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Poster Sessions

Elucidation of the serotonergic circuits involving in nicotine withdrawal symptoms by using optogenetics

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Abrupt tobacco cessation in chronic smokers causes various withdrawal symptoms including anxiety, depressed mood, decreased arousal, and irritability. Recent studies have shown that interpeduncular nucleus is involved in nicotine withdrawal symptoms and that the nucleus projects to serotonergic nuclei. Therefore we hypothesized that the central serotonergic system regulates some of nicotine withdrawal symptoms. To test this hypothesis, we used transgenic mice expressing archaerhodopsin (ArchT) in central serotonergic neurons only, and examined whether serotonergic inhibition could induce withdrawal symptoms. Mice drank water containing nicotine for 6 weeks, and receive mecamylamine injection to induce withdrawal symptoms. Withdrawal symptoms: somatic signs, anxiety-like behavior, and depressive-like behavior were measured by visual observation, an elevated plus maze test, and a forced swim test, respectively. Somatic signs were precipitated by mecamylamine following chronic nicotine drinking. Neither anxiety-like nor depressive-like behavior was affected by chronic nicotine drinking or mecamylamine. Central serotonergic inhibition induced somatic signs in mice received mecamylamine injection without chronic nicotine drinking.