Methylphenidate (MPD) is a psychostimulant that is widely prescribed to treat attention deficit-hyperactivity disorder (ADHD). The effects of MPD, namely increased alertness and focus with decreased fatigue, make it a popular drug in the non-ADHD student population with this use spiking recently. There are still questions regarding the potential of abuse of MPD, reinforced by past psychostimulants being pulled from the market. The nucleus accumbens (NAc), part of the motive circuit that modulates drug seeking and reward behavior, is the target of MPD action. This study seeks to determine if there are any differences in behavioral and NAc neuronal activity in freely-behaving adolescent and adult rat models in response to acute and chronic exposure of differing doses of MPD. Rats at postnatal day (P) 40 (adolescent) and P60 (adult) were split into four groups: Saline (control), 0.6, 2.5 and 10.0 mg/kg MPD. After a 10 day protocol of 6 daily injections of saline or MPD, followed by 3 washout days and then a MPD re-challenge on day 10, the following was found. The same dose of MPD elicited behavioral sensitization in some animals and behavioral tolerance in others. In general, higher doses of MPD resulted in a greater ratio of tolerant to sensitized adults but the opposite was seen in the adolescents. In terms of neuronal activity, a significant difference was observed between animals that expressed sensitization versus tolerance. We hypothesize that different genotypes result in some animals expressing sensitization and others expressing tolerance. Moreover, this predisposition is reflected in the significant difference in baseline and locomotor neuronal activity and the different responses to MPD between adolescent and adult.

Biography
Asif Kabani has completed his high school and undergraduate studies in Dallas, USA. After graduating from the University of Texas at Dallas, he moved to Houston for Medical School. In addition to his global health concentration, he works as a tutor and assumes leadership positions in the extracurricular activities he is involved in.

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