



Effects of Nicotine Exposure in Adolescent Rats on Acquisition of Alcohol Drinking and Response to Nicotine in Adulthood

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[Bracken, Amy L.](#)



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Abstract:

Nicotine is one of the most widely abused drugs in the world, and most smokers begin smoking during their adolescent years. Adolescence is a unique developmental period during which vulnerability to the effects of drug exposure is especially high. This dissertation uses rodent models to investigate the persistent effects of adolescent nicotine exposure on both neurobiological and behavioral measures of drug sensitivity in adulthood. The aims of this dissertation were to 1) determine whether nicotine would be self-administered into the posterior ventral tegmental area (pVTA), a neuroanatomical component of the mesolimbic dopamine (DA) system, which is known to be involved in reward and

reinforcement; 2) investigate whether adolescent nicotine exposure would alter the sensitivity of the mesolimbic DA system as measured by DA release in the nucleus accumbens (NAc) in response to nicotine microinjections into the pVTA; 3) examine the effects of adolescent nicotine exposure on behavioral sensitization to nicotine in adulthood; and 4) investigate whether adulthood alcohol drinking behavior, in both Wistar and alcohol-preferring (P) rats, would be augmented by nicotine exposure during adolescence. Results of this dissertation demonstrated that 1) the pVTA is a neuroanatomical site that supports nicotine self-administration; and that adolescent nicotine exposure results in 2) increased nicotine-stimulated DA release in the NAc during adulthood; 3) augmented behavioral sensitization to nicotine in adult animals; and 4) enhanced acquisition of alcohol drinking behavior in adult Wistar and P rats. Overall, this dissertation provides insight into the diverse and persistent changes, in both neurobiology and behavior, caused by exposure to nicotine during the critical developmental period of adolescence.

Description:

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