**Prenatal immune challenge and repeated predator scent exposure in adulthood have opposite effects on the excitability of serotoninergic neurons in the rat brain.**

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Central serotonin (5-HT) is fundamental in mood, emotions, cognition, and stress response. This neurotransmitter also plays a key role in pathophysiology of depression and related stress and anxiety disorders. One of the factors determining 5-HT neurotransmission is excitability of 5-HT-secreting neurons. In our recent studies, we examined the effects of prenatal immune challenge and adulthood exposure to the predator scent on the excitability of dorsal raphe nucleus (DRN) 5-HT neurons. Prenatal immune challenge was induced by repeated administration of the rising doses of polysaccharide (LPS) to the gestating dams, during the days 15-19 of gestation; control dams were given saline. *In vivo* electrophysiological assessment of 5-HT neuronal firing activity in offspring was performed during the days 53-63 postpartum. Predator scent exposure was performed using the adult rats’ placement into the cages containing sand soaked with cat urine, for 10 min daily during 10 consecutive days; control rats were places in cages containing sand soaked with clean water. Electrophysiological assessments were performed 14 days after the last exposure. We found that maternal immune challenge resulted in decreased excitability of 5-HT neurons in offspring’s DRN. This finding is consistent with decreased brain 5-HT concentration and depressive-like behavior observed in offspring of LPS-treated dams. It is thus possible that decreased excitability of central 5-HT neurons is responsible, at least in part, for psychopathologies triggered by prenatal stress and infection. Interestingly, repeated exposure to the predator scent during adulthood resulted in increased excitability of DRN 5-HT-secreting neurons. It is possible that increased excitability of 5-HT neurons after repeated exposure to the certain stressors is an intrinsic compensatory mechanism. Summarizing, different stressors might have opposite effects on 5-HT neuronal firing activity, depending on the nature of the stressor and/or lifespan period when it is applied. The work of the authors was supported by the Scientific Grant Agency of Ministry of Education of Slovak Republic, and Slovak Academy of Sciences (grant VEGA 2/0046/18) and Neuron Era Net UNMET project.