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### **Research interests and expertise**

My research focuses on the immunology and immunopathology during infection and major diseases. Special interest is the role of monocyte/macrophage cell lineages in these scenarios. My expertise is the use of different imaging techniques (intravital microscopy, live-cell imaging, etc.) which is combined with traditional immunological approaches to address scientific questions. One of my directions is to understand the recruitment, development and function of different monocyte/macrophage lineages in animal disease models. Another direction is to control, manipulate the functions of these cell types using approaches including liposome or viral-vector mediated delivery of regulatory cargo. Our studies will allow optimal control of monocyte/macrophage lineages to better exert their functions in fighting against invading pathogens and tissue remodeling, but limit their overreaction during inflammation which causes tissue damage or immunoinhibitory role in cancerous tissues.

### **Education and Training**

2006-2010 B.S, Huazhong University of Science and technology, Wuhan, China  
2010-2013 M.S Wuhan Institute of Virology, Chinese Academy of Sciences  
2013-2018 PhD University of Maryland, College Park  
2018-2020 Research associate University of Maryland, College Park  
2020-present Tenure-track associate professor, Shanghai Jiao Tong University

### **Peer-Reviewed Publications** (\* co-first authors)

- Sun D\*, Zhang M\*, Sun P, Liu G, Strickland AB, Chen Y, *et al.*. VCAM1/VLA4 interaction mediates Ly6Clow monocyte recruitment to the brain in a TNFR signaling dependent manner during fungal infection. **PLoS Pathogens** 2020 16(2): e1008361.
- Sun D\*, Sun P\*, He S, Shi M. Rat IgG mediated circulatory cell depletion in mice requires mononuclear phagocyte system and is facilitated by complement. **Journal of Leukocyte Biology**. 2020 107:529–539.
- Sun DL\*, Gao YZ\*, Ge X\*, Shi ZL, Zhou NY. Special features of bat microbiota differ from those of terrestrial mammals. **Frontiers in Microbiology**. 2020 11:1040.
- Sun D, Sun P, Li H, Zhang M, Liu G, Strickland AB *et al.*. Fungal dissemination is limited by liver macrophage filtration of the blood. **Nature Communications** 2019 10 (1), 1-14. (F1000 Recommended)  
**Commented in** Kupffer Cells Mediate Systemic Antifungal Immunity. **Trends**

**in Immunology** 2019 Nov 14.

- Liu G, Fu Y, Yosri M, Chen Y, Sun P, Xu J, Zhang M, Sun D *et al.*. CR1g plays an essential role in intravascular clearance of bloodborne parasites by interacting with complement **Proceedings of the National Academy of Sciences** 2019 116 (48), 24214-24220.
- Sun D, Zhang M, Liu G, Wu H, Li, Zhou H, Zhang X, Shi M. Intravascular clearance of disseminating *Cryptococcus neoformans* in the brain can be improved by enhancing neutrophil recruitment in mice. **European Journal of Immunology** 2016 46(7):1704-1714.
- Zhang M\*, Sun D\*, Liu G, Wu H, Zhou H, Shi M. Real-time in vivo imaging reveals the ability of neutrophils to remove *Cryptococcus neoformans* directly from the brain vasculature. **Journal of Leukocyte Biology**. 2016 99(3):467-473.
- Sun D, Zhang M, Liu G, Wu H, Zhu X, Zhou H, Shi M. Real-time imaging of interactions of neutrophils with *Cryptococcus neoformans* demonstrates a crucial role of complement C5a-C5aR signaling. **Infection and Immunity**. 2015 84(1):216-229.
- Sun D, Shi M. Neutrophil swarming toward *Cryptococcus neoformans* is mediated by complement and leukotriene B4. **Biochemical and Biophysical Research Communications**. 2016 477(4):945-951
- Sun DL, Jiang X, Wu QL, Zhou NY. Intragenomic heterogeneity of 16S rRNA genes causes overestimation of prokaryotic diversity. **Applied Environmental Microbiology**. 2013 79(19):5962-9.
- Liu G, Sun D, Wu H, Zhang M, Huan H, Xu J, Zhang X, Zhou H, Shi M. Distinct contributions of CD4+ and CD8+ T cells to pathogenesis of *Trypanosoma brucei* infection in the context of gamma interferon and interleukin-10. **Infection and Immunity** 2015 83(7):2785-95.
- Liu G, Xu J, Wu H, Sun D, Zhang X, Zhu X, Magez S, Shi M. IL-27 Signaling is crucial for survival of mice infected with african trypanosomes via preventing lethal effects of CD4+ T cells and IFN- $\gamma$ . **PLoS Pathogens**. 2015 11(7):e1005065.
- Zhang M, Sun D, Shi M. Dancing cheek to cheek: *Cryptococcus neoformans* and phagocytes. **Springerplus**. 2015 12;4:410.
- Diago-Navarro E, Calatayud-Baselga I, Sun D, Khairallah C, Mann I, Ulacia-Hernando A, *et al.*. Antibody based immunotherapy to treat and prevent infection with hypervirulent *Klebsiella pneumoniae*. **Clinical and Vaccine Immunology**. 2017 24(1): e00456-16
- Mendez J, Sun D, Tuo W, Xiao Z. Bovine neutrophils form extracellular traps in response to the gastrointestinal parasite *Ostertagia ostertagi*. **Scientific reports** 2018 8 (1), 17598.

### **Honors and Awards**

2017 AAI Trainee Abstract Award.

2018 Chinese government award for outstanding self-finance students

2018 Avrum Gudelsky Award

**Conference presentations**

Sun D, Liu G, Shi M. Intravital imaging reveals effective complement C3 mediated filtering of *Cryptococcus neoformans* out of vasculature by Kupffer cells. Gordon Research Conference, Fungal Immunology, Huston, 2015.

Sun D, Zhang M, Shi, M. IL-27 limits neutrophil mediated pathology during pulmonary infection with *Cryptococcus neoformans*. AAI Meetings, Washington DC, 2017