Chao Hou, Ph.D.
E-mail: ch3849@cumc.columbia.edu, bjmuhou@gmail.com
http://chaohou.netlify.app
1130 St Nicholas Avenue, New York, NY 10032

Academic Curriculum Vitae (Update: Oct 2024)

Personal:

- Language: Chinese, English
- Hobbies: Basketball, Skiing, Photography

Research Interests:

- Protein dynamics and multi-conformation
- Protein language models
- Functional analysis of genetic mutations in disease
- Cell reprogramming and design
- Transcription regulation and cell fate determination
- Drug designation and effect prediction

Work Experience:

- Postdoc Research Scientist — Columbia University — Sep 2023 - Now
  - Advisor: Dr. Yufeng Shen

Education:

- Ph.D. in Biomedical Informatics — Peking University — Sep 2020 - Jul 2023
  - Advisor: Dr. Tingting Li
- Bachelor of Medicine and Economics — Peking University — Sep 2015 - Jul 2020

Main Publications:

(# indicates co-first author)

1. **Hou C**, Yufeng Shen. SeqDance: A Protein Language Model for Representing Protein Dynamic Properties. **BioRxiv**. 2024 Oct 15.
2. **Hou C#**, Wang X#, Xie H#, Chen T, Zhu P, Xu X, You K, Li T. PhaSepDB in 2022: annotating phase separation-related proteins with droplet states, co-phase separation partners and other experimental information. **Nucleic Acids Res**. 2023 Jan 6.
3. **Hou C**, Li Y, Wang M, Wu H, Li T. Systematic prediction of degrons and E3 ubiquitin ligase binding via deep learning. **BMC Biology.** 2022 Jul 14.
4. **Hou C**#, Xie H#, Fu Y#, Ma Y#, Li T. MloDisDB: a manually curated database of the relations between membraneless organelles and diseases. **Brief Bioinform.** 2021 Jul 20.
5. Chen Z#, **Hou C#**, Wang L#, Yu C, Chen T, Shen B, Hou Y, Li P, Li T. Screening membraneless organelle participants with machine-learning models that integrate multimodal features. **Proc Natl Acad Sci U S A**. 2022 Jun 14.
6. Zhu P#, **Hou C**#, Liu M, Chen T, Li T, Wang L. Investigating phase separation properties of chromatin-associated proteins using gradient elution of 1,6-hexanediol. **BMC Genomics**. 2023

Aug 28.

7. Han P, **Hou C**, Zheng X, Cao L, Shi X, Zhang X, Ye H, Pan H, Liu L, Li T, Hu F, Li Z. Serum Antigenome Profiling Reveals Diagnostic Models for Rheumatoid Arthritis. **Front Immunol**. 2022 Apr 20.

Other Publications:

8. Xu X, Li Y, Chen T, **Hou C**, Yang L, Zhu P, Zhang Y, Li T. investigating variant impact on phosphorylation events driving carcinogenesis. Brief Bioinform. 2023 Dec 29.
9. Yu C, Lang Y, **Hou C**, Yang E, Ren X, Li T. Distinctive Network Topology of Phase-Separated Proteins in Human Interactome. J Mol Biol. 2022 Jan 15.
10. Shi M, You K, Chen T, **Hou C**, Liang Z, Liu M, Wang J, Wei T, Qin J, Chen Y, Zhang MQ, Li T. Quantifying the phase separation property of chromatin-associated proteins under physiological conditions using an anti-1,6-hexanediol index. Genome Biol. 2021 Aug 17.
11. Chen T, Tang G, Li T, Yanghong Z, **Hou C**, Du Z, Ma L, Li T. PhaSeDis: A Manually Curated Database of Phase Separation–Disease Associations and Corresponding Small Molecules. BioRxiv.

Oral Presentations

2024.09 Learning Representation of Protein Dynamic Properties with a Language Model. Retreat of Department of Systems Biology of Columbia University. PA, US.

2023.07 The degradation regulation of phase separating proteins. The student symposium in Fudan international summer school of life science, Shanghai, China.

2023.06 The degradation regulation of phase separating proteins. Excellent graduates symposium of Peking University School of Basic Medical Sciences, Beijing, China.

2023.04 The degradation regulation of phase separating proteins. Multidisciplinary Conference on New ideas and New Technologies at Peking University, Beijing, China.

2022.12 Targeting disordered degrons on phase separating proteins. Silk Road International Symposium for Distinguished Young Scholars at Xi'an Jiaotong University, Virtual meeting.

Poster Presentations

2024.07 Learning Representation of Protein Dynamic Properties with a Language Model. The International Conference on Intelligent Systems for Molecular Biology (ISMB 2024). Montreal, Canada.

Honors and Awards

2023 First prize in the student symposium in Fudan international summer school of life science
2023 Peking University Excellent Graduate
2022 Peking University President Scholarship
2021 Peking University Doctoral Innovation Scholarship
2020 Peking University Junior Scholar
2016 National Scholarship
2014 Silver medal in the final of Chinese Physics Olympiad

Journal Referee

Ebiomedicine, Plos Computational Biology, Protein Science

Teaching

2024.06 – present: Program for Mathematical Genomics (PMG) Undergrad Student Summer Program. Mentor for Jason Xie. Columbia Unversity.