

# Ilan A. Kerman, M.D., Ph.D.

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## Professional Experience

- 2008-                      Research Investigator  
                                 Molecular and Behavioral Neuroscience Institute  
                                 University of Michigan  
                                 Ann Arbor, MI
- 2003-2008                Research Fellow  
                                 Laboratory of Dr. Stanley J. Watson  
                                 Molecular and Behavioral Neuroscience Institute  
                                 University of Michigan  
                                 Ann Arbor, MI
- 2002                        Resident Physician, Research Track Residency  
                                 Department of Psychiatry, University of Michigan  
                                 Ann Arbor, MI
- 1998                        Visiting Researcher  
                                 Laboratory of Dr. Robin M. McAllen  
                                 Howard Florey Institute of Experimental Physiology and Medicine  
                                 University of Melbourne, Melbourne, Vic., Australia
- 1993-1994                Research Assistant  
                                 Laboratory of Dr. John I. Simpson  
                                 Department of Physiology and Neuroscience  
                                 New York University School of Medicine  
                                 New York, NY
- 1993                        Research Assistant  
                                 Laboratory of Dr. Victor J. Wilson  
                                 Laboratory of Neurophysiology  
                                 The Rockefeller University, New York, NY

**Education**

1994-2002            Medical Scientist Training Program (MSTP)  
University of Pittsburgh School of Medicine  
Pittsburgh, PA

2002                 M.D.  
University of Pittsburgh School of Medicine  
Pittsburgh, PA

1999                 Ph.D.  
Department of Neuroscience,  
University of Pittsburgh, Pittsburgh, PA

1998                 M.S.  
Department of Neuroscience  
University of Pittsburgh, Pittsburgh, PA

1993                 B.A.  
College of Arts and Science  
New York University, New York, NY

**Funding – current**

NIMH 1K99MH081927-01A1

**Role:** Principal Investigator

**Project Title:** Neural Substrates of Somatomotor and Autonomic Disturbances in Major Depression

**Source:** National Institute of Mental Health, NIH Pathway to Independence Award (K99/R00)

**Total Costs:** \$908,178

**Funding Dates:** 08/01/2008 – 07/31/2013

This grant focuses on elucidating neural substrates that may contribute to motor and autonomic symptoms of major depressive disorder. Proposed studies consist of neural circuit investigations, including virally-mediated neuroanatomical analyses and gene and protein expression studies in rodent models of depression. Results of these studies will then be translated to investigation of potential structural alterations in post-mortem brains harvested from depressed individuals.

NARSAD Young Investigator Award

**Role:** Principal Investigator

**Project Title:** Genome-wide Gene Expression Studies in Raphe Nuclei in Major Depression and Bipolar Disorder

**Source:** NARSAD

**Total Costs:** \$60,000

**Funding Dates:** 07/01/2007 – 6/30/2009

The aim of this grant is to apply laser capture microdissection and downstream gene expression analyses to characterize patterns of gene expression alterations in the raphe nuclei of mood disorder patients.

**Funding – completed**

Pilot Innovations Grants Program

**Role:** Co-Principal Investigator

**Project Title:** Gene Expression Alterations in the Monoaminergic Circuits of Depressed and Bipolar Subjects

**Source:** University of Michigan Comprehensive Depression Center

**Total Costs:** \$25,000

**Funding Dates:** 11/01/2006 – 12/31/2007

The aim of this grant is to combine laser capture microdissection with molecular biological and bioinformatics approaches for characterization of gene expression alterations in serotonergic and noradrenergic transmitter systems in postmortem brains of patients with major depressive disorder and bipolar disorder.

**Honors and Awards — postgraduate**

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|------|---|
| 2008 | Scholar, Career Development Institute (CDI) in Psychiatry sponsored by the University of Pittsburgh and Stanford University |
| 2007 | Young Investigator Memorial Travel Award, American College of Neuropsychopharmacology (ACNP)                                |
| 2004 | Institutional Nominee by the University of Michigan for the Burroughs Wellcome Fund Career Award in the Biomedical Sciences |

**Honors and Awards — graduate**

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|-----------|--|
| 1999      | Nominee for the Van Harreveld Memorial Award, Central Nervous System Section, American Physiological Society |
| 1998      | Travel Award, Center for Neuroscience, University of Pittsburgh  |
| 1997-1999 | Graduate Student Researchers Program Fellowship, NASA  |
| 1997      | Mellon Pre-doctoral Fellowship (declined), Faculty of Arts and Sciences, University of Pittsburgh            |

**Honors and Awards — undergraduate**

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|-----------|---|
| 1993      | <i>cum laude</i> graduating honors, College of Arts and Science, New York University                        |
| 1993      | Student-Athlete Academic Achievement Award, New York University   |
| 1992      | Summer Undergraduate Research Fellowship, Rockefeller University  |
| 1992      | Science and Engineering Research Semester, Lawrence Berkeley National Laboratory, U.S. Department of Energy |
| 1991-1993 | Dean's List, College of Arts and Science, New York University   |
| 1991      | Howard Hughes Undergraduate Research Fellowship, Center for Neural Science, New York University             |
| 1989-93   | Dean's Circle Scholar, College of Arts and Science, New York University                                     |

**Teaching Experience**

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|-------|---|
| 2002- | Research Mentor, Undergraduate Research Opportunity Program (UROP) University of Michigan |
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### **Teaching Experience (continued)**

- 1997-2000            Human Physiology course  
                         Guest Lecturer
- Acid-Base Balance in Health and Disease
  - Use of Echocardiography and Electrocardiography in Clinical Evaluation of Heart Structure and Function
- Faculty of Arts and Science, University of Pittsburgh
- 1998                    Medical Neuroscience course, Laboratory Instructor,  
University of Pittsburgh School of Medicine

### **Mentorship**

- James Spiropoulos – undergraduate student at the University of Pittsburgh, in the lab from 1997-1998; co-authored one abstract.
- Tina Mathur – undergraduate student at the University of Pittsburgh, in the lab from 1997-1998; went on to obtain an MPH and a PhD in the Department of Health and Physical Activity at the University of Pittsburgh.
- Ben Emanuel – undergraduate student at the University of Pittsburgh, in the lab from 1998-1999; co-authored one paper and two abstracts; completed medical school and is currently a resident in Neurology.
- Quan Kyle Zhu – undergraduate student at the University of Michigan, in the lab from 2002-2004.
- Bradley J. Buck – undergraduate student at the University of Michigan, in the lab from 2003-2006; awarded high graduating honors for a senior undergraduate research thesis completed under my supervision; co-authored two papers (as a first author on one) and two abstracts; earned M.S. in Physiology from Georgetown University, currently a student at the University of Toledo College of Medicine.
- Cyrus Shabrang – undergraduate student at the University of Michigan, in the lab from 2005-2008; co-authored one paper and one abstract; currently a student at the Case Western Reserve University School of Medicine.
- Devin Rosenthal – undergraduate student at the University of North Carolina Wilmington, in the lab during the Summer of 2006; co-authored one paper and one abstract; currently a PhD student in Cell and Molecular Biology (CMB) at the University of Michigan.
- Naome Muzamhindo – undergraduate student at the University of Michigan, in the lab from 2007-2008; currently a senior Neuroscience major; co-authored one abstract.
- Nina Vachhani – undergraduate student at the University of Michigan, in the lab from 2007-2008; currently a junior Neuroscience major; co-authored one abstract.
- Lyndsy Brenner – undergraduate student at the University of Michigan, in the lab from Summer 2008-present; currently a junior Nursing student.
- Amber Morykwas – undergraduate student at the University of Michigan; in the lab from Fall 2008-present; currently a junior.
- Nina Amilineni – undergraduate student at the University of Michigan; in the lab from Fall 2008-present; currently a junior.

**Mentorship (continued)**

-Alex Ku – undergraduate student at the University of Michigan, in the lab from Fall 2008-present; currently a freshman

**Professional Society**

Society for Neuroscience

**Ad Hoc Reviewing**

Analytical Biochemistry

Brain Research

Brain Research Bulletin

Experimental Brain Research

Journal of Comparative Neurology

Journal of Neuroendocrinology

Journal of Physiology

Journal of Vestibular Research

Molecular Psychiatry

Neuropsychiatric Disease and Treatment

Neuroscience

Neuroscience Letters

Progress in Neuro-Psychopharmacology & Biological Psychiatry

**Talks and Invited Presentations**

1998 – University of Pittsburgh, Pittsburgh, PA, title: “*Vestibular Influences on Different Outflow Limbs of the Sympathetic Nervous System*”

1998 – University of Newcastle, Newcastle, NSW, Australia, title: “*Are Vestibulosympathetic Reflexes Autonomically Patterned?*”

1999 – University of Pittsburgh, Pittsburgh, PA, title: “*Regional and Functional Patterning in the Expression of Vestibulosympathetic Reflexes*”

1999 – Opio, France, Programming Autonomic Function for Action conference, talk title: “*Patterns of Changes in Sympathetic Nervous System Activity During Vestibular Stimulation*”

1999 – London, England, University College of London, title: “*Patterns of Changes in Sympathetic Nervous System Activity During Vestibular Stimulation*”

2001 – University of Michigan, Ann Arbor, MI, title: “*Central Control of Sympathetic Function: Feedforward Regulatory Mechanisms & Possible Clinical Implications*”

2005 – New York Medical College, Valhalla, NY, title: “*Anatomy of Sympatho-Motor Circuits: Trans-Synaptic Tracing Studies with Recombinant Strains of the Pseudorabies Virus*”

### **Talks and Invited Presentations (continued)**

- 2006 – University of Michigan, Ann Arbor, MI, Pritzker Neuropsychiatric Disorders Research Consortium, Ann Arbor, MI, title: “*Progress Report on Brainstem and Hypothalamus Study*”
- 2007 – University of Michigan, Ann Arbor, MI, Undergraduate Research Opportunity Program (UROP), title: “*Use of Electronic Resources in Literature Research*”
- 2007 – University of Michigan, Ann Arbor, MI, Depression Center, title: “*Gene Expression Alterations in the Monoaminergic Circuits of Depressed and Bipolar Subjects*”
- 2007 – American College of Neuropsychopharmacology 46th Annual Meeting, Boca Raton, FL, title: “*Evidence for Transcriptional Dysregulation in the Dorsal Raphe in Major Depressive Disorder*”
- 2008 – Career Development Institute in Psychiatry, Pittsburgh, PA, title: “*Neural Substrates of Somatomotor and Autonomic Disturbances in Major Depression*”
- 2008 – University of Michigan, Ann Arbor, MI, Laboratory of Dr. Martin Myers, Metabolism, Endocrinology, and Diabetes (MEND), Department of Internal Medicine, title: “*Organization of Central Circuits Regulating Somatomotor and Sympathetic Functions*”
- 2008 – University of Michigan, Ann Arbor, MI, Pritzker Neuropsychiatric Disorders Research Consortium, Ann Arbor, MI, title: “*Brainstem and Hypothalamic Systems in Mood Disorders: LCM and Gene Expression Studies*”

### **Bibliography**

#### **Publications — In Preparation**

1. Bernard, R., **Kerman, I. A.**, Thompson, R. C., Meng, F., Evans, S. J., Amrein, I., Jones, E. G., Bunney, W. E., Barchas, J. D., Myers, R. M., Schatzberg, A. F., Akil, H., Watson, S. J. Altered expression of glutamate and glia-related genes in the locus coeruleus of patients with major depression. In preparation.
2. Gonsalvez, D. G., **Kerman, I. A.**, McAllen, R. M., Anderson, C. R. Cocaine and amphetamine-regulated peptide immunoreactivity identifies vasoconstrictor sympathetic preganglionic neurons in the rat. In preparation.
3. **Kerman, I. A.**, Bernard, R., Meng, F., Jones, E. G., Bunney, W. E., Barchas, J. D., Myers, R. M., Schatzberg, A. F., Thompson, R. C., Akil, H., Watson, S. J. Evidence for transcriptional dysregulation in the dorsal raphe in major depressive disorder. In preparation.
4. **Kerman, I. A.**, Bernard, R., Thompson, R. C., Jones, E. G., Bunney, W. E., Barchas, J. D., Myers, R. M., Schatzberg, A. F., Akil, H., Watson, S. J. Monoamine gene expression in the postmortem human brainstem: effects of age, mood disorders, and suicidality. In preparation.

5. **Kerman, I. A.\***, Clinton, S. M.\*, Bernard, R., Miller, S., Shabrang, C., Bedrosian, T. A., Orr, H., Akil, H., Watson, S. J. Disturbed circadian HPA axis functioning in the low responder rat model of comorbid depression and anxiety. In preparation. \* - **equal contributors**
6. **Kerman, I. A.\***, Clinton, S. M.\*, Burghardt, P. R., Akil, H., Watson, S. J. Rodent models of depression exhibit alterations in emotional-somatomotor but not limbic-autonomic circuits. In preparation. \* - **equal contributors**
7. **Kerman, I. A.**, Faouzi, M., Louis, G., Leshan, R., Leininger, G. M., Jones, J. C., Rhodes, C. J., Münzberg, H. Leptin receptor neurons in the dorsomedial hypothalamus as important regulators of preautonomic and neuroendocrine function in the paraventricular nucleus. In preparation.
8. Krolewski, D. M., Medina, A., **Kerman, I. A.**, Bernard, R., Burke, S., Jones, E. G., Bunney, W. E., Myers, R. M., Barchas, J. D., Schatzberg, A., Akil, H., Watson, S. J. Anatomical analysis of gene expression patterns in the anterior region of the human hypothalamus. In preparation.
9. Medina, A., Krolewski, D. M., **Kerman, I. A.**, Bernard, R., Jones, E. G., Bunney, W. E., Akil, H., Watson, S. J. Combining neurohistology and mRNA expression maps as a guide for anatomical alignments of the mammillary region of the human hypothalamus. In preparation.

#### **Publications — Peer-Reviewed Manuscripts**

1. Yates, B. J., Goto, T., **Kerman, I. A.**, Bolton, P. S. Responses of caudal medullary raphe neurons to natural vestibular stimulation. *Journal of Neurophysiology* 70:938-946, 1993
2. Yates, B. J., Grélot, L., **Kerman, I. A.**, Jakuš, J., Miller, A. D. Organization of vestibular inputs to nucleus tractus solitarius and adjacent structures in cat brainstem. *American Journal of Physiology* 267:R974-R983, 1994
3. Leonard, C. S., **Kerman, I.**, Blaha, G., Taveras, E., Taylor, B. Interdigitation of nitric oxide synthase-, tyrosine hydroxylase- and serotonin- containing neurons in and around the laterodorsal and pedunculopontine tegmental nuclei of the guinea pig. *Journal of Comparative Neurology* 362:411-432, 1995
4. Yates, B. J. and **Kerman, I. A.** Post-spaceflight orthostatic intolerance: possible relationship to microgravity-induced plasticity in the vestibular system. *Brain Research Reviews* 28:73-82, 1998
5. **Kerman, I. A.** and Yates, B. J. Regional and functional differences in the distribution of vestibulosympathetic reflexes. *American Journal of Physiology* 275:R824-R835, 1998
6. Bolton, P.S., **Kerman, I. A.**, Woodring, S.F., Yates, B. J. Influences of neck afferents on sympathetic and respiratory nerve activity. *Brain Research Bulletin* 47: 413-419, 1998
7. **Kerman, I. A.** and Yates, B. J. Patterning of somatosympathetic reflexes. *American Journal of Physiology* 277: R716-R724, 1999

8. **Kerman, I. A.**, Yates, B. J., McAllen, R. M. Anatomical patterning of vestibulosympathetic reflexes. *American Journal of Physiology* 279:R109-R117, 2000
9. **Kerman, I. A.**, McAllen, R. M., Yates, B. J. Patterning of the sympathetic nerve activity in response to vestibular activation. *Brain Research Bulletin* 53:11-16, 2000
10. **Kerman, I. A.**, Emanuel, B. A., Yates, B. J. Vestibular stimulation leads to distinct hemodynamic patterning. *American Journal of Physiology* 279: R118-R125, 2000
11. Cameron, W. E., Núñez-Abades, P. A., **Kerman, I. A.**, Hodgson, T. M. Role of potassium conductances in determining input resistance of developing brain stem motoneurons. *Journal of Neurophysiology* 84: 2330-2339, 2000
12. Biegon, A. and **Kerman, I. A.** Autoradiographic study of pre- and postnatal distribution of cannabinoid receptors in human brain. *Neuroimage* 14:1463-1468, 2001
13. **Kerman, I. A.**, Enquist, L. W., Watson, S. J. Yates, B. J. Brainstem substrates of sympatho-motor circuitry identified using transsynaptic tracing with pseudorabies virus recombinants. *Journal of Neuroscience* 23:4657-4666, 2003
14. **Kerman, I. A.**, Buck, B. J., Evans, S. J., Akil, H. Watson, S. J. Combining laser capture microdissection with quantitative real-time PCR: effects of tissue manipulation on RNA quality and gene expression. *Journal of Neuroscience Methods* 153:71-85, 2006, Epub December 5<sup>th</sup>, 2005. One of Top 25 Hottest Articles published in *Journal of Neuroscience Methods* from January-June 2006:  
[http://top25.sciencedirect.com/index.php?subject\\_area\\_id=18&journal\\_id=01650270&cat\\_id=7](http://top25.sciencedirect.com/index.php?subject_area_id=18&journal_id=01650270&cat_id=7)
15. **Kerman, I. A.**, Akil, H., Watson, S. J. Rostral elements of sympatho-motor circuitry: a virally-mediated transsynaptic tracing study. *Journal of Neuroscience* 26:3423-3433, 2006
16. **Kerman, I. A.**, Shabrang, C., Taylor, L., Akil, H., Watson, S. J. Relationship of presympathetic-premotor neurons to the serotonergic transmitter system in the rat brainstem. *Journal of Comparative Neurology* 499:882-896, 2006, Epub October 27<sup>th</sup>, 2006
17. Buck, B. J.\*, **Kerman, I. A.\***, Burghardt, P. R., Koch, L. G., Britton, S. L., Akil, H., Watson, S. J. Upregulation of GAD65 mRNA in the medulla of the rat model of metabolic syndrome. *Neuroscience Letters* 419:178-183, 2007, Epub April 25<sup>th</sup>, 2007  
\* - equal contributors
18. **Kerman, I. A.**, Bernard, R., Rosenthal, D., Beals, J., Akil, H, Watson, S. J. Distinct populations of presympathetic-premotor neurons express orexin or melanin-concentrating hormone in the rat lateral hypothalamus. *Journal of Comparative Neurology* 505:586-601, 2007, Epub October 9<sup>th</sup>, 2007. Selected by Faculty of 1000 Biology:  
<http://www.f1000biology.com/article/id/1092424/evaluation>
19. **Kerman, I. A.** Organization of brain somatomotor-sympathetic circuits. *Experimental Brain Research* 187:1-16, Epub March 28<sup>th</sup>, 2008

20. Bernard, R. \*, **Kerman, I. A.** \*, Meng, F., Evans, S. J., Amrein, I., Jones, E. G., Bunney, Jr., W. E., Akil, H., Watson, S. J., Thompson, R. C. Gene expression profiling of neurochemically-defined regions of the human brain by in situ hybridization-guided laser capture microdissection. In press in *Journal of Neuroscience Methods*. Epub November 25th, 2008.

\* - equal contributors

21. Sonmez, K., Zaveri, N. T., **Kerman, I. A.**, Burke, S., Neal, C. R., Watson, S. J., Toll, L. Evolutionary sequence modeling for discovery of peptide hormones. *PLoS Computational Biology* 5:e1000258, 2009.  
Top featured Research Selection, *PLoS Computational Biology*, January 2009

### **Publications — Book Chapters**

1. Yates, B. J., Bolton, P. S., Goto, T., **Kerman, I. A.**, Miller, A. D. The role of the ventral brainstem in vestibulosympathetic and vestibulorespiratory reflexes. Ventral Brainstem Mechanisms and Control of Respiration and Blood Function, Ed.: C. O. Trueth, R. M. Millis, H. Kiwull-Shöne, M. E. Schläfke. Marcel-Dekker, New York, NY, 1995, pp. 181-191
2. Biegon, A. and **Kerman, I.** Quantitative autoradiography and cannabinoid receptors in the human brain post-mortem. Sites of Drug Action in the Human Brain, Ed.: A. Biegon and N.D. Volkow. CRC Press, Boca Raton, FL, 1995, pp. 65-74
3. Yates, B. J., Holmes, M. J., Jian, B. J., **Kerman, I. A.** Vestibular influences on cardiovascular control during movement. Textbook of Audiological Medicine, Ed.: L. M. Luxon. Taylor and Francis, London, UK, 2003, pp. 691-700

### **Publications — Abstracts**

1. Leonard, C. S., **Kerman, I.**, Blaha, G., Taveras, E. Anatomical relations between NADPH-diaphorase (ND), tyrosine hydroxylase (TH) and serotonin (5-HT) containing neurons of the guinea pig mesopontine tegmentum: a quantitative light microscopic study, *Society for Neuroscience Abstracts* 18:98, 1992
2. **Kerman, I.**, Bar-Peled, O., Biegon A. Age dependent changes in human brain cannabinoid receptor distribution. *Society for Neuroscience Abstracts* 18:372, 1992
3. Yates, B. J., Bolton, P. S., Goto, T., **Kerman, I. A.**, Miller, A. D. Vestibular input to the ventral brainstem: role in vestibulo- sympathetic and respiratory reflexes. *Ventral Brainstem Mechanisms and Control Functions (Satellite Symposium to 23rd Society for Neuroscience Meeting)*, Washington, D.C., 1993
4. Goto, T., **Kerman, I.**, Bolton, P. S., Yates, B. J. Analysis of vestibular input to caudal medullary raphespinal neurones by natural stimulation in the cat. *Neuroscience Research Supplement* 18:S168, 1993
5. Bolton, P. S., Goto, T., **Kerman, I. A.**, Yates, B. J. Descending pathways responsible for vestibulo-sympathetic responses. *Bárány Society Meeting*, Sydney, Australia, 1996

6. **Kerman, I. A.** and Yates, B. J. Adrenal nerve responses to electrical vestibular stimulation. *Society for Neuroscience Abstracts* 22:92, 1996
7. Yates, B. J., Steinbacher, B. C., **Kerman, I. A.**, Jian, B. J., Woodring, S. F., Miller, A. D. Vestibular influences on autonomic control: role in maintenance of homeostasis. *International Workshop on Motion Sickness*, Marabella, Spain, 1997
8. **Kerman, I. A.** and Yates, B. J. Regional and functional differences in sympathetic nerve responses to electrical vestibular stimulation. *National MD/PhD Student Conference*, Aspen, CO., 1997
9. **Kerman, I. A.**, Spiropoulos, J., Yates, B. J. Regional and functional differences in sympathetic nerve responses to electrical vestibular stimulation. *Society for Neuroscience Abstracts* 23: 1518, 1997
10. Bolton, P. S., **Kerman, I. A.**, Woodring, S. F., Yates, B. J. Influences of neck afferents on sympathetic and respiratory nerve activity. *Society for Neuroscience Abstracts* 23: 753, 1997
11. Bolton, P. S., **Kerman, I. A.**, Woodring, S. F., Yates, B. J. Integration of vestibular and neck influences on cardiovascular and respiratory control. *Association for Research in Otolaryngology Midwinter Meeting*, St. Petersburg, FL., 1998
12. **Kerman, I. A.** and Yates, B. J. Quantitative differences in the distribution of somato-sympathetic reflexes. *Society for Neuroscience Abstracts* 24:623, 1999
13. **Kerman, I. A.**, Yates, B. J., McAllen, R. M. Are vestibulosympathetic reflexes patterned anatomically? *Proceedings of the Australian Society for Neuroscience Abstracts* 10:75, 1999
14. **Kerman, I. A.**, Yates, B. J., McAllen, R. M. Are vestibulosympathetic reflexes patterned anatomically? *FASEB Journal* 13:A450, 1999
15. **Kerman, I. A.**, McAllen, R. M., Emanuel, B. A., Yates, B. J. Patterns of changes in sympathetic nervous system activity during vestibular stimulation. *Programming Autonomic Function for Action Meeting*, Opio, France, 1999
16. **Kerman, I. A.**, Emanuel, B. A., Yates, B. J. Vestibular stimulation leads to distinct hemodynamic changes. *Society for Neuroscience Abstracts* 25:1955, 1999
17. Mori, R. L., Bergsman, A. E., **Kerman, I. A.**, Holmes, M. J., Yates, B. J. The role of the medial medullary reticular formation in relaying vestibular signals to respiratory motoneurons. *Society for Neuroscience Abstracts* 26:1460, 2000
18. **Kerman, I. A.**, Cloonan K., Card J. P., Yates B. J. Neurons of the medial medullary reticular formation are part of the central command circuitry. *Science 2001*, University of Pittsburgh Research Symposium, 2001
19. **Kerman, I. A.**, Hartge K., Card J. P., Yates B. J. Neurons of the medial medullary reticular formation are part of the central command circuitry. *Society for Neuroscience Abstracts*, 2001, accessed at <http://sfn.scholarone.com/itin2001/>

20. **Kerman, I. A.**, Card J. P., Yates B. J. A novel bulbospinal projection with collaterals to sympathetic preganglionic neurons and motoneurons: a possible neuroanatomical substrate for motor and autonomic dysfunction in psychiatric disorders. *American College of Neuropsychopharmacology Annual Meeting*, Waikoloa, HI, 2001
21. **Kerman, I. A.**, Card J. P., Watson, S. J., Yates B. J. Neural circuits coordinating motor and sympathetic outflows: possible clinical implications. *American College of Neuropsychopharmacology Annual Meeting*, San Juan, Puerto Rico, December, 2002
22. **Kerman, I. A.**, Card, J. P., Watson, S., Yates B. Definition of neural circuits coordinating motor and sympathetic outflows using Pseudorabies virus. *FASEB Abstracts*, 2003, accessed at <http://select.biosis.org/faseb/>
23. **Kerman, I.**, Buck, B., Watson, S. Neurochemical phenotyping of rat ventromedullary neurons using laser capture microdissection (LCM) and RT-PCR. *FASEB Abstracts*, 2004, accessed at <http://select.biosis.org/faseb/>
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26. **Kerman, I. A.** and Watson, S. J. Rostral elements of sympatho-motor circuitry. Program No. 305.6. *2005 Abstract Viewer/Itinerary Planner*. Washington, DC: *Society for Neuroscience*, 2005. Online.
27. Shabrang, C., **Kerman, I. A.**, Taylor, L., Akil, H., Watson, S. J. Relationship between sympatho-motor neurons and the serotonergic transmitter system in the rat brainstem. 722.2. *2006 Abstract Viewer/Itinerary Planner*. Washington, DC: *Society for Neuroscience*, 2006. Online.
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29. Buck, B. J., **Kerman, I. A.**, Burghardt, P. R., Koch, L. G., Britton, S. L., Akil, H., Watson, S. J. Upregulation of GAD65 mRNA in cardiovascular-regulatory regions in a rat model of metabolic syndrome. 454.14. *2006 Abstract Viewer/Itinerary Planner*. Washington, DC: *Society for Neuroscience*, 2006. Online.
30. Bernard, R., **Kerman, I. A.**, Thompson, R.C., Burke, S., Amrein, I., Meng, F., Evans, S. J., Jones, E. G., Bunney, W. E., Myers, R. M., Akil, H., Watson, S.J. Glutamate and fibroblast growth factor signaling pathways in Locus coeruleus are altered in major depressive disorder

- (MDD) but not in bipolar disorder (BPD). 191.10. *2006 Abstract Viewer/Itinerary Planner*. Washington, DC: *Society for Neuroscience*, 2006. Online.
31. Medina, A., Krolewski, D., **Kerman, I.**, Bernard, R., Burke, S., Jones, E. G., Bunney, Jr, W., Akil, H., Watson, S. J. Combining neurohistology and mRNA expression maps as a guide for anatomical alignments of the mammillary region of the human hypothalamus. 85.19. *2007 Abstract Viewer/Itinerary Planner*. Washington, DC: *Society for Neuroscience*, 2007. Online.
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