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Beefing Up an Enzyme Lab: Acetylcholinesterase Activity in Extracts from Bean Beetles Standardized for Protein Content

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The insecticide malaoxon inhibits acetylcholinesterase (AChE) activity. Various factors might affect the effectiveness of malaoxon. We have previously described a colorimetric enzyme assay to look at the differences in inhibition of AChE caused by malaoxon in crude extracts from the bean beetle *Callosobruchus maculatus* in a set up that lends itself to a multi-week lab sequence. Here we expand this set of exercises to include the Bradford assay to measure protein concentration in crude extracts using a standard curve. This allows us to standardize the initial activity of AChE based on protein content and thus consider both initial activity of the enzyme and relative inhibition of the activity due to the insecticide. These two parameters have been shown to be inversely correlated and may respond differently to environmental factors such as the food source on which the animals are raised. These types of projects not only introduce students to different biochemical techniques, but also raise questions such as costs and benefits of insecticide resistance.

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