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**MEETING ABSTRACT**

**A13.10**  
Lack of dopamine-mediated effects differentiate modafinil from methylphenidate actions on cocaine-reinforced behavior in rats  
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Modafinil (MOD) and methylphenidate are drugs approved for the treatment of narcolepsy and attention-deficit disorders, respectively. Similar to cocaine, both drugs inhibit dopamine (DA) reuptake by blocking the DA transporter, and have been extensively tested in clinical studies to treat cocaine dependence. MOD and methylphenidate have been described as smart drugs, especially used by students in order to increase their cognitive performance. Importantly, this young population is also at risk for abuse of illicit drugs like cocaine and thus it is important to understand how these drugs interact with cocaine and other illicit drugs. We have investigated the effects of MOD, methylphenidate and cocaine, alone and in combination, in self-administration and nucleus accumbens shell DA microdialysis studies using Sprague Dawley rats. MOD (0.1–10 mg/kg, i.v.) failed to maintain self-administration behavior in rats, while methylphenidate self-administration was maintained at the same doses used for cocaine self-administration (0.1–1.0 mg/kg, i.v.). However, combinations of low doses of MOD (10–32 mg/kg, i.p.) or methylphenidate (1–10 mg/kg, i.p.) potentiated cocaine self-administration, shifting the dose–effect curves to the left. This effect of methylphenidate was paralleled by a larger cocaine-induced stimulation of DA, while MOD did not enhance the stimulation of DA by cocaine. Lack of a DA action in the effects of MOD triggered ongoing experiments to test whether electronic coupling or orexin-mediated effects might underlie MOD-induced potentiation of cocaine reinforcing effects. In summary, MOD showed a unique stimulant profile compared to cocaine and methylphenidate. Considering its relatively low potential for abuse and positive results from recent clinical trials, MOD might be effective as a potential agonist substitution therapy for the treatment of cocaine-use disorders in certain patient populations.

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