

UNIVERSITY OF PENNSYLVANIA - PERELMAN SCHOOL OF MEDICINE  
Curriculum Vitae

Date: 03/15/2018

Max B. Kelz, MD PhD

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Philadelphia, PA 19104 United States

If you are not a U.S. citizen or holder of a permanent visa, please indicate the type of visa you have:  
none (U.S. citizen)

Education:

1993	BS	Yale University (Molecular Biophysics and Biochemistry)
1993	MS	Yale University (Molecular Biophysics and Biochemistry)
1999	PhD	Yale University (Neuroscience)
2000	MD	Yale University (Medicine)

Postgraduate Training and Fellowship Appointments:

2000-2001	Transitional Internship, University of Pennsylvania Perelman School of Medicine
2001-2004	Resident in Anesthesiology, University of Pennsylvania Perelman School of Medicine

Military Service:  
[none]

Faculty Appointments:

2004-2014	Assistant Professor of Anesthesiology and Critical Care, University of Pennsylvania School of Medicine
2014-2016	Associate Professor of Anesthesiology and Critical Care, University of Pennsylvania School of Medicine
2016-present	David E. Longnecker Associate Professor of Anesthesiology and Critical Care, University of Pennsylvania School of Medicine

Hospital and/or Administrative Appointments:

2004-present	Attending Anesthesiologist, Hospital of the University of Pennsylvania
2012-present	Chair of Admissions, Department of Neuroscience MD PhD program, University of Pennsylvania, Perelman School of Medicine
2013-present	MSTP Program Advisor, University of Pennsylvania
2013-2015	Ombudsman, Department of Anesthesiology & Critical Care, University of Pennsylvania

2014-present	Director for Research Education, Department of Anesthesiology, University of Pennsylvania, Perelman School of Medicine
2015-present	Member, Committee on Appointments and Promotions, Department of Anesthesiology, University of Pennsylvania
2017-present	Ombudsman, Department of Anesthesiology and Critical Care, University of Pennsylvania
2017-present	Education Council Member, Children's Hospital of Philadelphia, Department of Anesthesiology

Other Appointments:

2000-2004	Postdoctoral Researcher, University of Pennsylvania, Department of Pharmacology, Laboratory of Dr. James Eberwine
2005-present	Member, Mahoney Institute of Neurological Sciences, University of Pennsylvania
2005-present	Member, Penn Genomics Institute, University of Pennsylvania
2005-present	Member, Neuroscience Graduate Group, University of Pennsylvania
2006-present	Member, Graduate Group in Pharmacological Sciences, University of Pennsylvania
2006-present	Member, Center for Sleep and Circadian Neurobiology, University of Pennsylvania
2006-present	Member, Institute for Translational Medicine and Therapeutics

Specialty Certification:

2001	Diplomat, National Board of Medical Examiners
2005	Diplomat, American Board of Anesthesiology

Licensure:

2005-present	State of Pennsylvania
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Awards, Honors and Membership in Honorary Societies:

1992	Richter Fellow, Davenport College, Yale University
1993	B. Edward Bensinger III prize, Yale University
1996	Farr Scholar, Yale University
1997-2000	NIH Predoctoral National Research Service Award
1999-2000	Yale University Outstanding Doctoral Thesis Award
2000	Farr Scholar, Yale University
2003	Sir James Young Simpson Award
2006-2007	McCabe Pilot award
2010	American Society of Anesthesiologists Presidential Scholar Award
2010	Elected to the Association for University Anesthesiologists
2011-2014	Elected to the Scientific Advisory Board of the Association of University Anesthesiologists

2011	Selected as the ACES Scholar visiting professor, Duke University
2013	Selected to deliver the 27th Annual Helrich Matjasko Lecture, University of Maryland Department of Anesthesiology
2016	Appointed with the Inagural David E. Longnecker Endowed Chair
2017	Elected to the Academy of Research Mentors, Foundation for Anesthesia Education and Research

Memberships in Professional and Scientific Societies and Other Professional Activities:

International:

2000-Present	International Anesthesia Research Society (Member, IARS Mentored Research Training Grant Reviewer 2014-Present)
2011-Present	Sleep Research Society (Member)

National:

1993-Present	Society for Neuroscience (Member)
2000-Present	American Society of Anesthesiologists (Member, Committee on Anesthetic Action and Biochemistry 2006-2007; Committee on Experimental Neurosciences 2015-present, Committee on Excellence in Research 2010-present)
2010-Present	Association of University Anesthesiologists (Member)
2010-Present	Society for Anesthesia and Sleep Medicine (Founding Member)
2011-Present	Society for Neuroscience in Anesthesia and Critical Care (Member)

Local:

2004-Present	Pennsylvania Society of Anesthesiologists (Member)
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Editorial Positions:

2006-Present	Ad hoc reviewer, Brain Research
2006-Present	Ad hoc reviewer, Anesthesiology
2006-Present	Ad hoc reviewer, Biological Psychiatry
2008-Present	Ad hoc reviewer, Journal of Neuroscience
2009-Present	Ad hoc reviewer, Clinical Pharmacology & Therapeutics
2009-Present	Ad hoc reviewer, Pain
2009-Present	Ad hoc reviewer, Experimental Neurology
2009-Present	Ad hoc reviewer, New England Journal of Medicine
2010-present	Ad hoc reviewer, Sleep
2010-Present	Ad hoc reviewer, Anesthesia & Analgesia
2010-Present	Ad hoc reviewer, Journal of Clinical Anesthesia
2010-Present	Ad hoc reviewer, Journal of Cerebral Blood Flow and Metabolism

2010-Present	Ad hoc reviewer, Proceedings of the National Academy of Sciences
2010-Present	Ad hoc reviewer, Journal of Clinical Investigation
2011-Present	Ad hoc reviewer, Journal of Neurochemistry
2011-Present	Ad hoc reviewer, British Journal of Anaesthesia
2011-Present	Ad hoc reviewer, PLoS One
2011-Present	Ad hoc reviewer, Behavioral Brain Research
2012-Present	Ad hoc reviewer, Current Biology
2012-2016	Editorial Board Member, Sleep
2013-2016	Editorial Board Member, BMC Anesthesiology
2013-Present	Editorial Board Member, Current Anesthesia Reports
2013-Present	Ad hoc reviewer, Psychopharmacology
2014-Present	Ad hoc reviewer, Progress in Neurobiology
2014-Present	Ad hoc reviewer, Frontiers in Systems Neuroscience
2015-Present	Ad hoc reviewer, CNS Neuroscience & Therapeutics
2015-Present	Ad hoc reviewer, Neuropeptides
2015-Present	Ad hoc reviewer, Critical Care Medicine
2016-Present	Ad hoc reviewer, Journal of Clinical Monitoring and Computing
2016-Present	Ad hoc reviewer, Consciousness and Cognition
2017-Present	Ad hoc reviewer, Brain and Behavior
2017-Present	Ad hoc reviewer, Canadian Journal of Pharmacology and Physiology
2018-Present	Ad hoc reviewer, Journal of Clinical Medicine
2018-Present	Ad hoc reviewer, Scientific Reports

#### Academic and Institutional Committees:

2005-Present	Member, Rotation Talk Committee, Neuroscience
2005-Present	Member, Department of Anesthesiology Residency Selection Committee
2006-Present	Member, Anesthesia Education Committee
2007-Present	Member, University of Pennsylvania Conflict of Interest Standing Committee
2007	Member, Britter Gundersen's PhD Preliminary Committee, Department of Neuroscience
2007-2012	PhD Thesis Advisor for Jason Moore, Department of Neuroscience
2008-2009	Member, Christopher Vecsey's PhD Thesis Committee, Department of Neuroscience
2008-Present	Member, Neuroscience Graduate Group MD/PhD Admissions Committee
2009-2012	Member, Mathiew Wimmer's PhD Thesis Committee, Department of Neuroscience
2009-2010	Member, Amanda Crocker's PhD Thesis Committee, Department of Neuroscience
2009-2014	PhD thesis Advisor for Hilary McCarren, Department of Pharmacology
2010	Member, Kevin Snyder's PhD Preliminary Committee, Department of Neuroscience

2011-2015	Chairman, Adam Watson's PhD Thesis Committee, Department of Neuroscience
2012	Member, Ali Buch's PhD Qualifying Exam Committee, Department of Neuroscience
2012	Member, Brian Weiser's PhD Qualifying Exam Committee, Department of Pharmacology
2012	Member, Nick Trojanowski's PhD Qualifying Exam Committee, Department of Neuroscience
2012-Present	Chairman, Neuroscience Graduate Group's MD PhD Admission Committee
2012-2015	Member, Ali Buch PhD Thesis Committee, Department of Neuroscience
2012-2014	Member, Brian Weiser's PhD Thesis Committee, Department of Pharmacology
2013-2015	Ombudsman, Department of Anesthesiology
2013-2017	Graduate Thesis Advisor for Kaitlyn Maier, Department of Pharmacology
2014	Member, Gregory Artiushin's PhD preliminary exam committee, Department of Neuroscience
2014-2015	Chairman, Kellie Woll Pharmacology PhD Qualifying exam committee
2015-2016	Member, Sheng Tang PhD Qualifying Exam Committee Department of Neuroscience
2015-2017	Chairman, Kellie Woll's PhD Thesis Committee, Department of Pharmacology
2015-Present	PhD thesis advisor for Sarah Reitz, Department of Neuroscience
2015-2017	Member, Chris Angelakos PhD thesis committee
2016-Present	PhD Thesis Advisor for Adeeti Aggarwal Department of Neuroscience
2017	Chair, Jack Jacobs Candidacy Exam Committee, Department of Pharmacology
2017-Present	Member Jack Jacobs PhD thesis committee, Department of Pharmacology
2018-Present	Chair, Jennifer Staib PhD candidacy exam committee, Department of Neuroscience

Major Academic and Clinical Teaching Responsibilities:

1997-1998	Course Director and Lecturer, "Molecular Biology, Medicine, and Ethics", Yale University undergraduate course offering
1997-1998	Physiology Lecturer, Yale University, Physician Associate Program
2004-Present	Resident Education, Department of Anesthesiology and Critical Care
2004-Present	Medical Student Education: University of Pennsylvania Neurobiology, Physiology, and Pharmacology of Respiratory Control

2004-Present	University of Pennsylvania Department of Anesthesia Grand Rounds: Review of Sleep Neurobiology and Its Relevance to Anesthetic Action
2004-2006	Medical Student 200 Physiology Lecture Series: Physiology of Respiratory Control, University of Pennsylvania School of Medicine
2005-Present	Medical Student Education, University of Pennsylvania Anesthesia Day: History and Mystery of Anesthesiology
2006-Present	Resident Anesthesia Lecture Series, Muscle Relaxants
2006-2011	Anesthesia Resident Education: Small group leader
2006	"General Anesthetics Hijack Endogenous Sleep Pathways to Produce Hypnosis", University of Pennsylvania Department of Anesthesiology and Critical Care Grand Rounds
2007-2011	Instructor in Physiology and Anesthesiology Simulation Center designed to improve resident recognition and treatment for rare events
2007-Present	Resident Lecture Series: Pulmonary Physiology, Neural Control, and Effects of Anesthetics
2007-Present	Resident Lecture Series: Mechanisms of Anesthetic Action
2007-2012	PhD thesis Advisor for Jason Moore Department of Neuroscience
2009-Present	Structural Neurobiology (INSC593): The Hypothalamus
2009	"Neural Inertia: A barrier to cognitive restoration in flies, mice, and men," Department of Neurosurgery Grand Rounds, Philadelphia PA
2009-2014	PhD Thesis Advisor for Hilary McCarren, Department of Pharmacology
2010-2011	Course Co-Director, NGG 584: Neurobiology of Sleep and Arousal
2011-Present	Neuropharmacology (PHRM510/INSC596): Hypocretin/Orexin Neurophysiology
2011-Present	Medical Pharmacology, PHRM600 General Anesthetics
2012-2013	Course Co-Director, NGG 584: Neurobiology of Sleep and Arousal
2012-Present	Neurotransmitter Signaling and Pharmacology PHRM510/NGG510
2013-Present	PhD thesis advisor for Kaitlyn Maier, Department of Pharmacology
2013-Present	NeuroAnesthesia Resident Lecture Series: Strategies to Reduce Awareness Under Anesthesia
2014	Course Co-Director, NGG 584: Neurobiology of Sleep and Arousal
2014	"Exit from the Anesthetic State: Reconstructing Consciousness and Cognition in Humans", University of Pennsylvania Department of Neurosurgery Grand Rounds
2014-Present	NeuroAnesthesia Resident Lecture Series: EEG interpretation guides for estimating anesthetic depth
2016-Present	Medical Pharmacology 600 Lecturer: Local Anesthetics
2016-Present	Medical Pharmacology 600 Lecturer: Sedative Hypnotics
2017	Course Co-Director, NGG 584: Neurobiology of Sleep and Arousal

Lectures by Invitation (Last 5 years):

Apr, 2013	"Anesthetic activation of putative sleep promoting neurons contributes to drug-induced hypnosis," Wash U, St. Louis, MO
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- May, 2013 "Neuronal Mechanisms of Anesthetic Emergence," International Anesthesia Research Society 2013 Annual Meeting, San Diego CA
- Jun, 2013 "Hijacking Endogenous Sleep Circuits and the Neuronal Mechanisms of Anesthetic Induced Unconsciousness" Euroanaesthesia 2012 Congress, Barcelona, Spain
- Sep, 2013 "Helrich Matjasko 27th Annual Lecture in Anesthesiology," University of Maryland Department of Anesthesiology, Baltimore Maryland
- Sep, 2013 "Mechanisms of and Barriers to Anesthetic Emergence," University of Maryland Grand Rounds, Baltimore Maryland
- Oct, 2013 "Interfaces of Sleep and Anesthesia," American Society of Anesthesiologists Annual Meeting, San Francisco, CA
- Mar, 2014 "Pro-Con Debate: Depth of Anesthesia Monitoring is Expensive and Ineffective" 35th Western Anaesthesia Symposium Galway, Ireland
- Mar, 2014 "Anesthetic Hijacking of Endogenous Sleep Circuits", 35th Western Anaesthesia Symposium Galway, Ireland
- Oct, 2014 "Ascent from the Anesthetic Abyss: Adrenergic and Orexinergic Contributions" ASA Annual Meeting New Orleans, LA
- Oct, 2014 "Neural Inertia and the Neurobiology of Emergence" Society for Neuroscience in Anesthesiology and Critical Care 42nd Annual Meeting, New Orleans, LA
- Dec, 2014 "Negative Neural Inertia: Lessons from Unexpected Laboratory Findings," NS704 The Cognitive Neuroscience of Consciousness, University of Michigan, Ann Arbor, MI
- Dec, 2014 "Hypnosis and Anesthetic Recruitment of Sleep-Active VLPO Neurons," University of Michigan Department of Anesthesiology Grand Rounds, Ann Arbor, MI
- Feb, 2015 "Anesthetic Activation of Endogenous Sleep-Promoting Neurons: Quirky Coincidence or Critical Cause of Hypnosis" University of Washington, Seattle, WA
- May, 2015 "General Anesthetics Commandeer Endogenous Sleep-Active Systems to Produce Unconsciousness", Department of Pharmacology Research Seminar Series, Weill Cornell Medical College, New York, NY
- Jun, 2015 "Alpha-2 Adrenergic Stimulation of the VLPO Destabilizes the Anesthetic State," Mechanisms of Anesthesia Conference, Bonn, Germany
- Oct, 2015 "Preoptic Hypothalamus: A Gateway to Accessing and Maintaining Sleep and Anesthetic States," Cortex, Consciousness, and Anesthesia Conference, University of Wisconsin, Madison, WI
- Oct, 2015 "The Unresponsive Patient," Society for Neuroanesthesia and Critical Care Annual Meeting, San Diego, CA
- Dec, 2015 "Anesthesia and Sleep" Physician Scientist Mentorship Series, Thomas Jefferson University, Philadelphia, PA
- May, 2016 "NIH Mock Study Section for K-series grants," IARS-AUA Annual Meeting, San Francisco, CA

- Oct, 2016 "Under the Cortex: Subcortical Sites of Anesthetic Action," American Society of Anesthesiologists Annual Meeting, Chicago Illinois
- Mar, 2017 "Neuronal Mechanisms Underlying Anesthetic Unconsciousness" Stanford University, Palo Alto CA
- Apr, 2017 "Anesthetic Activation of Hypothalamic Sleep-Promoting Neurons: Coincidence or Convergent Cause of Hypnosis" Oxford University, England
- May, 2017 "Recent Advances in Neural Circuit Mechanisms of General Anesthesia" IARS 2017 Annual Meeting, Chicago, IL
- Oct, 2017 "Emergence from Anesthesia" ASA Annual Meeting, Boston MA
- Oct, 2017 "Reshaping Anesthesia through Neuroscience" ASA Annual Meeting Boston, MA
- Mar, 2018 "Anesthetic Hijacking of Endogenous Sleep Circuits," Basic Science Seminar University of Colorado Denver, CO
- Mar, 2018 "Schrodinger's Patient: Unconscious and Not," Department of Anesthesia Grand Rounds, University of Colorado Denver, CO
- Apr, 2018 "IARS Scholars Program: Moving from Insight to Scientific Premise to Research Program" IARS 2018 Annual Meeting, Chicago, IL

#### Organizing Roles in Scientific Meetings:

- Nov, 2007 International Working Group on Rodent Models of Narcolepsy San Diego, CA
- Oct, 2010 Founding Member for the Society for Anesthesia and Sleep Medicine San Diego, CA
- May, 2011 Scientific Advisory Board, Association of University Anesthesiologists Annual Meeting Philadelphia PA
- Oct, 2011 Steering Committee, International Consortium for EEG Training of Anesthesia Practitioners Interactive Website Training Module: <http://www.icetap.org/>
- May, 2012 Scientific Advisory Board, Association of University Anesthesiologists Annual Meeting Cleveland OH
- Apr, 2013 Scientific Advisory Board, Association of University Anesthesiologists 60th Annual Meeting Miami, Florida
- 2017 Dripps Anesthesia Research Fellowship Quarterly Seminar Series University of Pennsylvania, Philadelphia PA

#### Bibliography:

Research Publications, peer reviewed (print or other media):



1. Hope BT, Kelz MB, Duman RS, Nestler EJ: Chronic electroconvulsive seizure (ECS) treatment results in expression of a long-lasting AP-1 complex in brain with altered composition and characteristics. Journal of Neuroscience 14(7): 4318-28, Jul 1994.
2. Hope BT, Nye HE, Kelz MB, Self DW, Iadarola MJ, Nakabeppu Y, Duman RS, Nestler EJ: Induction of a long-lasting AP-1 complex composed of altered Fos-like proteins in brain by chronic cocaine and other chronic treatments. Neuron 13(5): 1235-44, Nov 1994.
3. Chen J, Nye HE, Kelz MB, Hiroi N, Nakabeppu Y, Hope BT, Nestler EJ: Regulation of delta FosB and FosB-like proteins by electroconvulsive seizure and cocaine treatments. Molecular Pharmacology 48(5): 880-9, Nov 1995.
4. Nye HE, Hope BT, Kelz MB, Iadarola M, Nestler EJ: Pharmacological studies of the regulation of chronic FOS-related antigen induction by cocaine in the striatum and nucleus accumbens. Journal of Pharmacology & Experimental Therapeutics 275(3): 1671-80, Dec 1995.
5. Chen J, Kelz MB, Hope BT, Nakabeppu Y, Nestler EJ: Chronic Fos-related antigens: stable variants of deltaFosB induced in brain by chronic treatments. Journal of Neuroscience 17(13): 4933-41, Jul 1 1997.
6. Wexler BE, Fulbright RK, Lacadie CM, Skudlarski P, Kelz MB, Constable RT, Gore JC: An fMRI study of the human cortical motor system response to increasing functional demands. Magnetic Resonance Imaging 15(4): 385-96, 1997.
7. Chen J, Kelz MB, Zeng G, Sakai N, Steffen C, Shockett PE, Picciotto MR, Duman RS, Nestler EJ: Transgenic animals with inducible, targeted gene expression in brain. Molecular Pharmacology 54(3): 495-503, Sep 1998.
8. Kelz MB, Chen J, Carlezon WA Jr, Whisler K, Gilden L, Beckmann AM, Steffen C, Zhang YJ, Marotti L, Self DW, Tkatch T, Baranauskas G, Surmeier DJ, Neve RL, Duman RS, Picciotto MR, Nestler EJ: Expression of the transcription factor deltaFosB in the brain controls sensitivity to cocaine. Nature 401(6750): 272-6, Sep 16 1999.
9. Nankova BB, Rivkin M, Kelz M, Nestler EJ, Sabban EL: Fos-related antigen 2: potential mediator of the transcriptional activation in rat adrenal medulla evoked by repeated immobilization stress. Journal of Neuroscience 20(15): 5647-53, Aug 1 2000.
10. Sabatakos G, Sims NA, Chen J, Aoki K, Kelz MB, Amling M, Bouali Y, Mukhopadhyay K, Ford K, Nestler EJ, Baron R: Overexpression of DeltaFosB transcription factor(s) increases bone formation and inhibits adipogenesis.[see comment] Nature Medicine 6(9): 985-90, Sep 2000.

11. Kelz MB, Kuszak JR, Yang Y, Ma W, Steffen C, Al-Ghoul K, Zhang YJ, Chen J, Nestler EJ, Spector A: DeltaFosB-induced cataract. Investigative Ophthalmology & Visual Science 41(11): 3523-38, Oct 2000.
12. Chen J, Zhang Y, Kelz MB, Steffen C, Ang ES, Zeng L, Nestler EJ: Induction of cyclin-dependent kinase 5 in the hippocampus by chronic electroconvulsive seizures: role of [Delta]FosB. Journal of Neuroscience 20(24): 8965-71, Dec 15 2000.
13. Sims NA, Sabatakos G, Chen JS, Kelz MB, Nestler EJ, Baron R: Regulating DeltaFosB expression in adult Tet-Off-DeltaFosB transgenic mice alters bone formation and bone mass. Bone 30(1): 32-9, Jan 2002.
14. Chen J, Kelz MB, Zeng G, Steffen C, Shockett PE, Terwilliger G, Schatz DG, Nestler EJ: Inducible, reversible hair loss in transgenic mice. Transgenic Research 11(3): 241-7, Jun 2002.
15. Sakai N, Thome J, Newton SS, Chen J, Kelz MB, Steffen C, Nestler EJ, Duman RS: Inducible and brain region-specific CREB transgenic mice. Molecular Pharmacology 61(6): 1453-64, Jun 2002.
16. Zachariou V, Bolanos CA, Selley DE, Theobald D, Cassidy MP, Kelz MB, Shaw-Lutchman T, Berton O, Sim-Selley LJ, Dileone RJ, Kumar A, Nestler EJ: An essential role for DeltaFosB in the nucleus accumbens in morphine action. Nature Neuroscience 9(2): 205-11, Feb 2006.
17. Sun Y, Chen J, Pruckmayr G, Baumgardner JE, Eckmann DM, Eckenhoff RG, Kelz MB: High throughput modular chambers for rapid evaluation of anesthetic sensitivity. BMC Anesthesiology. Biomed Central, 6(1): 13, November 2006.
18. Leach NT, Sun Y, Michaud S, Zheng Y, Ligon KL, Ligon AH, Sander T, Korf BR, Lu W, Harris DJ, Gusella JF, Maas RL, Quade BJ, Cole AJ, Kelz MB, Morton CC: Disruption of diacylglycerol kinase delta (DGKD) associated with seizures in humans and mice. American Journal of Human Genetics 80(4): 792-799, April 2007.
19. Zhu Y, Fenik P, Zhan G, Mazza E, Kelz M, Aston-Jones G, Veasey SC: Selective loss of catecholaminergic wake active neurons in a murine sleep apnea model. Journal of Neuroscience 27(37): 10060-71, Sep 2007.
20. Kelz MB, Sun Y, Chen J, Meng QC, Moore JT, Veasey SC, Dixon S, Thornton MI, Funato H, Yanagisawa M: An essential role for orexins in emergence from general anesthesia. Proceedings of the National Academy of Sciences 105(4): 1309-1314, January 2008 Notes: (Commentary in PNAS 2008 v.105(7) 2257-8, 18272494).

21. Gompf H, Chen J, Sun Y, Yanagisawa M, Aston-Jones G, Kelz MB : Halothane-induced hypnosis is not accompanied by inactivation of orexinergic output in rodents Anesthesiology 111(5): 1001-1009, November 2009.
22. Bianchi SL, Caltagarone MS, Oddo S, LeFerla FM, Eckenhoff RG, Kelz MB: Inhaled anesthetic potency in aged Alzheimer's mice. Anesthesia and Analgesia 110: 427-430, Feb 2010 Notes: Accompanied by an editorial: Anesthesia and Analgesia 2010 110:2 291-2. PMID 20081125.
23. Friedman EB, Sun Y, Moore JT, Tung H, Meng QC, Perera P, Joiner WJ, Thomas SA, Eckenhoff RG, Sehgal A, Kelz MB: A conserved behavioral state barrier impedes transitions between anesthetic-induced unconsciousness and wakefulness: Evidence for neural inertia PLOS ONE 5(7): e11903, July 2010 Notes: Editorial in Science Translational Medicine; <http://stm.sciencemag.org.proxy.lib.umich.edu/content/3/98/98ec140.full?sid=860ebb91-6c41-4158-9fe8-8cb38e8d91f6>.
24. Pick J, Chen Y, Moore JT, Sun Y, Wyner AJ, Friedman EB, Kelz MB: Rapid eye movement sleep debt accrues in mice exposed to volatile anesthetics. Anesthesiology 115(4): 702-712, Oct 2011 Notes: Accompanied by an editorial: Anesthesiology 2011 115(4)683-4. PMID 21829133.
25. Li RQ, McKinstry AR, Moore JT, Caltagarone BM, Eckenhoff MF, Eckenhoff RG, Kelz MB: Is hydrogen sulfide induced suspended animation general anesthesia? JPET 341(3): 735-42, June 2012.
26. Hu FY, Hanna GM, Wei H, Mardini F, Thomas SA, Wyner AJ, Kelz MB: Hypnotic hypersensitivity to volatile anesthetics and dexmedetomidine in dopamine  $\beta$ -hydroxylase knockout mice. Anesthesiology 117(5): 1006-17, November 2012 Notes: Published with an accompanying an Editorial, Sanders RD and Maze M, Anesthesiology 2012; 117:945-7.
27. Moore JT, Chen J, Han B, Meng Q-C, Veasey SC, Beck SG, Kelz MB: Direct activation of sleep-promoting VLPO neurons by volatile anesthetics contributes to anesthetic hypnosis. Current Biology 22: 2008-16, November 2012 Notes: Published with an editorial by Solt Current Biology 2012 22:R918-9. Publication was the subject of a Nature News and Views [http://www.nature.com/nature/journal/v491/n7422/full/491046a.html?WT.ec\\_id=NATURE-20121101](http://www.nature.com/nature/journal/v491/n7422/full/491046a.html?WT.ec_id=NATURE-20121101).
28. Weiser BP, Kelz MB, Eckenhoff RG: In vivo activation of azi-propofol prolongs anesthesia and reveals synaptic targets. J Biol Chem 288(2): 1279-85, Jan 2013.

29. Kretschmannova K, Hines RM, Revilla-Sanchez R, Terunuma M, Tretter V, Jurd R, Kelz MB, Moss SJ, Davies PA: Enhanced tonic inhibition influences the hypnotic and amnestic actions of the intravenous anesthetics etomidate and propofol. Journal of Neuroscience 33(17): 7264-73, April 2013.
30. Newman J, Blake K, Fennema J, Harris D, Shanks A, Avidan MS, Kelz MB, Mashour GA. : Incidence, risk factors and outcomes of postoperative coma: an observational study of 858,606 patients. European Journal of Anesthesiology 30(8): 476-82, Aug 2013.
31. Joiner WJ, Friedman EB, Hung H-T, Koh K, Sowcik M, Sehgal A, Kelz MB: Genetic and anatomical basis of the barrier separating wakefulness and anesthetic-induced unresponsiveness. PLoS Genetics 9(9): e1003605, September 2013 Notes: Published with an editorial by Sanders RD and Maze M: Take Off, Landing, and Fly Anesthesia PLoS Genetics 9(9): e1003788, 2013.
32. McCarren HS, Moore JT, Kelz MB: Assessing changes in volatile general anesthetic sensitivity of mice after local or systemic pharmacological intervention JoVE 80: e51079, October 2013.
33. Deutschman CS, Raj NR, McGuire EO, Kelz MB: Orexinergic Activity Modulates Altered Vital Signs and Pituitary Hormone Secretion in Experimental Sepsis. Critical Care Medicine 41(11): e368-75, Nov 2013.
34. Han B, McCarren HS, O'Neill D, Kelz MB: Distinctive Recruitment of Endogenous Sleep-promoting Neurons by Volatile Anesthetics and a Nonimmobilizer. Anesthesiology 121(5): 999-1009, Nov 2014.
35. Jaber SM, Hankenson FC, Heng K, McKinstry-Wu A, Kelz MB, Marx JO: Dose regimens, variability, and complications associated with using repeat-bolus dosing to extend a surgical plane of anesthesia in laboratory mice. J Am Assoc Lab Anim Sci. 53(6): 684-91, Nov 2014.
36. McCarren HS, Chalifoux MR, Han B, Moore JT, Meng QC, Baron-Hionis N, Sedigh-Sarvestani M, Contreras D, Beck SG, Kelz MB:  $\alpha$ 2-Adrenergic Stimulation of the VLPO Destabilizes the Anesthetic State. Journal of Neuroscience 34(49): 16385-96, Dec 2014.
37. Drobish JK, Kelz MB, DiPuppo P, Cook-Sather SD: Case report: Emergence delirium with transient associative agnosia and expressive aphasia reversed by flumazenil in a pediatric patient. Anesthesia & Analgesia Case Reports 11(4): 148-150, June 2015.
38. Gardner B, Strus E, Meng QC, Coradetti T, Naidoo NN, Kelz MB, Williams JA.: Sleep Homeostasis and General Anesthesia: Are Fruit Flies Well Rested after Emergence from Propofol? Anesthesiology 124(2): 404-16, Feb 2016.

39. Erickson RL, Terzi MC, Jaber SM, Hankenson FC, McKinstry-Wu A, Kelz MB, Marx JO.: Intraperitoneal Continuous-Rate Infusion for the Maintenance of Anesthesia in Laboratory Mice (*Mus musculus*). J Am Assoc Lab Anim Sci. 55(5): 548-57, September 2016.
40. Wasilczuk AZ, Proekt A, Kelz MB, McKinstry-Wu AR.: High-density Electroencephalographic Acquisition in a Rodent Model Using Low-cost and Open-source Resources. J Vis Exp. 117: e54908, Nov 2016.
41. Richardson Andrew G, Liu Xilin, Weigand Pauline K, Hudgins Eric D, Stein Joel M, Das Sandhitsu R, Proekt Alexander, Kelz Max B, Zhang Milin, Van der Spiegel Jan, Lucas Timothy H: Hippocampal gamma-slow oscillation coupling in macaques during sedation and sleep. Hippocampus Jul 2017.
42. Blain-Moraes Stefanie, Tarnal Vijay, Vanini Giancarlo, Bel-Behar Tarik, Janke Ellen, Picton Paul, Golmirzaie Goodarz, Palanca Ben J A, Avidan Michael S, Kelz Max B, Mashour George A: Network Efficiency and Posterior Alpha Patterns Are Markers of Recovery from General Anesthesia: A High-Density Electroencephalography Study in Healthy Volunteers. Frontiers in human neuroscience 11: 328, 2017.
43. Maier Kaitlyn L, McKinstry-Wu Andrew R, Palanca Ben Julian A, Tarnal Vijay, Blain-Moraes Stefanie, Basner Mathias, Avidan Michael S, Mashour George A, Kelz Max B: Protocol for the Reconstructing Consciousness and Cognition (ReCCognition) Study. Frontiers in human neuroscience 11: 284, 2017.
44. Mashour GA, Kelz MB: Systems Neuroscience: The Exciting Journey to Oblivion. Current Biology 28(5): R223-4, Mar 2018.

Research Publications, peer-reviewed reviews:

1. Nestler EJ, Kelz MB, Chen J: DeltaFosB: a molecular mediator of long-term neural and behavioral plasticity. Brain Research 835(1): 10-7, Jul 17 1999.
2. Kelz MB, Nestler EJ: deltaFosB: a molecular switch underlying long-term neural plasticity. [Review] [51 refs] Current Opinion in Neurology 13(6): 715-20, Dec 2000.
3. Kelz MB, Dent GW, Therianos S, Marciano PG, McIntosh TK, Coleman PD, Eberwine JH: Single-cell antisense RNA amplification and microarray analysis as a tool for studying neurological degeneration and restoration. Science of Aging Knowledge Environment 2002(1): re1, Jan 9 2002.
4. Eckenhoff R, Zheng W, Kelz M: From Anesthetic Mechanisms Research to Drug Discovery. Clin Pharmacol Ther 84(1): 144-8, July 2008.

5. Kelz MB, Friedman E: Anesthetic sensitivity: Learning to fly. Anesthesiology 111(1): 5-7, July 2009.
6. Kelz MB, Sleigh J: From the edge of oblivion: The dance between intrinsic neuronal currents and neuronal connectivity. Anesthesiology 116(5): 977-9. May 2012.
7. Scharf MT, Kelz MB: Sleep and anesthesia interactions: A pharmacological appraisal. Current Anesthesiology Reports 3(1): 1-9, Mar 2013 Notes: epub at <http://link.springer.com/article/10.1007/s40140-012-0007-0/fulltext.html>.

Contributions to peer-reviewed research publications, participation cited but not by authorship:

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The Perelman School of Medicine, commonly known as Penn Med, is the medical school of the University of Pennsylvania. It is located in the University City section of Philadelphia. Founded in 1765, the Perelman School of Medicine is the oldest medical school in the United States and is one of the seven Ivy League medical schools. Penn Med consistently ranks among the highest recipients of NIH research awards, and it is currently tied for 3rd place on U.S. News & World Report's "Best Medical Schools The Perelman School of Medicine (Penn Med), is the medical school of the University of Pennsylvania. It is an Ivy League school located in Philadelphia, Pennsylvania. Opened in 1765, Penn Med is the first and oldest medical school in the United States. Today, the Perelman School of Medicine is a chief place of biological and medical research and education. It is one of the country's top medical schools. The school ranks among the highest recipients of the National Institutes of Health research awards. The Perelman School of Medicine at University of Pennsylvania, or Penn Med, is the oldest medical school in the United States. Founded in 1765, it also operated the first school hospital in the nation. With 1,740 total students and over 2,300 full-time faculty members, the faculty-student ratio currently stands at approximately 4.8 to 1. Affiliated hospitals include Penn Presbyterian Medical Center, Hospital of the University of Pennsylvania and Pennsylvania Hospital. They give students the chance to get hands-on experience at leading institutes in the fields of AIDS, geriatrics and women's health.