Do hypothalamic injections of a glutamate receptor inhibitor influence feeding and foraging in rats?

Biology 250: Introduction to Research
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What is the Significance of this Study?

Why glutamate receptors in the LH?

Glutamate receptor subtypes:
- NMDA
- KA
- AMPA

Previous studies on glutamate receptor antagonist D-AP5

- Dose dependent reduction in food intake
- Receptor subtype specific
- Feeding done in home cages
- Our rats fed in foraging cages

Stanley et al., 1996
What is the Hypothesis of Our Study?

- Lateral hypothalamic injections of the NMDA glutamate receptor antagonist, D-AP5, will decrease feeding and foraging behaviors below baseline observations for 24-hour food-deprived rats.

Targeting the LH for injections

- Surgically insert bilateral cannulas into lateral hypothalamus of 15 male Sprague-Dawley rats

Transitioning the Rats

- Allow rats to recover from surgery
- Familiarize rats – injection grip – foraging cage and fruit loops

What do rats do?

Foraging Behaviors:

Non-Foraging Behaviors:
What do rats do?
Foraging Behaviors:

Non-Foraging Behaviors:

What do rats do?
Foraging Behaviors:

Non-Foraging Behaviors:

What do rats do?
Foraging Behaviors:

Non-Foraging Behaviors:

What do rats do?
Foraging Behaviors:

Non-Foraging Behaviors:
What do rats do?

Foraging Behaviors:

Non-Foraging Behaviors:
Latency: Time to Initial Food Intake

Total Consumption in Foraging Cage (30 min post-injection)

Total Consumption in Foraging Cage and Home Cages (60 min post-injection)

Behavior in Home Cage
Summary and Conclusions

✓ Accept hypothesis
- D-AP5 dose-dependently decreases feeding and foraging behavior
• Future Directions: mechanisms and other glutamate receptor subtypes:
  - KA
  - AMPA