

## Episode Three Debriefing: Teacher Guide



### ACTIVITY 3 – THE RIGHT STUFF

In this activity, students will learn about the pros and cons of using humans and animals for research on Club Drugs.

#### Background

Most research performed today is intended to help humans. Animals as different as sea slugs, rats, and rhesus monkeys are used in experiments designed to teach us about humans. A lot of research can also be performed on cells in tissue cultures derived from either humans or animals, often many years ago. Each of these organisms or groups of cells is called an animal model, and different models mimic certain human functions.

Researchers use a variety of methods to study the effects of drugs. Each method has its pros and cons. The summary below lists some of the pros and cons of using different organisms.

#### Humans

##### *Pro*

- Results observed can be applied to humans directly
- Social effects on human function are best modeled using humans
- If part of the research protocol is designed to help humans (for example research on how to quit smoking), research subjects can benefit directly from participating in the study

##### *Con*

- Many kinds of research cannot be done on humans, such as removing parts of the brain
- Unless an illegal drug is used as part of therapy (for example, MDMA is used in post-traumatic stress disorder), researchers have to find people already using the drug
- Many illegal drug users use a variety of legal and illegal drugs, so effects observed are difficult to attribute to a single cause
- Recruiting and retaining human subjects is hard, since research participation has to be voluntary
- Research on humans is expensive; researchers have to pay subjects to participate

#### Animals

##### *Pro*

- Can administer drugs to animals in precise amounts and on a precise schedule
- Can look at anatomy and function of the brain as part of study
- Can breed animals with known genetic characteristics
- Small animals such as rats or mice are relatively inexpensive to house

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- Small animals have short generation times, so researchers can study effects on their offspring

### **Con**

- Animal function is not exactly the same as human function
- If an effect is seen only when taking multiple drugs, it will not show up in animals given a single drug
- Animals do not have the social pressures seen in humans (difficult to model peer pressure or family influence on behavior)

### **Learning Objectives**

Students will:

1. Be able to name two different animal models used in medical research.
2. List two reasons for and against humans vs. animals as drug research subjects.

### **Materials**

- *Club Drug Research Plan Student Sheet* (one per group of students)
- computers with Internet access, or books on animals in research
- stuffed animal example of animals used in medical research (rat, rabbit, dog, monkey), optional

### **Procedure**

1. Copy the *Club Drug Research Plan Student Sheets* (one per group of students).
2. Put a stuffed animal in front of each group.
3. Ask students to follow the instructions on their sheet.
4. If students are having trouble coming up with pros and cons, guide their thinking by asking questions such as whether they can apply their results directly, how easy it would be to recruit subjects, and what can they do ethically to humans vs. animals.
5. Have students present their proposals using PowerPoint, poster boards, or verbal presentations.

### **References**

McCardle, K, Luebbers, S, Carter, JD, Croft, RJ and Stough, C. 2004. Chronic MDMA (Ecstasy) Use, Cognition, and Mood. *Psychopharmacology* 173: 434-439.

Jacobsen, LK, Mencl, WE, Pugh, KR, Skudlarski, P, Krystal, JH. 2004. Preliminary Evidence of Hippocampal Dysfunction in Adolescent MDMA (“Ecstasy”) Users: Possible Relationship to Neurotoxic Effects. *Psychopharmacology* 173: 383-390.

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## **Resources**

Foundation for Biomedical Research <http://www.fbresearch.org/> \*

Kids for Research <http://www.kids4research.org> \*

Caputo, Robert 1980. More than just pets: Why people study animals.  
Putnam Publishing Group.

# Episode Three Debriefing: Student Activity Sheet



## ACTIVITY 3 – THE RIGHT STUFF

In this activity, you will learn about the pros and cons of using humans and animals for research on Club Drugs.

### Background

Medical researchers are always looking for the best way to study a particular problem. Researchers interested in drugs have to decide between using animals such as rats or rabbits or using people to discover more about drugs and drug abuse.

### Procedure

Your group is interested in whether Ecstasy use causes brain damage in adolescents. You are trying to decide whether to study this question using humans or animals as subjects.

1. Read about the use of animals in medical research on the following web sites, or use other resources provided by your teacher:
  - a. <http://www.fbresearch.org/>
  - b. <http://www.kids4research.org>
2. Write three factors that might influence your decision under each heading below, and then decide which subjects are more likely to meet your needs. Defend your decision in front of the rest of the class.

### Humans

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### Animals

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