

1. **Faculty Name:** Marlene C. Welch, MD, PhD
2. **Academic Rank:** Assistant Professor
3. **Department:** Surgery
4. **Telephone Number:** 419-383-6939
5. **Name, Academic Rank, and Department of any Co-Investigators:** none
6. **Project Title:** "Quantitative Trait Loci (QTL) for Obesity"
7. **Brief Summary/Description of Project: (Limit this section to one page. Include a well-defined Specific Aim for the student's project and related methodology. DO NOT append a copy of your grant application.)**

Research Plan

Obesity is a complex polygenic trait. Although several Mendelian obesity genes have been identified (leptin, leptin receptor, POMC), these are rare causes for human obesity. Common obesity is multifactorial and the pathophysiology involves a complex interplay of genes and environment. Twin and adoptee studies suggest that up to 70% of obesity is genetic. The genes responsible for polygenic obesity have not been identified. The goal of this work is to dissect the complex genetic nature of obesity by identifying quantitative trait loci (QTL) linked to obesity in two inbred strains of rats with divergent obesity phenotypes. Two rat strains, Copenhagen (COP) and Buffalo (BUF) demonstrate a 5-fold difference in fat weight. This wide phenotypic difference in obesity will provide the basis for a genome scan to identify QTLs for obesity.

Specific Aims:

- 1a.** To breed a segregating population of F2 (COP X BUF) rats and genotype rats in the highest 20% and lowest 20% for the obese phenotype.
- 1b.** To perform a genome scan using polymorphic microsatellite markers to identify QTLs linked with the obese phenotype.
- 1c.** To genotype the remaining F2 (COP X BUF) rats in chromosomal regions identified as QTLs linked with the obese phenotype.

To date, specific aim 1a is completed and we are currently performing the genome scan from specific aim 1b. I anticipate that by June 2008, we will be working on specific aim **1c**. This will be the core project for the student this summer.

8. **Describe Student's Role and Responsibilities.**
 - i. Genotyping of rats for genome scan
 - ii. Analysis of genotyping data and identification of QTLs
 - iii. Rat colony maintenance for genome scan project
9. Special Qualifications Required (NO STUDENT IDENTIFIED).

