CURRICULUM VITAE

NAME: Robert B. Innis, MD, PhD

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Phone: 1-301-594-1368
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BORN: June 6, 1952; Newburgh, New York

EDUCATION:
B.S., Yale College, 1974, Molec. Biophysics & Biochemistry (1970 - 1974)
M.D., Johns Hopkins School of Medicine, 1978 (1974 - 1978)
Ph.D., Pharmacology, Johns Hopkins School of Medicine, 1981 (1976 - 1980)
Nuclear Medicine, six-moth training for Authorized User (10 CFR 35) of radiopharmaceuticals in human subjects (1995)

CAREER:

1980-84	Resident in Psychiatry, Yale University (1980 - 1984)
1984-90	Assistant Professor, Dept. Psychiatry, Yale University
1988-01	Director of Psychiatric Research, West Haven VA Medical Center
1989-01	Director of Neurochemical Brain Imaging Program (Dept. Psychiatry)
1990-94	Associate Professor, Yale Dept. Psychiatry
1994-01	Appointment with tenure, Yale University
1995-96	Associate Professor (secondary), Yale Dept. Pharmacology
1996-01	Professor of Psychiatry (primary) and Pharmacology (secondary), Yale University
1999-01	Scientific Director, Yale/VA PET Center
2001-	Chief, Molecular Imaging Branch, NIMH
2008 -10	Acting Director, Mood and Anxiety Disorders Program, NIMH

LABORATORY WEB SITE: http://intramural.nimh.nih.gov/mib/

PROFESSIONAL HONORS:

1970	Valedictorian of Newburgh Free Academy, a public high school
1974	Phi Beta Kappa, summa cum laude graduate of Yale College
1975-80	Recipient of MD/PhD stipend from the Insurance Medical Scientist Scholarship Training Fund
1983	Winner of Lustman Research Award, Yale Department of Psychiatry
1983	Winner of the Mead Johnson Travel Award to attend American College of Neuropsychopharmacology (ACNP) Meeting in San Juan, Puerto Rico.
1985	Diplomat in psychiatry, certified by the American Board of Psychiatry and Neurology, November, 1985 (certificate #27409).
1986	Winner of Alfred P. Sloan Research Fellowship
1992	Keynote Lecture at Johns Hopkins Conference on PET and SPECT Imaging
1995	Keynote Lecture on Imaging the Dopamine Transporter, meeting organized by Niels Lassen, MD, PhD; Copenhagen, Denmark
1995	Organize Teaching Day on Neuroimaging at American College of Neuropsychopharmacology (ACNP) Meeting in San Juan, Puerto Rico
1996	Keynote Lecture at both Fukui Conference (Fukui, Japan) and Brain Function Imaging Conference (Nagoya, Japan)
1996-	Scientific Advisory Board, Brain & Behavior Research Foundation (formerly NARSAD)
1997-2007	Deputy Editor of *Biological Psychiatry*
1999	Finalist, Frank Berry Award for US government scientists
1999	Invited Plenary Lecture on neuroreceptor imaging to joint meeting of the Japanese Societies of Nuclear Medicine and Cerebral Blood Flow & Metabolism
2003-2006	Adjunct Professor in the Brain Sciences, Swinburne University, Victoria, Australia

2003 Janssen Distinguished Professor in Psychiatry for the University of Texas Health Science Center at San Antonio, Texas. September 8-10, 2003.

2003 Keynote Lecture, Center of Excellence Symposium on Future of Biomedical Imaging, Tohoku University, Sendai, Japan. November 4-6, 2003.

2005 NIH Director's Merit Award for establishing and directing the joint PhD program in neuroscience with the Karolinska Institutet

2005 Marie Curie Award for best paper at the European Association of Nuclear Medicine meeting in Istanbul, Turkey (October 2005). See publication #207.

2006 Keynote lecture at inauguration of Japan's Molecular Imaging Program (RIKEN & NIRS), March 13, 2006, Tokyo, Japan.

2007 FDA Visiting Professor Lecture Series, Jan. 11, 2007 on "PET Radioligand Development for CNS and Oncology"

2008 Co-director of proposal to evaluate PET imaging of the peripheral benzodiazepine receptor as a cellular marker of inflammation in Alzheimer's disease and atherosclerosis. Biomarkers Consortium of NIH, industry, and FDA.

2009 Award for Mentor of the Year, NIMH Intramural Research Program

2010 NIMH Director's award for "extraordinary commitment to successful scientific writing through effective, dedicated, and inspiring mentoring of NIMH Fellows"

2010 NIMH Director's award for "outstanding dedication, leadership, and mentorship to the Mood and Anxiety Disorders Program"

2016 Kuhl-Lassen Award from the Society of Nuclear Medicine and Molecular Imaging for a scientist who has made outstanding contributions and whose research in and service to the discipline of functional brain imaging is of the highest caliber

2016 Invited plenary lecture for Japanese Society of Nuclear Medicine

2018 Henry Wagner, Jr., MD, Best Abstract Award at annual meeting of the Society of Nuclear Medicine and Molecular Imaging (SNMMI) for the first successful PET imaging of cyclooxygenase-2 (COX-2) in an animal model of neuroinflammation

2018 Mentor for the Soumen Paul, PhD, who received the SNMMI Young Professionals Committee first place award for his project on PET imaging in transgenic mice, monkeys, and humans of *O*-GlcNAcase, an enzyme involved in the clearance of hyperphosphorylated tau protein from the brain.

2018 National Center for Advancing Translational Sciences (NCATS) Director's Award for extraordinary leadership in the discovery and development of first-in-class peripheral CB_1 receptor antagonist for therapeutic use in metabolic syndrome.

2019 NIMH award for outstanding efforts to re-establish and enhance the NIMH PET facility while setting or exceeding current regulatory standards

PATENTS

1994 Co-inventor "Iodinated neuroprobe for mapping monoamine reuptake sites." Patents #5,310,912 and 5,439,666

2003 Co-inventor "Neuroprobes for mapping monoamine reuptake sites." Patent #6,537,522

2007 Co-inventor "Radioligands to image amyloid," submitted.

2008 Co-inventor "Radioligands to image the function of Permeability-glycoprotein (P-gp)." Patent #7,989,630 (8/2/2011).

2014 Co-inventor "Beta-amyloid PET imaging agents." Patent #8,703,096

INSTITUTIONAL ACTIVITIES:

Yale University

-Chairman, Visiting Lectureship Committee, Department of Psychiatry (1987 - 2001)
-PGY-II Curriculum Evaluation Committee (1988-90)
-Yale Animal Care and Use Committee (1990 - 1993)
-Yale-New Haven Hospital Radiation Safety Committee (1991 - 2001)
-Yale Radioactive Drug Research Committee (1991 - 2001)
-VA Animal Care Committee (1990 - 2001)
-VA Radioactive Drug Research Committee (consultant 1991 - 2001)

National Institutes of Health

-Co-Director, NIH / Karolinska Institute Joint PhD Program in Neuroscience (2001 -)
-NIMH Scientific Director's Steering Committee (2002 - 2004; 2008 -)
-NIMH IRP Tenure & Promotion Committee (member 2002-2004 and Chair 2004 - 2010)
-NIH Mouse Imaging Facility Steering Committee (2001 -)
-NIH Roadmap Intramural Probe Development Core (2003 -)
-NIMH Technology Advisory Committee (2004 -)
-NIH Radiation Safety Committee (2004 –)

OTHER PROFESSIONAL ACTIVITIES:

-Society for Neuroscience since 1976
-Society of Nuclear Medicine since 1990
-American College of Neuropsychopharmacology, member since 1992
-Society of Biological Psychiatry since 1997
-Society of Nuclear Imaging in Drug Development (SNIDD) 1998 - 2006
-Brain & Behavior Research Foundation (formerly NARSAD), Scientific Advisory Board since 1996

EDITORIAL BOARDS

Synapse; 1992 - 2011
European Journal Nuclear Medicine; 1993 - 2004
Journal of Nuclear Medicine; 1995 - 2003
Psychiatry Research: Neuroimaging, 1996 - 2007
Biological Psychiatry (Deputy Editor) 1997 – 2007; Editorial Board 2008 -

GRANT REVIEW COMMITTEES

NIMH "Clinical Neuroscience and Biological Psychopathology" Member 1995 - 1996.
Ad hoc member of several NIH and VA committees

ORIGINAL ARTICLES:

1. **R.B. Innis**, D.B. Bylund and S.H. Snyder. A simple, sensitive, and specific radioreceptor assay for ß-adrenergic antagonist drugs. *Life Sci.*, 23: 2031-2038, 1978.
2. **R.B. Innis** and H. Moses. Thallium poisoning. *Johns Hopkins Medical Journal*, 142: 27-31, 1978.
3. **R.B. Innis,** F.M.A. Correa, G.R. Uhl, B. Schneider, and S.H. Snyder. Cholecystokinin octapeptide-like immunoreactivity: histochemical localization in rat brain. *Proc. Natl. Acad. Sci*. USA, 76: 521-525, 1979.
4. F.M.A. Correa, **R.B. Innis,** G.R. Uhl, and S.H. Snyder. Bradykinin-like immunoreactive neuronal systems localized histochemically in rat brain. *Proc. Natl. Acad*. *Sci. USA*, 76: 1489-1493, 1979.
5. K.A. Freedberg, **R.B. Innis,** I. Creese, and S.H. Snyder. Antischizophrenic drugs: differential plasma protein binding and therapeutic activity. *Life Sci.*, 24: 2467-2474, 1979.
6. **R.B. Innis,** F.M.A. Correa, and S.H. Snyder. Carazolol, an extremely potent ß-adrenergic blocker. *Life Sci.*, 24: 2255-2264, 1979.
7. **R.B. Innis,** L. Tune, R. Rock, R. DePaulo, D.C. U'Prichard, and S.H. Snyder. Tricyclic antidepressant radioreceptor assay. *Eur. J. Pharmacol.*, 58: 473-477, 1979.
8. F.M.A. Correa, **R.B. Innis,** B. Rouot, G.W. Pasternak, and S.H. Snyder. Fluorescent probes of alpha- and ß-adrenergic and opiate receptors: biochemical and histochemical evaluation. *Neurosci. Lett.*, 16: 47-53, 1980.
9. S.H. Snyder, R.F. Bruns, J.W. Daly, and **R.B. Innis.** Multiple neurotransmitter receptors in brain: amines, adenosine and cholecystokinin. *Fed. Proceed*., 40: 142-146, 1981.
10. **R.B. Innis,** and S.H. Snyder. Cholecystokinin receptor binding in brain and pancreas: regulation by cyclic and acyclic guanine nucleotides. *Eur. J. Pharmacol*., 65: 123-124, 1980.
11. **R.B. Innis,** and S.H. Snyder. Distinct cholecystokinin in receptors in brain and pancreas. *Proc. Natl. Acad. Sci. USA*, 77: 6917-6921, 1980.
12. F.M.A. Correa, **R.B. Innis,** L.D. Hester, and S.H. Snyder. Diffuse enkephalinergic innervation from caudate to globus pallidus. *Neurosci. Lett*., 25: 63-68, 1981.
13. **R.B. Innis,** D.C. Manning, J.M. Stewart, and S.H. Snyder. ^{3}H-Bradykinin receptor binding in mammalian tissue membranes. *Proc. Natl. Acad. Sci. USA*, 78: 236-2634, 1981.
14. M.A. Zarbin, J.K. Wamsley, **R.B.Innis,** and M.J. Kuhar. Cholecystokinin receptors: presence and axonal flow in the rat vagus nerve. *Life Sci*., 29: 697-705, 1981.
15. M.A. Zarbin, **R.B. Innis,** J.K. Wamsley, S.H. Snyder, and M.J. Kuhar. Autoradiographic localization of CCK receptors in guinea pig brain. *Eur. J. Pharmacol*., 71: 349-350, 1981.
16. M.A. Zarbin, **R.B. Innis,** J.K. Wamsley, S.H. Snyder, and M.J. Kuhar. Autoradiographic localization of cholecystokinin receptors in rodent brain. *J. Neurosci.*, 3: 877-906, 1983.
17. **R.B. Innis,** R. Andrade, and G.K. Aghajanian. Substance K excites dopaminergic and non-dopaminergic neurons in rat substantia nigra. *Brain Res*., 335: 381-383, 1985.
18. **R.B. Innis,** and G.K. Aghajanian. CCK-containing and nociceptive neurons in rat Edinger-Westphal nucleus. *Brain Res*., 363: 230-238, 1986.
19. **R.B. Innis,** B.S. Bunney, D.S. Charney, L. Price, W. Glazer, W.G. Sternberg, L. Rubin, and G.R. Heninger. Does the cholecystokinin antagonist proglumide possess antipsychotic activity? *Psychiatry Res.*, 18: 1-7, 1986.
20. **R.B. Innis,** and G.K. Aghajanian. Pertussis toxin blocks autoreceptor-mediated inhibition of dopaminergic neurons in rat substantia nigra. *Brain Res*., 411: 139-143, 1987.

21. **R.B. Innis,** D.S. Charney, G.R. Heninger. Differential ^{3}H-imipramine platelet binding in patients with panic disorder and depression. *Psychiatry Res.*, 21: 33-41, 1987.

22. M.F. Kritzer, **R.B. Innis,** and P.S. Goldman-Rakic. Regional distribution of cholecystokinin receptors in primate cerebral cortex determined by in vitro receptor autoradiography. *J. Comp. Neurol*., 263: 418-435, 1987.

23. **R.B. Innis,** and G.K. Aghajanian. Pertussis toxin blocks $5HT_{1A}$ and $GABA_B$ receptor-mediated inhibition of serotonergic neurons. *Eur. J. Pharmacol*., 143: 195-204, 1987.

24. **R.B. Innis,** E.J. Nestler, and G.K. Aghajanian. Evidence for G-protein mediation of serotonin- and $GABA_B$-induced hyperpolarization of rat dorsal raphe neurons. *Brain Res.,* 459: 27-36, 1988.

25. M.F. Kritzer, **R.B. Innis,** and P.S. Goldman-Rakic. Regional distribution of cholecystokinin receptors in macaque medial temporal lobe determined by in vitro receptor autoradiography. *J. Comp. Neurol.*, 276: 219-230, 1988.

26. D.S. Charney, **R.B. Innis,** R.S. Duman, S.W. Woods, and G.R. Heninger. Platelet alpha-2 receptor binding and adenylate cyclase activity in panic disorder. *Psychopharmacology,* 98: 102-107, 1989.

27. M.S. Lidow, P.S. Goldman-Rakic, P. Rakic, and **R.B. Innis.** Dopamine D2 receptors in cerebral cortex and striatum of rat and monkey: distribution and pharmacological characterization with [^{3}H]raclopride. *Proc. Natl. Acad. Sci. USA*, 86: 6412-6416, 1989.

28. A.Y. Deutch, B. Moghaddam, **R.B. Innis,** J.H. Krystal, G.K. Aghajanian, B.S. Bunney, and D.S. Charney. Mechanisms of action of atypical antipsychotic drugs: implications for novel therapeutic strategies for schizophrenia. *Schizophrenia Res.*, 4: 121-156, 1991.

29. M.F. Kritzer, **R.B. Innis,** and P.S. Goldman-Rakic. Regional distribution of cholecystokinin binding in macaque basal ganglia determined by in vitro receptor autoradiography. *Neuroscience*, 38: 81-92, 1990.

30. E.W. Johnson, S.W. Woods, S. Zoghbi, R. Baldwin, and **R.B. Innis.** Characterization of the benzodiazepine radioligand ^{125}I-Ro16-0154: potential probe for SPECT brain imaging. *Life Sci.*, 47: 1535-1546, 1990.

31. **R. Innis,** S. Zoghbi, E. Johnson, S. Woods, M. Al-Tikriti, R. Baldwin, J. Seibyl, R. Malison, G. Zubal, D. Charney, G. Heninger, P. Hoffer. SPECT imaging of the benzodiazepine receptor in non-human primate brain with [^{123}I]Ro 16-0154. *Eur. J. Pharmacol*., 193: 249-252, 1991.

32. **R.B. Innis,** M.S. Al-Tikriti, S.S. Zoghbi, R.M. Baldwin, E.H. Sybirska, M.A. Laruelle, R.T. Malison, J.P. Seibyl, R.C. Zimmermann, E.W. Johnson, E.O.Smith, D.S. Charney, G.R. Heninger, S.W. Woods, and P.B. Hoffer. SPECT Imaging of the benzodiazepine receptor: feasibility of in vivo potency measurements from stepwise displacements curves. *J. Nucl. Med*., 32: 1754-1761, 1991.

33. E.W. Johnson, E. Sybirska, M. Al-Tikriti, and **R.B. Innis.** Calibration of [^{123}I] labeled tissue standards for autoradiographic studies. *Applied Radiation and Isotopes*, 42: 1199-1201, 1991.

34. J.L. Neumeyer, S. Wang, R.A. Milius, R.M. Baldwin, Y. Zea-Ponce, P.B. Hoffer, E. Sybirska, M. Al-Tikriti, D.S. Charney, R.T. Malison, M.A. Laruelle, and **R.B. Innis.** [^{123}I]-2-ß-Carbomethoxy-3-ß-(4-iodophenyl)-tropane (ß-CIT): High Affinity SPECT Radiotracer of Monoamine Reuptake Sites in Brain. *J. Med. Chem*., 34: 3144-3146, 1991.

35. R.M. Kessler, M.S. Ansari, D.E. Schmidt, T. de Paulis, J.A. Clanton, **R. Innis,** M. Al-Tikriti, R.G. Manning, D. Gillespie. High affinity dopamine D2 receptor radioligands. 2. [^{125}I]epidepride, a potent and specific radioligand for the characterization of striatal and extrastriatal dopamine D2 receptors. *Life Sci.*, 49: 617-628, 1991.

36. M. Al-Tikriti, R. Kessler, R. Roth, and **R. Innis.** Autoradiographic localization of dopamine D1 and D2 receptors in rat cerebral cortex following unilateral neurotoxic lesions. *Brain Res*., 575: 39-46, 1992.

37. E.W. Johnson, N.C. de Lanerolle, J.H. Kim, Sundaresan, D.D. Spencer, R. Mattson, S., Zoghbi, R. Baldwin, P. Hoffer, J. Seibyl, and **R.B. Innis.** "Central" and "peripheral" benzodiazepine receptors: opposite changes in human epileptogenic tissue. *Neurology*, 42: 811-815, 1992.

38. **R.B. Innis,** R.T. Malison, M. Al-Tikriti, E.H. Sybirska, S. Zoghbi, R.M. Baldwin, P.B. Hoffer, R.H. Roth. Amphetamine-mediated dopamine release competes for [^{123}I]IBZM binding to dopamine D2 receptors in non-human primate brain. *Synapse*, 10: 177-184, 1992.

39. S.W. Woods, J.P. Seibyl, A.W. Goddard, H.M. Dey, S.S. Zoghbi, M. Germine, R.M. Baldwin, E.O. Smith, D.S. Charney, G.R. Heninger, P.B. Hoffer, and **R.B. Innis.** Dynamic SPECT imaging of the benzodiazepine receptor in healthy human subjects with [^{123}I]Ro 16-0154. *Psychiatry Res. Neuroimaging*, 47: 67-77, 1992.

40. E. Sybirska, M. Al-Tikriti, S.S. Zoghbi, R.M. Baldwin, E.W. Johnson, and **R.B. Innis.** SPECT imaging of the benzodiazepine receptor: autoradiographic comparison of receptor density and radioligand distribution. *Synapse*., 12: 119-128, 1992.

41. **R. Innis,** R. Baldwin, E. Sybirska, Y. Zea, M. Laruelle, M. Al-Tikriti, D. Charney, S. Zoghbi, E. Smith, G. Wisniewski, P. Hoffer, S. Wang, R. Milius, and J. Neumeyer. SPECT imaging of monoamine reuptake sites in primate brain with [^{123}I]CIT. *Eur. J. Pharmacol*., 200: 369-370, 1991.

42. S. Zoghbi, R.M. Baldwin, J.P. Seibyl, M. Al-Tikriti, Y. Zea-Ponce, M. Laruelle, E. Sybirska, S.W. Woods, A. Goddard, R.T. Malison, R. Zimmermann, D. Charney, E.O. Smith, P.B. Hoffer, and **R.B. Innis.** Pharmacokinetics of the SPECT benzodiazepine receptor radioligand [^{123}I]iomazenil in human and non-human primates. *Nucl. Med. Biol.,* 19: 881-888, 1992.

43. J.P. Seibyl, S.W. Woods, A.W. Goddard, H.M. Dey, S.S. Zoghbi, R.M. Baldwin, I.G. Zubal, M. Germine, E.O. Smith, G.R. Heninger, D.S. Charney, H.F. Kung, A. Alavi, P.B. Hoffer, and **R.B. Innis.** Dynamic SPECT and whole body imaging of dopamine D2 receptors in human subjects with [^{123}I]IBZM. *J. Nucl. Med*., 33: 1964-1971, 1992.

44. M. Laruelle, R.M. Baldwin, R.T. Malison, Y. Zea-Ponce, S.S. Zoghbi, M.S. Al-Tikriti, E.H. Sybirska, R.C. Zimmermann, G. Wisniewski, J.L. Neumeyer, R.A. Milius, S. Wang, E.O. Smith, D.S. Charney, R.H. Roth, P.B. Hoffer,and **R.B. Innis.** SPECT imaging of dopamine and serotonin transporters with [^{123}I]CIT: Pharmacological characterization of brain uptake in nonhuman primates. *Synapse*, 13: 295-309, 1993.

45. R.M. Baldwin, Y. Zea-Ponce, S.S. Zoghbi, M. Laruelle, M.S. Al-Tikriti, E.H. Sybirska, R.T. Malison, J.L. Neumeyer, R.A. Milius, S. Wang, M.Stabin, E.O. Smith, D.S. Charney, P.B. Hoffer, and **R.B. Innis.** Evaluation of the monoamine uptake site ligand [^{123}I] methyl 3ß-(4-iodophenyl)tropane-2ß-carboxylate ([^{123}I]ß-CIT) in nonhuman primates: pharmacokinetics, biodistribution, and SPECT brain imaging coregistered with MRI. *Nucl. Med. Biol.- Int. J. Rad. App. B*. 20: 597-606, 1993.

46. M. Laruelle, A. Abi-Dargham, M.S. Al-Tikriti, Y. Zea-Ponce, S.S. Zoghbi, D.S. Charney, J. Price, J.J. Frost, P.B. Hoffer, R.M. Baldwin, **R.B. Innis.** SPECT measurement of benzodiazepine receptor number and affinity in primate brain: a constant infusion paradigm with [^{123}I]iomazenil. *Eur. J. Pharmacol*., 230: 119-123, 1993.

47. S.C. Wall, **R.B. Innis,** G. Rudnick. Binding of the cocaine analog [^{125}I]-2ß-carbomethoxy-3ß-(4-iodophenyl) tropane (ß-CIT) to serotonin and dopamine transporters: different ionic requirements for substrate and ß-CIT binding. *Mol. Pharmacol*. 43: 264-270, 1993.

48. R.T. Malison, E.G. Miller, R. Greene, P.B. Hoffer, G. McCarthy, and **R.B. Innis.** Computer-assisted coregistration of multislice SPECT and MR images by fixed external fiducials. *J. Comput. Assist. Tomogr.*, 17: 952-960, 1993.

49. E.H. Sybirska, J.P. Seibyl, D. Bremner, R.M. Baldwin, M.S. Al-Tikriti, Y. Zea-Ponce, S. Zoghbi, R.T. Malison, C. Bradberry, M. During, A.W. Goddard, S.W. Woods, P.B. Hoffer, D.S. Charney, and **R.B. Innis.** [^{123}I]Iomazenil SPECT imaging demonstrates significant benzodiazepine receptor reserve in human and nonhuman primate brain. *Neuropharmacol*., 32: 671-680, 1993.

50. Y. Zea-Ponce, R.M. Baldwin, S.S. Zoghbi, and **R.B. Innis.** Formation of [^{123}I]1-iodobutane in labeling [^{123}I]iomazenil by iododestannylation: implications for the reaction mechanism. *Appl. Radiat. Isot.* 45: 63-68, 1993.

51. S. Wang, Y. Gao, M.A. Laruelle, R.M. Baldwin, B.E. Scanley, **R.B. Innis,** and J.L. Neumeyer. Enantioselectivity of cocaine recognition sites: binding of (1S)- and (1R)-2ß-carbomethoxy-3ß-(4-iodophenyl) tropane (ß-CIT) to monoamine transporters. *J. Med. Chem*., 36: 1914-1917, 1993.

52. J.D. Bremner, T.M. Scott, R.C. Delaney, S.M. Southwick, J.W. Mason, D.R. Johnson, **R.B. Innis,** G. McCarthy, D.S. Charney. Deficits in short-term memory in posttraumatic stress disorder. *Am. J. Psychiatry*, 150: 1015-1019, 1993.

53. P.J. Kontur, M. Al-Tikriti, **R.B. Innis,** and R.H. Roth. Postmortem stability of monoamines and receptor binding in rat brain. *J. Neurochem*., 62: 282-290, 1994.

54. M. Laruelle, S.S. Giddings, Y. Zea-Ponce, S.S. Zoghbi, D.S. Charney, J.L. Neumeyer, R.M. Baldwin, and **R.B. Innis.** *In vitro* binding of [^{125}I]ß-CIT to dopamine and serotonin transporters under "physiological" conditions. *J. Neurochem*., 62: 978-986, 1994.

55. **R.B. Innis,** J.P. Seibyl, E. Scanley, M. Laruelle, A. Abi-Dargham, E. Wallace, R.M. Baldwin, Y. Zea-Ponce, S. Zoghbi, S. Wang, Y. Gao, J.L. Neumeyer, D.S. Charney, P.B. Hoffer, and K. Marek. Single photon emission computed tomographic imaging demonstrates loss of striatal dopamine transporters in Parkinson disease. *Proc. Natl. Acad. Sci. USA*, 90: 11,965-11,969, 1993.

56. R.M. Baldwin, Y. Zea-Ponce, S.S. Zoghbi, M.S. Al-Tikriti, J.P. Seibyl, E.H. Sybirska, R.T. Malison, M. Laruelle, D.S. Charney, P.B. Hoffer, and **R.B. Innis.** Pharmacokinetics of three radioiodinated high affinity dopamine D2 receptor ligands ([^{123}I]IBF, Epidepride, and 2'-ISP) in nonhuman primates. *Nucl. Med. Biol*., 21(7): 969-976, 1994.

57. M. Laruelle, R.M. Baldwin, Z. Rattner, M. Al-Tikriti, Y. Zea-Ponce, S.S. Zoghbi, D.S. Charney, J.C. Price, J.J. Frost, P.B. Hoffer, and **R.B. Innis.** SPECT quantification of [^{123}I]iomazenil binding to benzodiazepine receptors in nonhuman primates. I. Kinetic analysis of single bolus experiments. *J. Cereb. Blood Flow Metab*., 14: 439-452, 1994.

58. M. Laruelle, A. Abi-Dargham, M. Al-Tikriti, R.M. Baldwin, Y. Zea-Ponce, S.S. Zoghbi, D.S. Charney, P.B. Hoffer, and **R.B. Innis.** SPECT quantification of [^{123}I]iomazenil binding to benzodiazepine receptors in nonhuman primates. II. Equilibrium analysis of constant infusion experiments and correlation with *in vitro* parameters. *J. Cereb. Blood Flow Metab*., 14: 453-465, 1994.

59. J.P. Seibyl, E. Wallace, E.O. Smith, R.M. Baldwin, S.S. Zoghbi, Y. Zea-Ponce, Y. Gao, W.Y. Zhang, J.L. Neumeyer, I.G. Zubal, M. Stabin, D.S. Charney, P.B. Hoffer, and **R.B. Innis.** Whole body biodistribution, radiation absorbed dose, and brain SPECT imaging with [^{123}I]ß-CIT in healthy human subjects. *J. Nucl. Med.*, 35: 764-770, 1994.

60. H.M. Dey, J.P. Seibyl, J.B. Stubbs, S.S. Zoghbi, R.M. Baldwin, E.O. Smith, I.G. Zubal, C. Olson, D.S. Charney, P.B. Hoffer,and **R.B. Innis.** Human biodistribution and dosimetry of the SPECT benzodiazepine receptor radioligand [^{123}I]iomazenil. *J. Nucl. Med*., 35: 399-404, 1994.

61. B.E. Scanley, R.M. Baldwin, M.S. Al-Tikriti, M. Laruelle, Y. Zea-Ponce, S. Zoghbi, S.S. Giddings, D.S. Charney, P.B. Hoffer, S. Wang, J.L. Gao, J.L. Neumeyer, and **R.B. Innis.** Active and inactive enantiomers of ß-CIT: comparison using homogenate binding and SPECT imaging. *Mol. Pharmacol*., 45: 136-141, 1994.

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GRANTS & CONTRACTS: Active at time of departure from Yale University (2001)

"Serotonin 5-HT2A Receptors in Depression." NIMH R01 MH58620. PI: R. Innis. Annual direct costs: $216,000. Total period (direct & indirect): $818,343; Expected funded period: 1/1/00 – 12/31/02.

"Neuroimaging of Dopamine Transporters in Parkinson's Disease." VA Merit Review. PI: R. Innis. Annual direct costs: $129,900. Total period (direct & indirect): $447,700; 10/1/99- 8/31/02.

"VA Schizophrenia Research Center," PI: R. Innis. Annual direct costs: $400,000. Total period (direct & indirect): $1,700,000; 1/1/00-12/31/04.

"Neuroimaging Sciences Training Program." NINDS T32 NS07416. PI: R. Innis. This institutional training grant will support 4 postdoctoral fellows per year for up to 2-3 years in areas of methodology and research imaging using nuclear magnetic resonance and radiotracer techniques. First year direct costs approximately $156,000. Total period (direct & indirect): $890,630; 7/1/97-6/30/02.

"SPECT Benzodiazepine Receptor and MR Imaging in PTSD." VA Research Service. PI: R. Innis. Annual direct costs: $100,000. Total period (direct & indirect): $300,000; 4/1/99- 3/31/02.

"Neuronal Mechanisms and Treatment Response in Depression." VA Research Enhancement Award Program (REAP). PI: R. Innis. Annual direct costs: $300,000. Total period (direct & indirect): $1,600,000; 1/1/99-12/31/04.

"Mental Health Clinical Research Center." NIMH P30-MH30929. PI: G. Heninger. Dr. Innis directs the Laboratory of Neuroimaging on this competitive renewal. Annual direct costs for Laboratory: $100,000. Total period (direct & indirect): $490,500; 9/1/98-8/31/01.

"Transdisciplinary Tobacco Use Research Center." NIDA & NCI P50 DA84733. PI: S. O'Malley. Dr. Innis directs a project entitled "Imaging of Serotonergic and Cholinergic Markers in Smokers." Project annual direct: $220,000. Project total period (direct & indirect): $1,520,000; 10/1/99-9/30/04.

"Clinical Neuroscience Division for the National Center for Post-Traumatic Stress Disorder." VA. PI: J. Krystal. Annual direct costs approx. $1.2M; total period (direct & indirect) ~$9M. Dr. Innis is Director of the Laboratory of Brain Imaging, annual direct costs, approx. $140,000; 5/1/89-without term;

"Epilepsy Research Center Program Project." NINDS P50 NS06208. PI: R. Mattson. Director of Imaging Project: R. Innis. Annual direct costs for imaging: $15,000. Total period (direct & indirect): $122,625; 9/1/97-8/31/02.

"VA Alcohol Research Center." Co-PI's: B. Rounsaville and J. Krystal. As Investigator, Dr. Innis directs the brain imaging studies, with an annual budget of $20,000. Total period (direct & indirect) $100,000; 2/1/99-1/31/04.

"Mental Illness: Research, Education, and Clinical Center" (MIRECC). VA. PI: B. Rounsaville. Dr. Innis directs a SPECT imaging project of dopaminergic transmission in dual diagnosis (cocaine addiction and schizophrenia). Project annual direct costs: $95,000. Total period (direct & indirect): $475,000; 9/1/97 - 8/31/02.

"Striatal and Extrastriatal Dopaminergic Neurotransmission in Schizophrenia." NIMH P50 MH44866. This project is directed by Dr. Innis and is part of the CNMD (Center for Neuroscience of Mental Disorders; PI: P.Goldman-Rakic). Project annual direct costs: $100,000. Project total period (direct & indirect): $817,500; 9/1/98 - 8/31/03.

"Center for the Study of Borderline Personality Disorder." PI: T. McGlashan. Source: Swiss Foundation. Dr. Innis directs the PET neuroimaging Core. Annual direct costs for Core: ~$100,000. 1/1/00 – 1/1/05.

"Iodinated Imaging Agents for the Serotonin Transporter." Phase I SBIR (Small Business Innovative Research) application from RadioTracer, Inc. to NIMH. PI: R. Baldwin. Dr. Innis will direct the subcontract to Yale. Subcontract (6 mos.) direct costs: $10,716. Total period (direct & indirect): $15,548; 9/1/99 – 3/31/00.

"Technetium Radiotracers for the Dopamine Transporter." Phase II SBIR (Small Business Innovative Research) application from Department of Energy to RadioTracer, Inc. PI: R. Baldwin. Dr. Innis is President of RadioTracer, Inc. and will also direct the subcontract to Yale. Subcontract annual direct costs: $13,280. Total period (direct and indirect): $38,514; 10/1/99-9/30/01.