**SHAN ZHA**

**Overview**

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**Academic Appointments**

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

**Administrative Titles**

**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 <https://www.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 Nov 25:canres.2447.2020.

PMID: 33239428 DOI: 10.1158/0008-5472.CAN-20-2447.

1. **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
2. **Clinical PARP inhibitors do not abrogate PARP1 exchange at DNA damage sites in vivo.** Shao Z, Lee BJ, Rouleau-Turcotte E, Langelier M, Estes VM, Lin X., Pascal JM, Zha S#. **Nucleic Acid Research** 2020 Sep 25;48(17):9694-9709.

PMID: 32890402 DOI: 10.1093/nar/gkaa718.

1. **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#. # Co-corresponding authors **Nature**. 2020.

PMID: 32103174, DOI: 10.1038/s41586-020-2041-2

1. **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
2. **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
3. **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
4. **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
5. **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
6. **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
7. **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
8. **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
9. **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