



NORTHWEST A&F UNIVERSITY

April 14, 2024

Dear Dr. Chris Tuggle,

My name is Ningbo Chen. I obtained my Ph.D in Animal Genetics, Breeding and Reproduction from Northwest Agricultural and Forest University in 2019. I am now an Associate Professor at the College of Animal Science and Technology, Northwest A & F University. My research focused on the genetic architecture of bovine populations, including cattle, yak, and other wild bovine species, quantitatively characterized their admixture features, and revealed their migration history and adaptive divergence. Next-generation sequencing of the mitochondrial and nuclear genomes of both ancient and modern bovine species was used to reveal population evolution and adaptive introgression.

I am truly interested in joining the Early Career Scientist (ECS) representative to the ISAG Executive Committee. If I join the ECS representative, I am willing to fulfill the following duties: (a) represent early career researchers in the animal genetics field on the ISAG executive committee. (b) Serving as chair of a committee to organize a workshop, such as ancient and modern animal genetics, dedicated to early career researcher professional development and recognition. I expect to develop plans for workshops, such as “Genomics Applied to Tropically Adapted Livestock” and “Population Genomics of Livestock Using Ancient DNA Data”. In addition, I truly like to present my early career research works about the genomic studies of cattle, yak, and other wild bovine species in workshops.

I currently serve as editorial members for several journals, such as BMC Biology, BMC Genomics, and the Journal of Genetics and Genomics. I have several collaborations with various countries. I had some training in academic activities. Therefore, I think I am a suitable candidate for this position because of my scientific and communicative skills.

I sincerely appreciate your favorable consideration of my application.

Sincerely,

A handwritten signature in black ink that reads "Ningbo Chen".

Ningbo Chen, Ph. D

Associate Professor of College of Animal Science and Technology

Northwest A&F University

China

Ningbo Chen, Ph.D.

Current Position: Associated Professor at College of Animal Science and Technology, Northwest A&F University, Yangling, Shaanxi 712100 China

E-mail: ningbochen@nwfau.edu.cn; ningboch@126.com

Tel: +86 18700595957

Date: December 15, 1987

Nationality: Chinese

Homepage: <https://www.researchgate.net/profile/Ningbo-Chen>;

<https://dkxy.nwsuaf.edu.cn/en/Faculty/65506f610b6c4c97a801544846add35c.htm>

**Academic formation**

June 2019. Ph.D. degree in Animal genetics and breeding, Northwest A&F University.

July 2019. Associate Professor, College of Animal Science and Technology Northwest A&F University.

Aug 2020-Jan 2024. Postdoctoral Fellow, College of Animal Science and Technology Northwest A&F University.

Research areas**Cattle Population Omics/ Bovine Genetics/ Molecular Evolution/ Bioinformatics/**

My research provides fundamental insight into the origin of cattle, genome organization and plasticity of farm animals, thereby improving our understanding of the molecular-genetic underpinnings of complex traits and diseases. Focus on to dissect genetic architecture of bovine populations, including cattle, yak, and other wild bovine species, quantitatively characterize their admixture features, and reveal their migration history and adaptive divergence. Using next generation sequencing, mitochondrial and the nuclear genome of both ancient and modern bovine species to reveal the population evolution and adaptive introgression.

The four main research goals include:

- [1] genome assembly and pangenome integration of Chinese cattle,
- [2] the origin and formation of East Asian bovine species, including cattle, yak, aurochs, using ancient and modern DNA technology,
- [3] the genetic characterization of cattle adaptation to extremely environments, and
- [4] population-scale complex trait genomics using omics data.

Editorial and reviewer activity

Editorial Board of BMC Biology, Genomics Proteomics Bioinformatics, BMC Genomics, BMC Genomic Data, Journal of Integrative Agriculture, Journal of Genetics and Genomics, Animal Research and One Health, Agriculture Communications, Modern Agriculture.

The reviewer activity carried out refers to Genome Biology, PNAS, iScience, Journal of Animal Breeding and Genetics, Animal Genetics, Genetic Selection Evolution, BMC Ecology and Evolution, Journal of Archaeological Science: Reports.

Awards

2020 Technology New Star in Shaanxi province, China

2020 Reward-gainers of the excellent PhD dissertations in Shaanxi Province, China
2023 Travel Bursary Award, 2023 ISAG Conference
2023 Best Poster Presentation, 2023, GPB Omics & Bioinformatics Frontiers Symposium

Publications

Preprints and submitted manuscripts.

- [1] Yang Lyu#, Fuwen Wang#, Haijian Cheng#, Jing Han#, Ruihua Dang#, Xiaoting Xia#, Hui Wang, Jincheng Zhong, Johannes A. Lenstra, Hucai Zhang, Jianlin Han, David MacHugh, Ivica Medugorac, Maulik Upadhyay, Alexander S Leonard, He Ding, Xiaorui Yang, Mingshan Wang, Suolang Quji, Basang Zhuzha, Pubu Quzhenp, Silang Wangmu, Nima Cangjue, Da Wa, Weidong Ma, Jianyong Liu, Jicai Zhang, Bizhi Huang, Xingshan Qi, Fuqiang Li, Yongzhen Huang, Yun Ma, Yu Wang, Yuanpeng Gao*, Wenfa Lu*, Chuzhao Lei*, **Ningbo Chen***. (2024). Recent selection and adaptive introgression facilitated high-altitude adaptation of Qinghai-Tibetan Plateau cattle (submitted to Science Bulletin, under revision)
- [2] Shungang Chen*, Lele Ren, Jiawen Hou, Yu Gao, Guanghui Dong, Guilian Sheng, Jianlin Han, Xinyi Liu, **Ningbo Chen***, Fahu Chen. (2024) The earliest hybridization between East Asian aurochs and taurine cattle on the Tibetan Plateau 3400 years ago. (submitted to Science Bulletin, under revision)

Selected publications from peer-reviewed journals, * stands for Corresponding author, # stands for Co-first author.

- [1] **Ningbo Chen**#, Xiaoting Xia#, Quratulain Hanif#, Fengwei Zhang#, Ruihua Dang#, Bizhi Huang#, Yang Lyu, Xiaoyu Luo, Hucai Zhang, Shikang Wang, Fuwen Wang, Jialei Chen, Xiwen Guan, Yangkai Liu, Shuang Li, Liangliang Jin, Pengfei Wang, Luyang Sun, Haijian Cheng, Jicai Zhang, Jianyong Liu, Kaixing Qu, Yanhong Cao, Junli Sun, Yuying Liao, Zhengzhong Xiao, Ming Cai, Lan Mu, AMAM Zonaed Siddiki, Muhammad Asif, Shahid Mansoor, Masroor Ellahi Babar, Tanveer Hussain, Gamamada Liyanage Lalanie Pradeepa Silva, Neena Amatya Gorkhali, Endashaw Terefe, Gurja Belay, Abdulfatai Tijjani, Tsadkan Zegeye, Mebrate Genet Gebre, Yun Ma, Yu Wang, Yongzhen Huang, Xianyong Lan, Hong Chen, Nicola Rambaldi Migliore, Giulia Colombo, Ornella Semino, Alessandro Achilli, Mikkel-Holger S Sinding, Johannes A Lenstra, Olivier Hanotte*, Jianlin Han*, Yu Jiang*, Chuzhao Lei*. (2023) Global genetic diversity, introgression and evolutionary adaptation of indicine cattle revealed by whole genome sequencing. **Nature Communications. 14, 7803.**
- [2] **Ningbo Chen**#, Zhengwei Zhang#, Jiawen Ho#, Jialei Chen#, Xuan Gao, Li Tang, Shargan Wangdue, Xiaoming Zhang, Mikkel-Holger S Sinding, Xuexue Liu, Jianlin Han, Hongliang Lü*, Chuzhao Lei*, Fiona Marshall* and Xinyi Liu*. (2023) Evidence for early domestic yak, taurine cattle, and their hybrids on the Tibetan Plateau. **Science Advances. 9, eadi6857.**

- [3] Xiaoting Xia, Fengwei Zhang, Shuang Li, Xiaoyu Luo, Lixin Peng, Zheng Dong, Hubert Pausch, Alexander S. Leonard, Danang Crysnanto, Shikang Wang, Bin Tong, Johannes A. Lenstra, Jianlin Han, Fuyong Li, Tieshan Xu, Lihong Gu, Liangliang Jin, Ruihua Dang, Yongzhen Huang, Xianyong Lan, Gang Ren, Yu Wang, Yuanpeng Gao, Zhijie Ma, Haijian Cheng, Yun Ma, Hong Chen, Weijun Pang*, Chuzhao Lei*, **Ningbo Chen*** (2023) Structural variation and introgression from wild populations in East Asian cattle genomes confer adaptation to local environment. **Genome Biology**. **24**, 211. **【Featured article】**
- [4] **Chen Ningbo#**; Cai Yudong#; Chen Qiuming#; Li Ran#; Wang Kun#; Huang Yongzhen#; Hu Songmei; Huang Shisheng; Zhang Hucai; Zheng Zhuqing; Song Weining; Ma Zhijie; Ma Yun; Dang Ruihua; Zhang Zijing; Xu Lei; Jia Yutang; Liu Shanzhai; Yue Xiangpeng; Deng Weidong; Zhang Xiaoming; Sun Zhouyong; Lan Xianyong; Han Jianlin; Chen Hong; Bradley Daniel G; Jiang Yu*; Lei Chuzhao*. (2018) Whole-genome resequencing reveals world-wide ancestry and adaptive introgression events of domesticated cattle in East Asia. **Nature Communications** 9. **【Featured article】**
- [5] **Chen, Ningbo#**; Ren, Lele#; Du, Linyao#; Hou, Jiawen#; Mullin, VictoriaE.; Wu, Duo; Zhao, Xueye; Li, Chunmei; Huang, Jiahui; Qi, Xuebin; Capodiferro, Marco Rosario; Achilli, Alessandro; Lei, Chuzhao; Chen, Fahu; Su, Bing*; Dong, Guanghui*; Zhang, Xiaoming*. (2020) Ancient genomes reveal tropical bovid species in the Tibetan Plateau contributed to the prevalence of hunting game until the late Neolithic. **Proceedings of the National Academy of Sciences**, 117(45): 28150-28159. **【Featured article】**
- [6] Yang Lyu, Tingting Yao, Zhefu Chen, Ruiyao Huangfu, Haijian Cheng, Weidong Ma, Xingshan Qi, Fuqiang Li, **Ningbo Chen***, Chuzhao Lei*. (2024) Genomic characterization of dryland adaptation in endangered Anxi cattle in China. *Animal Genetics*. DOI: 10.1111/age.13416.
- [7] Yang Lyu#, Yaxuan Ren#, Kaixing Qu, Suolang Quji, Basang Zhuzha, Chuzhao Lei* and **Ningbo Chen***. (2023) Local ancestry and selection in admixed Sanjiang cattle. **Stress Biology**. 3:30.
- [8] Xiaoting Xia, Kaixing Qu, Yan Wang, Mikkel-Holger S. Sinding, Fuwen Wang, Quratulain Hanif, Zulfqar Ahmed, Johannes A. Lenstra, Jianlin Han, Chuzhao Lei* and **Ningbo Chen***. (2023) Global dispersal and adaptive evolution of domestic cattle: a genomic perspective. **Stress Biology**. 3:8.
- [8] **Ningbo Chen** and Artem Nedoluzhko. (2023) Ancient DNA: the past for the future. **BMC genomics**. 24:309.
- [9] Fengwei Zhang#, Chong Wang#, Haiyue Xu#, Xiaoting Xia, Xiaoyu Luo, Kaihui Li, Jianlin Han, Chuzhao Lei*, **Ningbo Chen***, Xiangpeng Yue*. (2023) Genomic analysis reveals a KIT-related chromosomal translocation associated with the white coat phenotype in yak. **Journal of Animal Breeding and Genetics**. 140(3):330-342.
- [10] Yuqing Han#, Lulan Zeng#, Shuang Li, Gaoxiang Yuan, Ying Liu, Xuhong Ding, Kaixing Qu, Fuqiang Li, Jicai Zhang, Chuzhao Le, Bizhi Huang*, **Ningbo Chen***. (2021) T2R12 gene variation in Chinese native cattle owing to banteng introgression. **Animal Genetics**,52(4):565-566.
- [11] Xiao-Ting Xia, Alessandro Achilli, Johannes A. Lenstra, Bin Tong, Yun Ma, Yong-Zhen Huang, Jian-Lin Han, Zhou-Yong Sun, Hong Chen, Chu-Zhao Lei1, Song-Mei Hu*, **Ning-Bo Chen***. (2021) Mitochondrial genomes from modern and ancient Turano-Mongolian

- cattle reveal an ancient diversity of taurine maternal lineages in East Asia. **Heredity**, 126(6):100-1008.
- [12] **Chen, Ningbo#**; Fu, Weiwei#; Zhao, Jianbang; Shen, Jiafei; Chen, Qiuming; Zheng, Zhuqing; Chen, Hong; Sonstegard, Tad S.; Lei, Chuzhao; Jiang, Yu*. (2020) BGVD: Integrated Web-database for Bovine Sequencing Variations and Selective Signatures. **Genomics, Proteomics & Bioinformatics**. 18(2): 186-193.
- [13] **Chen Ningbo#**; Huang Jieping#; Zulfiqar Abbasi; Li Ran; Xi Yulian; Zhang Mingming; Dang Ruihua; Lan Xianyong; Chen Hong; Ma Yun; Lei Chuzhao*. (2018) Population structure and ancestry of Qinchuan cattle. **Animal Genetics** 49, 246-8.
- [14] Han Haoyuan#, **Chen Ningbo#**, Jordi Jordana, Li C., Sun Ting, Xia Xiaoting, Zhao X, Ji C, Shen S, Yu Jie, Ainhua F., Chen Hong, Lei Chuzhao; Dang Ruihua*. (2017) Genetic diversity and paternal origin of domestic donkeys. **Animal Genetics** 48, 708-11.
- [15] Wang Shaoqiang#; **Chen Ningbo#**; Capodiferro Marco Rosario#; Zhang Tao; Lancioni Hovirag; Zhang Hucui; Miao Yongwang; Chanthakhoun V; Wanapat Metha; Yindee Marnoch; Zhang Yi; Lu Hongzhao; Caporali Leonardo; Dang Ruihua; Huang Yongzhen; Lan Xianyong; Plath Martin; Chen Hong; Lenstra Johannes A; Achilli Alessandro*; Lei Chuzhao*. (2017) Whole Mitogenomes Reveal the History of Swamp Buffalo: Initially Shaped by Glacial Periods and Eventually Modelled by Domestication. **Scientific Reports** 7.
- [16] **Chen Ningbo#**; Ma Yun#*; Yang Ting#; Lin Fen; Fu Weiwei; Xu Yongjie; Li Fen; Li Junya; Gao Shuxin. (2015) Tissue expression and predicted protein structures of the bovine ANGPTL3 and association of novel SNPs with growth and meat quality traits. **Animal** 9, 1285-97.
- [17] Ma Yun#*; **Chen Ningbo#**; Li Fen; Fu Weiwei; Han Yapeng; Chang Yanlin; Jiang Xiangxiang; Li Junya; Bai Yueyu; Tan Xuxin. (2015) Bovine HSD17B8 gene and its relationship with growth and meat quality traits. **Science Bulletin** 60, 1617-21.

Presentations

- [1] Structural Variation and Wild Introgression in East Asian Cattle, PAG Australia (Perth, 2023);
- [2] History and unique evolutionary adaptation of indicine cattle, PAG Australia (Perth, 2023);
- [3] Genomics landscape of Chinese cattle PAG Online Conference, June 24, 2022
- [4] The tropical and Subtropical Adaptation and Genetic Diversity of Chinese Local Cattle Based on the Whole Genome Data Shenzhen PAG June 7, 2019