

COMBATting PEST RESISTANCE IN MAJOR BRAZILIAN CROPPING SYSTEMS THROUGH NOVEL BIOTECHNOLOGICAL APPROACHES

This proposal seeks to address major concerns relating to economically important insect pests in Brazilian agricultural, through the development and use of novel, efficacious and safe biopesticides. One of the target insect pests selected for study is the native, polyphagous armyworm *Spodoptera frugiperda*, which has evolved resistance to a number of chemistries and the transgenic tools currently available for applied pest control (Bt plants). The recent spread of this species to Africa and its polyphony and resistance to several pesticides makes this species a real threat to the agriculture of the whole tropical and subtropical areas of the Old World and Asia. The other species selected is the invasive Old World bollworm *Helicoverpa armigera* (for Phase 1). This species has devastated large areas of agricultural crops in Brazil causing severe damage to cotton and soybean plantations. Most of the severe damage caused is due to the insensitivity of the invasive population to the pesticides used in Brazil. Therefore, this project is aimed at generating information and new technologies to fight these pests and overcome the existing resistance mechanisms. In order to achieve these goals our main objectives are 1) Design novel biopesticides using species-specific dsRNAs against target pests by in silico approaches; 2) Produce dsRNAs for preliminary toxicity testing using injection and artificial diet bioassays with selected insect pests; 3) Generate metatranscriptomic data of gut associated microbials of *S. frugiperda* and *H. armigera* to design novel biopesticides using species-specific dsRNAs targeted to obligate insect symbionts; 4) Exploit insect gut symbionts as insect-target dsRNAs delivery systems; 5) Identify suitable molecular targets in selected insect pests (*Spodoptera frugiperda* and *Helicoverpa armigera*) resistant to conventional pesticides using in silico approaches.

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ABOUT THE PROJECT

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