

项目公示材料

项目名称：农业害虫对外源异生物质的解毒代谢调控机制研究

提名者：云南农业大学

提名等级：云南省自然科学三等奖

项目简介：以鉴定害虫防治新靶标并发展有效的害虫抗药性治理策略为出发点，紧密围绕害虫对化学杀虫剂和植物次生代谢物解毒代谢抗性的分子调控机制这一重要科学问题，在害虫对杀虫剂等胁迫因子的感受识别、上游关键信号通路鉴定及解毒酶基因的转录调控网络等方面开展了创新性研究。

代表性论文：

1. Zhongxiang Sun, Rumeng Wang, Yifei Du, Binyuan Gao, Furong Gui, Kai Lu*. Olfactory perception of herbicide butachlor by GOBP2 elicits ecdysone biosynthesis and detoxification enzyme responsible for chlorpyrifos tolerance in *Spodoptera litura*. *Environmental Pollution*. 2021, 285: 117409.
2. Tianxiang Xiao, Wenxiu Wang, Mengqing Deng, Zhiming Yang, Haoxue Peng, Zifan Huang, Zhongxiang Sun*, Kai Lu*. CYP321A subfamily P450s contribute to the detoxification of phytochemicals and pyrethroids in *Spodoptera litura*. *Journal of Agricultural and Food Chemistry*. 2023, 71: 14989–15002.
3. Kai Lu*, Yimin Li, Tianxiang Xiao, Zhongxiang Sun*. The metabolic resistance of *Nilaparvata lugens* to chlorpyrifos is mainly driven by the carboxylesterase CarE17. *Ecotoxicology and Environmental Safety*. 2022, 241: 113738.
4. Kai Lu, Yibei Cheng, Wenru Li, Yimin Li, Rensen Zeng, Yuanyuan Song*. Activation of CncC pathway by ROS burst regulates cytochrome P450 CYP6AB12 responsible for λ -cyhalothrin tolerance in *Spodoptera litura*. *Journal of Hazardous Materials*. 2020, 387: 121698.
5. Kai Lu, Yuanyuan Song, Rensen Zeng*. The role of cytochrome P450-mediated detoxification in insect adaptation to xenobiotics. *Current Opinion in Insect Science*. 2021, 43: 103–107.

6. Kai Lu[#], Yimin Li[#], Yibei Cheng, Wenru Li, Yuanyuan Song, Rensen Zeng*, Zhongxiang Sun*. Activation of the NR2E nuclear receptor HR83 leads to metabolic detoxification-mediated chlorpyrifos resistance in *Nilaparvata lugens*. *Pesticide Biochemistry and Physiology*. 2021, 173: 104800.
7. Kai Lu[#], Yibei Cheng[#], Yimin Li, Wenru Li, Yuanyuan Song, Rensen Zeng*, Zhongxiang Sun*. The KNRL nuclear receptor controls hydrolase-mediated vitellin breakdown during embryogenesis in the brown planthopper, *Nilaparvata lugens*. *Insect Science*. 2021, 28: 1633–1650.
8. Zhongxiang Sun[#], Yibin Lin[#], Rumeng Wang[#], Qilin Li, Qi Shi, Scott R. Baerson, Li Chen, Rensen Zeng and Yuanyuan Song*. Olfactory perception of herbivore-induced plant volatiles elicits counter-defenses in larvae of the tobacco cutworm. *Functional Ecology*. 2021, 35: 384-397.

主要完成人基本情况

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