P1-31: An undergraduate nursing student’s collaborative summer study on the role of 5-HT2A receptor in cognition

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**Abstract:**

**Introduction:** Patient education of drug action is an important nursing role. Inherent in this role is the understanding of the mechanisms involved in a drug action, an important content in nursing pharmacology classes. This study reports on a summer research experience of an undergraduate nursing student in the Pharmacology Department, which investigated the effects of direct injection of the selective 5-HT2A receptor antagonist, MDL 100,907, into the orbitofrontal cortex (OFC) on reversal learning in a rodent model for attentional set-shifting task (AST). Reversal learning is one of the measures of cognitive flexibility, a prefrontal function which may be utilized by individuals in shifting their mind set (from sad to happy). It was hypothesized that the 5-HT2A antagonist will affect reversal learning.

**Method(s):** The experimental study design used male Sprague Dawley rats (6-8/group) stereotaxically implanted with bilateral guide cannulae aimed at the OFC and allowed to recover for > 3 days. Following a 7-day food restriction (14g/day), habituation and training, the rats were tested in the AST. The rats were taken through tasks such simple and compound discriminations, then microinjected into the OFC with vehicle or MDL 100,907 (0.02-20 nmol doses) at 0.50μl/side, and tested on the reversal task. Behavioral data were analyzed using analysis of variance with a p level set at <0.05.

**Results:** Direct injection of MDL 100, 907 produced an inverted U-shaped dose curve, significantly (p<0.05) impairing reversal learning performance at 0.2 nmol dose compared to controls. The data indicate a role of 5-HT2A in the OFC in reversal learning.

**Discussion & Conclusions:** This study is first to report that direct injection of 5-HT2A receptor antagonist in the OFC impairs reversal learning, an aspect of prefrontal cognitive function. This was also a unique collaborative opportunity for the student to learn more about the mechanistic aspects of pharmacology. Understanding of these pharmacologic mechanisms would contribute towards better patient teaching, and also scientifically inform development of drugs to improve cognition.

**Abstract History:**

**Financial Disclosure:**

No, I (or a member of my immediate family) have not received something of value* from or own stock (or stock options) in a commercial company or institution related directly or indirectly to the subject of my presentation.

**FDA Disclosure:**

The FDA has not cleared the following pharmaceuticals and/or medical devices for the use described in this presentation. The following pharmaceuticals and/or medical devices are being discussed for an off-label use (see note below).

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