**SHAN ZHA**

**Overview**

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**Academic Appointments**

* Associate Professor of Pediatrics, Pathology & Cell Biology, Immunology & Microbiology

**Research**

The Zha lab investigates how defects in DNA repair and DNA damage responses impact normal immune system development, lymphomagenesis, and treatment responses. The lab has developed cutting-edge technologies, including high-throughput translocation sequencing, sing cell-seq, multi-color flow-cytometry, CRISPR-based depletion and activation screens, high-content live-cell imaging, and a collection of over sixty-five unique mouse models, including the serial of mouse models expressing catalytically inactive ATM, ATR, DNA-PKcs, and now PARP1 and PARP2, which revealed unexpected structural function of DNA damage response factors. More details can be found at zhalab.org. We invite committed young scientists to join us in the adventures.

**Selected Publications**

1. **The cancer-associated ATM R3008H mutation reveals the link between ATM activation and its exchange**Milanovic M, Houghton LM, Menolfi D, Lee JH, Yamamoto K, Li Y, Lee BJ, Xu J, Estes VM, Wang D, McKinnon PJ, Paull TT, Zha S  
   Cancer Res. 2020.  
   PMID: 33239428, DOI: 10.1158/0008-5472.CAN-20-2447
2. **Clinical PARP inhibitors do not abrogate PARP1 exchange at DNA damage sites in vivo**Shao Z, Lee BJ, Rouleau-Turcotte É, Langelier MF, Lin X, Estes VM, Pascal JM, Zha S  
   Nucleic Acids Res. 2020.  
   PMID: 32890402, DOI: 10.1093/nar/gkaa718
3. **Dual-Color Plasmonic Nanosensor for Radiation Dosimetry**Tao Y, Li M, Liu X, Leong KW, Gautier J, Zha S  
   ACS Appl Mater Interfaces. 2020.  
   PMID: 32337977, DOI: 10.1021/acsami.0c03001
4. **DNA-PKcs has KU-dependent function in rRNA processing and haematopoiesis**Shao Z, Flynn RA, Crowe JL, Zhu Y, Liang J, Jiang W, Aryan F, Aoude P, Bertozzi CR, Estes VM, Lee BJ, Bhagat G, Zha S, Calo E  
   Nature. 2020.  
   PMID: 32103174, DOI: 10.1038/s41586-020-2041-2
5. **CtIP is essential for early B cell proliferation and development in mice**Liu X, Wang XS, Lee BJ, Wu-Baer FK, Lin X, Shao Z, Estes VM, Gautier J, Baer R, Zha S  
   J Exp Med. 2019.  
   PMID: 31097467, DOI: 10.1084/jem.20181139
6. **Kinase-dead ATR differs from ATR loss by limiting the dynamic exchange of ATR and RPA**Menolfi D, Jiang W, Lee BJ, Moiseeva T, Shao Z, Estes V, Frattini MG, Bakkenist CJ, Zha S  
   Nat Commun. 2018.  
   PMID: 30559436, DOI: 10.1038/s41467-018-07798-3
7. **Kinase-dependent structural role of DNA-PKcs during immunoglobulin class switch recombination**Crowe JL, Shao Z, Wang XS, Wei PC, Jiang W, Lee BJ, Estes VM, Alt FW, Zha S  
   Proc Natl Acad Sci USA. 2018.  
   PMID: 30072430, DOI: 10.1073/pnas.1808490115
8. **PAXX promotes KU accumulation at DNA breaks and is essential for end-joining in XLF-deficient mice**Liu X, Shao Z, Jiang W, Lee BJ, Zha S  
   Nat Commun. 2017.  
   PMID: 28051062, DOI: 10.1038/ncomms13816
9. **Kinase-dead ATM protein is highly oncogenic and can be preferentially targeted by Topo-isomerase I inhibitors**Yamamoto K, Wang J, Sprinzen L, Xu J, Haddock CJ, Li C, Lee BJ, Loredan DG, Jiang W, Vindigni A, Wang D, Rabadan R, Zha S  
   Elife. 2016.  
   PMID: 27304073, DOI: 10.7554/eLife.14709
10. **Differential phosphorylation of DNA-PKcs regulates the interplay between end-processing and end-ligation during nonhomologous end-joining**Jiang W, Crowe JL, Liu X, Nakajima S, Wang Y, Li C, Lee BJ, Dubois RL, Liu C, Yu X, Lan L, Zha S  
    Mol Cell. 2015.  
    PMID: 25818648, DOI: 10.1016/j.molcel.2015.02.024
11. **Kinase-dead ATM protein causes genomic instability and early embryonic lethality in mice**Yamamoto K, Wang Y, Jiang W, Liu X, Dubois RL, Lin CS, Ludwig T, Bakkenist CJ, Zha S  
    J Cell Biol. 2012.  
    PMID: 22869596, DOI: 10.1083/jcb.201204098
12. **ATM damage response and XLF repair factor are functionally redundant in joining DNA breaks**Zha S, Guo C, Boboila C, Oksenych V, Cheng HL, Zhang Y, Wesemann DR, Yuen G, Patel H, Goff PH, Dubois RL, Alt FW  
    Nature. 2011.  
    PMID: 21160472, DOI: 10.1038/nature09604
13. **Lymphocyte-specific compensation for XLF/cernunnos end-joining functions in V(D)J recombination**Li G, Alt FW, Cheng HL, Brush JW, Goff PH, Murphy MM, Franco S, Zhang Y, Zha S  
    Mol Cell. 2008.  
    PMID: 18775323, DOI: 10.1016/j.molcel.2008.07.017