

## **National Institute on Drug Abuse: Aging and the Effects of Abused Substances**

This animal research seeks to find differences in how opiates, the key ingredient in most pain medications, affect pain and produce pleasure in older populations, with implications for pain management and opiate abuse in the elderly.

### **Lead Agency:**

National Institute on Drug Abuse (NIDA)/National Institutes of Health (NIH)

### **Agency Mission:**

The mission of the National Institute on Drug Abuse is to lead the Nation in bringing the power of science to bear on drug abuse and addiction. This charge has two critical components. The first is the strategic support and conduct of research across a broad range of disciplines. The second is ensuring the rapid and effective dissemination and use of the results of that research to significantly improve prevention, treatment, and policy as it relates to drug abuse and addiction.

### **Principal Investigator:**

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### **General Description:**

#### **Aging and the Effects of Abused Substances**

Featured are two projects by the same principal investigator, which have informed each other and yielded interesting findings. The long-term objective of this basic research was to compare young and old rats' responses to opiates and cocaine. Considerable evidence shows that aging alters brain systems implicated in the pleasurable effects of abused substances. The first study examined the functional consequences of these brain alterations using a number of animal models for seeing how abused substances stimulate the brain. The second study looked at whether the hedonic potency (i.e., degree of pleasurable response) of opiates decreases with age, via experiments to determine differences in the hedonic effects of morphine—the prototypic opiate—as measured by the drug's effect on the threshold for rewarding intracranial stimulation in young, middle-aged, and aged rats. The pharmacokinetics (drug absorption, distribution, metabolism, and elimination) of morphine were compared.

***Excellence:*** What makes this project exceptional?

These experiments were exceptional for being among the first to examine the relationship between analgesic and hedonic effects of opiates and aging.

***Significance:*** How is this research relevant to older persons, populations and/or an aging society?

As the baby boomer generation (born 1946-1964) prepares to swell the ranks of older adults in this country, we will likely also see an increase in drug abuse among older Americans, including prescription medications and illicit substances. Indeed, studies suggest that 4.4 million Americans over the age 50 will present with addiction problems by 2020, and even more will misuse painkillers and other prescription drugs.

***Effectiveness:*** What is the impact and/or application of this research to older persons?

The basic research represented by these studies is needed to fill major gaps in our current knowledge. For while it is now evident that the brain changes continuously across life, how drugs of abuse interact with these age-related changes remains unclear. Substance abuse during older age may augment the risks and require unique considerations for diagnosis and treatment, which studies like these will begin to elucidate. In addition, baby boomers may be carrying forward into old age some risky behaviors that they've been living with and dying from since they were young adults.

***Innovativeness:*** Why is this research exciting or newsworthy?

This research is exciting because it provides important clues about age-related brain differences, about how aging affects brain systems involved in drug abuse, and about the potential impact of drug abuse on the aging brain.