## Abstract View

# EFFECT OF ACUTE ADMINISTRATION OF METHYLPHENIDATE ON CEREBRAL GLUCOSE METABOLISM: AN MPET ASSESSMENT USING FDG

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Previous clinical studies have shown that cerebellar metabolism consistently increased (10%) after MP administration in all subjects while regional activity in other areas varied (Volkow et al. 1997). The study found a positive correlation between the D2R and metabolic rate, suggesting a link between dopamine and metabolism due to the lack of receptors in the cerebellum and varying levels in other regions. We utilized D4R deficient (D4R-/-) mice to study the brain metabolic effects of MP and in particular examine the contribution to the D4R in the brain metabolic response to MP. It has been shown that D4R-/- mice are hypersensitive to psychostimulants; display reduced spontaneous locomotor activity, and performs better on rotorod tests compared to D4R+/+ (Rubinstein, et al, 1997). In the current study, we measured the effects of MP on brain glucose metabolism in adult D4 mice (n=36) [D4R+/+, D4R+/-, D4R-/-] using mPET and FDG. Each animal received two scans: I) A baseline scan and II) MP challenge (10mg/kg ip; 5 min following MP, mice were injected with FDG, allowed 30 min uptake, anesthetized and scanned). Preliminary results indicated differences in baseline activity between strains in several cortical areas. However, the most profound difference was noted in the cerebellum baseline vs. MP challenge. These findings support the notion that D4R plays a critical role in the brain metabolic response to MP, and may further be used to predict individual response to drug treatment.
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