

BIOGRAPHICAL SKETCH

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NAME Dykstra, Linda A.		POSITION TITLE William R. Kenan Jr. Professor/Psychology; Pharmacology; Curriculum in Neurobiology	
eRA COMMONS USER NAME dykstra			
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
Hope College, Holland, MI	B.A.	1966	Mathematics/Psych
University of Chicago, Chicago, IL	M.A.	1968	English Literature
University of Chicago, Chicago, IL	Ph.D.	1972	Psychopharmacology
University of North Carolina, Chapel Hill, NC	Postdoctoral	1973	Pharmacology

A. Positions and Honors.**Positions and Employment**

1970-1972 NIMH Predoctoral Research Fellow, University of Chicago
 1972-1973 NIDA Postdoctoral Research Fellow, University of North Carolina, Dept of Pharmacology
 1973-1979 Assistant Professor of Psychology and Pharmacology, University of North Carolina
 1979 Visiting Assistant Professor, Harvard University, Laboratory of Psychobiology
 1979-1984 Associate Professor of Psychology and Pharmacology, University of North Carolina
 1984-present Distinguished Professor of Psychology and Pharmacology, University of North Carolina
 1985 Visiting Professor, University of Michigan, Department of Pharmacology
 1996-present Dean of Graduate School, University of North Carolina at Chapel Hill
 2001-2002 Visiting Professor, Duke University, Department of Cell Biology

President or Chair of Professional Groups

1988 Chair, Psychopharmacology Division, American Psychological Association
 1997-1998 President, College on Problems of Drug Dependence
 2005 Chair, Behavioral Pharmacology Division, American Society of Pharmacology & Experimental Therapeutics
 2006 President, Association of Graduate Schools; American Association Universities
 2007-09 Chair, Executive Board, North Carolina Association Biomedical Research

Membership on Advisory Committees

1983-1987 NIDA Clinical and Behavioral Review Group
 1991-1994 National Advisory Council on Drug Abuse
 2002-current Scientific Advisory Board, New England Regional Primate Research Center
 2002-current Executive Board, North Carolina Association Biomedical Research
 2004-current Advisory Board, Graduate Record Exam, Educational Testing Services; Chair, Services Committee

Honors

1966 B.A., magna cum laude
 1967-1968 Ford Foundation Fellow in the Humanities
 1977-1987 Research Scientist Development Award, NIH
 1988-1993 Research Scientist Award, NIH
 1988-1998 NIH/NIDA Merit Award
 1988-1998 Fellow, American Psychological Association
 1991 Elected Member, American College of Neuropsychopharmacology
 1991 Appointed: William Rand Kenan Jr. Professor
 1993-1998 Research Scientist Award

B. Selected peer-reviewed publications (in reverse chronological order).

(Publications selected from over 150 peer-reviewed publications)

- Allen, R.M., Dykstra, L.A. and Carelli, R.M. (2007) Continuous exposure to a competitive NMDA receptor antagonist facilitates escalation of cocaine consumption in rats. *Psychopharmacology* 191: 341-351.
- Ward, S.J. and Dykstra, L.A. (2007) Attenuation of cue-induced reinstatement of ensure[®] but not corn oil seeking by the cannabinoid CB1 antagonists, SR141716A and CB1 knockout in mice. *Neuropsychopharmacology*
- Carrigan, K. A. and Dykstra, L.A. (2007) Behavioral effects of morphine and cocaine in M1 muscarinic acetylcholine receptor-deficient mice. *Psychopharmacology* 191: 985-993.
- Fischer, B.D. and Dykstra, L.A. (2006) Interactions between an NMDA antagonist and low-efficacy opioid receptor agonists in assays of schedule-controlled responding and thermal nociception. *J. Pharmacol. Exp. Ther.* 318:1300-1306.
- Ward, S.J. and Dykstra, L.A. (2005) The role of endogenous cannabinoids in sweet versus fat reinforcement: effect of CB1 receptor deletion, CB1 receptor antagonism (SR141716A), and CB1 receptor agonism (CP-55940). *Behav Pharmacol.* 16: 381-388.
- Allen, R.M., Carelli, R.M., Dykstra, L.A., Suchey, T.L., Everett, C.V. (2005) Effects of the competitive NMDA receptor antagonists, (-)-6-phosphonomethyl-deca-hydroisoquinoline-3-carboxylic acid (LY235959), on responding for cocaine under both fixed and progressive ratio schedules of reinforcement. *J. Pharmacol. Exp. Ther.* 315: 449-457
- Fischer, B.D., Carrigan, K.A. and Dykstra, L.A. (2005) Effects of N-methyl-D-aspartate receptor antagonists on acute morphine- and l-methadone-induced antinociception in mice. *J. Pain* 6: 425-433
- Hughes, C.E., Sigmon, S.C., Pitts, R.C. and Dykstra, L.A. (2005) Morphine tolerance as a function of ratio schedule: response requirement or unit price? *J. Exp. Anal. Behav.* 83: 281-296
- Medvedev, I.O., Bohn, L.M., Gainetdinov, R.R., Caron, M.G. and Dykstra, L.A. (2005) Characterization of conditioned place preference to cocaine in isogenic dopamine transporter knockout mice. *Psychopharmacology* 180: 408-413
- Carroll, F.I., Thomas, J.B., Dykstra, L.A., Granger, A.L., Allen, R.M., Howard, J.L., Pollard, G.T., Aceto, M.D. and Harris, L.S. (2004) Pharmacological properties of JD111: A novel μ -opioid receptor antagonist. *Eur. J. Pharmacol.* 501: 111-119
- Sotnikova, T.D., Budygin, E.A., Jones, S.R., Dykstra, L.A., Caron, M.G., Gainetdinov, R.R. (2004) Dopamine transporter-dependent and -independent actions of trace amine beta-phenylethylamine. *J. Neurochemistry* 91:362-373
- Bohn, L.M., Dykstra, L.A., Lefkowitz, R.J., Caron, M.G. and Barak, L.S. (2004) Relative efficacy is determined by the complements of the G protein-coupled receptor desensitization machinery. *Mol. Pharm.* 66:106-112
- Walker, E.A., Picker, M.J., Granger, A. and Dykstra, L.A. (2004) Effects of opioids in morphine-treated pigeons trained to discriminate among morphine, the low-efficacy agonist nalbuphine and saline. *J. Pharmacol. Exp. Ther.* 310: 150-158
- Allen, R.M., Granger, A.L. and Dykstra, L.A. (2003) The competitive NMDA receptor antagonist, LY235959, potentiates the antinociceptive effects of opioids that vary in efficacy at the μ -opioid receptor. *J. Pharmacol. Exp. Ther.* 307: 785-792
- Bohn, L.M., Gainetdinov, R.R., Sotnikova, T.D., Lefkowitz, R.J., Dykstra, L.A. and Caron, M.G. (2003) Enhanced Rewarding Properties of Morphine, but not Cocaine, in β -arrestin-2 Knockout Mice. *J. Neurosci.* 23: 10265-10273
- Dykstra, L.A., Granger, A.L., Allen, R.M. Xiaoyan Zhang and Kenner C. Rice (2002) Antinociceptive effects of the selective delta opioid agonist, SNC 80, alone and in combination with mu opioids in the squirrel monkey titration procedure. *Psychopharmacology* 163; 420-429
- Allen, R.M. and Dykstra, L.A. (2002) Dextromethorphan Potentiates the Antinociceptive Effects of Morphine and the Delta-Opioid Agonists SNC80 in Squirrel Monkeys. *J. Pharmacol. Exp. Ther.* 300:435-441
- Allen, R.M. and Dykstra, L.A. (2001) N-methyl-D-aspartate receptor antagonists potentiate the antinociceptive effects of morphine in squirrel monkeys. *J. Pharmacol. Exp. Ther.* 298: 288-297
- Walker, E.A., Picker, M.J. and Dykstra, L.A. (2001) Three-choice discrimination in pigeons is based on relative efficacy differences among opioids. *Psychopharmacology*. 155:389-398

- Allen, R.M. and Dykstra, L.A. (2000) The attenuation of mu-opioid tolerance and cross-tolerance by the competitive NMDA receptor antagonist, LY23595, is related to tolerance and cross-tolerance magnitude. J. Pharmacol. Exp. Ther. 295:1012-1021
- Allen, R.M. and Dykstra, L.A. (2000) NMDA receptor antagonists potentiate the antinociceptive effects of morphine in squirrel monkeys. J. Pharmacol. Exp. Ther. 298: 1-10
- Allen, R.M. and Dykstra, L.A. (2000) Opioid tolerance and the NMDA receptor: I. Role of morphine maintenance dose in the development of tolerance and its prevention by an NMDA receptor antagonist. Psychopharmacol. 148: 59-65.
- Allen, R.M. and Dykstra, L.A. (1999) The competitive NMDA receptor antagonist LY235959 modulates the progression of morphine tolerance in rats. Psychopharmacol. 142:209-214
- West, J.P., Dykstra, L.A., and Lysle, D.T. (1999) Immunomodulatory effects of morphine withdrawal in the rat are time-dependent and reversible by clonidine. Psychopharmacol. 146:320-327.
- Walker, E.A., Tiano, M.J., Benyas, S.I., Dykstra, L.A., and Picker, M.J. (1999) Naltrexone and B-funaltrexamine antagonism of the antinociceptive and response rate-decreasing effects of morphine, dezocine, and d-propoxyphene. Psychopharmacol. 144:45-53.
- Walker, E.A., Hawkins, E.R., Tiano, M.J., Picker, M.J., and Dykstra, L.A. (1999) Discriminative-stimulus effects of nalbuphine in nontreated and morphine-treated pigeons. Pharmacol Biochem Behav. 64(2):445-448
- Pitts, R.C., Allen, R.M., Walker, E.A., and Dykstra, L.A. (1998) Cloccinamox antagonism of the antinociceptive effects of micro-opioids in squirrel monkeys. J. Pharmacol. Exp. Ther. 285: 1997-1206
- Tiano, M.J., Walker, E.A., and Dykstra, L.A. (1998) Cross-tolerance to etorphine differentiates μ -opioid agonists in a rat tail withdrawal assay. Analgesia 3:251-257.
- West, J.P., Lysle, D.T., & Dykstra, L.A. (1997). Tolerance development to morphine-induced alterations of immune status. Drug and Alc. Dep., 46, 147-157.
- Nelson, C.J., Dykstra, L.A., & Lysle, D.T. (1997). Comparison of the time course of morphine's analgesic and immunologic effects. Anesth. Analg. 85, 620-626.
- Dykstra, L.A., Preston, K.L., and Bigelow, G.E. (1997) Discriminative stimulus effects of opioids with kappa activity: Data from Laboratory Animals and Human Subjects. Psychopharmacol. 130: 14-27.
- Hughes, C.E. and Dykstra, L.A. (1997) Antagonism of the response rate-decreasing effects of meperidine and morphine by B-funaltrexamine and naltrexone in squirrel monkeys. Drug and Alc. Dep. 45: 197-206.
- Fecho, K., Maslonek, K.A., Dykstra, L.A. and Lysle, D.T. (1997) Acetylcholinesterase monoclonal antibody-induced sympathectomy: effects on immune status and acute morphine-induced immunomodulation. Brain, Behavior and Immunity 11: 167-184.
- Pitts, R.C., West, J.P., Hapke, D.M., Morgan, D., Dykstra, L.A., and Picker, M.J. (1996) Opioids and rate of positively reinforced behavior: Antagonism by B-funaltrexamine. Exp. Clin. Psychopharm. 4: 389-395.
- Powell, K.R., and Dykstra, L.A. (1996) The role of serotonin in the effects of opioids in squirrel monkeys responding under a titration procedure.II. Mu Opioids. Psychopharmacol. 126: 42-49.
- Allen, R.M., Powell, K.R., and Dykstra, L.A. (1996) Effects of morphine and 8-OH-DPAT in a squirrel monkey tail-withdrawal procedure. Analgesia 2: 145-149.
- Lysle, D.T., Hoffman, K.E., and Dykstra, L.A. (1996) Evidence for the involvement of the caudal region of the periaqueductal gray in a subset of morphine-induced alterations of immune status. J. Pharmacol. Exp. Ther. 277: 1533-1540.
- Hughes, C.E., Dykstra, L.A., and Picker, M.J. (1996) Behavioral tolerance and cross-tolerance to the response rate-decreasing effects of mu opioids in rats. Behavioral Pharmacology 7: 228-236.
- Dykstra, L.A. (1995) Opioid Analgesics. In: C.R. Schuster, S.W. Gust and M.J. Kuhar (eds.) Handbook of Experimental Pharmacology. Springer-Verlag.

C. Current Research Support

R01-DA02749-30 Dykstra, L. (PI) 01/01/05 – 12/31/10

National Institute on Drug Abuse

Opioid Analgesics: Pharmacological and Behavioral Factors,

The specific research goals of this grant are based on evidence that the effects of opioid analgesics can be modulated by interactions between opioid and N-methyl-D-aspartate (NMDA) receptor systems. This project examines these interactions with emphasis on both the acute effects of morphine as well as the development of morphine tolerance.

Role: Principal Investigator

P20 MD00175-04 Harewood, K. (PI) 09/01/03 – 8/30/08

National Institutes of Health

EXPORT, Center of Excellence; Minority Health & Health Disparities

Functional Genomics of Stress and Substance Abuse, Core 2

The goal of this research core is to investigate the influence of prior drug exposure or stress on the reinforcing and the antinociceptive effects of opioid drugs as a function of the genomic differences between wildtype, heterozygous and homozygous strains of transgenic mice deficient in the CB1 cannabinoid receptor or gene regulatory proteins (fosB or CREB).

Role: Co-Investigator

T32-DA 07244-16-20 Dykstra, Linda A. (PI) 08/01/05 – 7/31/10

National Institute on Drug Abuse

Predocutorial Training in Interdisciplinary Research on Drug Abuse,

This program provides interdisciplinary, graduate training in areas related to drug and alcohol abuse for predoctoral students pursuing careers either in basic or in more clinically-related research on drug abuse. This training grant was recently renewed for its 4th, 5-year period.

Role: Director

5 K12 GM00678-08 Dykstra, Linda A. (PI) 09/01/05 – 08/31/09

National Institute of General Medical Sciences

SPIRE (Seeding Postdoctoral Innovators in Research & Education)

The SPIRE program is an innovative training program for postdoctoral fellows in the biomedical sciences. It is delivered through the University of North Carolina at Chapel Hill in partnership with seven historically minority universities within the state of North Carolina. The program provides research training as well as professional development and a year of hands-on teaching experience at minority-serving undergraduate institutions.

Role: Director