**Effect of Diet and Age on Ovarian Metabolome**

Metabolomics Analysis: RTI RCMRC

PI, RTI RCMRC P&F Study: Susan E. Appt, DVM, Wake Forest University Health Sciences

IRB Number: A-03-050, A-05-156, A-10-091 (Institutional Animal Care and Use Committee of WFUHS)

**Abstract:**

The rationale for this study stems from observations of Western diet-associated infertility in rodents, adverse effects on ovarian reserve in monkeys and observational studies in women indicating a relationship between dietary patterns and fertility. Ovarian-metabolomic profiling has been used to show that aging women, and those with reduced ovarian reserve, have altered follicular fluid levels of carbohydrates and reproductive hormones compared to normal ovarian reserve women. This study will compare the effects of chronic exposure to a typical Western diet with a prudent diet on the ovarian metabolic signature.

Ovarian samples from twenty-one adult, female Cynomolgus monkeys were studied, eight of which were fed the Western #907 diet, and 13 of which were fed the Prudent #611 diet. Of these monkeys, serum was collected from 11 of the 13 monkeys receiving the prudent diet and 6 of the 8 monkeys receiving the Western diet. Prudent diet samples were collected prior to experimental manipulation with exposure only to a prudent, commercial diet (low in cholesterol and saturated fats, high in complex carbohydrates) supplemented with fruits and vegetables. Western diet samples were collected following 2 years of exposure to a typical Western diet (high cholesterol, saturated animal fats, and soluble carbohydrates).

This metabolomics study was conducted to provide data to identify the metabolites that best differentiate the metabolic profiles between those monkeys fed a Western diet and those fed a prudent diet. This information will serve to address whether the metabolome of ovarian tissue from cynomolgus monkeys (*Macaca fascicularis*) differentiates by nutritional background, both in the global metabolome and in the metabolites associated with oxidative stress responses.

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

Procedures: 1. APPT-OVARY Metabolomics Procedure.docx

Study Design Table: 2. APPT-OVARY Design Table And\_Subject\_ID..xlsx

Metadata: 3. APPT-OVARY MetaData and Analytical Metadata.xlsm

Processed Data: 4a. Appt-Ovary-RP-POS-Phenotypic and Normalized Data.xlsx

4b. Appt-Ovary-RP-NEG-Phenotypic and Normalized Data.xlsx

Raw Data: 5a. Appt-Ovary\_RP-POS-Zipped LC-MS Data.zip

5b. Appt-Ovary\_RP-NEG-Zipped LC-MS Data.zip

**Notes:**

**Reference:**