

Xiaoqing Dai

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MD and Ph.D. in molecular and cellular biology neuroscience program with 8+ years of experience as a research scientist and postdoctoral fellowship. Authorized to work in the US for any employer.

Work Experience

Senior Research Scientist

University of Texas MD Anderson Cancer Center - Houston, TX

Advanced Technology Genomics Sequencing Core (ATGC)

February 2020 to January 2023

Built up a Laboratory Information Management System (LIMS). Managed Next Generation Sequencing(NGS) assay teams to develop, validate, execute, troubleshoot, and analyze library and sequencing data and support ATGC across multiple projects.

- Executed NGS RNA applications (RNA Exome, stranded mRNA-Seq, stranded total RNA-Seq, low input mRNA-Seq, low input total RNA-seq, small RNA-Seq, RCR a/b profiling, RNA capture).
- Led NGS DNA applications (Agilent exome V7, Agilent clinical research exome, ChIP-Seq, targeted capture, whole Genome-Seq).
- Carried out two 96-well plates (200 samples) for library preparation, QC/QA of RNA, cluster generation using Agilent 4200 TapeStation system, and real-time qPCR.
- Sequenced multiple flow cells in two (NovaSeq 6000, NextSeq 500) or three (HiSeq 4000/3000 and MiSeq500/550, iSeq100) genome facilities.
- Processed RNA sequencing data: converting base calls into fastq format, demultiplexing, trimming reads, mapping reads, and classifying UMI references.
- Pre-process and sanitize data into a single command, giving the data team a complete set of inputs for GUIDESeq Bioconductor analysis.
- Designed a 200-sample-daily library preparation method based on sample quality, quantity, and experimental objective of investigators.
- Documented standard operating procedure (SOP) of LIMS to deliver results from 14 to 7 days.
- Created a complete biospecimen lifecycle to monitor all metadata such as shipment information, informed consent status, study protocols, storage locations, laboratory analyses, and maintained results.
- Managed routine lab activities, such as ordering/stocking general lab supplies and installing and maintaining equipment/instruments.
- Trained new group members and students on continuing improvement laboratory procedures.

Research Scientist

The University of Texas Health Science Center - Houston, TX

Department of Neurosurgery

January 2016 to December 2019

Developed, scheduled, and performed molecular/cellular bioassay in vitro, mammalian tissue biopsy in vivo, and anesthesia/laceration/implant injection operation.

- Operated mice tissue laceration model and implanted Alzet osmotic minipumps.
- Cloned targeted genes into the plasmid expression system.
- Generated transfections via siRNA or lentivirus into all cell lines, such as HEK293, muscle stem cells, iMuSCs, neural stem cells, and dissociated hippocampal neurons.
- Conducted primary cell isolation and cell sorting.
- Optimized cell propagation and subsequent viral infection in large-scale tissue culture vessels, including roller bottles and ten-shelf cell factories.
- Tested viral and cellular proteins by Western blot, FACS, and immunofluorescent staining via microscopy.
- Performed neural/muscular experiments such as apoptosis/migration assay, wound healing assay, and in vivo rescue analysis.

Postdoctoral fellowship

University of Houston - Houston, TX

Department of Pharmacological and Pharmaceutical Sciences

January 2014 to December 2015

Screened and characterized small molecular inhibitors of oncogenes or genes, such as MDM2, MDMX, β -catenin, and NFAT1, using orthotopic tumor-bearing mice.

- Carried out cell-based assays, including ubiquitination, real-time quantitative PCR, immunocytochemistry, western blotting, and luciferase reporter assay.
- Processed tumor models: xenograft, orthotopic, and patient-derived xenograft (PDX).
- Removed various tissues (lungs, brain, heart, liver, spleen, GI, and kidneys) for biopsy, fixation, cryosection, and Hematoxylin and Eosin (H&E) staining.
- Applied statistical analysis for all clinical data and presented scientific reports in retreat and lab meetings.

Education

Doctoral of Philosophy (PhD)

The University of Tokyo Neuroscience Program April 2009 to March 2013

Master of Human Genetics (MD)

Ningxia Medical University September 2005 to June 2008

Skills

TruSeq RNA library preparation, RNA QC, real-time qPCR, HiSeq, iSeq, MiSeq, NextSeq, NovaSeq genome Analyzer, LIMS software, Gene clone, siRNA, knock-down assay via virus, overexpression plasmid system, cell culture (neural stem cell, muscle stem cell), xenograft cancer model, immunofluorescence, immunohistochemistry, thin slice of cryosection preparation, implantation minipump subcutaneously, western blotting, laser confocal microscopy.

Publications

- Murray, I.R., Gonzalez, Z.N., Baily, J. et al. α v integrins on mesenchymal cells regulate skeletal and cardiac muscle fibrosis. *Nat Commun* 8, 1118 (2017).
- Chen K, Dai X, Wu J. Alternative splicing: an essential mechanism in stem cell biology. *World J Stem Cells*. 2015 Jan 26;7(1):1-10.
- Dai, Xiaojing, et al. "Dlx1 transcription factor regulates dendritic growth and postsynaptic differentiation through inhibition of neuropilin-2 and PAK3 expression." *European Journal of Neuroscience* 39.4 (2014): 531-547.
- Yang, F., Bai, X., Dai, X., & Li, Y. (2021). The biological processes during wound healing. *Regenerative medicine*, 16(04), 373-390.
- Vojnits, K., Pan, H., Dai, X., Sun, H., Tong, Q., Darabi, R., ... & Li, Y. (2017). Functional Neuronal Differentiation of Injury-Induced Muscle-Derived Stem Cell-Like Cells with Therapeutic Implications. *Scientific Reports*, 7.
- Zhao, X., Mu, C., Ma, J., Dai, X., & Jiao, H. (2019). The association of four SNPs in DNA mismatch repair genes with idiopathic male infertility in northwest China. *International journal of immunogenetics*, 46(6), 451-458.
- Tang, M. L., Bai, X. J., Li, Y., Dai, X. J., & Yang, F. (2018). MMP-1 Over-expression Promotes Malignancy and Stem-Like Properties of Human Osteosarcoma MG-63 Cells In Vitro. *Current Medical Science*, 38(5), 809-817.
- Zhu, W., Zhao, H., Xu, F., Huang, B., Dai, X., Sun, J., ... & Ni, S. (2020). Lipid-Lowering Drug, Fenofibrate Combined with si-HOTAIR Can Effectively Inhibit the Proliferation of Gliomas.
- Reprogramming Myoblasts Into Potent Stem Cells Through Injury Muscle Tissue Extracts abstract in Western Michigan University Homer Stryker M.D. School of Medicine.
- Dai, X., Yang, F., Shi, X., Huard, J., & Li, Y. (2017). Potential Mechanisms behind Physical Exercise vs. Epigenetic Regulation for Preventing Breast Cancer. *J Cancer Prev Curr Res*, 8(4), 00282.
- Kin, K., Chen, X., Gonzalez-Garay, M., & Fakhouri, W. D. (2016). The effect of non-coding DNA variations on P53 and cMYC competitive inhibition at cis-overlapping motifs. *Human Molecular Genetics*, 25(8), 1517-1527.