

## **“Using Liver Microsomes to Assess Resistance of Chlorophacinone and Diphacinone in Meadow Voles.”**

P.I. Dr. Thomas Primus

### **Research Summary**

Rodenticide chlorophacinone was evaluated and found to be much less effective than when introduced about 20 years ago to control meadow voles (*Microtus californicus*) in artichoke fields within Central California. University of California researchers found that the baiting strategies used were likely to increase the chances of developing genetic resistance in the target population. Anticoagulant resistance in other locations has been linked to enzyme activity, which is carried out in the liver microsomes. A brief overview was presented on a two-week experiment on a rat treated with 50 ppm diphacinone bait with no tetracycline hydrochloride and a male Wistar rat treated with chlorophacinone. According to the study, chlorophacinone did not metabolize as well as diphacinone. Liver microsomes from voles will be collected, in which the liver will be cleaned with a saline solution to remove the blood contents, frozen, and then brought back to the lab to extract the microsomes using a centrifuge procedure. The in-vitro liver microsome experiments will be used to assess resistance to the anticoagulant chlorophacinone and to see if resistance can be assessed based on metabolism. This resistance can be evaluated and the synergism between anticoagulants and agents such as antibiotics can be evaluated to assess their impact on resistance. The in-vitro experiments can generate data much more efficiently and multiple interactions can be studied much more effectively than with live animal studies. Within the next two to four weeks, plans to trap meadow voles from chlorophacinone resistant and non-resistant populations and to collect their livers are to take place in Castroville and Davis. Liver microsomes from both sets of meadow voles will be collected afterwards, and those microsomes will be used to evaluate the metabolism of both chlorophacinone and diphacinone. This resistance can be evaluated and the synergism between anticoagulants and agents such as antibiotics can be evaluated to assess their impact on resistance