**Policy on Drug Abuse Research with Laboratory Animals**

Drug abuse research using laboratory animals has a long and productive history. Research with animals has enhanced our understanding of the biological, behavioral, and pharmacological causes and consequences of drug abuse, including drug intoxication, tolerance, reinforcement, dependence, and toxicity[1-4]. It has contributed significantly to the identification of specific brain regions and neurotransmitter systems that mediate the reinforcing effects of drugs that maintain drug use[5, 6]. Research with animals has also identified genetic, behavioral, and environmental factors associated with individual differences in vulnerability to drug taking[7-9]. Recent scientific advances have produced an explosion of knowledge about brain function and molecular biology, and research with animals will be required to apply this knowledge to problems of drug abuse.

From prevention to treatment, animal research has been critical in designing strategies that prevent drug abuse and developing treatment interventions to reduce drug abuse and prevent relapse during recovery. For instance, animal research has been instrumental in assessing the abuse liability of new prescription opioids and opioid formulations[10, 11], thereby assuring that new drugs with significant risk of abuse are introduced with proper regulatory control and physician education. Animal research has also been critical in identifying the biological, genetic, and environmental factors that increase vulnerability to opioid addiction[12-14]. Furthermore, research with laboratory animals has been essential in the development of new medications for the treatment of opioid addiction, including novel formulations of buprenorphine and naltrexone[15]. It has contributed significantly to the development of opioid antagonists[16], which have saved thousands of lives by quickly reversing the effects of unintended overdoses. Findings from animal models have also played a significant role in the development and refinement of behavioral methods for treating drug abuse and preventing relapse[17-20]. These same methodologies have been applied to the development of new drug abuse prevention and treatment strategies for other drugs, including cocaine, methamphetamine, nicotine, alcohol, and marijuana[21-25].

The high morbidity and mortality associated with drug abuse underscores the need for research to develop better drug abuse prevention and treatment methods. From an economic perspective, the abuse of tobacco, alcohol, and illicit drugs is estimated to cost our nation more than $740 billion each year in crime, lost work productivity, and health care[26]. These financial costs do not include the immeasurable personal suffering associated with drug abuse, or the extent to which drug abuse contributes to other social problems, such as HIV/AIDS, mental disorders, domestic abuse, unwanted pregnancy, and the rising incidence of newborns who experience neonatal abstinence syndrome because their mothers used drugs during pregnancy.

Research with drugs of abuse using laboratory animals helps us better understand a wide range of human disorders in addition to drug abuse. For example, the administration of drugs of abuse to laboratory animals has provided basic information concerning brain function, including mechanisms that underlie pain, memory, sleep, appetite, cognition, anxiety, depression, and social and emotional behavior[27-35]. This research, in turn, has contributed significantly to the development of numerous treatment medications, including new analgesics, anxiolytics, and antidepressants, as well as medications to treat a variety of other medical and psychiatric conditions[36-40].

There is an urgent need to know more about novel drugs with significant abuse liability, particularly emerging drugs of abuse such as synthetic cannabinoids (“Spice”, “K2”), synthetic cathinones (“Bath Salts”), and high-potency synthetic opiates (Carfentanil). The use of these

drugs has increased dramatically in recent years with parallel reports of severe toxicity and lethality[41-43]. Research with laboratory animals will play a key role in these efforts. Drug abuse is a pathology of behavior, and behavioral studies using live animals provide an essential complement to studies that examine underlying neurobiological mechanisms. Research with laboratory animals provides scientists with the means to study drug-related phenomena in the laboratory under controlled conditions using the best scientific methods available. Such research contributes significantly to our efforts to understand, prevent, and treat drug abuse and addiction. Careful attention to the well-being of the laboratory animals used in these studies is essential, not only for the safe and ethical conduct of the research but also for the quality and reliability of the research results.

Drug abuse research with laboratory animals in all countries must conform to all applicable national, state, and local laws and regulations that govern the use of laboratory animals in research. In the United States, such research must comply with federal regulations promulgated by the U.S. Department of Agriculture (USDA) under the Animal Welfare Act. If the research is federally funded, it must also comply with the U.S. Public Health Service Policy on Humane Care and Use of Laboratory Animals and the Institute of Laboratory Animal Resources Guide for the Care and Use of Laboratory Animals.

The College on Problems of Drug Dependence recognizes the value and importance of drug abuse research involving laboratory animals and supports the humane use of animals in research that has the potential to benefit human health and society. Such research plays a vital role in the acquisition of the new knowledge needed to understand and reduce drug abuse and its associated problems.

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