

Albert Einstein College of Medicine of Yeshiva University

**Curriculum Vitae**

Date: April 28, 2015

**Name:** Noboru Hiroi, Ph.D.

Office Address: Albert Einstein College of Medicine

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Bronx, NY 10461  
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E-mail: noboru.hiroi@einstein.yu.edu

Citizenship: Japanese citizen and US permanent resident (Green Card holder)

**Education:** 1981-1985 B.A. Waseda University, Tokyo, Japan (Psychology)  
1985-1991 Ph.D. McGill University, Montreal, Canada  
(Psychology, Behavioral Neuroscience Program)

**Postgraduate Training and Fellowship Appointments:**

1991-1994 Post-doctoral Fellow (Laboratory of Ann M. Graybiel, Ph.D.)  
Department of Brain and Cognitive Sciences,  
Massachusetts Institute of Technology, Cambridge, MA  
1994 summer Post-doctoral Fellow (Laboratory of Norman M. White, Ph.D.),  
Department of Psychology, McGill University, Montreal, Canada  
1994-1995 Post-doctoral Associate (Laboratory of Eric J. Nestler, M.D., Ph.D.),  
Department of Psychiatry, Yale University School of Medicine, New Haven,  
CT

**Professional Employment:**

1995-1998: Associate Research Scientist, Division of Molecular Psychiatry, Department  
of Psychiatry, Yale University School of Medicine, New Haven, CT  
1998-2005 Assistant Professor of Psychiatry, Assistant Professor of Neuroscience,  
Director of Laboratory of Molecular Psychobiology, Department of  
Psychiatry and Behavioral Sciences and Department of Neuroscience, Albert  
Einstein College of Medicine, Bronx, NY  
2005-2011 Associate Professor of Psychiatry, Associate Professor of Neuroscience,  
Director of Laboratory of Molecular Psychobiology, Department of  
Psychiatry and Behavioral Sciences and Department of Neuroscience, Albert  
Einstein College of Medicine, Bronx, NY  
2006-2009 Visiting Scientist, RIKEN-Brain Science Institute (BSI), Wako, Saitama,  
Japan.

- 2011-present Associate Professor. Department of Genetics, Albert Einstein College of Medicine, Bronx, NY
- 2011-present Professor of Psychiatry, Professor of Neuroscience, Director of Laboratory of Molecular Psychobiology, Department of Psychiatry and Behavioral Sciences and Department of Neuroscience, Albert Einstein College of Medicine, Bronx, NY

**Board Certification:** N/A

**Professional Society Membership:**

- International:  
Society for Neuroscience (Member, 1988-present)  
International Brain Research Organization (Member, 1988-present)  
Society of Biological Psychiatry (Member, 2004-present)  
American College of Neuropsychopharmacology(ACNP) (2013-present).  
Psychiatric Research Society (Member, 2014-present)  
22Q Society (Founding Member, 2014-present)

**Awards and Honors:**

- 1981-1985 Okuma Shigenobu Memorial Scholarship, Waseda University, Japan
- 1985-1986 Sankei Scholar
- 1986-1991 Government of Canada Award
- 1986-1988 Bindra Pre-doctoral Fellowship
- 1991 Dean's Honor List, McGill University
- 1992-1994 Human Frontier Science Program Fellow
- 1998 NARSAD Young Investigator Award
- 2001 The best poster prize, the 1<sup>st</sup> International Cajal Club Meeting, Madrid, Spain
- 2006 Invited participant of Roche-Nature Medicine Translational Neuroscience Symposium 9/18-19/2006, Palo Alto, CA
- 2006-2008 NARSAD Independent Investigator Award
- 2007-2008 Maltz NARSAD Investigator
- 2008 Top 10 Reviewers for *Biological Psychiatry* in 2008
- 2009 Top 10 Reviewers for *Biological Psychiatry* in 2009
- 2010 Top 10 Reviewers for *Biological Psychiatry* in 2010
- 2011 Top 10 Reviewers for *Biological Psychiatry* in 2011
- 2013 #1 reviewer, *Neuropsychopharmacology*, 2013
- 2013 Elected Full Member of the American College of Neuropsychopharmacology (ACNP)
- 2014 Elected member of the Psychiatric Research Society
- 2014 Ambassador, CINP
- 2014 #1 reviewer, *Neuropsychopharmacology*, 2014

**Other Professional Activities:**NIH Study section:

- 2003 Ad-hoc Reviewer, NIDA study section for the Cutting-Edge Basic Research Awards (CEBRA).
- 2004 Ad-hoc Reviewer, NIH study section (P50) Transdisciplinary Tobacco Use Research Center (TTURC)
- 2006 Ad-hoc Reviewer, NIH Special Emphasis Panel Study Section, ZDA1 MXS-M (24)24
- 2007 Ad-hoc Reviewer, NCI P01 review panel SubCommittee E, October 2007.
- 2008 Ad-hoc Reviewer, NIH/NIDA study section, ZDA1 RXL-E(08)
- 2009 Ad-hoc Reviewer, NIH/NIDA study section, ZDA GXM-A (04), May 14, 2009.
- 2010 Ad-hoc reviewer, NIH/NIDA study section, B/START R03 Review Meeting Dates: 03/10/2010, Meeting Identifier: 2010/05 ZDA1 GXM-A (02) 1
- 2010 Ad-hoc reviewer, NIH/NCI study section, Disparities, Cancer Risk, and Prognostic Factors, Special Emphasis Panel , 9/28-29/2010 ZCA1 RPRB-7 (J1)
- 2011 Ad-hoc reviewer, NIH/NIDA study section, Support Opportunity for Addiction Research, 5/18-5/19/2011, ZRG1 IFCN-L (50) R
- 2011 Ad-hoc reviewer, NIH/NIDA study section, 5/25/2011, 2011/10 ZDA1 GXM-A (02) 1.
- 2011 Ad-hoc reviewer, Special Emphasis Panel/Scientific Review Group, 06/14/2011-06/15/2011, ZRG1 IFCN-A (03) Member Conflict: Neuropharmacology (NMB).
- 2011 Ad-hoc reviewer, Special Emphasis Panel/Scientific Review Group 2011/10 ZRG1 BBBP-V (02) Member Conflict: Biobehavioral Regulation, Learning and Ethology, 7/11/2011.
- 2011 Ad-hoc reviewer, NIH/NCI , Special Emphasis Panel/Scientific Review Group Disparities, cancer risk, prevention and prognostic factors, 10/5-6/2011.
- 2012 Ad-hoc reviewer, NIH/NCI , NCI P01 Special Emphasis Panel One ZCA1 RPRB-B (M1) 2/2-3/2012.
- 2012 Ad-hoc reviewer, NIH/NCI , NCI P01 Special Emphasis Panel One, ZCA1 RPRB-7 (M1) R, SPORE in Lymphoma, Brain, Head/Neck and Lung Cancers, and Sarcoma. 2/8/2012-2/9/2012. 2012/05
- 2012 Ad-hoc reviewer, ZRG1 IFCN-H (03) M, Member Conflict: Integrative and Functional Neuroscience Study section, 02/28/2012-02/29/2012
- 2012 Ad-hoc reviewer, ZRG1 IFCN-Q 03 M, 6/19/2012-6/19/2012
- 2012 Ad-hoc reviewer, ZRG1 IFCN-C (03) M Member Conflict SEP: Stress, Nicotine and Reward, 12/5/2012
- 2013 Ad-hoc reviewer, ZCA-RPRB-7(M1), 2/6/2013
- 2013 Reviewer, BRLE, 6/10/2013
- 2014 Ad-hoc reviewer, ZRG1 BBBP-V (02) M, 2/13-14, 2014
- 2014 Ad-hoc reviewer, Developmental Brain Disorders (DBD) study section. 10/23-10/24, 2014.
- 2015 Ad-hoc reviewer, Molecular Neurogenetics (MNG) study section, June 4-5, 2015

External reviewer for faculty promotion: NIDA, 2009; Mount Sinai School of Medicine, 2009; Northwestern University, 2011; New York University, 2011

Editorial Positions:

- 2008-Present Member, Editorial board of Neuropsychopharmacology, the official journal of the American College of Neuropsychopharmacology.
- 2008-Present Member, Editorial board of Biological Psychiatry, the official journal of the Society of Biological Psychiatry
- 2008-present Member, Editorial Advisory Board, The Open Neuropsychopharmacology Journal
- 2011-present Member, Editorial Board, Current Psychopharmacology
- 2011-present Associate Editor, Nicotine & Tobacco Research, the official journal of the Society for Research on Nicotine and Tobacco

Ad-hoc Reviewer of Journals:

*Human Molecular Genetics*  
*Biological Psychiatry*  
*Journal of Neuroscience*  
*Brain*  
*Neuropsychopharmacology*  
*Genes, Brain and Behavior*  
*Journal of Comparative Neurology*  
*International Journal of Neuropsychopharmacology*  
*Journal of Neurochemistry*  
*European Journal of Neuroscience*  
*Neurobiology of Disease*  
*Nicotine and Tobacco Research*  
*Journal of Pharmacology and Experimental Therapeutics*  
*Psychoneuroendocrinology*  
*Brain Research*  
*Behavioral Brain Research*  
*Pharmacology, Biochemistry and Behavior*  
*Biochemical Pharmacology*  
*Molecular Medicine*  
*Hippocampus*  
*Acta histochemica*  
*European Neuropsychopharmacology*  
*Anatomical Record*  
*Molecular Medicine*  
*PlosOne*

Academic and Institutional Committees:

- 2000-present Member, Addiction Psychiatry Fellowship Program, Department of Psychiatry and Behavioral Sciences, Albert Einstein College of Medicine
- 2002-present Faculty Coordinator, Psychiatric Scientist Track, Department of Psychiatry and Behavioral Sciences, Albert Einstein College of Medicine
- 2004-2008 Senator, The senate of the Albert Einstein College of Medicine.
- 2006 Ad-hoc chair of the faculty promotions subcommittee, Albert Einstein College of Medicine
- 2006-2007 Chair, Psychiatry Faculty Search Committee
- 2008-present Member, the faculty promotions and appointments committee, Albert Einstein College of Medicine
- 2009 Ad-hoc external reviewer for the Appointments & Promotions Committee of the Mount Sinai School of Medicine.
- 2009 Ad-hoc external reviewer for the Appointments & Promotions Committee of the National Institute on Drug Abuse (NIDA)/NIH.
- 2009-2010 Member, Departmental Planning Committee for Dean's 2010 strategic planning, Albert Einstein College of Medicine
- 2011-2012 Member, Department of Genetics, Training Grant Steering Committee, Albert Einstein College of Medicine

Organizational Roles in Scientific Meetings:

- 2007-2009 Member, the Ziskind-Somerfeld Research Award Committee, the Society of Biological Psychiatry
- 2015-2017 Member, the Membership Selection Committee, American College of Neuropsychopharmacology (ACNP)

Consultationships:

- 2008-2009 Consultant, Intracellular Therapies Inc. 3960 Broadway, New York NY 10032
- 2013 Consultant, DaiNippon Sumitomo Pharmaceuticals, Inc, Osaka, Japan

**Research:**

Completed (over the past 5 years only):

R01DA013232

“Intracellular Molecules of Nicotine Addiction”

Principal Investigator: Noboru Hiroi, Ph.D.

Agency, NIDA; Type, R01; Period, 8/1/00-4/30/05 (no cost-extension to 4/30/06)

\$750,000 (direct costs)

P01NS037409

“Molecular Etiology of Early Onset Torsion Dystonia”

Principal Investigator: X. O. Breakefield and Laurie Ozelius, Ph.D.

Collaborator: Noboru Hiroi, Ph.D.

Agency, NINDS; Type, P01; Period, 6/14/04-6/30/07

\$31,856 (direct costs, 9% effort)

“A human 22q11.2 segment and endophenotypes of schizophrenia in mice”

PI: Noboru Hiroi, Ph.D., NARSAD Maltz Investigator

Agency, NARSAD Independent Investigator Award; Period, 9/15/2006 - 9/14/2008

\$100,000 (total costs)

R21HD053114

“22q11 Genes and Complex Behavior in Mice”

PI: Noboru Hiroi, Ph.D.

Agency, NICHD/NIMH/NINDS; Type, R21; Period, 02/01/2008 - 01/31/2010 (no cost extension to 1/31/2012)

\$275,000 (direct costs)

R01DA024330

“Molecular Mechanisms of Nicotine Addiction and Extinction”

PI: Noboru Hiroi, Ph.D.

Agency, NIDA; Type, R01; Period, 9/20/2007 – 8/31/2012

\$980,080 (direct costs)

Active:

1R01MH099660-01A1

“COMT and Developmental Memory Capacity”

PI: Noboru Hiroi, Ph.D.

Agency, NIMH; Type, R01; Period, 1/18/2013-12/31/2014 (NCE to Dec 31, 2015)

“Establishing *in vivo* high-density electrophysiological methods to interrogate circuit-level functional connectivity in genetic mouse models of Autism.”

PI John Foxe, Ph.D.; co-PI, Noboru Hiroi, PhD

Agency, Intellectual Disability Developmental Disorders Research Center, Albert Einstein College of Medicine; Type, internal grant; Period, 2/1/2014-6/30/2015

“The structure and function of neonatal social communication in a mouse model of 16p11.2 copy number variants.”

PI: Noboru Hiroi, Ph.D.

Agency, Astellas Pharma, Inc.; Type, grant; Period, 2/14/2015-2/13/2016

Pending:

1R01HD084988-01

“Identifying the Structure and Function of Social Communication in Autism”

PI: Noboru Hiroi, Ph.D.

Agency, NICHD/NIMH; Type, R01; Period, 7/1/2015-6/30/2020 (Impact score 21; Percentile 11)

Lectures by Invitation over the past 10 years:

International:

March 24, 2005 “Chromosome 22q11: Mouse models of schizophrenia”, The National Institute of Neuroscience, Tokyo, Japan

March 25, 2005 “Chromosome 22q11: Mouse models of schizophrenia”, RIKEN-Genomic Sciences Center, Yokohama, Japan

- March 24, 2006 “22q11.2 Genes and Neuropsychiatric Disorders”, Tokyo Institute of Psychiatry, Tokyo, Japan
- October 5, 2007 “Mouse models of Schizophrenia and Nicotine Dependence”, Department of Engineering, Waseda University, Tokyo, Japan
- October 6, 2007 “Mouse models of Schizophrenia and Nicotine Dependence”, Plenary lecture, the 67<sup>th</sup> Japanese Society for Animal Psychology, Tokyo, Japan
- March 25, 2010 “Mouse models of Neuropsychiatric Disorders”, Department of Psychiatry, National Defense Medical College, Tokorozawa, Saitama, Japan
- April 8, 2010 “Molecular Basis of Nicotine Cue Reactivity”. 12th International Neuroscience Winter Conference April 6th - April 10th 2010, Sölden, Austria
- July 30, 2010 “Tbx1 heterozygosity impairs hippocampus-dependent reference memory in mice” Symposium at the 7<sup>th</sup> International 22q11.2 Deletion Syndrome Scientific Meeting, July 29-31, 2010, Coventry, UK.
- Feb. 16, 2011 “Nicotine Cue Reactivity: Withdrawal, Seeking, and cGMP-dependent protein kinase”. Symposium “Tobacco Addiction: Basic Science Insights on a Multifaceted Disorder. Co-Organizers: Darlene Brunzell and Paul Clarke. The 2011 Annual Meeting of the Society for Research on Nicotine and Tobacco. Toronto, Canada
- March 31, 2011 “Molecular mechanisms of addiction”, Special Interest Session Chair, 13<sup>th</sup> International Neuroscience Winter Conference, March 29-April 2, 2011. Sölden, Austria
- July 15, 2011 “Heterozygosity of Tbx1 causes phenotypes in social behavior and spatial and working memory in mice. To be given in a symposium on July 15, 2011. 18<sup>th</sup> International Scientific meeting of the Velo-Cardio-Facial Syndrome Educational Foundation, Inc. New Brunswick, NJ, July 14-17, 2011.
- September, 2011 Deconstructing craving: dissociable anatomical and molecular control of extinction of nicotine cue reactivity in mice. Symposium, European Society for Research on Tobacco and Nicotine, Turkey.
- October 27, 2011 “Genetic mouse model of developmental neuropsychiatric disorders”, Symposium, Annual meeting of the Japanese Society of Neuropsychopharmacology, Tokyo, Japan, October 27-29, 2011.
- October 31, 2011 “Deconstructing nicotine craving: dissociable anatomical and molecular control of nicotine cue reactivity in mice.” Hoshi Pharmaceutical College, Tokyo, Japan
- September 26, 2012. “Human chromosome 22q11 and Developmental Neuropsychiatric Disorders” Hiroshima University, Hiroshima, Japan.
- September 28, 2012. “Copy Number Variation: What We Learn from Mouse Models of 22q11.2-associated Neuropsychiatric Disorders” Plenary lecture at the 34<sup>th</sup> Annual Meeting of the Japanese Society of Biological Psychiatry, Kobe, Japan.
- October 2, 2012. “Human chromosome 22q11 and Developmental Neuropsychiatric Disorders” RIKEN-BSI, Wako, Japan.
- June 22, 2013 “Translating 22q11.2 CNV-associated developmental neuropsychiatric disorders into mouse models. Neuro2013, Kyoto, Japan

- June 26, 2013 “What 22q11.2 CNV mouse models tell us about mechanisms underlying developmental neuropsychiatric disorders. Meijo Univeristy, Nagoya, Japan
- June 28, 2013 “Copy Number Variation: from rare variants to common mechanisms of developmental neuropsychiatric disorders” Kyoto University, Kyoto, Japan
- July 20, 2013 “Tbx1 andSept5 contribute to behavioral phenotypes of 22q11.2 associated developmental neuropsychiatric disorders. VCFS Conference, Dublin, Ireland July 18-21, 2013
- February 13, 2014 “Copy Number Variation at 22q11.2: from rare variants to common mechanisms of developmental neuropsychiatric disorders.” Naha, Okinawa, Japan Feb 14-16, 2014
- February 17, 2014 “Copy Number Variation at 22q11.2: from rare variants to common mechanisms of developmental neuropsychiatric disorders.” Kyushu University, Fukuoka, Japan
- February 18, 2014 “Copy Number Variation at 22q11.2: from rare variants to common mechanisms of developmental neuropsychiatric disorders.” Nagoya University, Nagoya, Japan
- June 23, 2014 “Identification of chromosomal segments and individual genes critical for developmental neuropsychiatric disorders in mouse models of 22q11.2 copy number variants”. College of International Neuropsychopharmacology (CINP) World Congress. Panel session, Vancouver, Canada.
- August 5, 2014 Structure of social communication in a mouse model of developmental neuropsychiatric disorders. Ultrasonic communication in Rodents. 2nd international workshop-, University of Tokyo, Tokyo, Japan
- August 7, 2014 Human chromosome 22q11.2 and neuropsychiatric disorders. Osaka University School of Medicine, Osaka, Japan
- August 8, 2014 Delving into Brain Mechanisms of Neuropsychiatric Disorders associated with 22q11.2 Copy Number Variation. RIKEN-BSI, Wako, Saitama, Japan
- August 4, 2015 Nara Medical College, Nara, Japan
- August 5, 2015 Kobe University School of Medicine, Kobe Japan
- August (TO BE SCHEDULED) Astellas Pharma Research Center, Tsukuba, Japan
- August 25, 2015 Forum of Creativity, Tohoku University, Sendai, Japan

National:

- September 27, 2005 “Intracellular Molecules of Addiction”, University of Pennsylvania School of Medicine, Center for Neurobiology and Behavior.
- April 13, 2007 “Genes, Molecules and Nicotine Dependence”, University of Southern California, Los Angeles
- January 9, 2008 “Chromosome 22q11: A Cornucopia of Behavioral Genes”, Children’s Hospital of Philadelphia, University of Pennsylvania School of Medicine
- February 23, 2010 “22q11 and Neuropsychiatric Disorders”. Ground Round, Lincoln Hospital, Bronx, NY
- March 16, 2011 “Autism: 22q11 Bridges Mouse Proxy and Human Correlation. Departmental seminar series, Department of Neuroscience, Albert Einstein College, Bronx, NY



- July 7, 2012 “Alterations of Social Behavior Through Genetic and Environmental Manipulation of the 22q11.2 Gene SEPT5 in the Mouse Brain” 8th Biennial 22q11.2 Deletion Syndrome Meeting. Lake Buena Vista, Florida, USA - From July 6 – 10, 2012.
- July 31, 2012 “ Human 22q11.2 and Developmental Neuropsychiatric Disorders” Autism Center of Excellence Summer School Seminar Series. Department of Pediatrics, Albert Einstein College of Medicine, Bronx, NY
- Dec 13, 2012 “Human Chromosome 22q11.2 and Developmental Neuropsychiatric Disorders” Einstein Internal Faculty Seminar Series, Albert Einstein College of Medicine, Bronx, NY
- Dec 9, 2013 “Tbx1 and Sept5 contribute to behavioral and neuronal phenotypes in mouse models of 22q11.2-associated ASD. Co-Chair of the Panel Session “Autism Spectrum Disorders: From Rare Chromosomal Abnormalities to Common Molecular Targets” ACNP meeting. Hollywood, FA.
- May 9, 2014 “Identification of chromosomal segments and individual genes critical for schizophrenia-related phenotypes in mouse models of 22q11.2 copy number variants. Symposium at the Annual Meeting of the Society of Biological Psychiatry, New York, NY.
- July 15, 2014 “Identification of chromosomal segments and individual genes critical for schizophrenia-related phenotypes in mouse models of 22q11.2 copy number variants. ACE Internship lecture series, IDDRC, Albert Einstein College of Medicine, Bronx, NY.
- February 5, 2015 “Delving into Brain Mechanisms of Autism Spectrum Disorders associated with 22q11.2 Copy Number Variation”. Psychiatry Research Society, Park City, Utah
- April 17, 2014 “Copy Number Variation at 22q11.2: from rare variants to common mechanisms of developmental neuropsychiatric disorders” Center of Neurobiology and Behavior. University of Pennsylvania School of Medicine, Philadelphia, PA

**Faculty Advisor/Mentor:**

I have mentored the following students, post-doctoral fellows, and residents in my laboratory:

Post-doctoral fellows

Hongwen Zhu, M.D. Currently Vice Chair, Tianjin Hospital, People’s Republic of China  
1998-2000

Dr. Zhu was enrolled in the Graduate Program of the Neuroscience Department in 2000 and graduated with a PhD in 2007.

Soh Agatsuma, M.D., Ph.D. Currently Professor of Psychiatry, Kobe College, Kobe, Japan  
2003-2006, Psychiatry fellow  
2006 – 2009, Instructor in the Hiroi laboratory

Dr. Agatsuma was awarded a Ph.D. in 2008 from his alma mater, Osaka University, Japan, based on the work he completed in my laboratory.

Takehito Sawamura, M.D. Currently Chief Psychiatrist, Lieutenant Commander, Self-Defense Forces Central Hospital, Japan.  
2004 Post-doctoral fellow

Go Suzuki, M.D. Currently a research psychiatrist at Japan Aerospace Exploration Agency (JAXA),  
2007-2008, Post-doctoral fellow.

Tomohisa Takahashi, MD Currently Psychiatrist, Department of Psychiatry, National Defense Medical  
College, Japan  
2012- 2013, Post-doctoral fellow

Akitoyo Hishimoto, MD, PhD. Currently Assistant Professor at Kobe University School of Medicine,  
Japan  
2013-2014, Post-doctoral fellow

Takeshi Izumi, MD, PhD Currently, Lecturer, Department of Psychiatry, Hokkaido University School of  
Medicine, Japan  
2013-2014, Visiting Scientist

Shuken Boku, MD, PhD Currently Assistant Professor at Kobe University School of Medicine, Japan  
July 2012-2014, Post-doctoral fellow

Akira Nishi, 2014 Student at University of Tokushima School of Medicine  
2014, Visiting student from University of Tokushima School of Medicine, Japan.

Current

Takeshi Hiramoto, Ph.D. 2008-2009; 2010-present (Associate).

Seiji Abe, Ph.D. 2014-present

Hiroko Nomaru, PhD, 2015-present

Yoshinobu Ishitobi, MD, 2015-present

Yasuhiko Naka, MD, 2015-present

Past Ph.D. Student:

Hongwen Zhu, M.D., Ph.D. (2000-2007) completed his Ph.D. studies in June 2007.  
He is currently Vice Chair, Tianjin Hospital, People's Republic of China.

Daniel Scott, Ph.D. (2004-2011) successfully defended his Ph.D. thesis in March, 2011 and graduated with  
a PhD on June 1, 2011. He is currently a post-doctoral position at University of Texas Southwestern  
Medical School.

Kathryn Harper, PhD (2006- 2012)

She completed her thesis work in 2012 and is currently a post-doctoral fellow at University of North  
Carolina.

Advisory Committee

Robert J. Hayes, Ph.D.

Michelle Riley, Ph.D.

Jordan A. Spector, M.Sc.  
Kyle Lapidus, Ph.D.  
Mana Mirjany, Ph.D.  
Collene Lawhorn, Ph.D.

Thesis Defense Committee

Stanislav R. Vorel, Ph.D.  
Robert J. Hayes, Ph.D.  
Kyle Lapidus, Ph.D.

Summer research program student:

Ms. Shiry Wagner (2000)  
Mr. David Elson (2001)  
Ms. Jennie Tenuto (2004)

Intel Talent Search Competition student

Ms. Priya Chordia (2004 Intel Science Talent Search student)

Mr. Brian Rosenberg (2002-2004). Mr. Brian Rosenberg carried out a research project under my supervision and received the following awards:

- 1) NY regional finalist and a national semifinalist, the Intel Science Talent Search
- 2) National Winner of the American Academy of Neurology
- 3) First place, Biology, Tri-County Science Fair

## Bibliography

### A. Original Communications in Reviewed Journals:

1. **Hiroi, N.** and White, N.M. Conditioned stereotypy: behavioral specification of the UCS and pharmacological investigation of the neural change. Pharmacol Biochem Behav 32(1), 249-58, 1989.
2. **Hiroi, N.** and White, N.M. The reserpine-sensitive dopamine pool mediates (+)-amphetamine conditioned reward in the place preference paradigm. Brain Res. 510(1), 33-42, 1990.
3. White, N.M., Packard, M.G., and **Hiroi, N.** Place conditioning with dopamine D1 and D2 agonists injected peripherally and into nucleus accumbens. Psychopharmacol. 103(2), 271-276, 1991.
4. **Hiroi, N.** and White, N.M. The amphetamine conditioned place preference: differential involvement of dopamine receptor subtypes and two dopamine terminal areas. Brain Res. 552(1), 141-152, 1991.
5. **Hiroi, N.** and White, N.M. The lateral nucleus of the amygdala mediates expression of the amphetamine-produced conditioned place preference. J. Neurosci. 11(7), 2107-2116, 1991.
6. White, N.M. and **Hiroi, N.** Pipradrol conditioned place preference is blocked by SCH23390. Pharmacol Biochem Behav 43(2), 377-380, 1992.
7. **Hiroi, N.** and White, N.M. The ventral pallidum area is involved in the acquisition, but not expression of the amphetamine conditioned place preference. Neurosci. Lett. 156(1-2), 9-12, 1993.
8. Xu, M., Moratalla, R., Gold, L.H., **Hiroi, N.**, Koob, G.F., Graybiel, A.M., Tonegawa, S. Dopamine D1 receptor mutant mice are deficient in striatal expression of dynorphin and in dopamine-mediated behavioral responses. Cell 79(4), 729-742, 1994.
9. **Hiroi, N.** Compartmental organization of calretinin in the rat striatum. Neurosci. Lett. 197(3), 223-226, 1995.
10. Chen, J.S., Nye, H.E., Kelz, M.B., **Hiroi, N.**, Nakabeppu, Y., Hope, B.T., Nestler, E.J. Regulation of deltaFosB and FosB-like proteins by electroconvulsive seizure and cocaine treatments. Mol. Pharmacol. 48(5), 880-889, 1995.
11. Berhow, M.T., **Hiroi, N.** and Nestler, E.J. Regulation of ERK (extracellular signal regulated kinase), part of the neurotrophin signal transduction cascade, in the rat mesolimbic dopamine system by chronic exposure to morphine and cocaine. J. Neurosci. 16(15), 4707-4715, 1996.
12. **Hiroi, N.** and Graybiel, A.M. Atypical and typical neuroleptic treatments induce distinct programs of transcription factor expression in the striatum. J. Comp. Neurol. 374(1), 70-83, 1996.
13. Berhow, M.T., **Hiroi, N.**, Kobienski, L., Hyman, S.E., Nestler, E.J. Influence of cocaine on the JAK-STAT pathway in the mesolimbic dopamine system. J. Neurosci. 16(24), 8019-8026, 1996.
14. **Hiroi, N.**, Brown, J.R., Haile, C.N., Ye, H., Greenberg, M.E., Nestler, E.J. FosB mutant mice: Loss of chronic cocaine induction of Fos-related proteins and heightened sensitivity to cocaine's psychomotor and rewarding effects. Proc. Natl. Acad. Sci. USA 94(19), 10397-10402, 1997.
15. Rocha, B.A., Scearce-Levie, K., Lucas, J.J., **Hiroi, N.**, Castanon, N., Crabbe, J.C., Nestler, E.J., Hen, R. Increased vulnerability to cocaine in mice lacking serotonin<sub>1B</sub> receptor. Nature 393 (6681), 175-178, 1998.
16. White, N.M. and **Hiroi, N.** Preferential localization of self-stimulation sites in striosomes/patches in the rat striatum. Proc. Natl. Acad. Sci. USA 95(11), 6486-6491, 1998.
17. Fienberg, A.A., **Hiroi, N.**, Mermelstein, P.G., Song, W.-J., Snyder, G.L., Nishi, A., Cheramy, A., O'Callaghan, J.P., Miller, D.B., Cole, D.G., Corbett, R., Haile, C.N., Cooper, D.C., Onn, S.P., Grace, A.A., Ouimet, C.C., White, F.J., Hyman, S.E., Surmeier, D.J., Girault, J.A., Nestler, E.J., Greengard, P. DARPP-32: regulator of the efficacy of dopaminergic neurotransmission. Science 281(5378), 838-842, 1998.

18. **Hiroi, N.**, Marek, G., Brown, J.R., Ye, H., Saudou, F., Vaidya, V.A., Duman, R.S., Greenberg, M.E., Nestler, E.J. Essential role of the *fosB* gene in molecular, cellular, and behavioral actions of chronic electroconvulsive seizures. J. Neurosci. 18(17), 6952-6962, 1998.
19. Carlezon, W.A., Thome, J., Olson, V.G., Lane-Ladd, S.B., Brodtkin, E.S., **Hiroi, N.**, Duman, R.S., Neve, R.L., Nestler, E.J. Regulation of cocaine reward by CREB. Science 282(5397), 2272-2275, 1998.
20. **Hiroi, N.**, Fienberg, A., Haile, C., Alburges, M., Hanson, G., Greengard, P., Nestler, E.J. Neuronal and behavioral abnormalities in striatal function in DARPP-32 mutant mice. Eur. J. Neurosci 11(3), 1114-1118, 1999.
21. Atkins, J.B., Chlan-Fourney, J., Nye, H.E., **Hiroi, N.**, Carlezon, W.A. Jr., Nestler, E.J. Region-specific induction of deltaFosB by repeated administration of typical versus atypical antipsychotic drugs. Synapse 33, 118-28, 1999.
22. Haile, C.N., **Hiroi, N.**, Nestler, E.J., Kosten, T.A. Differential behavioral responses to cocaine are associated with dynamics of mesolimbic dopamine proteins in Lewis and Fischer 344 rats. Synapse 41(3):179-90, 2001.
23. **Hiroi, N.**, Martin, AB, Grande, C, Alberti, I, Rivera, A, Moratalla, R. Molecular dissection of dopamine receptor signaling. J Chem. Neuroanat. 23(4):237-42, 2002. Based on the poster that received the best poster prize at the 1<sup>st</sup> International Cajal Club Meeting, Madrid, Spain.
24. Grande, C., Zhu, H., Martin, A.B., Lee, M., Ortiz, O., **Hiroi, N.**, Moratalla, R. Chronic treatment with atypical neuroleptics induces striosomal aggregation of FosB/ $\Delta$ FosB expression in rats. Biological Psychiatry 55(5):457-63, 2004.
25. Lee, M, Chen, K., Shih, JC, **Hiroi, N.** MAO-B knockout mice exhibit deficient habituation of locomotor activity but normal nicotine intake. Genes, Brain & Behavior. 3(4), 216-227, 2004.
26. **Hiroi, N** and Agatsuma, S Genetic susceptibility to substance dependence. Molecular Psychiatry 10(4), 336-344, 2005. Feature Review.
27. Zhu, HW, Lee, MS, Guan, F. Agatsuma, S, Scott, D, Fabrizio, K, Fienberg, AA, **Hiroi, N.** DARPP-32 phosphorylation opposes the behavioral effects of nicotine. Biol. Psychiatry 58(12):981-9, 2005.
28. **Hiroi N.**, Zhu H., Lee M., Funke B., Arai M., Itokawa M., Kucherlapati R., Morrow B., Sawamura T., Agatsuma S. A 200-kb region of human chromosome 22q11.2 confers antipsychotic-responsive behavioral abnormalities in mice. Proc. Natl. Acad. Sci. USA 102(52), 19132-19137, 2005.
29. Agatsuma S., Lee M., Zhu H., Chen K., Shih J., Seif I., **Hiroi N.** Monoamine oxidase A knockout mice exhibit impaired nicotine preference but normal responses to novel stimuli. Human Molecular Genetics 15(18):2721-31, 2006.
30. Zhu H., Lee M., Agatsuma S., **Hiroi N.** Pleiotropic impact of constitutive *fosB* inactivation on nicotine-induced behavioral alterations and stress-related traits in mice. Human Molecular Genetics. 16(7):820-36, 2007
31. Suzuki, G., Harper, K., Hiramoto, T., Lee, M., Kang, G., Kinoshita, M., Tanigaki, M., Buell, M., Geyer, M., Trimble, W., Agatsuma, S., **Hiroi, N.** *Sept5* deficiency exerts pleiotropic influence on social and affective behaviors and cognitive functions in mice. Human Molecular Genetics, 18(9):1652-60, 2009.
32. **Hiroi N.** and Scott, D. Constitutional mechanisms of vulnerability and resilience to nicotine dependence. Molecular Psychiatry 14(7):653-67, 2009. Feature Review.
33. Suzuki, G., Harper, K.M., Hiramoto, T., Funke, B., Lee, M.S., Kang, G., Buell, M., Geyer, M.A., Kucherlapati, R., Morrow, B., Männistö, P.T., Agatsuma, S., **Hiroi, N.** Over-expression of a human chromosome 22q11.2 segment including TXNRD2, COMT, and ARVCF developmentally affects incentive learning and working memory in mice. Human Molecular Genetics, 18(20):3914-25, 2009.
34. Agatsuma, S., Dang, M.T., Li, Y., **Hiroi, N.** NMDA receptors on striatal neurons are essential for cocaine cue reactivity in mice. Biological Psychiatry, 67(8):778-80, 2010.

35. Scott, D and **Hiroi, N.** Emergence of dormant conditioned incentive approach by conditioned withdrawal in nicotine addiction. Biological Psychiatry 68(8):726-32, 2010
36. Scott, D and **Hiroi, N.** Deconstructing craving: dissociable cortical control of cue reactivity in nicotine addiction. Biological Psychiatry 69(11):1052-9, 2011.
37. Hiramoto, T., Kang, G., Suzuki, G., Satoh, Y., Kucherlapati, R., Watanabe, Y., **Hiroi, N.** Tbx1: identification of a 22q11.2 gene as a risk factor for autism spectrum disorder in a mouse model. Human Molecular Genetics, 20(24):4775-85 2011.
38. Lapidus KA, Nwokafor C, Scott D, Baroni TE, Tenenbaum SA, Hiroi N, Singer RH, Czaplinski K. Transgenic expression of ZBP1 in neurons suppresses cocaine-associated conditioning. Learning and Memory, 19(2):35-42. 2012.
39. Yoshida A, Yamamoto N, Kinoshita M, **Hiroi N**, Hiramoto T, Kang G, Trimble WS, Tanigaki K, Nakagawa T, Ito J. Localization of septin proteins in the mouse cochlea. Hear Res. 289(1-2):40-51, 2012 PMID:22575789
40. Harper, K.M., Hiramoto, T., Tanigaki, K., Kang, G., Suzuki, G., Trimble, W., **Hiroi, N.** Alterations of social interaction through genetic and environmental manipulation of the 22q11.2 gene *Sept5* in the mouse brain. Human Molecular Genetics 21(15): 3489-3499, 2012 PMID:22589251
41. **Hiroi, N.**, Hiramoto, T., Harper, K.M., Suzuki, G., Boku, S. Mouse Models of 22q11.2-associated Autism Spectrum Disorder. Autism S1:001, 1-9, 2012, <http://dx.doi.org/10.4172/2165-7890.S1-001>
42. **Hiroi, N.**, Takahashi, T., Hishimoto, A., Izumi, A. Boku, S., Hiramoto, T. Copy Number Variation at 22q11.2: from rare variants to common mechanisms of developmental neuropsychiatric disorders. Molecular Psychiatry 18: 1153-1165, 2013.
43. **Hiroi, N.** Small Cracks in the Dam: Rare genetic variants provide opportunities to delve into mechanisms of neuropsychiatric disorders. Biological Psychiatry 76(2):91-2, 2014.
44. Boku, S., Toda, H., Nakagawa, S, Kato, A., Inoue, T., Koyama, K., **Hiroi, N.**, Kusumi, I. Neonatal maternal separation alters the capacity of adult neural precursor cells to differentiate into neurons via methylation of retinoic acid receptor gene promoter. Biological Psychiatry 77(4) 335-344, 2015.
45. Takahashi, T., Okabe, S., Ó Broin, P., Nishi, A., Ye, K., Beckert, M.V., Izumi, T., Machida, A., Kang, G., Pena, JL., Golden, A., Kikusui, K., **Hiroi, N.** Structure and function of neonatal social communication in a genetic mouse model of autism (submitted)

## **B. Books, Chapters in Books, and Review Articles:**

### Peer-reviewed Review Articles:

1. White, N.M. and **Hiroi, N.** Amphetamine cue preference and the neurobiology of drug-seeking. Sem. Neurosci. 5, 329-336, 1993.
2. Agatsuma, S, **Hiroi, N.** Genetic basis of drug dependence and comorbid traits. Japanese Journal of Neuropsychopharmacology 24(3), 137-145, 2004.
3. Agatsuma, S and **Hiroi, N.** Chromosome 22q11 and schizophrenia. Japanese Journal of Neuropsychopharmacology 25(2), 79-84, 2005.
4. **Hiroi, N.** Mouse models of neuropsychiatric disorders: schizophrenia and nicotine dependence. Japanese J. Animal Psychology 58 (1), 33-39 (2008). Based on the plenary lecture given at the 67<sup>th</sup> Japanese Society for Animal Psychology, Tokyo, Japan, October 6, 2007.

### Books and Chapters in Books

5. **Hiroi, N.**, Chen, J.S., Nye, H.E., Nestler, E.J. Chronic FRAs: Novel transcription factors regulated in the basal ganglia by chronic neuronal perturbations. In The Basal Ganglia. V. (C. Ohye, M. Kimura, J.S. McKenzie, eds.). Plenum Press, New York, 1996.

6. **Hiroi, N.** and Nestler, E.J. Nuclear memory: Gene transcription and behavior. In Advances in Pharmacology 42, 1037-1041, 1998.
7. **Hiroi, N.** Dependence, tolerance, and alteration in gene expression. In Marihuana and Medicine. (G. G. Nahas, K.M. Sutin, Harvey, D., Agurell, S. eds.). Humana Press. Totowa, New Jersey, 1999.
8. **Hiroi, N.** and Nishi, A. Dimensional deconstruction and reconstruction of CNV-associated neuropsychiatric disorders. In Modeling the psychopathological dimensions of schizophrenia and related psychoses (M. Pletnikov and J.L. Waddington, eds). Handbook of Behavioral Neuroscience Series, Elsevier (in press, 2015).
9. Nishi, A. **Hiroi, N** Genetic mechanisms emerging from mouse models of CNV-associated neuropsychiatric disorders. In: *The Neurobiology of Schizophrenia*. Edited by (T. Abel, PhD and T. Nickl-Jockschat, MD, eds) Elsevier (in press, 2015).