BIOGRAPHICAL SKETCH

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NAME: Fang, Chengli

eRA COMMONS USER NAME (credential, e.g., agency login): FangCheng

POSITION TITLE: Postdoctoral Fellow

EDUCATION/TRAINING *(Begin with baccalaureate or other initial professional education, such as nursing, include postdoctoral training and residency training if applicable. Add/delete rows as necessary.)*

INSTITUTION AND LOCATION	DEGREE *(if applicable)*	Start Date MM/YYYY	Completion Date MM/YYYY	FIELD OF STUDY
Hunan University of Science and Technology	BS	09/2012	06/2016	Biological Engineering
Center for Excellence in Molecular Plant Sciences, Chinese Academy of Sciences	PhD	09/2016	12/2021	RNA polymerases
Oregon Health & Science University	Postdoc	06/2022	present	Neurotransmitter receptor

A. Personal Statement

Protein as the main executor of life activities, I am very interested in the mechanism of protein exerting the function. Structural biology is a great method to analyze the mechanism of protein. I pursued a Ph.D. in structural biology at the Center for Excellence in Molecular Plant Sciences, Chinese Academy of Sciences. I have focused on characterizing the detailed structural and mechanistic basis of RNA polymerase (RNAP) transcription, transcription initiation, and activation. During my 5-year doctorate, my academic training and research experience have provided me with an excellent background in structural biology and biochemistry. I received several academic awards and have some publications. I always complete my projects with great efficiency and make highly significant achievements in my research. After receiving my Ph.D. degree, I joined the Gouaux lab in June 2022 to study the structural and functional basis of AMPAR receptors. In the Gouaux lab, given my advanced training in membrane proteins, the opportunity to learn from Dr. Gouaux, and the excellent research environment in the Gouaux lab, I am confident to complete the proposed project and advance our understanding of the structure and function of AMPAR receptors.

B. Positions, Scientific Appointments and Honors

Positions

2022– Present Postdoctoral Fellowship, Oregon Health & Science University

Honors

2019 Merit student at the University of Chinese Academy of Sciences, CAS
2019 National Scholarship for PhD's degree, CAS
2020 Zhu Li Yuehua outstanding doctoral scholarship, CAS
2021 The president scholarship of CAS

C. Contributions to Science

1. My graduate research focused on characterizing the detailed structural and mechanistic basis of RNA polymerase (RNAP) transcription, transcription initiation, and activation. My study establishes that ECF σ factors and primary σ factors employ distinct mechanisms for promoter recognition and for promoter

unwinding. A subsequent study provides strong support for the DNA distortion paradigm of allosteric transcriptional control by MerR TFs.

a. **Fang CL,** Li L, Shen L, Shi J, Wang S, Feng Y, Zhang Y. Structures and mechanism of transcription initiation by bacterial ECF factors. Nucleic Acids Res. 2019 Jul 26;47(13):7094-7104.

b. Li L, **Fang CL**, Zhuang N, Wang T, Zhang Y. Structural basis for transcription initiation by bacterial ECF σ factors. Nat Commun. 2019 Mar 11;10(1):1153.

c. **Fang CL**, Philips SJ, Wu X, Chen K, Shi J, Shen L, Xu J, Feng Y, O'Halloran TV, Zhang Y. CueR activates transcription through a DNA distortion mechanism. Nat Chem Biol. 2021 Jan;17(1):57-64.

d. **Fang CL**, Li L, Zhao Y, Wu X, Philips SJ, You L, Zhong M, Shi X, O'Halloran TV, Li Q, Zhang Y. The bacterial multidrug resistance regulator BmrR distorts promoter DNA to activate transcription. Nat Commun. 2020 Dec 8;11(1):6284.

e. **Fang CL**, Zhang Y. Bacterial MerR family transcription regulators: activation by distortion. Acta Biochim Biophys Sin (Shanghai). 2022 Jan 25;54(1):25-36.

2. I also work on transcription related to genomic methylation in plants. The plant-specific Pol IV forms a complex with RDR2 (an RNA-dependent RNA polymerase) to produce double-stranded precursors of small interfering RNA essential for genomic DNA methylation. In this study, we first show this complex structure.

    a. Huang K, Wu XX, **Fang CL**, Xu ZG, Zhang HW, Gao J, Zhou CM, You LL, Gu ZX, Mu WH, Feng Y, Wang JW, Zhang Y. Pol IV and RDR2: A two-RNA-polymerase machine that produces double-stranded RNA. Science. 2021 Dec 24;374(6575):1579-1586.

3. I also work on the crystal structures of natural product synthesis metabolic enzymes.

    a. Huang JP, **Fang CL,** Ma XY, Wang L, Yang J, Luo J, Yan Y, Zhang Y, Huang SX. Tropane alkaloids biosynthesis involves an unusual type III polyketide synthase and non-enzymatic condensation. Nat Commun. 2019 Sep 6;10(1):4036.

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