

CURRICULUM VITAE

Xiaowen Bai PhD

Professor

Department of Cell Biology, Neurobiology and Anatomy

OFFICE ADDRESS:

Basic Science Building
8701 Watertown Plank Rd
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MCW TEACHING ACTIVITIES:

Pharmacy Student Education

10/2023 - Present Independent Research Course

Graduate Student Education

09/2018 - 03/2021 Developmental and Stem Cell Biology course (Mitochondria and Stem Cell Biology)

09/2019 - 09/2020 Molecules to Cells Course (Chemotherapy of Cancer_Targeting Nucleotide Metabolism)

02/2022 Advanced Cell Biology Course (Stem Cell-based Therapy)

04/2022 Professional Development Course

EXTRAMURAL TEACHING:

Medical Student Education

09/1996 - 07/2001 Beijing University of Chinese Medicine, Biochemistry Course for Medical Students

COMMUNITY SERVICE ACTIVITIES:

2015 - 2018 Poster Judge for MCW Graduate School and Postdoc Office Poster Day

10/2016 Moderator, Oral Session (Neurotoxicity), American Society of Anesthesiologist (ASA) Annual Meeting, Chicago

11/2016 Chair, Oral Session titled "Frontier Science of Stem Cell Biology and Breaking Multidisciplinary Research" at BIT's 10th Annual World Congress of Regenerative Medicine & Stem Cell, Nanjing, China

2016 - 2019 Chair, Science Review Committee of Badger State Science and Engineering Fair (BSSEF) program. Roles and achievement: As the Chair of the Science Review Committee of BSSEF, I have led and coordinated the efforts of the committee members. My responsibilities included addressing inquiries from students and teachers, reviewing project submissions, and ensuring strict adherence to the rules and guidelines set by the Intel International Science and Engineering Fair (ISEF), particularly for projects involving animal and human studies, as well as toxic and bio-hazardous materials. Under my and other committee members' leadership, we successfully organized the yearly BSSEF events, achieving significant accomplishments. Notably, in 2018, three exceptional high school students' projects from Wisconsin were awarded the opportunity to participate in the renowned ISEF event. These projects received recognition and accolades at ISEF, including the NASA Specialty Award, 1st Place in Biomedical & Health Sciences, Best of Category in Biomedical & Health Sciences, 1st Place in Animal Sciences, and Best of Category in Animal Sciences. Witnessing the enthusiasm for science research among Wisconsin's high school students has been an enriching experience, and I am honored to play a role in fostering their scientific curiosity.

2016 - 2019 Member, Badger State Science and Engineering Fair program committee. Roles: The primary goal of the BSSEF is to provide a platform for Wisconsin high school students to present and showcase

their original research projects. Our mission at BSSEF is to ignite enthusiasm for scientific research among students across Wisconsin.

2016 - 2023 Grant review for the applications submitted to AHW, Cancer Center, Clinical & Translational Science Institute (CTSI), Cardiovascular Center Grant, Herma Heart Institute at MCW.

2017 - 2019 Member, American Society of Anesthesiologist Neuroscience Abstract Review Committee

2017 - 2019 Poster Judge for MCW Research Day

10/2018 Moderator, Poster Session (Neuroscience), American Society of Anesthesiologist Annual Meeting

2018 Poster Judge for Proteomic Symposium Poster

2018 Poster Judge for MCW Cardiovascular Research Center Research Retreat Poster

03/2019 Member, the International Anesthesia Research Society Abstract Review on Neurosciences

2020 Poster Judge for the Summer Academic program for Medical Students (SAMS) and the Medical Student Summer Research Program (MSSRP)

2022 - Present Executive Director, Hematology of World Federation of Chinese Medicine Societies (WFCMS)

04/2023 Chair, Oral Session titled "Cellular and Molecular Neurobiology" at Cell and Experimental Biology, Houston

10/2023 MCW Responsible Conduct of Research (RCF) faculty facilitator

BIBLIOGRAPHY

Refereed Journal Publications/Original Papers

1. **Bai X**, Yan Y, Canfield S, Muravyeva MY, Kikuchi C, Zaja I, Corbett JA, Bosnjak ZJ. Ketamine enhances human neural stem cell proliferation and induces neuronal apoptosis via reactive oxygen species-mediated mitochondrial pathway. *Anesth Analg*. 2013 Apr;116(4):869-80. PMID: PMC3606677
2. Twaroski DM, Yan Y, Olson JM, Bosnjak ZJ, **Bai X**. Down-regulation of microRNA-21 is involved in the propofol-induced neurotoxicity observed in human stem cell-derived neurons. *Anesthesiology*. 2014 Oct;121(4):786-800. PMID: PMC4174986
3. Zaja I, **Bai X**, Liu Y, Kikuchi C, Dosenovic S, Yan Y, Canfield SG, Bosnjak ZJ. Cdk1, PKC γ and calcineurin-mediated Drp1 pathway contributes to mitochondrial fission-induced cardiomyocyte death. *Biochem Biophys Res Commun*. 2014 Oct 31;453(4):710-21. PMID: PMC4312217
4. Ma CX, Song YL, Xiao L, Xue LX, Li WJ, Laforest B, Komati H, Wang WP, Jia ZQ, Zhou CY, Zou Y, Nemer M, Zhang SF, **Bai X**, Wu H, Zang MX. EGF is required for cardiac differentiation of P19CL6 cells through interaction with GATA-4 in a time- and dose-dependent manner. *Cell Mol Life Sci*. 2015 May;72(10):2005-22. PMID: PMC11113121
5. Kikuchi C, Bienengraeber M, Canfield S, Koopmeiner A, Schäfer R, Bosnjak ZJ, **Bai X**. Comparison of Cardiomyocyte Differentiation Potential Between Type 1 Diabetic Donor- and Nondiabetic Donor-Derived Induced Pluripotent Stem Cells. *Cell Transplant*. 2015;24(12):2491-504. PMID: PMC4627864
6. Olson JM, Yan Y, **Bai X**, Ge ZD, Liang M, Kriegel AJ, Twaroski DM, Bosnjak ZJ. Up-regulation of microRNA-21 mediates isoflurane-induced protection of cardiomyocytes. *Anesthesiology*. 2015 Apr;122(4):795-805. PMID: PMC4366274
7. Yu H, Fischer G, Ebert AD, Wu HE, **Bai X**, Hogan QH. Analgesia for neuropathic pain by dorsal root ganglion transplantation of genetically engineered mesenchymal stem cells: initial results. *Mol Pain*. 2015 Feb 12;11:5. PMID: PMC4331376
8. Twaroski DM, Yan Y, Zaja I, Clark E, Bosnjak ZJ, **Bai X**. Altered Mitochondrial Dynamics Contributes to Propofol-induced Cell Death in Human Stem Cell-derived Neurons. *Anesthesiology*. 2015 Nov;123(5):1067-83. PMID: PMC4632973
9. Canfield SG, Zaja I, Godshaw B, Twaroski D, **Bai X**, Bosnjak ZJ. High Glucose Attenuates Anesthetic Cardioprotection in Stem-Cell-Derived Cardiomyocytes: The Role of Reactive Oxygen Species and Mitochondrial Fission. *Anesth Analg*. 2016 May;122(5):1269-79. PMID: PMC5189917
10. Prantl L, Schreml J, Gehmert S, Klein S, **Bai X**, Zeitler K, Schreml S, Alt E, Gehmert S, Felthaus O. Transcription Profile in Sporadic Multiple Symmetric Lipomatosis Reveals Differential Expression at the Level of Adipose Tissue-Derived Stem Cells. *Plast Reconstr Surg*. 2016 Apr;137(4):1181-1190.
11. Sedlic F, Muravyeva MY, Sepac A, Sedlic M, Williams AM, Yang M, **Bai X**, Bosnjak ZJ. Targeted Modification of Mitochondrial ROS Production Converts High Glucose-Induced Cytotoxicity to Cytoprotection: Effects on Anesthetic Preconditioning. *J Cell Physiol*. 2017 Jan;232(1):216-24.

PMCID: PMC5028252

12. Yu H, Fischer G, Ebert AD, Wu HE, **Bai X**, Hogan QH. Analgesia for neuropathic pain by dorsal root ganglion transplantation of genetically engineered mesenchymal stem cells: initial results. *Mol Pain*. 2015 Dec;11(1):2.
13. Fischer G, Wang F, Xiang H, **Bai X**, Yu H, Hogan QH. Inhibition of neuropathic hyperalgesia by intrathecal bone marrow stromal cells is associated with alteration of multiple soluble factors in cerebrospinal fluid. *Exp Brain Res*. 2017 Sep;235(9):2627-2638. PMCID: PMC6688185
14. Liu Y, Yan Y, Inagaki Y, Logan S, Bosnjak ZJ, **Bai X**. Insufficient Astrocyte-Derived Brain-Derived Neurotrophic Factor Contributes to Propofol-Induced Neuron Death Through Akt/Glycogen Synthase Kinase 3 β /Mitochondrial Fission Pathway. *Anesth Analg*. 2017 Jul;125(1):241-254. PMCID: PMC5484590
15. Yan Y, Qiao S, Kikuchi C, Zaja I, Logan S, Jiang C, Arzua T, **Bai X**. Propofol Induces Apoptosis of Neurons but Not Astrocytes, Oligodendrocytes, or Neural Stem Cells in the Neonatal Mouse Hippocampus. *Brain Sci*. 2017 Oct 14;7(10). PMCID: PMC5664057
16. Ge ZD, Li Y, Qiao S, **Bai X**, Wartier DC, Kersten JR, Bosnjak ZJ, Liang M. Failure of Isoflurane Cardiac Preconditioning in Obese Type 2 Diabetic Mice Involves Aberrant Regulation of MicroRNA-21, Endothelial Nitric-oxide Synthase, and Mitochondrial Complex I. *Anesthesiology*. 2018 Jan;128(1):117-129. PMCID: PMC5726897
17. Logan S, Jiang C, Yan Y, Inagaki Y, Arzua T, **Bai X**. Propofol Alters Long Non-Coding RNA Profiles in the Neonatal Mouse Hippocampus: Implication of Novel Mechanisms in Anesthetic-Induced Developmental Neurotoxicity. *Cell Physiol Biochem*. 2018;49(6):2496-2510. PMCID: PMC6221186
18. Pant T, Mishra MK, **Bai X**, Ge ZD, Bosnjak ZJ, Dhanasekaran A. Microarray analysis of long non-coding RNA and mRNA expression profiles in diabetic cardiomyopathy using human induced pluripotent stem cell-derived cardiomyocytes. *Diab Vasc Dis Res*. 2019 Jan;16(1):57-68.
19. Alt E, Yan Y, Gehmert S, Song YH, Altman A, Gehmert S, Vykoukal D, **Bai X**. Fibroblasts share mesenchymal phenotypes with stem cells, but lack their differentiation and colony-forming potential *Biology of the Cell*. August 2011;103(8):403.
20. Altman AM, Chiu ES, **Bai X**, Yan Y, Song YH, Newsome RE, Alt EU. Human adipose-derived stem cells adhere to acellular dermal matrix. *Aesthetic Plast Surg*. 2008 Jul;32(4):698-9.
21. Horikoshi Y, Yan Y, Terashvili M, Wells C, Horikoshi H, Fujita S, Bosnjak ZJ, **Bai X**. Fatty Acid-Treated Induced Pluripotent Stem Cell-Derived Human Cardiomyocytes Exhibit Adult Cardiomyocyte-Like Energy Metabolism Phenotypes. *Cells*. 2019 Sep 17;8(9). PMCID: PMC6769886
22. Niu X, Zhao Y, Yang N, Zhao X, Zhang W, **Bai X**, Li A, Yang W, Lu L. Proteasome activation by insulin-like growth factor-1/nuclear factor erythroid 2-related factor 2 signaling promotes exercise-induced neurogenesis. *Stem Cells*. 2020 Feb;38(2):246-260.
23. Pant T, Dhanasekaran A, **Bai X**, Zhao M, Thorp EB, Forbess JM, Bosnjak ZJ, Ge ZD. Genome-wide differential expression profiling of lncRNAs and mRNAs associated with early diabetic cardiomyopathy. *Sci Rep*. 2019 Oct 25;9(1):15345. PMCID: PMC6814824
24. Logan S, Arzua T, Yan Y, Jiang C, Liu X, Yu LK, Liu QS, **Bai X**. Dynamic Characterization of Structural, Molecular, and Electrophysiological Phenotypes of Human-Induced Pluripotent Stem Cell-Derived Cerebral Organoids, and Comparison with Fetal and Adult Gene Profiles. *Cells*. 2020 May 23;9(5). PMCID: PMC7291286
25. **Bai X**, Lu S, Bai C. . Effect of T-2 toxin on epiphyseal cartilage of tibiartarsi in chicks: histomorphological observations *Medical Recapitulate*. 1996; 113: 149-50.
26. **Bai X**, Ling L. Effect of low selenium on cartilage collagen metabolism. *Chinese Journal of Control of Endemic Diseases*. 2000; 152:93-4.
27. Bai L, **Bai X**, Bai C, Lu S. . Extraction and purification of type x collagen from growth plate of tibiartarsi in chicks. *Chin J Rheumatol* 3 (supplement). 1999; 44-5.
28. **Bai X**, Xiao Z, Pan Y, Hu J, Pohl J, Wen J, Li L. Cartilage-derived morphogenetic protein-1 promotes the differentiation of mesenchymal stem cells into chondrocytes. *Biochem Biophys Res Commun*. 2004 Dec 10;325(2):453-60.
29. Pan Y, Chen X, Wang S, Yang S, **Bai X**, Chi X, Li K, Liu B, Li L. In vitro neuronal differentiation of cultured human embryonic germ cells. *Biochem Biophys Res Commun*. 2005 Feb 11;327(2):548-56.
30. Yang Y, **Bai XW**, Song SJ, Ge LH, Cao CF. Mutation analysis of cathepsin C gene in a Chinese patient with pre-pubertal periodontitis. *Chin Med J (Engl)*. 2005 Jul 05;118(13):1109-12.
31. Yang Y, **Bai XW**, Liu HS, Cao CF, Ge LH. [Novel mutations of cathepsin C gene in two Chinese patients

- with Papillon-Lefèvre syndrome]. *Zhonghua Kou Qiang Yi Xue Za Zhi*. 2006 Oct;41(10):602-5.
32. **Bai X**, Pinkernell K, Song YH, Nabzdyk C, Reiser J, Alt E. Genetically selected stem cells from human adipose tissue express cardiac markers. *Biochem Biophys Res Commun*. 2007 Feb 16;353(3):665-71.
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 34. Liu HS, **Bai XW**, Yang Y, Ge LH. [Multilineage potential of pulp stem cells from human young permanent teeth in vitro]. *Beijing Da Xue Xue Bao Yi Xue Ban*. 2007 Feb 18;39(1):41-5.
 35. Yang Y, **Bai X**, Liu H, Li L, Cao C, Ge L. Novel mutations of cathepsin C gene in two Chinese patients with Papillon-Lefèvre syndrome. *J Dent Res*. 2007 Aug;86(8):735-8.
 36. **Bai X**, Ma J, Pan Z, Song YH, Freyberg S, Yan Y, Vykoukal D, Alt E. Electrophysiological properties of human adipose tissue-derived stem cells. *Am J Physiol Cell Physiol*. 2007 Nov;293(5):C1539-50.
 37. **Bai X**, Sadat S, Gehmert S, Alt E, Song YH. VEGF receptor Flk-1 plays an important role in c-kit expression in adipose tissue derived stem cells. *FEBS Lett*. 2007 Oct 02;581(24):4681-4.
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 39. Valina C, Pinkernell K, Song YH, **Bai X**, Sadat S, Campeau RJ, Le Jemtel TH, Alt E. Intracoronary administration of autologous adipose tissue-derived stem cells improves left ventricular function, perfusion, and remodelling after acute myocardial infarction. *Eur Heart J*. 2007 Nov;28(21):2667-77.
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 41. Schimroszyk K, Song YH, Vykoukal J, Vykoukal D, **Bai X**, Coleman M, Krohn A, Freyberg S, Alt EU. Liposome-mediated transfection with extract from neonatal rat cardiomyocytes induces transdifferentiation of human adipose-derived stem cells into cardiomyocytes. *Scand J Clin Lab Invest*. 2008;68(6):464-72.
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 47. Alt E, Yan Y, Gehmert S, Song YH, Altman A, Gehmert S, Vykoukal D, **Bai X**. Fibroblasts share mesenchymal phenotypes with stem cells, but lack their differentiation and colony-forming potential. *Biol Cell*. 2011 Apr;103(4):197-208.
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 50. Bosnjak ZJ, Yan Y, Canfield S, Muravyeva MY, Kikuchi C, Wells CW, Corbett JA, **Bai X**. Ketamine induces toxicity in human neurons differentiated from embryonic stem cells via mitochondrial apoptosis pathway. *Curr Drug Saf*. 2012 Apr;7(2):106-19. PMID: PMC3684944
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- Ross GR, Rizvi F, Tajik AJ, Jahangir A. Biphasic effect of metformin on human cardiac energetics. *Transl Res.* 2021 Mar;229:5-23. PMID: PMC10655614
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54. Jiang C, Arzua T, Yan Y, **Bai X**. Expression Signature of lncRNAs and mRNAs in Sevoflurane-Induced Mouse Brain Injury: Implication of Involvement of Wide Molecular Networks and Pathways. *Int J Mol Sci.* 2021 Jan 30;22(3). PMID: PMC7869012
55. Alt EU, Schmitz C, **Bai X**. Perspective: Why and How Ubiquitously Distributed, Vascular-Associated, Pluripotent Stem Cells in the Adult Body (vaPS Cells) Are the Next Generation of Medicine. *Cells.* 2021 Sep 03;10(9). PMID: PMC8467324
56. Yu H, Liu X, Chen B, Vickstrom CR, Friedman V, Kelly TJ, **Bai X**, Zhao L, Hillard CJ, Liu QS. The Neuroprotective Effects of the CB2 Agonist GW842166x in the 6-OHDA Mouse Model of Parkinson's Disease. *Cells.* 2021 Dec 16;10(12). PMID: PMC8700250
57. Gunaratne GS, Rebbeck RT, McGurran LM, Yan Y, Arzua T, Frolkis T, Sprague DJ, **Bai X**, Cornea RL, Walseth TF, Marchant JS. Identification of a dihydropyridine scaffold that blocks ryanodine receptors. *iScience.* 2022 Jan 21;25(1):103706. PMID: PMC8760560
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60. Arzua T, Yan Y, Jiang C, Logan S, Allison RL, Wells C, Kumar SN, Schäfer R, **Bai X**. Correction to: Modeling alcohol-induced neurotoxicity using human induced pluripotent stem cell-derived three-dimensional cerebral organoids. *Transl Psychiatry.* 2021 Feb 01;11(1):87. PMID: PMC7851120
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Books, Chapters, and Reviews

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2. Xu X, Kriegel AJ, Jiao X, Liu H, **Bai X**, Olson J, Liang M, Ding X. miR-21 in ischemia/reperfusion injury: a double-edged sword? *Physiol Genomics.* 2014 Nov 01;46(21):789-97. PMID: PMC4280148
3. Twaroski D, Bosnjak ZJ, **Bai X**. MicroRNAs: New Players in Anesthetic-Induced Developmental Neurotoxicity. *Pharm Anal Acta.* 2015;6:357. PMID: PMC4486668
4. Bosnjak ZJ, Logan S, Liu Y, **Bai X**. Recent Insights Into Molecular Mechanisms of Propofol-Induced Developmental Neurotoxicity: Implications for the Protective Strategies. *Anesth Analg.* 2016 Nov;123(5):1286-1296. PMID: PMC5073000
5. Xiaowen Bai. Review for the book of Anesthesia and Neurotoxicity. *Anesthesia & Analgesia.* 2018;172(2):p e16.
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7. Twaroski D, Yan Y, Olson JM, Liang M, Bosnjak ZJ, **Bai X**. Analysis of MicroRNAs and their potential targets in human embryonic stem cell-derived neurons treated with the anesthetic propofol. *Neuromethods.* 2017;128:29-42.
8. **Bai X**. Stem cell-like characteristics of dermal fibroblasts: Proliferation, antigen profiles, and differentiation

- capacity Dermal Fibroblasts: Histological Perspectives, Characterization and Role in Disease. April 2013:123-133.
9. **Bai X**. Preface Dermal Fibroblasts: Histological Perspectives, Characterization and Role in Disease. April 2013.
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 11. Alt EU, Schmitz C, **Bai X**. Fundamentals of stem cells: why and how patients' own adult stem cells are the next generation of medicine. Bioethics and Research on Adult Stem Cells. In: Bioethics and Research on Adult Stem Cells; Trafny, T., Spiri, S., Eds; IF Press: Pontifical Council for Culture, Rome, Italy, 2021.
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 13. **Bai X**, Yan S, Liu H, Yang Y. Chondrogenesis by mesenchymal stem cells in vitro Clinic J Orthop Trauma. 2005; 7(5):1.
 14. **Bai X**, Lu S. Advances in the study of CDMP1. Medical Recapitulate. 2008; 13.
 15. **Bai X**, Alt E. Myocardial regeneration potential of adipose tissue-derived stem cells. Biochem Biophys Res Commun. 2010 Oct 22;401(3):321-6.
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 19. Yan Y, Arzua T, Logan S, **Bai X**. Isolation and Culture of Human-Induced Pluripotent Stem Cell-Derived Cerebral Organoid Cells. Methods Mol Biol. 2022;2454:483-494. PMID: PMC8030126
 20. Alt EU, Schmitz C, **Bai X**. Perspective: Why and How Ubiquitously Distributed, Vascular-Associated, Pluripotent Stem Cells in the Adult Body (vaPS Cells) Are the Next Generation of Medicine. Cells. 2021 Sep 03;10(9). PMID: PMC8467324
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 22. Wang J, Tang B, **Bai X**, et al. Biochemistry. In: Chinese Science and Technology Publishing Company. 2001.

Editorials, Letters To Editor, Other

1. **Bai X**, Bosnjak ZJ. Emerging model in anesthetic developmental neurotoxicity: human stem cells. Int J Clin Anesthesiol. 2013 Jul;1:1002. PMID: PMC4068347
2. **Bai X**. Stem Cell-Based Disease Modeling and Cell Therapy. Cells. 2020 Sep 29;9(10). PMID: PMC7599677
3. **Bai X**. Use of induced pluripotent stem cell-derived brain cells, organoids, assembloids, and blood-brain barrier models in understanding alcohol and anesthetic-induced brain injuries: an emerging perspective. Neural Regen Res. 2024 May;19(5):953-954. PMID: PMC10749634