind J.S., Puyo A., Armando I., and Enero, M.A. Further evidence for interaction between vasodilators beta-2-adrenoceptor and vasoconstriction-alpha-2-adrenoceptor mediated responses in maintaining vascular tone in anesthetized rats. *J. Cardiovasc. Pharmacol.*, **14**:874-880, 1989.
22. Nazarali A.J., Gutkind J.S., Correa F.M.A., and Saavedra J.M. Selective decrease of angiotensin II receptors in the subfornical organ of spontaneously hypertensive rats after chronic treatment with a converting enzyme inhibitor. *Am. J. Physiol.*, **256**:H1609-H1614, 1989.
23. Nazarali A.J., Gutkind J.S., and Saavedra J.M. Calibration of [¹²⁵I]-polymer standards with [¹²⁵I]-brain paste standards for use in quantitative receptor autoradiography. *J. Neurosci. Methods*, **30**:247-253, 1989.
24. Sugita K., Gutkind J.S., Katamine S., and Robbins K.C. The actin domain of Gardner-Rasheed feline sarcoma virus inhibits kinase and transforming activities. *J. Virology*, **63**:1715-1720, 1989.
25. Notario V., Gutkind J.S., Imaizumi M., Katamine S., and Robbins K.C. Expression of the *fgr* proto-oncogene product as a function of myelomonocytic cell maturation. *J. Cell Biol.*, **109**:3129-3136, 1989.
26. Gutkind J.S. and Robbins K.C.: Mobilization of the *c-fgr* protein-tyrosine kinase as a consequence of neutrophil activation. *Proc. Natl. Acad. Sci. USA*, **86**:8783-8787, 1989.
27. Gutkind J.S., Lacal P.M., and Robbins K.C. Thrombin-dependent association of phosphatidylinositol-3 kinase with p60^{c-src} and p59^{fyn} in human platelets, *Mol. Cell. Biol.*, **10**:3806-3809, 1990.
28. Benhamou M., Gutkind J.S., Robbins K.C., and Siraganian R.P. Tyrosine phosphorylation coupled to IgE receptor-mediated signal transduction and histamine release. *Proc. Natl. Acad. Sci. USA*, **87**:5327-5330, 1990.
29. Vukicevic S., Paralkar V.M., Cunningham N.S., Gutkind J.S., and Reddi A.H. Autoradiographic localization of osteogenin binding sites in cartilage and bone during rat embryonic development. *Dev. Biol.*, **140**:209-214, 1990.

30. Heidarman M.A., Pierce J.H., Lombardi D., Ruggiero M., Gutkind J.S., Matsui T., and Aaronson S.A. Deletion or substitution within the α PDGF receptor kinase insert domain: effects on functional coupling with intracellular signaling pathways. *Mol. Cell. Biol.*, **11**:134-142, 1991.
31. Yu, J.-C., Heidarman M.A., Pierce J.H., Gutkind J.S., Lombardi D., Ruggiero M., and Aaronson S.A. Tyrosine mutations within the α PDGF kinase insert domain abrogate receptor-associated PI-3 kinase activity without affecting mitogenic or chemotactic signal transduction. *Mol. Cell. Biol.*, **11**:3780-3785, 1991.
32. Gutkind J.S., Link D.C., Katamine S., Lacal P., Miki T., Ley T.J., and Robbins K.C. A novel *c-fgr* exon utilized in Epstein-Barr virus infected B-lymphocytes but not normal monocytes. *Mol. Cell. Biol.*, **11**:1505-1507, 1991.
33. Gusovsky F. and Gutkind J.S.: Selective effect of activation of protein kinase-C isoenzymes on cAMP accumulation. *Mol. Pharmacol.*, **39**:124-129, 1991.
34. Gutkind J.S., Novotny E., Brann M.R., and Robbins K.C. Muscarinic acetylcholine receptor subtypes as agonist dependent oncogenes. *Proc. Natl. Acad. Sci. USA*, **88**:4703-4707, 1991.
35. Hermouet S., Merendino J. Jr., Gutkind J.S., and Spiegel A.M. Activating and inactivating mutations of $G_{\alpha i2}$ have opposite effects on proliferation of NIH 3T3 cells. *Proc. Natl. Acad. Sci. USA*, **88**:10455-10459, 1991.
36. Sartor O., Moriuchi R., Sameshima J., Severino M., Gutkind J.S., and Robbins K.C. Diverse biologic properties imparted by the *c-fgr* proto-oncogene. *J. Biol. Chem.*, **267**:3460-3465, 1992.
37. Volker S., Benhamou M., Gutkind J.S., Robbins K.C., and Siraganian R.P. Fc ϵ RI-induced protein tyrosine phosphorylation of pp72 in rat basophilic leukemia cells (RBL-2H3): Evidence for a novel signal transduction pathway unrelated to G protein activation and phosphatidylinositol hydrolysis. *J. Biol. Chem.*, **267**:5434-5441, 1992.
38. Thompson P.A., Gutkind J.S., Robbins K.C., Ledbetter J.A., and Bolen J.B. Identification of distinct populations of PI-3 kinase following T cell activation. *Oncogene*, **7**:719-725, 1992.
39. Link D.C., Gutkind J.S., Robbins K.C., and Ley T.J. Characterization of the 5' untranslated region of the human *c-fgr* gene and identification of the major myelomonocytic *c-fgr* promoter. *Oncogene*, **7**:877-884, 1992.
40. Kalinec G., Nazarali A.J., Hermouet S., Xu N., and Gutkind J.S. Mutated α subunit of the G_q protein induces malignant transformation in NIH 3T3 cells. *Mol. Cell. Biol.*, **12**:4687-4693, 1992.
41. Gutkind J.S. and Robbins K.C. Activation of transforming G protein-coupled receptors induces rapid tyrosine phosphorylation of cellular proteins, including p125^{FAK} and the p130 *v-src* substrate. *Biochem. Biophys. Res. Commun.*, **188**:155-161, 1992.
42. Wang L.-M., Keegan A.D., Paul W.E., Heidarman M.A., Gutkind J.S., and Pierce J.H. IL-4 activates a distinct signal transduction cascade from IL-3 in factor dependent myeloid cells. *EMBO J.*, **11**:4899-1908, 1992.
43. Stephens E.V., Kalinec G., Brann M.R., and Gutkind J.S. Transforming G protein-coupled receptors transduce potent mitogenic signals in NIH 3T3 cells independent of cAMP-inhibition or conventional protein kinase C. *Oncogene*, **8**:19-26, 1993.

44. Wang L.-M., Keegan A.D., Li W., Lienhard G.E., Pacini S., Gutkind J.S., Myers M.G., Sun X.-J, White M.F., Aaronson S.A., Paul W.E., and Pierce J.H. Common elements in IL-4 and insulin signaling pathways in factor dependent hematopoietic cells. *Proc. Natl. Acad. Sci. USA* **90**:4032-4036, 1993.
45. Xu N., Bradley L., Ambdukari I., and Gutkind J.S. A mutant α subunit of G_{12} potentiates the eicosanoid pathway and is highly oncogenic in NIH 3T3 cells. *Proc. Natl. Acad. Sci. USA*, **90**:6741-6745, 1993.
46. Xu N., McCormick F., and Gutkind J.S. The non-catalytic domain of *ras*-GAP inhibits transformation induced by G protein coupled receptors. *Oncogene*, **9**:597-602, 1994.
47. Xu N., Voyno-Yasenetskaya T., and Gutkind J.S. Potent transforming activity of the $G_{13}\alpha$ subunit defines a novel family of oncogenes. *Biochem. Biophys. Res. Commun.*, **201**:603-609, 1994.
48. Calderon S.N., Izenwasser S., Heller B., Gutkind J.S., Mattson M., Su T.-P., and Newman A.H. Novel 1-phenylcycloalkancarboxylic acid derivatives are potent and selective σ_1 ligands. *J. Med. Chem.*, **37**:2285-2291, 1994.
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