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Education:

1985: B.S., Biochemistry, East China University of Science and Technology

1994: Ph.D., Biochemistry, Kansas State University

1995-1998: Postdoc, Biochem & Immunol, Kansas State University

Academic Appointments:

1985-1991: Assistant Researcher, Laboratory of Genetic Engineering, Shanghai Research Center of Biotechnology, Chinese Academy of Sciences

1995-1999: Postdoctoral Research Associate, Department of Biochemistry, Kansas State University

2000-2006: Assistant Professor, Department of Entomology and Plant Pathology, Oklahoma State University

2006-2009: Associate Professor, Department of Entomology and Plant Pathology, Oklahoma State University

2009-2016: Professor, Department of Entomology and Plant Pathology, Oklahoma State University

2009-present: Regents Professor, Department of Entomology and Plant Pathology, Oklahoma State University

Awards and Honors

2008: Whatley Award for Meritorious Research in Agricultural Sciences

2006: Big Twelve Faculty Fellowship Award

1994: Merck Graduate Biochemistry Research Award

1993-1995: Kansas Health Foundation Fellowship

Other Professional Experiences and Memberships:

1992-present: American Society for Biochemistry and Molecular Biology

2002-present: Entomological Society of America

Research Funding:

Current:

- 2018-2022: R01 GM58634, "Function and regulation of two key serine proteases in insect immunity", Role: PI
- 2014-2017: R21 AI112662, "Prophenoloxidases of *Anopheles gambiae*", Role: PI

Selected Publications:

1. Jiang, H., Wang, Y., Kanost, M.R. 1994. Mutually exclusive exon use and reactive center diversity in insect serpins. *J. Biol. Chem.* 269, 55-8.
2. Jiang, H., Kanost, M.R. 1997. Characterization and functional analysis of twelve naturally occurring reactive site variants of serpin-1 from *Manduca sexta*. *J. Biol. Chem.* 272, 1082-7.
3. Jiang, H., Wang, Y., Ma, C., Kanost, M.R. 1997. Subunit composition of prophenoloxidase from *Manduca sexta*. *Insect Biochem. Mol. Biol.* 277, 835-50.
4. Jiang, H., Wang, Y., Kanost, M.R. 1998. Prophenoloxidase activating proteinase from *Manduca sexta*: a bacteria-inducible protein similar to *Drosophila easter*. *PNAS* 95, 12220-5.
5. Yu, X-Q, Jiang, H., Wang, Y., Kanost, M.R. 2003. Nonproteolytic serine proteinase homologs are involved in phenoloxidase activation in the tobacco hornworm, *Manduca sexta*. *Insect Biochem. Mol. Biol.* 33, 197-208.
6. Jiang, H., Wang, Y., Yu, X-Q, Kanost, M.R. 2003. Prophenoloxidase-activating proteinase-2 (PAP-2) from hemolymph of *Manduca sexta*: a bacteria-inducible serine proteinase containing two clip domains. *J. Biol. Chem.* 278, 3552-61.
7. Jiang, H., Ma, C., Lu, Z., Kanost, M.R. 2004. β -1,3-glucan recognition protein-2 (β GRP-2) from *Manduca sexta*: an acute-phase protein that binds β -1,3-glucan to aggregate fungi and bacteria and stimulate prophenoloxidase activation. *Insect Biochem. Mol. Biol.* 34, 89-100.
8. Wang, Y., Jiang, H. 2004. Prophenoloxidase (PPO) activation in *Manduca sexta*: an initial analysis of molecular interactions among PPO, PPO-activating proteinase-3 (PAP-3), and a cofactor. *Insect Biochem. Mol. Biol.* 34, 731-42.
9. Gupta, S., Wang, Y., Jiang, H. 2005. *M. sexta* proPO activation requires proPO-activating proteinase (PAP) and serine proteinase homologs (SPHs) simultaneously. *Insect Biochem. Mol. Biol.*, 35, 241-48.
10. Tong, Y., Jiang, H., Kanost, M.R. 2005. Identification of plasma proteases inhibited by *M. sexta* serpin-4 and serpin-5 and their association with components of the prophenoloxidase activation pathway. *J. Biol. Chem.* 280, 14932-42.
11. Zou, Z., Jiang, H. 2005. *Manduca sexta* serpin-6 regulates immune serine proteinases PAP-3 and HP8: cDNA cloning, protein expression, inhibition kinetics, and function elucidation. *J. Biol. Chem.* 280, 14341-8.
12. Jiang, H., Wang, Y., Gu, Y., Guo, X., Zou, Z., Scholz, F., Trenczek, T.E., Kanost, M.R. 2005. Molecular identification of a bevy of serine proteinases in *Manduca sexta* hemolymph. *Insect Biochem. Mol. Biol.* 35, 931-43.
13. Wang, Y., Jiang, H. 2006. Interaction of β -1,3-glucan with its recognition protein activates hemolymph proteinase 14, an initiation enzyme of the prophenoloxidase activation system in *Manduca sexta*. *J. Biol. Chem.* 281, 9271-9278.
14. Wang, Y., Jiang, H. 2007. Reconstitution of a branch of *Manduca sexta* prophenoloxidase activation cascade in vitro: Snake-like hemolymph proteinase 21 cleaved by HP14 activates prophenoloxidase-activating proteinase-2 precursor. *Insect Biochem. Mol. Biol.* 37, 1015-25.
15. Gorman, M.J., Wang, Y., Jiang, H., Kanost, M.R. 2007. *Manduca sexta* hemolymph proteinase 21 activates prophenoloxidase activating proteinase 3 in an insect innate immune response proteinase cascade. *J. Biol. Chem.* 282, 11742-9.
16. Waterhouse, R.M. et al, 2007. Evolutionary dynamics of immune-related genes and pathways in disease-vector mosquitoes. *Science.* 316 (5832), 1738-43.
17. Zhao, P., Li, J., Wang, Y., Jiang, H. 2007. Broad-spectrum antimicrobial activity of the reactive compounds generated in vitro by *M. sexta* PO. *Insect Biochem. Mol. Biol.* 37, 952-9.
18. Huang, R., Lu, Z., Dai, H., Vander Velde, D., Prakash, O., Jiang, H. 2007. The solution structure of the clip domains from *Manduca sexta* prophenoloxidase activating proteinase-2. *Biochemistry* 46, 11431-9.
19. Zou, Z., Evans, J., Lu, Z., Zhao, P., Williams, M., Sumathipala, N., Hetru, C., Jiang, H. 2007. Comparative genome analysis of the *Tribolium* immune system. *Genome Biol.* 8, R177.
20. Wang, Y., Jiang, H. 2008. A positive feedback mechanism in the *M. sexta* prophenoloxidase activation. *Insect Biochem. Mol. Biol.* 38, 763-9.
21. Lu, Z, Beck, M.H., Wang, Y., Jiang, H., Strand, M.R. 2008. The viral protein EGF1.0 is a dual activity inhibitor of prophenoloxidase activating proteinases 1 and 3 from *Manduca sexta*. *J. Biol. Chem.* 283, 21325-33.
22. Zou, Z., Zhao, P., Weng, H., Mita, K., Jiang, H. 2009. A comparative analysis of serpin genes in the silkworm genome. *Genomics*, 93, 367-75.
23. Jiang, H., Liu, S., Zhao, P., Pope, C. 2009. Recombinant expression and biochemical characterization of the catalytic domain of acetylcholinesterase-1 from the African malaria mosquito, *Anopheles gambiae*. *Insect Biochem. Mol. Biol.* 39, 646-53.
24. An, C., Ishibashi, J., Ragan, E., Jiang, H., Kanost, M. 2009. Functions of *M. sexta* hemolymph proteinases HP6 and HP8 in two innate immune pathways. *J. Biol. Chem.* 284, 19716-26.
25. Li, Y., Wang, Y., Jiang, H., Deng, J. 2009. Crystal structure of *M. sexta* prophenoloxidase provides insights into the mechanism of type-3 copper enzymes. *PNAS* 106, 17001-5.

26. An, C., Jiang, H., Kanost, M.R. 2010. Proteolytic activation and function of the cytokine spätzle in innate immune response of a lepidopteran insect, *Manduca sexta*. *FEBS J.* 277, 148-62.
27. Wang, Y., Sumathipala, N., Rayaprolu, S., Jiang, H. 2011. Recognition of microbial molecular patterns and stimulation of prophenoloxidase activation by a β -1,3-glucanase-related protein in *Manduca sexta* larval plasma. *Insect Biochem. Mol. Biol.* 41, 322-331.
28. Zhao, P., Lu, Z., Strand, M., Jiang, H. 2011. Antiviral, antiparasitic, and cytotoxic effects of 5,6-dihydroxyindole (DHI), a reactive compound generated by phenoloxidase during insect immune response. *Insect Biochem. Mol. Biol.* 41, 645-652.
29. Zhang, S., Zhang, X., Gunaratna, R., Najar, F., Wang, Y., Roe, B., Jiang, H. 2011. Pyrosequencing-based expression profiling and identification of differentially regulated genes from *Manduca sexta*, a lepidopteran model insect that lacks genome sequence. *Insect Biochem. Mol. Biol.* 41, 733-746.
30. Zhang, X., Zheng, Y., Jagadeeswaran, G., Ren, R., Sunkar, R., Jiang, H. 2012. Identification and developmental profiling of conserved and novel microRNAs in *Manduca sexta*. *Insect Biochem. Mol. Biol.*, 42, 381-395.
31. Gunaratna, R., Jiang, H. (2013) A comprehensive analysis of the *Manduca sexta* immunotranscriptome. *Dev. Com. Immunol.*, 39, 388-398.
32. Zhang, X., Zheng, Y., Jagadeeswaran, G., Ren, R., Sunkar R., Jiang, H. (2014) Identification of conserved and novel microRNAs in *Manduca sexta* and their possible roles in the expression regulation of immunity-related genes. *Insect Biochem. Mol. Biol.* 47, 12-22.
33. Zhang, S., Cao, X., He, Y., Hartson, S., Jiang, H. (2014) Semi-quantitative analysis of changes in the plasma peptidome of *Manduca sexta* larvae and their correlation with the transcriptome variations upon immune challenge. *Insect Biochem. Mol. Biol.* 47, 46-54.
34. Wang, Y., Lu, Z., Jiang, H. (2014) *Manduca sexta* prophenoloxidase activating proteinase-3 (PAP3) stimulates melanization by activating proPAP3, proSPHs, and proPOs. *Insect Biochem. Mol. Biol.* 50, 82-91.
35. Cao, X., Jiang, H. (2015) Integrated modeling of protein-coding genes in the *Manduca sexta* genome using RNA-Seq data from the biochemical model insect. *Insect Biochem. Mol. Biol.* 62, 2-10.
36. Zhang, X., Zheng, Y., Cao, X., Ren, R., Yu, X-Q., Jiang, H. (2015) Identification and profiling of *Manduca sexta* microRNAs and their possible roles in regulating specific transcripts in fat body, hemocytes, and midgut. *Insect Biochem. Mol. Biol.* 62, 11-22.
37. He, Y., Cao, X., Li, K., Hu, Y., Chen, Y., Blissard, G.W., Kanost, M.R., Jiang, H. (2015) A genome-wide analysis of antimicrobial effector genes and their transcription patterns in *Manduca sexta*. *Insect Biochem. Mol. Biol.* 62, 23-37.
38. Zhang, X., He, Y., Cao, X., Gunaratna, R.T., Chen, Y., Blissard, G.W., Kanost, M.R., Jiang, H. (2015) Phylogenetic analysis and expression profiling of the pattern recognition receptors: insights into molecular recognition of invading pathogens in *Manduca sexta*. *Insect Biochem. Mol. Biol.* 62, 38-50.
39. Cao, X., He, Y., Hu, Y., Zhang, X., Wang, Y., Zou, Z., Chen, Y., Blissard, G.W., Kanost, M.R., Jiang, H. (2015) Sequence conservation, phylogenetic relationships, and expression profiles of nondigestive serine proteases and serine protease homologs in *Manduca sexta*. *Insect Biochem. Mol. Biol.* 62, 51-63.
40. Cao, X., He, Y., Hu, Y., Wang, Y., Chen, Y-R., Bryant, B., Clem, R.J., Schwartz, L.M., Blissard, G.W., Jiang, H. (2015) The immune signaling pathways of *Manduca sexta*. *Insect Biochem. Mol. Biol.* 62, 64-74.
41. Hu, Y., Wang, Y., Deng, J., Jiang, J. (2016) The structure of a prophenoloxidase (PPO) from *Anopheles gambiae* provides new insights into the mechanism of PPO activation. *BMC Biol.* 14, 2.
42. He, Y., Cao, X., Zhang, S., Rogers, J., Hartson, S., Jiang, H. (2016) Changes in the plasma proteome of *Manduca sexta* larvae in relation to the transcriptome variations after an immune challenge: evidence for high molecular weight immune complex formation. *Mol. Cell. Proteomics*, 15, 1176-1187.
43. Wang, Y., Jiang, H. (2017) Prophenoloxidase activation and antimicrobial peptide expression induced by the recombinant microbe binding protein of *Manduca sexta*. *Insect Biochem. Mol. Biol.* 83, 35-43.
44. He, Y., Wang, Y., Yang, F., Jiang, H. (2017) *Manduca sexta* hemolymph protease-1, activated by an unconventional non-proteolytic mechanism, mediates immune responses. *Insect Biochem. Mol. Biol.* 84, 23-31.
45. Cao, X., Jiang, H. (2017) An analysis of 67 RNA-seq datasets from various tissues at different stages of a model insect, *Manduca sexta*. *BMC Genomics* 18, 796.
46. Yang, F., Wang, Y., Sumathipala, N., Cao, X., Kanost, M.R. Jiang, H. (2018) *Manduca sexta* serpin-12 controls the prophenoloxidase activation system in larval hemolymph. *Insect Biochem. Mol. Biol.* 99, 27-36.
47. He, Y., Wang, Y., Hu, Y., Jiang, H. (2018) *Manduca sexta* hemolymph protease-2 (HP2) activated by HP14 generates prophenoloxidase-activating protease-2 (PAP2) in wandering larvae and pupae. *Insect Biochem. Mol. Biol.* 101, 57-65.
48. Cao, X., Jiang, H. (2018) Building a platform for predicting functions of serine protease-related proteins in *Drosophila melanogaster* and other insects. *Insect Biochem. Mol. Biol.* 103, 53-69.

49. Hu, Y., Cao, X., Li, X., Wang, Y., Boons, G-J., Deng, J., Jiang, H. (2019) The three-dimensional structure and recognition mechanism of *Manduca sexta* peptidoglycan recognition protein-1. *Insect Biochem. Mol. Biol.* 108, 44–52.