Curriculum Vitae

****Personal Information****

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****Educational Background****

2008 - 2012: College of Life Sciences, Henan Normal University, Bachelor of Science in Biological Sciences
2012 - 2018: Institute of Zoology, Chinese Academy of Sciences, Key Laboratory of Animal Ecology and Conservation Biology, Ph.D. in Genomics. Supervisor: Fuwen Wei

****Work Experience****

2018 - 2020: Assistant Researcher, State Key Laboratory of Biomacromolecules, Institute of Biophysics, Chinese Academy of Sciences
2020 - 2021: Assistant Researcher, State Key Laboratory of Membrane Biology, Institute of Zoology, Chinese Academy of Sciences
2021 - Present: Associate Researcher, State Key Laboratory of Membrane Biology, Institute of Zoology, Chinese Academy of Sciences
2021 - Present: “Zhiyi” Researcher, Beijing Institute of Stem Cell and Regenerative Medicine

****Personal Profile****

Dr. Shuai Ma obtained his Ph.D. from the Institute of Zoology, Chinese Academy of Sciences (CAS). He is currently a “Zhiyi” Researcher at the Beijing Institute of Stem Cell and Regenerative Medicine and an Associate Researcher at the Institute of Zoology, CAS. Dr. Ma has been selected for the 7th Youth Talent Support Program and is a member of the Youth Innovation Promotion Association of CAS. He has received support from the National Natural Science Fund for Excellent Young Scholars from the National Natural Science Foundation of China. He has also participated in one National Key Research and Development Program project as the group leader, and another as a core member. Additionally, he has been involved in the CAS Strategic Priority Research Program on “Organ Rebuilding and Manufacturing,” as well as two CAS Cybersecurity and Informatization Special Projects. In recent years, Dr. Ma has published more than 50 SCI papers based on his work in China. Among them, he has published over 20 papers as a (co-)corresponding/first author in journals such as *Cell* (×3), *Cell Stem Cell*, *Cell*

Research, *Nature Cell Biology*, *Nature Aging*, *PNAS*, *Nucleic Acids Research*, and *Protein & Cell*. He has also filed for/obtained eight invention patents. His representative achievements have been awarded the "Top Ten Scientific Advances in China" in 2020, the "Top Ten Life Science Advances in China" in 2020 and 2024, and the Cell Press Most Popular China Paper Award in 2020 and 2022. As a major contributor, he received the "CAS Outstanding Scientific and Technological Achievement Award" in 2020 and the Second Prize of Natural Science from Beijing in 2023. Dr. Ma currently serves as a member of the Chinese Association of Geriatric Medicine's Basic and Translational Medicine Branch, the Anti-Aging Branch of the Chinese Association of Gerontology and Geriatrics, the Genetics of Aging Branch of the Chinese Society of Genetics, and the Aging Biomarker Consortium (ABC).

Research Achievements

Focusing on the biological study of organismal system aging, the applicant used techniques, such as single-cell sequencing and gene editing, to conduct a series of investigations and analyses on the novel molecular mechanisms of aging, aging-related diseases, and their interventions through rodent and primate research models. In recent years, the main research achievements include: 1) revealing the cellular and molecular basis of organismal system aging and interventions (*Cell* 2024a; *Cell* 2024b; *Cell* 2020; *Cell Stem Cell* 2022; *The Innovation* 2023); 2) uncovering the molecular mechanisms and intervention targets of primate cardiopulmonary system aging and COVID-19 (*Cell Research* 2020; *Nature Cell Biology* 2021; *Protein & Cell* 2022); 3) establishing a multidimensional omics data platform for aging, regeneration, and lineage differentiation (*Nucleic Acids Research* 2020/2021/2022; *Protein & Cell* 2024).

Representative Publications

1. **Ma S[#] (马帅)**, Ji Z[#], Zhang B[#], Geng L[#], Cai Y[#], Nie C[#], Li J[#], Zuo Y[#], Sun Y[#], Xu G[#], Liu B, Ai J, Liu F, Zhao L, Zhang J, Zhang H, Sun S, Huang H, Zhang Y, Ye Y, Fan Y, Zheng F, Hu J, Zhang B, Li J, Feng X, Zhang F, Zhuang Y, Li T, Yu Y, Bao Z, Pan S, Esteban CR, Liu Z, Deng H, Wen F, Song M, Wang S, Zhu G, Yang J, Jiang T, Song W, Belmonte JCI, Qu J*, Zhang W*, Gu Y*, Liu GH*. Spatial Transcriptomic Landscape Unveils Immunoglobin-associated Senescence as a Hallmark of Aging. ***Cell* (IF = 45.6)**, 2024. doi:10.1016/j.cell.2024.10.019.
2. **Ma S[#] (马帅)**, Sun S[#], Geng L[#], Song M[#], Wang W, Ye Y, Ji Q, Zou Z, Wang S, He X, Li W, Esteban CR, Long X, Guo G, Chan P, Zhou Q, Belmonte JCI*, Zhang W*, Qu J*, Liu GH*. Caloric Restriction Reprograms the Single-Cell Transcriptional Landscape of Rattus Norvegicus Aging. ***Cell* (IF = 45.6),** 2020. 180(5): 984-1001.
3. **Ma S[#] (马帅)**, Wang S[#], Ye Y[#], Ren J[#], Chen R[#], Li W, Li J, Zhao L, Zhao Q, Sun G, Jing Y, Zuo Y, Xiong M, Yang Y, Wang Q, Lei J, Sun S, Long X, Song M, Yu S, Chan P, Wang J, Zhou Q, Belmonte JCI, Qu J*, Zhang W*, Liu GH*. Heterochronic parabiosis induces stem cell revitalization and systemic rejuvenation across aged tissues. ***Cell Stem Cell* (IF = 19.8),** 2022. 29(6): 990-1005. e10.
4. **Ma S[#] (马帅)**, Ma S[#], Sun S[#], Li J[#], Fan Y[#], Qu J[#], Sun L[#], Wang S, Zhang Y, Yang S,

Liu Z, Wu Z, Zhang S, Wang Q, Zheng A, Duo S, Yu Y, Belmonte JCI, Chan P, Zhou Q, Song M*, Zhang W*, Liu GH*. Single-cell transcriptomic atlas of primate cardiopulmonary aging. ***Cell Research*** **(IF = 28.2),** 2020. 31(4): 415-432.

5. **Ma S[#] (马帅)**, Wu Q, Hu Y*, Wei F. Patterns and effects of GC3 heterogeneity and parsimony informative sites on phylogenetic tree of genes. ***Gene*** **(IF = 2.6)**, 2018. 655: 56-60.
6. **Ma S[#] (马帅)**, Chi X[#], Cai Y[#], Ji Z[#], Wang S*, Ren J*, Liu GH*. Decoding Aging Hallmarks at the Single-Cell Level. ***Annual Review of Biomedical Data Science*** **(IF = 7)**, 2023. doi:10.1146/annurev-biodatasci-020722-120642.
7. Yang Y[#], Lu X[#], Liu N[#], **Ma S[#] (马帅，共同第一)**, Zhang H, Zhang Z, Yang K, Jiang M, Zheng Z, Qiao Y, Hu Q, Huang Y, Zhang Y, Xiong M, Liu L, Jiang X, Reddy P, Dong X, Xu F, Wang Q, Zhao Q, Lei J, Sun S, Jing Y, Li J, Cai Y, Fan Y, Yan K, Jing Y, Haghani A, Xing M, Zhang X, Zhu G, Song W, Horvath S, Rodriguez Esteban C, Song M, Wang S, Zhao G, Li W, Belmonte JCI, Qu J*, Zhang W*, Liu GH*. Metformin decelerates aging clock in male monkeys. ***Cell*** **(IF =45.6)**, 2024. 187(22):6358-6378.
8. Hu Q[#], Zhang B[#], Jing Y[#], **Ma S[#] (马帅，共同第一)**, Hu L[#], Li J, Zheng Y, Xin Z, Peng J, Wang S, Cheng B, Qu J*, Zhang W*, Liu GH*, Wang S*. Single-nucleus transcriptomics uncovers a geroprotective role of YAP in primate gingival aging. ***Protein & Cell*** **(IF = 13.6)**. 2024. doi:10.1093/procel/pwae017.
9. Wang S[#], Yao X[#], **Ma S[#] (马帅，共同第一)**, Ping Y[#], Fan Y[#], Sun S[#], He Z[#], Shi Y[#], Sun L[#], Xiao S[#], Song M[#], Cai J, Li J, Tang R, Zhao L, Wang C, Wang Q, Zhao L, Hu H, Liu X, Sun G, Chen L, Pan G, Chen H, Li Q, Zhang P, Xu Y, Feng H, Zhao GG, Wen T, Yang Y, Huang X, Li W, Liu Z, Wang H, Wu H, Hu B, Ren Y, Zhou Q, Qu J*, Zhang W*, Liu GH*, Bian XW*. A single-cell transcriptomic landscape of the lungs of patients with COVID-19. ***Nature Cell Biology*** **(IF = 17.3)**, 2021. 23(12), 1314-1328.
10. Sun S[#], **Ma S[#] (马帅，共同第一)**, Cai Y[#], Wang S[#], Ren J[#], Yang Y[#], Ping J, Wang X, Zhang Y, Yan H, Li W, Concepcion Rodriguez Esteban, Yu Y, Liu F, Belmonte JCI, Zhang W*, Qu J*, Liu GH*. A single-cell transcriptomic atlas of exercise-induced anti-inflammatory and geroprotective effects across the body, ***The Innovation*****(IF = 33.2)**, 2023. 5(1): 100380.
11. Wang Q[#], Wang X[#], Liu B[#], **Ma S[#] (马帅，共同第一)**, Zhang F[#], Sun S, Jing Y, Fan Y, Ding Y, Xiong M, Li J, Zhai Q, Zheng Y, Liu C, Xu G, Yang J, Wang S, Ye J, Izpisua Belmonte JC, Qu J*, Liu GH*, Zhang W*. Aging induces region-specific dysregulation of hormone synthesis in the primate adrenal gland. ***Nature Aging*** **(IF = 17)**, 2024. 4(3): 396-413.
12. Li H[#], Zhao W[#], Yang F[#], Qiao Q[#], **Ma S[#] (马帅，共同第一)**, Yang K[#], Song S[#], Wang S, Qu J*, Liu GH*, Bao Y*, Zhang W*. Immunosenescence Inventory—a multi-omics database for immune aging research. ***Nucleic Acids Research*** **(IF = 16.7),** 2024. 53(D1), D1047-D1054.
13. Yan H[#], Wang R[#], **Ma S[#] (马帅，共同第一),** Huang D[#], Wang S[#], Ren J[#], Lu C, Chen X, Lu X, Zheng Z, Zhang W*, Qu J*, Zhou Y*, Liu GH*. Lineage Landscape: a

comprehensive database that records lineage commitment across species, ***Nucleic Acids Research*** **(IF = 16.7),** 2023.doi.org/10.1093/nar/gkac951.

14. Wang Q[#], Wang X[#], Liu B[#], **Ma S[#] (马帅，共同第一)**, Zhang F[#], Sun S, Jing Y, Fan Y, Ding Y, Xiong M, Li J, Zhai Q, Zheng Y, Liu C, Xu G, Yang J, Wang S, Ye J, Izpisua Belmonte JC, Qu J*, Liu GH*, Zhang W*. Regeneration Roadmap: database resources for regenerative biology. ***Nucleic Acids Research*** **(IF = 16.7),** 2022. 50(D1): D1085-D1090.
15. Aging Atlas Consortium[#], **(Ma S[#] (马帅，共同第一))**, Zhang W*, Qu J*, Bao Y*, Liu GH*. Aging Atlas: A Multi-Omics Database for Aging Biology. ***Nucleic Acids Research*** **(IF = 16.7),** 2021. 49(D1): D825-D830.
16. Hu Y[#], Wu Q[#], **Ma S[#] (马帅，共同第一)**, Ma T[#], Shan L, Wang X, Nie Y, Ning Z, Yan L, Xiu Y, Wei F*. Comparative genomics reveals convergent evolution between the bamboo-eating giant and red pandas. ***Proc. Natl. Acad. Sci*** **(IF = 9.4)**, 2017. 114(5):1081-1086.
17. Lu H[#], Jing Y[#], Zhang C[#], **Ma S[#] (马帅，共同第一)**, Zhang W[#], Huang D, Zhang B, Zuo Y, Qin Y, Liu GH*, Yu Y*, Qu J*, Wang S*. Aging hallmarks of the primate ovary revealed by spatiotemporal transcriptomics. ***Protein & Cell*** **(IF = 13.6)**, 2024. 15(5): 364-384.
18. Sun S[#], Jiang M[#], **Ma S*（马帅，共同通讯）**, Ren J*, Liu GH*. Exploring the heterogeneous targets of metabolic aging at single-cell resolution. ***Trends in Endocrinology & Metabolism*** **(IF = 11.4)**, 2024, doi: 10.1016/j.tem.2024.07.009.
19. Zhang Y[#], Zheng Y[#], Wang S[#], Fan Y, Ye Y, Jing Y, Liu Z, Yang S, Xiong M, Yang K, Hu J, Che S, Chu Q, Song M, Liu GH*, Zhang W*, **Ma S* (马帅，共同通讯)**, Jing Qu[#]. Single-nucleus transcriptomics reveals a gatekeeper role for FOXP1 in primate cardiac aging. ***Protein & Cell*** **(IF = 13.6)**, 2023, doi:10.1093/procel/pwac038.
20. Yan H[#], Lu C[#], Lan C[#], Wang S[#], Zhang W[#], He Z, Hu J, Ai J, Liu GH*, **Ma S* (马帅，共同通讯)**, Zhou Y*, Qu J*. Degeneration Directory: A multi-omics web resource for degenerative diseases. ***Protein & Cell*** **(IF = 13.6)**, 2024. doi:10.1093/procel/pwad066.
21. Li LZ[#], Yang K[#], Jing Y[#], Fan Y[#], Jiang X, Wang S, Liu GH*, Qu J*, **Ma S* (马帅，共同通讯)**, Zhang W*. CRISPR-based screening identifies XPO7 as a positive regulator of senescence, ***Protein & Cell*** **(IF = 13.6)**, 2023.
22. Chu Q[#], Liu F[#], He Y[#], Jiang X[#], Cai Y, Wu Z, Yan K, Geng L, Zhang Y, Feng H, Zhou K, Wang S, Zhang W, Liu GH*, **Ma S*（马帅，共同通讯)**, Qu J*, Song M*. mTORC2/RICTOR exerts differential levels of metabolic control in human embryonic, mesenchymal and neural stem cells. ***Protein & Cell*** **(IF = 13.6)**, 2022. doi:10.1007/s13238-021-00898-9.
23. Li H[#], Zhu L[#], Wang R[#], Xie L[#], Ren J[#], **Ma S[#] (马帅，共同第一)**, Zhang W[#], Liu X, Huang Z, Chen B, Li Z, Feng H, Liu GH*, Wang S*, Qu J*, Su W*. Aging weakens Th17 cell pathogenicity and ameliorates experimental autoimmune uveitis in mice. ***Protein & Cell*** **(IF = 13.6)**, 2021. 1-24.
24. Bao H[#], Cao J[#], Chen M[#], Chen M[#], Chen W[#], Chen X[#], Chen Y[#], Chen Y[#], Chen Y[#], Chen Z[#], Chhetri JK[#], Ding Y[#], Feng J[#], Guo J[#], Guo M[#], He C[#], Jia Y[#], Jiang H[#],

Jing Y[#], Li D[#], Li J[#], Li J[#], Liang Q[#], Liang R[#], Liu F[#], Liu X[#], Liu Z[#], Luo OJ[#], Lv J[#], Ma J[#], Mao K[#], Nie J[#], Qiao X[#], Sun X[#], Tang X[#], Wang J[#], Wang Q[#], Wang S[#], Wang X[#], Wang Y[#], Wang Y[#], Wu R[#], Xia K[#], Xiao FH[#], Xu L[#], Xu Y[#], Yan H[#], Yang L[#], Yang R[#], Yang Y[#], Ying Y[#], Zhang L[#], Zhang W[#], Zhang W[#], Zhang X[#], Zhang Z[#], Zhou M[#], Zhou R[#], Zhu Q[#], Zhu Z[#], Cao F*, Cao Z*, Chan P*, Chen C*, Chen G*, Chen HZ*, Chen J*, Ci W*, Ding BS*, Ding Q*, Gao F*, Han JJ*, Huang K*, Ju Z*, Kong QP*, Li J*, Li J*, Li X*, Liu B*, Liu F*, Liu L*, Liu Q*, Liu Q*, Liu X*, Liu Y*, Luo X*, **Ma S* (马帅，共同通讯)**, Ma X*, Mao Z*, Nie J*, Peng Y*, Qu J*, Ren J*, Ren R, Song M*, Songyang Z*, Sun YE*, Sun Y*, Tian M*, Wang S*, Wang S*, Wang X*, Wang X*, Wang YJ*, Wang Y*, Wong CCL*, Xiang AP*, Xiao Y*, Xie Z*, Xu D*, Ye J*, Yue R*, Zhang C*, Zhang H*, Zhang L*, Zhang W*, Zhang Y*, Zhang YW*, Zhang Z*, Zhao T*, Zhao Y*, Zhu D*, Zou W*, Pei G*, Liu GH*.. Biomarkers of aging. ***Science China Life Science* (IF = 8),** 2023. Apr 11:1-174. doi:10.1007/s11427-023-2305-0. (Cover story).

25. Cai Y[#], Song W[#], Li J[#], Jing Y[#], Liang C[#], Zhang L[#], Zhang X[#], Zhang W[#], Liu B[#], An Y[#], Li J[#], Tang B[#], Pei S[#], Wu X[#], Liu Y[#], Zhuang CL[#], Ying Y[#], Dou X[#], Chen Y[#], Xiao FH[#], Li D[#], Yang R[#], Zhao Y[#], Wang Y[#], Wang L[#], Li Y[#], **Ma S* (马帅，共同通讯)**, Wang S*, Song X*, Ren J*, Zhang L*, Wang J*, Zhang W*, Xie Z*, Qu J*, Wang J*, Xiao Y*, Tian Y*, Wang G*, Hu P*, Ye J*, Sun Y*, Mao Z*, Kong QP*, Liu Q*, Zou W*, Tian XL*, Xiao ZX*, Liu Y*, Liu JP*, Song M*, Han JJ*, Liu GH*. The landscape of aging. ***Science China Life Sciences* (IF = 8)**, 2022. 1-101. doi:10.1007/s11427-022-2161-3.