**Metabolomic analysis of oxytocin effects on social deficits in mice**

Metabolomic Analysis: NIH Eastern Regional Comprehensive Metabolomics Resource Core (RTI RCMRC)

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Animal Research Approval Number: IACUC #15-257

**Abstract:**

The goal of this study is to determine the prosocial hormone oxytocin (OT) effects on metabolomic profiles in brain. Similar analyses will be conducted for blood and fecal samples, which could be relevant to peripheral measures available from human subjects. The study will use a mouse model of autism-like behavior, the BALB/cByJ inbred strain. Previous work by our research team at UNC has shown that treatment with oxytocin can reverse social deficits in BALB/cByJ mice. Overall, the results from this project may be valuable for the development of highly specific oxytocin-related drugs, which may have fewer side effects, and advance our understanding of autism treatment.

**Sample Description:**

24 BALB/cByJ male mice, with 12 each in the vehicle and oxytocin treatment groups. The regimen had four treatments (1.0 mg/kg) across 8 days, with at least 48 hours between each injection. Mice were evaluated in the 3-chamber test 24 hr after the final injection.

24 hr after the social test, mice were deeply anesthetized with 5% isoflurane, followed by rapid decapitation. Brains were removed, rinsed with ice-cold water, and then rapidly dissected into the following regions: forebrain, midbrain, cerebellum, remaining hindbrain, and olfactory bulbs. The dissected parts were frozen on dry ice and stored at -80o C.

The data obtained for the NMR metabolomics analysis can be found in the accompanying files:

Procedures: 1. Moy Brain NMR Procedures.docx

Study Design Tables: 2. Moy Brain NMR Study Design Table.xls

Metadata: 3. Moy Brain METADATA.xlsm

Processed Data: 4. Moy Brain NMR Normalized Binned Data.xlsx

Raw Data: 5. Moy Brain NMR Raw Data.zip

**Notes:**

Full sample preparation and analysis procedures are available in the accompanying document entitled **1. Moy Brain NMR Procedures**.

Descriptions of abbreviations for factors are available in the Variable Dictionary in the accompanying file no. **2. Moy Brain NMR Study Design Table.xls**.

The phenotypic and normalized data are available in the accompanying files: **4. Moy Brain NMR Normalized Binned Data.xlsx** for normalized binned NMR data. Sample ID and factors can be found in the first 7 columns and other columns in the spreadsheet contain sample metadata and the normalized binned data. If the statistical program does not allow variable names to begin with a number then add a prefix to the column names, for example, bin\_8.98 instead of 8.98.

The Sample ID serves as the unique identifier (Graphical ID) of the individual samples and is used as the NMR folder name in the raw NMR data file **5. Moy Brain NMR Raw Data.zip**.