**Broad Spectrum Metabolomics of Rat Placenta**

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

PI, RTI RCMRC Pilot Study: Susan Sumner, PhD., RTI International

PI, NCSU, CHHE: Heather Patisaul, PhD., Biological Sciences

Animal Research Approval #: 12-108-B

**Abstract**

Pregnant lab rats (dams) were assigned to three groups: a control group, which was not exposed to Firemaster (FM) 550; a low-dose group, which ingested 100 µg of FM550 once daily throughout pregnancy; and a high-dose group, which ingested 1000 µg FM550 on the same schedule. The placentas were harvested immediately after birth, frozen on dry ice and pulverized in liquid nitrogen via mortar and pestle. Samples were randomly analyzed across one plate.

**Goals**

The overall objective is to investigate the differences in the metabolic profiles of the placentas in each phenotypic group; control vs low dose vs high dose.

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

Procedures: 1. Rat Placenta Procedures.docx

1a. GCMS Procedures Flowchart.pdf

1b. GCMS Preparation of fatty acid methyl esters mixture.pdf

Study Design Table: 2. Rat Placenta Study Design.xlsx

Metadata: 3. Rat Placenta METADATA.xlsx

Raw Data: 4. Rat Placenta Raw GCMS Data.zip

Processed Data: 5. Rat Placenta Processed Data.xlsx

**Notes:**

Full sample preparation and instrumentation parameters are detailed in accompanying file **1. Rat Placenta Procedures.docx.** A flowchart detailing the sample preparation steps is located in accompanying file **1a. GCMS Procedures Flowchart.pdf.** The preparation of the fatty acid methyl esters (FAME) mixture is located in accompanying file **1b. GCMS Preparation of fatty acid methyl esters mixture.pdf**.

Factors listed in the study design are defined in the Variable Dictionary located in the accompanying file entitled **2. Rat Placenta Study Design.xlsx.** Available in the same file is information linking the Data File names to the Sample IDs.

Data files for each sample are generated by Leco’s ChromaTOF software and are exported in netCDF format . These files arelocated in the accompanying file entitled **4. Rat Placenta Raw GCMS Data.zip.**

The spreadsheet in accompanying file **5. Rat Placenta Processed Data.xlsx** has one data tab entitled BinBase Processed Data. The BinBase Processed Data shows raw output from BinBase. The height values have not been normalized.

**Reference:**

O Fiehn, G. Wohlgemuth, M Scholz, T Kind, DY Lee, Y Lu, S Moon and B Nikolau: Quality control for plant metabolomics: reporting MSI-compliant studies. The Plant Journal2008; 53:691-704.