Non-Technical Summary

Hypertension affects over 1 billion in the world, and risk factors for hypertension, including obesity and insulin resistance, are growing at epidemic proportions around the globe. This increasingly prevalent disease is in significant part due to increased sodium reabsorption by the kidney, but effects of obesity and insulin resistance on specific sodium channels/transporters are not known.

We have developed a robust mouse model of obesity, insulin resistance, and sodium retention to understand the role of insulin in this form of hypertension. Using this model, we have also discovered a novel role for obesity in the handling of potassium in the kidney and how this may also influence hypertension. For these reasons we have initiated a collaboration with Dr. Lise Bankir at INSERM in Paris, France. Dr. Bankir is an internationally recognized expert on the role of integrative renal physiology, and has a keen interest in how insulin and its counter-regulatory hormones, e.g. glucagon, integrate to influence sodium and potassium handling in the kidney. We propose to explore the mechanisms of an increasingly prevalent disease, and in doing so, establish a pipeline for future kidney-related research collaborations between our institutions.