**Meeting Abstract**

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**The clearance of dopamine from the striatum following methamphetamine stimulation is strain-dependent**

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**Introduction:** The psychostimulant methamphetamine increases synaptic dopamine concentration to produce euphoria and heightened energy. Although the abuse potential of this drug is high, only a subset of users progress to addiction, suggesting that gene and environmental factors influence the response to methamphetamine. This study used in vivo chronoamperometry and in vitro superfusion in male adolescent rats to examine the influence of developmental stress and genetic predisposition on methamphetamine-stimulated dopamine release and reuptake using a model of attention-deficit hyperactivity disorder, the spontaneously hypertensive rat (SHR), and Wistar Kyoto (WKY) and Sprague Dawley (SD) comparator strains.

**Materials and methods:** SHR, WKY and SD litters were exposed to either standard rearing (nMS) or the maternal separation (MS) model of developmental stress, in which litters are separated from the dam for 3 hr/day from postnatal day 2 to 14. In vivo chronoamperometry was employed in nMS and MS SHR, WKY and SD rats to determine real-time changes in extracellular striatal dopamine in response to methamphetamine, thereby providing a measure of dopamine transporter function and synaptic vesicle dopamine release. Strain differences in striatal [3H]dopamine release in response to methamphetamine were further analysed using in vitro superfusion.

**Results:** Methamphetamine produced positive deflections from baseline dopamine concentration in both chronoamperometric and superfusion experiments ($p < 0.0001$). Analysis of dopamine peak amplitude revealed no significant differences between groups. However, the chronoamperometry experiments revealed that the $k_1$ rate constant, a measure of the rate at which dopamine is taken up by the dopamine transporter, was higher in SHR than WKY ($p = 0.0139$). No effect of developmental stress on methamphetamine-induced dopamine release was found.

**Conclusions:** Methamphetamine administration reliably induced dopamine release in both chronoamperometric and superfusion experiments producing peaks in dopamine concentration that were equivalent across experimental groups. However, SHR striatum cleared dopamine at a faster rate than WKY. This suggests that the efficiency of the dopamine transporter may differ between strains.

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