SUBLETHAL EFFECTS OF HEAVY METAL POLLUTANTS ON BENEFICIAL INSECTS SUCH AS THE HONEY BEE

SUMMARY

• Levels of heavy metal pollutants are increasing due to intense agricultural activities
• They are potentially serious contaminants of food webs
• Our study targets effects of heavy metals on honey bee learning and memory, which is important for pollination and is also a sensitive measure of toxicity
• Students will receive research credit and co-authorship for substantial contributions to this research program

ABSTRACT

My laboratory is seeking undergraduate researchers to work on a newly funded project by the United States Department of Agriculture to study the effects of heavy metal pollutants on honey bee behavior. Very little is known about how heavy metals such as selenium impact the survival and behavior of beneficial insects such as honey bees, which pollinate a large percentage of agricultural crops. Yet levels of heavy metals from different sources are increasing in agricultural areas. Furthermore, they can be transmitted through the food web and into the nectar and pollen honey bees must collect for their survival. From there heavy metals can potentially make it onto the honey that is sold commercially for human consumption.

This work will follow up on initial studies we published recently in PLOS ONE (10.1371/journal.pone.0034137). Students will learn laboratory-based assays of honey bee learning and memory, which will be studied in the context of controlled treatment with heavy metal pollutants. They will learn microsurgical techniques and methods for topical treatment, feeding and microinjection of pollutants.

We seek students with a broad interest in Animal Behavior. Ideal candidates will have completed two, or close to two, years of study. And they will be willing to commit 10 hrs per week for two or more semesters to this work. Students will receive research credit, which can count toward a thesis. Students who contribute significantly to any project will also be listed as coauthors on peer-reviewed papers.

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