

BIOGRAPHICAL SKETCH

NAME: Zhu, Shu

POSITION TITLE: Professor

EDUCATION/TRAINING

INSTITUTION AND LOCATION	DEGREE (if applicable)	Completion Date MM/YYYY	FIELD OF STUDY
The University of Science and Technology of China	B.S.	07/2006	Biology
Shanghai Institutes for Biological Sciences, Chinese Academy of Sciences	Ph.D.	07/2012	Immunology
Yale University	Postdoctoral	09/2017	Immunology

A. Personal Statement

My lab is currently using various mouse models and molecular/cellular/omics techniques to study intestinal immune responses toward environmental cues including microbes and food.

We demonstrated how dsRNA from enteric viruses (norovirus, rotavirus, and commensal viruses) are recognized by intestinal epithelial cells-specific Nod-like receptors-Nlrp6 and Nlrp9, and activate inflammasome and interferon (*PNAS*, 2024; *Cell*, 2021; *Nature*, 2017a; *Science*, 2015); and also sensed by DC-expressed Rig-I to sustain the expansion of intraepithelial lymphocytes (*Nature Immunology*, 2019).

My lab elucidated that the dietary-antigen-dependent cleavage of Gasdermin D maintains food tolerance irrespective of pyroptosis (*Cell*, 2023); and found amino-acid formula induces microbiota dysbiosis and depressive-like behavior in mice (*Cell Reports*, 2024).

My lab has also investigated the potential immune mechanisms that contribute to microbiota dysbiosis (*Cell Research*, 2022; *PNAS*, 2021), and role of microbiota dysbiosis (elevated *Clostridium scindens* or *Peptostreptococcus anaerobius* and these bacteria produced metabolites DCA or IDA) in colorectal cancer development (*Immunity*, 2024; *Nature Cell Biology*, 2024); we also developed strategies (glucosylated nanoparticle encapsulated antibiotics or vitamin supplementation) to intervene microbiota dysbiosis and associated diseases such as IBD (*Nature Biomedical Engineering*, 2022; *Cell Reports*, 2022).

I am also the co-founder of Ibiome biotechnology, a start-up aims to treat immunological diseases and neuronal diseases with live bacteria or bacterial metabolites. We have received more than 125 million RMB investments from CD Capitals, China Capital Investment Group, etc.

Ongoing and recently completed projects that I would like to highlight include:

82325025, National Natural Science Foundation of China

Zhu, Shu (PI)

2024-2028

Intestinal immune sensing of microbes, Role: PI

82341121, National Natural Science Foundation of China

Zhu, Shu (PI)

2024-2027

Construction of a streamlined and effective system for sequencing analysis of intestinal RNA virus groups with validation of immune functionality, Role: PI

92374204, National Natural Science Foundation of China

Zhu, Shu (PI)

2024-2027

Single-cell TCR sequencing and MHCII-peptidomics reveals the food antigen and TCR landscape, Role: PI

2018YFA0508000, Ministry of Science and Technology of China

Zhu, Shu (PI)

2018-2022

Role of Nod like receptors in sensing of intestinal microbes

XDB29030101, Chinese Academy of Sciences

Zhu, Shu (PI)

2019-2023

Immune recognition and evasion of enteric virus, Role: PI

81822021, National Natural Science Foundation of China

Zhu, Shu (PI)

2018-2021

Sensing and immune response towards enteric virus, Role: PI

82061148013, National Natural Science Foundation of China

Zhu, Shu (PI) and Eran Elinav (PI)

2021-2025

Role of oral microbiota in IBD, Role: PI

91842105, National Natural Science Foundation of China

Zhu, Shu (PI)

2018-2021

Role of gut metabolites in neuronal inflammation, Role: PI

31770990, National Natural Science Foundation of China

Zhu, Shu (PI)

2017-2021

Role of Dhx15 in anti-enteric viral infection, Role: PI

B. Positions, Scientific Appointments, and Honors

Positions and Scientific Appointments

2023- Dean, School of Basic Medical Sciences, Division of Life Science and Medicine, University of Science and Technology of China.

2023- Vice president, The young investigators committee, Chinese Society of Immunology

2021- Vice president, Institute of Health and Medicine, Hefei Comprehensive National Science Center

2017-	Professor, Division of Life Science and Medicine, University of Science and Technology of China.
2014-2017	Postdoctoral Fellow (Helen Hay Whitney Foundation/HHMI), Yale School of medicine, Dr. Richard Flavell Lab
2012-2014	Postdoctoral Associate, Yale School of medicine, Dr. Richard Flavell Lab
2019-	Editorial Board member, Engineering, Medicine in Microecology, Precision Clinical Medicine.
2018-	Reviewer, Nature, Cell, Immunity, PNAS, Cell Reports, CMI, etc.

Honors

2022	Vcanbio award for biosciences and medicine
2018	Qiushi Award (Awarded to only 10 young PIs of all fields each year in top universities of China)
2018	MIT Technology Review 35 Innovators Under 35 (MIT TR35 China)
2014	Helen Hay Whitney Foundation fellowship
2013	Excellent 100 Doctoral Dissertation of Chinese Academy of Sciences
2012	Ray Wu Prize (The most prestigious biomedical award in China, awarded to 5-10 PhD students each year)
2012	The Chinese Academy of Sciences Dean's Award (The highest honor for PhD students in CAS, awarded to only one each institute every year)
2012	Olympus Innovation Award for the Eighth Youth Forum in Cell Biology
2011	Johnson & Johnson Asia Outstanding Graduate Thesis Award in Bio-tech
2006	Guo Moruo Scholarship (The highest honor for undergraduates in USTC, awarded to only one each department every year)

C. Contribution to Science

1. NLR-mediated microbial sensing in intestinal epithelial cells

I identified for the first time that Nlrp6 and a novel NLR, Nlrp9, are critical to mediate host antivirus immune defense to two major enteric viruses, rotavirus and norovirus, through different mechanisms (**Nature**, 2017a; **Science**, 2016).

- a. **Zhu S***, Ding S*, Wang P, Wang G, Lei X, Palm N, Pan W, Zheng Y, Feng N, Lu J, Shan L, Abraham C, Fikrig E, Greenberg H#, Flavell R#. Nlrp9b recognizes and restricts rotavirus infection in intestinal epithelial cells. 2017. **Nature**. doi:10.1038/nature22967. (Comment in **Nature**, doi:10.1038/nature23090, Comment in **Nat Rev Gastroenterol Hepatol**. doi: 10.1038/nrgastro.2017.94. Research highlight in **Cell Research**, doi: 10.1038/cr.2017.93, Evaluated by Faculty of 1000 Biology).
- b. Penghua Wang*, **Shu Zhu***, Long Yang, Shuan Cui, Wen Pan, Ruaidhri Jackson, Yunjiang Zheng, Anthony Rongvaux, Qiangming Sun, Guang Yang, Shandian Gao, Rongtuan Lin, Fuping You, Richard Flavell#, Erol Fikrig#. 2015. Nlrp6 regulates intestinal antiviral innate immunity. **Science**. 10.1126/science.aab3145.

My laboratory has elucidated the mechanisms and functions of RNA sensing in the intestine in collaboration with Hao Wu's lab, Rongbin Zhou's lab and Richard Flavell's lab: Viral RNA/NLRP6 forms Liquid-liquid phase separation to mediate inflammasome activation in intestinal epithelial cells (**Cell**, 2021); established A mouse model to distinguish NLRP6 mediated inflammasome-dependent and independent functions (**PNAS**, 2024); commensal viruses induce Rig-I/IRF1/IL-15 in DCs to maintain the numbers of intraepithelial lymphocytes (**Nature Immunology**, 2019); nucleic RNA helicase DHX9 cooperates with STAT1 to transcribe antiviral ISGs in the intestine (**Science Advance**, 2022).

- c. C Shen*, R Li*, R Negro, J Cheng, S Vora, T Fu, A Wang, K He, L Andreeva, P Gao, Z Tian, R Flavell, **S Zhu**[#], and H Wu[#], Phase Separation Drives RNA Virus-Induced Activation of the NLRP6 Inflammasome. *Cell* 184: 5759-5774 PMCID: PMC8643277 *Co-first authors, contributed equally, # Co-corresponding authors, contributed equally.
- d. L Liu*, T Gong*, W Tao*, B Lin, C Li, X Zheng, **S Zhu**[#], W Jiang[#], R Zhou[#]. 2019. Commensal viruses maintain the homeostasis of intestinal intraepithelial lymphocytes via non-canonical RIG-I signaling. *Nat Immunol*. 10.1038/s41590-019-0513-z. (Research highlight in Nature Reviews immunology, 2019 Dec;19(12):721. doi: 10.1038/s41577-019-0241-5; Comment in Nature Immunology, 2019 Dec;20(12):1563-1564. doi: 10.1038/s41590-019-0530-y; Evaluated by Faculty of 1000 Biology)
- e. Li R*, Zan Y*, Wang D, Chen X, Wang A, Tan H, Zhang G, Ding S, Shen C[#], Wu H[#], **Zhu S**[#]. A mouse model to distinguish NLRP6-mediated inflammasome-dependent and independent functions. *PNAS*. 2024 Feb 6;121(6):e2321419121. doi: 10.1073/pnas.2321419121.
- f. X Ren*, D Wang*, G Zhang*, T Zhou, Z Wei, Y Yang, Y Zheng, X Lei, W Tao, A Wang, M Li[#], R Flavell[#], **Zhu S**[#]. Nucleic DHX9 Cooperates with STAT1 to Transcribe Interferon-Stimulated Genes. *Science Advance*. DOI: 10.1126/sciadv.add5005
- g. R Li, **S Zhu**[#]. 2019. NLRP6 Inflammasome. *Mol Aspect Med*. doi.org/10.1016/j.mam.2020.100859
- h. T Wan*, Y Wang*, K He*, **S Zhu**[#]. Microbial sensing in the intestine. *Protein & Cell*, pwad028, 2023. doi.org/10.1093/procel/pwad028.

2. GSDMD-mediated food sensing in intestinal epithelial cells

My lab revealed that proteinaceous dietary antigen induces the CASP3/7-dependent cleavage of Gasdermin D, the 13kD N-terminus fragment translocate to the nucleus to transcribe MHCII in IECs, therefore induce Tr1 cells to maintains food tolerance. This study supports that differential cleavage of GSDMD can be understood as a regulatory hub controlling immunity versus tolerance in the small intestine (*Cell*, 2023). We also found AAD-fed mice exhibited dysbiotic microbiota, increased neuronal activity in both the intestine and brain, as well as gastrointestinal peristalsis disorders and depressive-like behavior. This study highlight the necessity to avoid the excessive use of AAF, which may influence the neuronal development and mental health of children (*Cell Reports*, 2024).

- a. K He*, T Wan*, D Wang*, J Hu*, T Zhou, W Tao, Z Wei, Q Lu, R Zhou, Z Tian, R Flavell[#], and **S Zhu**[#]. Gasdermin D licenses MHCII induction to maintain food tolerance in small intestine. *Cell*. 2023 Jun 9;S0092-8674(23)00577-9. doi: 10.1016/j.cell.2023.05.027.
- b. Hu J*, He K*, Yang Y*, Huang C, Dou Y, Wang H, Zhang G, Wang J, Niu C, Bi G, Zhang L[#], **Zhu S**[#]. Amino-acid formula induces microbiota dysbiosis and contributes to depressive-like behavior. *Cell Reports*. 2024 Feb 26;43(3):113817.doi: 10.1016/j.celrep.2024.113817.

3. The immune mechanisms, disease consequences, and the intervention of microbiota dysbiosis

My lab has investigated genetic mutations that cause dysregulated immune responses in macrophage or paneth cells that contribute to microbiota dysbiosis (*Cell Research*, 2022; *PNAS*, 2021).

- a. H Ma, T Hu, W Tao, J Tong, Z Han, D Herndler-Brandstetter, Z Wei, X Xu, K Zhang, R Liu, T Zhou, Q Liu, J Cho, HB Li, H Huang, R Flavell, and **Zhu S**[#]. A lncRNA from an inflammatory bowel disease risk locus maintains intestinal host-commensal homeostasis. *Cell Research*. doi.org/10.1038/s41422-023-00790-7.
- b. Y Wang*, K He*, B Sheng*, X Lei, W Tao, X Zhu, Z Wei, R Fu, A Wang, S Bai, Z Zhang, N Hong, C Ye, Y Tian, J Wang, K Zhang, H Yang, L Li[#], H Li[#], R Flavell[#], **S Zhu**[#]. The RNA helicase Dhx15 mediates Wnt-induced anti-microbial protein expression in Paneth cells. *PNAS*. 10.1073/pnas.2017432118

My lab also identified *Clostridium scindens*-produced DCA as a negative regulator for CD8+ T cell effector functions (*Immunity*, 2024), while *Peptostreptococcus anaerobius* derived IDA functions as an anti-ferroptosis metabolite that directly targets tumor cells (*Nature Cell Biology*, 2024). These two study establishes the causation between microbiota dysbiosis (elevated *Clostridium scindens* or *Peptostreptococcus anaerobius*), tumor cell ferroptosis, as well as anti-tumor immune response of CD8+ T cells in CRC, suggesting potential directions for anti-tumor therapy. We also found increased accumulation of α-Synuclein in inflamed appendix of Parkinson's disease patients where most abundant microbiota resides (*Movement Disorders*, 2021); we have collaborated with clinicians to initiate several IITs to investigate role of microbiota in intervention of immune and neuronal diseases.

- c. Cong J*, Liu P*, Han Z*, Ying W, Li C, Yang J, Song X, Dai L, Sun L, Kasper D, Pan W#, **Zhu S#**. Bile acids modified by the microbiota suppress gut anti-tumor immune responses. *Immunity*. 2024 Mar 6:S1074-7613(24)00090-6. doi: 10.1016/j.jimmuni.2024.02.014.
- d. W Cui, M Guo, D Liu, Y Zhang, J Cong, Z Han, Y Yang, J Liu, C Liang, S Shi, P Xiao, C Yang, H Huang, X Fu, Y Xu, L Du, C Yin, Y Zhang, J Sun, R Chai#, W Gu#, **S Zhu#**, B Chu#. Gut microbial metabolite facilitates colorectal cancer development via ferroptosis inhibition. *Nature Cell Biology*. 26, 124–137 (2024).
- e. Y Chen, S Zhao, J Hu, C Han, X Lv, G Wang, S Wang, P Bo, J Zhang, W Wu, W Gui, Q Tang#, Q Liu#, **S Zhu#**, F Yu#. Increased accumulation of α-Synuclein in inflamed appendix of Parkinson's disease patients. *Movement Disorders*. 2021 Apr 20. doi: 10.1002/mds.28553

We have developed strategies to intervene microbiota dysbiosis and associated diseases. We developed a glucosylated nanoparticle for the oral delivery of antibiotics to the proximal small intestine to protect mice from gut dysbiosis associated obesity, as well as ARG accumulation (*Nature Biomedical Engineering*, 2022). We found dysbiosis associated deficiency of vitamin B5 in part of autoimmune disease patients such as IBD and MS patients, and demonstrated vitamin B5 rewrites Th17 cell metabolism via impeding PKM2 nuclear translocation (*Cell Reports*, 2022); we have collaborated with clinician in Shanghai Hospital to start an IIT to investigate whether supplementation of vitamin B5 relieve the IBD symptoms.

- f. Zhang G*, Wang Q*, Tao W*, Jiang W, Elinav E, Wang Y#, **Zhu S#**. Glucosylated nanoparticles for the oral delivery of antibiotics to the proximal small intestine protect mice from gut dysbiosis. 2022. *Nature Biomedical Engineering*. s41551-022-00903-4.
- g. Chen C*, W Zhang*, T Zhou, Q Liu, C Han, Z Huang, S Chen, Q Mei, C Zhang, K Zhang, H Ma, R Zhou, W Jiang, Wen Pan, **Zhu S#**. Vitamin B5 rewrites Th17 cell metabolism via impeding PKM2 nuclear translocation. *Cell Reports*. 2022 Nov 29;41(9):111741. doi: 10.1016/j.celrep.2022.111741.

4. Epigenetic regulation of Th17 cell differentiation and cytokine secretion in intestinal inflammation and autoimmune diseases.

My lab studied the role of metabolic regulators (VB5) and epigenetic regulators (m6A modification, DNA hypomethylation, and microRNAs) in Th17 cell differentiation in intestinal inflammation and autoimmune diseases (*Elife*, 2022; *Nature*, 2017b; *Nature Communications*, 2015; *J Immunol*, 2010).

- a. Chen C*, W Zhang*, T Zhou, Q Liu, C Han, Z Huang, S Chen, Q Mei, C Zhang, K Zhang, H Ma, R Zhou, W Jiang, Wen Pan, **Zhu S#**. Vitamin B5 rewrites Th17 cell metabolism via impeding PKM2 nuclear translocation. *Cell Reports*. 2022 Nov 29;41(9):111741. doi: 10.1016/j.celrep.2022.111741.
- b. X Wang*, C Chen*, H Sun*, K Mao*, J Yao, W Zhang, M Zhan, H-B Li, Z Zhang#, **S Zhu#**, L Lu#. m6A mRNA modification potentiates Th17 functions to inflame autoimmunity. *Sci. China Life Sci.* (2023). <https://doi.org/10.1007/s11427-022-2323-4>.
- c. H Ma*, W Tao*, and **S Zhu#**. 2019. T Lymphocytes in Intestinal Mucosa: Defense and Tolerance. *Cell Mol Immunol*. (2019) 16:216–224.

- d. Hua-Bing Li*, Jiyu Tong*, **Shu Zhu***, Pedro Batista, Jun Zhao, Will Bailis, Yi Yang, Geng Wang, Howard Y. Chang, Zhinan Yin, Richard A. Flavell. m6A mRNA methylation controls T cell homeostasis by targeting IL-7 pathway. 2017. *Nature*. doi:10.1038/nature23450. (Comment in Immunol Cell Biol. 2017)
- e. Wen Pan*, **Shu Zhu***, Dai Dai, Zheng Liu, Dan Li, Bin Li, Nicola Gagliani, Yunjiang Zheng,.. Youcun Qian, Yingxuan Chen, Jingyuan Fang, Ronald Herbst, Laura Richman, Bahija Jallal, John B. Harley, Richard A. Flavell, Yihong Yao and Nan Shen. 2015. MiR-125a targets effector programs to stabilize Treg mediated immune homeostasis and controls autoimmunity. *Nature Communication*. DOI: 10.1038/ncomms8096.
- f. Pan, W*, **S. Zhu***, M. Yuan, H. Cui, L. Wang, X. Luo, J. Li, H. Zhou, Y. Tang, and N. Shen. 2010. MicroRNA-21 and microRNA-148a contribute to DNA hypomethylation in lupus CD4+ T cells by directly and indirectly targeting DNA methyltransferase 1. *J Immunol*. 184:6773-6781.

My works also identified the checkpoints of IL-17 mediating downstream signals and inflammation (*Nature Medicine*, 2012; *J Exp Med*, 2010).

- g. **Zhu, S.***, W. Pan*, X. Song, Y. Liu, Y. Tang, H. Wang, W. Liu, Y. Shi, D. He, J.B. Harley, N. Shen and Y. Qian. 2012. The microRNA miR-23b suppresses IL-17-associated autoimmune inflammation by targeting TAB2, TAB3 and IKK- α . *Nature Medicine*. 18: 1077-1086. DOI 10.1038/nm.2815
- h. **Zhu, S.**, W. Pan, P. Shi, H. Gao, F. Zhao, X. Song, Y. Liu, L. Zhao, X. Li, Y. Shi, and Y. Qian. 2010. Modulation of experimental autoimmune encephalomyelitis through TRAF3-mediated suppression of interleukin 17 receptor signaling. *J Exp Med*. 207:2647-2662.

5. The potential intestinal infection of SARS-CoV-2

My laboratory is among the first to study the potential intestinal infection of SARS-CoV-2 and disease consequences (*Nature Reviews Gastroenterology & Hepatology*, 2021; *Pathogen*, 2021; *Protein & Cell*, 2020; *Medicine in Microecology*, 2020)

- a. M Guo*, W Tao*, R Flavell#, and **S Zhu#**. Potential intestinal infection and fecal–oral transmission of SARS-CoV-2. *Nature Reviews Gastroenterology & Hepatology*. 10.1038/s41575-021-00416-6
- b. Z Zhao*, G Zhang*, M Guo*, W Tao*, X Liu, H Wei, T Jin#, Y Zhang#, **S Zhu#**. The Potential Role of an Aberrant Mucosal Immune Response to SARS-CoV-2 in the Pathogenesis of IgA Nephropathy. *Pathogens*. 2021, 10(7), 881. doi: 10.3390/pathogens10070881
- c. W Tao*, G Zhang*, X Wang*, X Ma, T Jin, L Liu#, J Weng#, and **S Zhu#**. Analysis of the intestinal microbiota in COVID-19 patients and its correlation with the inflammatory factor IL-18. *Medicine in Microecology*. 10.1016/j.medmic.2020.100023
- d. W Tao*, X Wang*, G Zhang*, M Guo, H Ma, D Zhao, L Liu, K Zhang, J Weng, Y Wang, X Ma#, T Jin# and **S Zhu#**. Re-detectable positive SARS-CoV-2 RNA tests in patients who recovered from COVID-19 with intestinal infection. *Protein & Cell*. 10.1007/s13238-020-00778-8
- e. W Wen*, G Zhang*, S Luo*, Z Bai, W Tao, M Guo, S Jia, W Liu, K Zhang, J Weng#, **S Zhu#**. Next-generation sequencing revealed influenza and Chlamydia infection in recurrent pneumonia in a recovered COVID-19 patient. *Precision Clinical Medicine*. 10.1093/pcmedi/pbaa033

Complete List of Published Works is listed below or can be found in Google Scholar:

2024

69. Cong J*, Liu P*, Han Z*, Ying W, Li C, Yang J, Song X, Dai L, Sun L, Kasper D, Pan W#, **Zhu S#**. Bile acids modified by the microbiota suppress gut anti-tumor immune responses. *Immunity*. 2024 Mar 6:S1074-7613(24)00090-6. doi: 10.1016/j.immuni.2024.02.014.

68. Hu J*, He K*, Yang Y*, Huang C, Dou Y, Wang H, Zhang G, Wang J, Niu C, Bi G, Zhang L#, **Zhu S#**. Amino-acid formula induces microbiota dysbiosis and contributes to depressive-like behavior. *Cell Reports*. 2024 Feb 26;43(3):113817.doi: 10.1016/j.celrep.2024.113817.

67. Li R*, Zan Y*, Wang D, Chen X, Wang A, Tan H, Zhang G, Ding S, Shen C#, Wu H#, **Zhu S#**. A mouse model to distinguish NLRP6-mediated inflammasome-dependent and independent functions. *PNAS*. 2024 Feb 6;121(6):e2321419121. doi: 10.1073/pnas.2321419121.

66. W Cui, M Guo, D Liu, Y Zhang, J Cong, Z Han, Y Yang, J Liu, C Liang, S Shi, P Xiao, C Yang, H Huang, X Fu, Y Xu, L Du, C Yin, Y Zhang, J Sun, R Chai#, W Gu#, **S Zhu#**, B Chu#. Gut microbial metabolite facilitates colorectal cancer development via ferroptosis inhibition. *Nature Cell Biology*. 26, 124–137 (2024). (IF=28.2)

2023

65. K He*, T Wan*, D Wang*, J Hu*, T Zhou, W Tao, Z Wei, Q Lu, R Zhou, Z Tian, R Flavell#, and **S Zhu#**. Gasdermin D licenses MHCII induction to maintain food tolerance in small intestine. *Cell*. 2023 Jun 9;S0092-8674(23)00577-9. doi: 10.1016/j.cell.2023.05.027. (IF=66.9)

Comment in:

Trends in Immunology. 2023 Aug;44(8):571-573. doi: 10.1016/j.it.2023.06.006. Chopped! Newfound GSDMD cleavage facilitates tolerance to food allergens.

Cell Research. 2023 Dec;33(12):896-897. doi: 10.1038/s41422-023-00856-6. Cleaving an epithelial path to food tolerance. *Gastroenterology*. doi:10.1053/j.gastro.2023.08.024. Tolerance to Dietary Antigens in the Upper Intestine Through Chopping of Gasdermin D.

Allergy. doi: 10.1111/all.16076. Insights in intestinal immune tolerance: The role of the cleavage form of gasdermin D.

62. X Wang*, C Chen*, H Sun*, K Mao*, J Yao, W Zhang, M Zhan, H-B Li, Z Zhang#, **S Zhu#**, L Lu#. m6A mRNA modification potentiates Th17 functions to inflame autoimmunity. *Sci. China Life Sci.* (2023). <https://doi.org/10.1007/s11427-022-2323-4>. (IF=10.4)

61. T Wan*, Y Wang*, K He*, **S Zhu**. Microbial sensing in the intestine. *Protein & Cell*, pwad028, 2023. doi.org/10.1093/procel/pwad028. (IF=15.3)

60. H Ma*, T Hu*, W Tao, J Tong, Z Han, D Herndler-Brandstetter, Z Wei, X Xu, K Zhang, R Liu, T Zhou, Q Liu, J Cho, HB Li#, H Huang#, R Flavell#, and **Zhu S#**. A lncRNA from an inflammatory bowel disease risk locus maintains intestinal host-commensal homeostasis. *Cell Research*. 2003. doi.org/10.1038/s41422-023-00790-7. (IF=46.3)

59. X Ren, D Wang, G Zhang, T Zhou, Z Wei, Y Yang, Y Zheng, X Lei, W Tao, A Wang, M Li#, R Flavell#, **Zhu S#**. Nucleic DHX9 Cooperates with STAT1 to Transcribe Interferon-Stimulated Genes. *Science Advance*. DOI: 10.1126/sciadv.add5005 (IF=14.1)

2022

58. Zhang G*, Wang Q*, Tao W*, Jiang W, Elinav E, Wang Y#, **Zhu S#**. Glucosylated nanoparticles for the oral delivery of antibiotics to the proximal small intestine protect mice from gut dysbiosis. 2022. *Nature Biomedical Engineering*. s41551-022-00903-4. (IF=29.2)

57. Chen C*, W Zhang*, T Zhou, Q Liu, C Han, Z Huang, S Chen, Q Mei, C Zhang, K Zhang, H Ma, R Zhou, W Jiang, Wen Pan, **Zhu S#**. Vitamin B5 rewrites Th17 cell metabolism via impeding PKM2 nuclear translocation. *Cell Reports*. 2022 Nov 29;41(9):111741. doi: 10.1016/j.celrep.2022.111741. (IF=10.0)

56. A Wang, W Tao, J Tong, J Gao, J Wang, G Hou, C Qian, G Zhang, R Li, D Wang, X Ren, K Zhang, S Ding, R Flavell, HB Li, W Pan[#], **S Zhu[#]**. m6A modifications regulate intestinal immunity and rotavirus infection. *Elife*. 2022;11:e73628 DOI: <https://doi.org/10.7554/eLife.73628> (**IF=8.1**)

55. Y Chen, X Wang, X Hao, B Li, W Tao, **S Zhu**, K Qu, H Wei, R Sun, H Peng, Z Tian. Ly49E separates liver ILC1s into embryo-derived and postnatal subsets with different functions. *J Exp Med*. 2022, 219(5): e20211805. (**IF=17.58**)

2021

54. Shen C*, Li R*, Negro R, Cheng J, Vora SM, Fu TM, Wang A, He K, Andreeva L, Gao P, Tian Z, Flavell RA, **Zhu S[#]**, Wu H[#]. Phase separation drives RNA virus-induced activation of the NLRP6 inflammasome. *Cell*. 2021 Oct 14:S0092-8674(21)01115-6. doi:10.1016/j.cell.2021.09.032. (**IF=41.6**)

Comment in:

Cell Research. doi: 10.1038/s41422-021-00594-7. It's just a phase: NLRP6 phase separations drive signaling.

53. M Guo*, W Tao*, R Flavell[#], and **S Zhu[#]**. Potential intestinal infection and fecal–oral transmission of SARS-CoV-2. *Nature Reviews Gastroenterology & Hepatology*. 10.1038/s41575-021-00416-6 (**IF=46.8**)

52. Y Wang*, K He*, B Sheng*, X Lei, W Tao, X Zhu, Z Wei, R Fu, A Wang, S Bai, Z Zhang, N Hong, C Ye, Y Tian, J Wang, K Zhang, H Yang, L Li[#], H Li[#], R Flavell[#], **S Zhu[#]**. The RNA helicase Dhx15 mediates Wnt-induced anti-microbial protein expression in Paneth cells. *PNAS*. 10.1073/pnas.2017432118 (**IF=11.2**)

51. Z Zhang*, G Zhang*, M Guo*, W Tao*, X Liu, H Wei, T Jin[#], Y Zhang[#], **S Zhu[#]**. The Potential Role of an Aberrant Mucosal Immune Response to SARS-CoV-2 in the Pathogenesis of IgA Nephropathy. *Pathogens*. 2021, 10(7), 881. doi: 10.3390/pathogens10070881 (**IF=3.5**)

50. J Tong, X Wang, Y Liu, X Ren, A Wang, Z Chen, J Yao, K Mao, T Liu, F Meng, W Pan, Q Zou, J Liu, Y Zhou, Q Xia[#], R Flavell[#], **S Zhu[#]**, HB Li[#]. Pooled CRISPR Screening Identifies m6A as a Positive Regulator of Macrophage Activation. *Science Advance*. 10.1126/sciadv.abd4742 (**IF=14.1**)

49. Y Chen, S Zhao, J Hu, C Han, X Lv, G Wang, S Wang, P Bo, J Zhang, W Wu, W Gui, Q Tang[#], Q Liu[#], **S Zhu[#]**, F Yu[#]. Increased accumulation of α-Synuclein in inflamed appendix of Parkinson's disease patients. *Movement Disorders*. 2021 Apr 20. doi: 10.1002/mds.28553 (**IF=10.3**)

48. X Zheng, L Liu, G Meng, **S Zhu**, R Zhou[#], W Jiang[#]. IL-18 maintains the homeostasis of mucosal immune system via inflammasome-independent but microbiota-dependent manner. *Science Bulletin*. Doi: 10.1016/j.scib.2021.01.025 (**IF=11.8**)

47. Song H, Song J, Cheng M, Zheng M, Wang T, Tian S, Flavell RA, **Zhu S**, Li HB, Ding C, Wei H, Sun R, Peng H, Tian Z. METTL3-mediated m6A RNA methylation promotes the anti-tumor immunity of natural killer cells. *Nat Commun*. 2021 Sep 17;12(1):5522. doi: 10.1038/s41467-021-25803-0. (**IF=14.9**)

46. G Xu, C Liu, S Zhou, Q Li, Y Feng, P Sun, H Feng, Y Gao, J Zhu, X Luo, Q Zhan, S Liu, **S Zhu**, H Deng, D Li, P Gao. Viral tegument proteins restrict cGAS-DNA phase separation to mediate immune evasion. *Molecular Cell*. doi.org/10.1016/j.molcel.2021.05.002 (**IF=18.0**)

45. H Han, Y Cao, C Feng, Y Zheng, **S Zhu**, C Shang, C Yuan, G Zong. Association of a Healthy Lifestyle with All-Cause and Cause-Specific Mortality Among Individuals with Type 2 Diabetes: A Prospective Study in UK Biobank Short Running. *Diabetes Care*. doi.org/10.2337/dc21-1512 (**IF=19.1**)

2020

44. W Tao*, X Wang*, G Zhang*, M Guo, H Ma, D Zhao, L Liu, K Zhang, J Weng, Y Wang, X Ma#, T Jin# and **S Zhu**#. Re-detectable positive SARS-CoV-2 RNA tests in patients who recovered from COVID-19 with intestinal infection. *Protein & Cell.* 10.1007/s13238-020-00778-8 (**IF=10.2**)

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