

Desiree Wanders, PhD
Assistant Professor

I. General Research Interests

- A. Nutritional and pharmacological interventions to prevent or treat obesity and metabolic disease, white and brown adipose tissue remodeling, adipose tissue physiology, regulation of energy balance, inflammation and metabolic disease

II. Current Research Projects

- A. Mechanisms by which methionine restriction modulates FGF21
- B. Neural mechanisms of FGF21 on energy balance
- C. Effects of berries on obesity-induced inflammation
- D. Berries prevent hypertension and cardiac damage by modulating the gut microbiota and attenuating oxidative stress and inflammation

III. Research Skills

- A. Animal Studies – rats and mice
 - 1. Breeding
 - 2. Oral gavage
 - 3. Intraperitoneal injections
 - 4. Glucose tolerance tests
 - 5. Insulin tolerance tests
 - 6. Transcardial perfusions
 - 7. Indirect calorimetry
 - 8. Body composition via MRI/NMR
 - 9. Interscapular osmotic minipump implantation
 - 10. Sacrifice and tissue collection
 - a. Whole blood → serum
 - b. Brain
 - c. Liver
 - d. Kidneys
 - e. Skeletal muscle
 - f. Heart
 - g. Brown adipose tissue
 - h. Inguinal white adipose tissue
 - i. Retroperitoneal white adipose tissue
 - j. Epididymal white adipose tissue
- B. Cell Culture
 - 1. Adipocytes (3T3-L1; adipocyte differentiation) and isolation of primary adipocytes and culture in a collagen matrix
 - 2. Hepatocytes (HepG2) and isolation of primary hepatocytes and culture
 - 3. Use of inhibitors to study cellular signaling pathways
- C. Other Laboratory Skills

1. RNA extraction from tissues and cells
2. cDNA synthesis (reverse transcription)
3. Measurement of gene expression through real-time PCR
4. Protein extraction from tissues and cells
5. Protein quantification through DC protein assay
6. Measurement of protein expression through western blot
7. Measurement of secreted proteins using ELISA
8. Statistical analysis using GraphPad Prism
9. Preparation of figures and tables