Our laboratory has had a long-standing interest in the molecular mechanisms of vascular disease including atherosclerosis, restenosis and abdominal aortic aneurysms (AAA), primarily focusing on signaling pathways and how they regulate vascular function and transcription. For this line of investigation, we utilize a variety of experimental approaches including molecular biology, cell biology, preclinical animal models, as well as translational clinical studies. We have developed novel models to better mimic human disease, and have incorporated known risk factors (e.g., sexual dimorphism of AAA, nicotine) to add greater insight into disease mechanisms. Throughout our studies we have exploited a variety of high-density data quantification tools including microarrays as well as RNA-seq. As such, we have gained significant experience in the analysis of large data sets to elucidate relevant biological pathways in cardiovascular disease. During this presentation, I will describe how we’ve used this approach to identify microRNAs as key regulators of vascular disease pathways and how their manipulation can alter disease progression.