CURRICULUM VITAE

PERSONAL INFORMATION

Name: Zhu Haiyan （朱海燕)

Date of birth: Oct. 12, 1984

Address: Laboratory of Synthetic Organic Chemistry
Graduate School of Pharmaceutical Sciences,
The University of Tokyo
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EDUCATION / CAREER

2012.9-present: **Postdoctoral Researcher**
Graduate School of Pharmaceutical Sciences, The University of Tokyo (Prof. Motomu Kanai, Dr. Shigehiro Kawashima)

2007.9-2012.7: **Ph.D. Biochemistry and Molecular Biology**
Shanghai Medical College, Fudan University, China
(Prof. Gu Jianxin)

2002.9-2007.7: **BMed Basic Medical Science**
Shanghai Medical College, Fudan University, China
(Prof. Wu Gencheng)

SKILLS & EXPERTISE

Background: molecular biology and immunology

Experimental Skills

General experiments in biochemistry and molecular biology:

- Yeast two-hybrid assay
- Protein expression and purification
- Immunological techniques (Western blot analysis, immunofluorescence)
- Molecular biology (cloning, PCR, RT-PCR, mutagenesis)
- Protein-protein interactions (pull-down, immunoprecipitation)
- Mammalian cell culture (overexpression, RNAi)

- Primary Macrophage and Dendritic cell culture
- *In vitro* kinase assay, Dual-luciferase reporter gene assay
- Statistical analysis experience with SigmaPlot and Microsoft Excel

DOCTOR PROJECTS

- **The interaction of LOX-1 with Hsp60**

  My research mainly focuses on the immunological regulation of lectin-like oxidized low-density lipoprotein receptor-1 (LOX-1) on dendritic cells. One of my major discoveries is that LOX-1, as a receptor for Hsp60, could bind and internalize Hsp60 via the C terminus of Hsp60. More importantly, bone marrow-derived dendritic cells could cross-present Hsp60-fused OVA Ag on MHC class I molecules via LOX-1. These results are valuable for further understanding the mechanism of cross-presentation mediated by LOX-1.

- **An efficient delivery of Hsp60 to cell surface**

  To clarify the function of Hsp60 on the cell surface during stress, an efficient delivery of Hsp60 is required. However, when Hsp60 was displayed out membrane through traditional way, it is modified with N-glycosylation, which may has potential influence in the function of surface Hsp60. Then I thought to deliver Hsp60 to cell surface using an unconventional secretory signal peptide, and found N18S was an efficient signal peptide. Further more, it could also deliver other DAMPs to cell surface in different cell lines. This method could be used in the research of translocated DAMPs.

- **Surface Heat shock proteins on apoptotic cells and cross-presentation of cell-associated antigen**

  Heat shock proteins were over-expressed on apoptotic cell surface. I found that LOX-1 could uptake apoptotic cells by recognizing heat shock proteins on the cell surface and facilitate cross-presentation of apoptotic cell-associated antigens. And I am now doing some research about the cross-talk between LOX-1 and Toll-like Receptor. Related articles are still in preparation.

AWARDS

2010	First Class Academic Scholarship awarded by Fudan University
	Guanghua Scholarship awarded by Fudan University
2009	First Class Freshman Scholarship awarded by Fudan University
2008	Second Class Academic Scholarship awarded by Fudan University
2007	First Class Freshman Scholarship awarded by Fudan University

PUBLICATIONS

1. **Zhu H**, Wang L, Ruan Y, Zhou L, Zhang D, Min Z, Xie J, Yu M, Gu J. An efficient delivery of DAMPs on the cell surface by the unconventional secretion pathway, Biochem Biophys Res Commun. 2011 Jan 21;404(3):790-5.

2. Xie J, **Zhu H**, Guo L, Ruan Y, Wang L, Sun L, Zhou L, Wu W, Yun X, Shen A, Gu J. Lectin-like oxidized low-density lipoprotein receptor-1 delivers heat shock protein 60-fused antigen into the MHC class I presentation pathway, J Immunol. 2010 Aug 15;185(4):2306-13.

3. **Zhu H**, Lee C, Zhang D, Wu W, Wang L, Fang X, Xu X, Song D, Xie J, Ren S, Gu J. Surface-associated GroEL of Escherichia coli Mediates Invasion in Macrophage Partially through Targeting LOX-1. Microbes Infect. 2012 Oct 18.

4. Xie J, **Zhu H**, Zhang D, Wang L, Wu W, Zhou L, Ruan Y, Yun X, Ren S, Xu J, Gu J. Membrane-bound Heat shock proteins facilitate the clearance of apoptotic cells and cross-presentation of cellular antigen. (Revised)

5. Zhang D, Sun L, **Zhu H**, Wang L, Wu W, Xie J, Gu, J. Microglial LOX-1 reacts with extracellular HSP60 to bridge neuroinflammation and neurotoxicity. Neurochem Int. 2012 Jul 27. (Epub)

6. Wang L, Ren S, **Zhu H**, Hao Y, Zhang D, Ruan Y, Zhou L, Lee C, Xie J, Gu J. Structural and functional conservation of CLEC-2 with the species-specific regulation of transcript expression in evolution. Glycoconjugate J. 2012 Aug;29(5-6):335-45.

7. Fang X, Hu H, Xie J, **Zhu H**, Zhang D, Mo W, Zhang R, Yu M. An involvement of neurokinin-1 receptor in FcεRI-mediated RBL-2H3 mast cell activation. Inflamm. Res. PLoS One. 2012;7(7):e40566.

8. Wu W, Sun Z, Wu J, Peng X, Gan H, Zhang C, Ji L, Xie J, **Zhu H**, Ren S, Gu J, Zhang S. Trihydrophobin 1 phosphorylation by c-Src regulates MAPK/ERK signaling and cell migration. PLoS One. 2012;7(1):e29920.

9. Zhou L, Xie J, Ruan Y, **Zhu H**, Wang W, Yun X, Guo L, Gan H, Sun L, Yu M, Gu J. Expression and purification of secreted recombinant hsp60 from eukaryotic cells, Protein Expr Purif. 2010 Aug;72(2):179-83

10. Xie J, Guo L, Ruan Y, **Zhu H**, Wang L, Zhou L, Yun X, Gu J. Laminarin-mediated targeting to Dectin-1 enhances antigen-specific immune responses. Biochem Biophys Res Commun. 2010 Jan 1;391(1):958-62.

11. Ruan Y, Guo L, Qiao Y, Hong Y, Zhou L, Sun L, Wang L, **Zhu H**, Wang L, Yun X, Xie J, Gu J. RACK1 associates with CLEC-2 and promotes its ubiquitin-proteasome degradation. Biochem Biophys Res Commun. 2009 Dec 11;390(2):217-22.

12. Guo L, Xie J, Ruan Y, Zhou L, **Zhu H**, Yun X, Jiang Y, Lü L, Chen K, Min Z, Wen Y, Gu J. Characterization and immunostimulatory activity of a polysaccharide from the spores of Ganoderma lucidum. Int Immunopharmacol. 2009 Sep;9(10):1175-82.

13. Xie J, Wu T, Guo L, Ruan Y, Zhou L, **Zhu H**, Yun X, Hong Y, Jiang J, Wen Y, Gu J.Molecular characterization of two novel isoforms and a soluble form of mouse CLEC-2. Biochem Biophys Res Commun. 2008 Jun 27;371(2):180-4.

PATENT

顾建新，谢建辉，**朱海燕**，恽小婧；能与 LOX-1 结合的 Hsp60 片段、其衍生物及应用，公开号：CN101967193A

COMMUNICATIONS

Oral Presentation on National Academic Meeting of Glycobiology, August, 2010, Changchun.