**Role of Trace amine-associated receptor 1 (TAAR1) in the modulation of dopaminergic system and cortico-striatal signaling**

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**Introduction**

Mammalian Trace Amine Associated Receptor 1 (TAAR1) is a G protein-coupled receptor (GPCR) that is mainly expressed in limbic regions and monoaminergic nuclei, such as ventral tegmental area, dorsal raphe and nucleus coeruleus (Brookes et al., 2001; Baronzio et al., 2001). TAAR1 can be activated by several members of a class of endogenous biogenic amines called “trace amines” (TAs) that includes β-phenylethylamine (β-PEA), octopamine, tryptamine as well as by several compounds known to target monoaminergic transmission such as amphetamine and some of its derivatives (Grandy, 2007). There is evidence indicating that TAAR1 could be involved in modulation of dopaminergic function (Sotnikova et al., 2009). In mice lacking TAAR1 (TAAR1-KO mice), amphetamine induces more pronounced locomotor stimulation and dopamine release (Wolinsky et al., 2007). Moreover, it has been reported that D2 receptor function is altered in TAAR1-KO mice (Espinoza et al., 2011). Dopamine system is involved in many physiological functions and has been implicated in various pathological states such as schizophrenia and Parkinson’s disease. Therefore, understanding the TAAR1 role in the modulation of dopamine system could help to better comprehend the etiology of these diseases and maybe to discover new pharmacological approaches to cure them.

**References**


3. Sotnikova TD, Caron MG and Gainetdinov RR (2009) Trace amine-associated receptors as emerging therapeutic targets.

4. Grandy DK (2007) Trace amine-associated receptor 1-Family archetype or iconoclast?


**Behavior**

TAAR1-KO mice don’t show timing defects but perseverative behavior

**Conclusions**

1. D2 receptor number and signaling is altered in striatum of TAAR1-KO mice

2. NMDA functions are reduced in prefrontal cortex

3. TAAR1 correct function seems important for fronto-striatal related behavior