Dr Maorong Xie

During my Master (2012-2015) I worked on the anti-viral restriction factor IFITM proteins family in HCMV infection at the Institut Pasteur of Shanghai under the supervision of Prof. Zhikang Qian. Surprisingly, we discovered that HCMV hijacks IFITMs to facilitate viral replication. I pursued my Ph.D. (2015-2019) in the lab of Prof. Serge Benichou, focusing on HIV-1 cell-to-cell transfer and viral dissemination in myeloid cells. We discovered that HIV-1 infected CD4 T cells induce cell fusion and syncytial formation for viral spreading in myeloid cells. I worked as post-doctoral research fellow at University College London under the supervision of Prof. Greg Towers from 2019-2024. In the Towers lab, my work aimed to understand the manipulation of host cells by HIV-1 and other primate lentiviruses, with a particular focus on viral accessory proteins, Vpr and Vpx. HIV has evolved multiple strategies to evade innate immune responses and counteract host restriction factors, with a little help from viral accessory proteins. Since 2024, I moved to the Department of Biology at the University of York to develop novel molecules for *ex vivo* hematopoietic stem cell expansion in the laboratories of Professor David Kent and Professor Ian Hitchcock.

email maorong.xie@york.ac.uk

Education

2015-2019 **Ph.D.** HIV-1 cell-to-cell transfer and dissemination in myeloid cells. Institut Cochin and University of Paris (Prof Serge Benichou).

2012-2015 **M.Sc** in **Immunology**. Soochow University, China

2008-2012 **B.Sc** in **Biotechnology**. Wuhan University of Technology, China

Research Experience

University of York, York Biomedical Research Institute, York

Research Associate Supervisor: David Kent and Ian Hitchcock Lab, 2024-present

Project: develop novel molecules for *ex vivo* hematopoietic stem cell expansion

− Develop Thrombopoietin receptor agonists (TPO-RAs) and modified TPO for HSC expansion.

− Analyse STAT signalling and mTOR signalling in *ex vivo* HSC expansion.

University College London, Towers Lab, London

Research fellow Supervisor: Greg Towers 2019-2024

Project: HIV-1 Vpr Antagonizes Interferon by Suppressing STAT Nuclear Transport

− Investigate the role of the HIV-1 accessory protein Vpr in HIV-1 infection.

− Analyse STAT signalling pathways in HIV-1 infection of myeloid cells.

Project: SARS-CoV-2 Orf6 Antagonizes Interferon Signalling by Blocking STAT Nuclear Translocation

− Investigate the role of SARS-CoV-2 Orf6 in SARS-CoV-2 infection.

− Analyse STAT1 signalling pathways in SARS-CoV-2 infection.

Institut Cochin, Team “Virus and Intracellular Trafficking’’, Paris

Ph.D. Supervisor: Serge BENICHOU 2015-2019

Project: Analysis of Macrophages Infection by Cell-To-Cell Transfer of HIV-1

− Cell imaging analysis of virus cell-to-cell transfer toward macrophages

− Analysis of signaling pathways and actin cytoskeleton re-organization during HIV-1 cell-to-cell transfer in myeloid cells

Institut Pasteur of Shanghai, Team “Herpesvirus and molecular virology research’’, Shanghai

Master. Supervisor: Zhikang Qian 2012-2015

Project: Elucidate the Role of Host Proteins in Cytomegalovirus Infection

− Analyze the role of antiviral proteins IFITMs in human cytomegalovirus infection

− Investigate the roles of oxysterol-binding (OSBP)-related proteins (ORPs) in cholesterol sensing and transport during human cytomegalovirus infection

Grant Review Experience

National Science Center (NCN, Poland), 2021-2023

Reviewed and assessed 9 grant proposals, demonstrating a comprehensive understanding of the field and the ability to critically assess research proposals.

Provided detailed feedback and assessments on the scientific merit, feasibility, and impact of proposed research projects.

Master's Student Supervision

2015-2019 **Institut Cochin, Paris**

Supervised 3 master's students (Camille Ciccone, Andrea Cottignies-Calamarte and Solène Cottis) in their research projects. Guided students in the development and execution of their research plans.

2022-2023 **University College London, London**

Supervised 1 master's students (Jessie Jungels) in their research projects.

Provided mentorship on experimental design, data analysis, and scientific writing.

Facilitated regular progress meetings to track and support student research milestones.

Publications

Google Scholar

https://scholar.google.com/citations?user=zwRy9XMAAAAJ&hl=en

Semantic Scholar

https://www.semanticscholar.org/author/Maorong-Xie/4567632

Xie M, Whelan MVX, Govasli ML, Towers GJ. HIV-1 Vpr antagonises interferon by suppressing STAT nuclear transport. Manuscript in preparation.

Xie M*, Whelan MVX*, Towers GJ. SARS-CoV-2 Orf6 antagonizes interferon signalling by blocking STAT nuclear translocation. Manuscript in preparation. (* co-first author)

Pan D, Xu W, **Xie M**, Hao H, Yue N, Tang S, Qian Z. OSBP is Involved in the Virion Assembly Compartment Morphogenesis of Human Cytomegalovirus. Submitted

Han M*, Cantaloube-Ferrieu V*, **Xie M**, Armani-Tourret M, Woottum M, Pagès J, Colin P, Lagane B and Benichou S. HIV-1 cell-to-cell spread overcomes the virus entry block of non-macrophage-tropic strains in macrophages. **PIOS Pathogens**. 2022 May 27;18(5):e1010335.

Leroy H, Han M, Woottum M, Bracq L, Bouchet J, **Xie M**, Benichou S. Virus-Mediated Cell-Cell Fusion. **Int J Mol Sci**. 2020 Dec 17;21(24):9644.

Xie M, Leroy H, Mascarau R, Woottum M, Dupont M, Ciccone C, Schmitt A, Raynaud-Messina B, Verollet C, Bouchet J, Bracq L and Benichou S. Cell-to-Cell Spreading of HIV-1 in Myeloid Target Cells Escapes SAMHD1 Restriction. **mBio**. 2019 Nov 19;10(6):e02457-19

Bracq L, **Xie M**, Benichou S, Bouchet J. Mechanisms for Cell-to-Cell Transmission of HIV-1. **Frontiers in Immunology**. 2018 Feb 19;9:260.

Bracq L, **Xie M**, Lambelé M, Vu LT, Matz J, Schmitt A, Delon J, Zhou P, Randriamampita C, Bouchet J, Benichou S. T cell-macrophage fusion triggers multinucleated giant cell formation for HIV-1 spreading. **Journal of Virology**. 2017 Oct 4. pii: JVI.01237-17. **(Cover of JVI March 2018, Volume 92, Issue 5, Spotlight in JVI.)**

Pan D, Xuan B, Sun Y, Huang S, **Xie M**, Bai Y, Xu W, Qian Z. An intein-mediated modulation of protein stability system and its application to study human cytomegalovirus essential gene function. **Scientific Report**. 2016 May 18;6:26167.

Xie M*, Xuan B*, Shan Z, Pan D, Sun Y, Shan Z, Zhang J, Yu D, Li B, and Qian Z. Human Cytomegalovirus Exploits Interferon-Induced Transmembrane Proteins to Facilitate Morphogenesis of the Virion Assembly Compartment. **Journal of Virology**. 2015 Mar;89(6):3049-61. (* co-first author)

Book Chapter

Xie M*. "Virus-induced Cell Fusion and Syncytia Formation." **Results and Problems in Cell Differentiation**, vol. 71 (2023). (*First author and corresponding author)

Conferences

Poster Presentations

"HIV-1 Vpr antagonises interferon by suppressing STAT nuclear transport."

Retroviruses 2023, Cold Spring Harbor, New York, May 2023

"HIV-1 cell-to-cell fusion mediates productive infection of macrophages and dendritic cells by both macrophage- and non-macrophage-tropic viruses."

Evolving Concepts in HIV and Emerging Viral Infections, Miami Winter Symposium 2019, January 2019

"HIV-1 cell-to-cell transfer and dissemination in myeloid target cells are mediated by an envelope-dependent two-step cell fusion mechanism."

The Frontiers in Retrovirology Conference 2018, Leuven, September 2018

"Human Cytomegalovirus Exploits Interferon-Induced Transmembrane Proteins to Facilitate Morphogenesis of the Virion Assembly Compartment."

The 1st National Symposium on Virology for Young Scholars, Shanghai, September 2014

Oral Presentations

"HIV-1 cell-to-cell transfer and dissemination in myeloid target cells are mediated by an envelope-dependent two-step cell fusion mechanism."

Retroviruses 2018, Cold Spring Harbor, New York, May 2018

Awards and Honors

2019 **IUBM Travel Fellowship**, Miami Winter Symposium 2019, Miami, USA,

2014 **Best Poster Award**, the 1st National Symposium on Virology for Young Scholars, Shanghai, China

2012 **Outstanding Graduates Awards**, Wuhan University of Technology, China

2010 **Merit Students Awards**, Wuhan University of Technology, China

2009 **Merit Students Awards**, Wuhan University of Technology, China

2009 **The Second Prize Scholarship**, Wuhan University of Technology, China

2009 **Advanced Individual**, Wuhan University of Technology, China