During pregnancy, many changes in blood pressure (BP) control occur. One hormone system involved in regulation of BP that undergoes major regulatory changes during pregnancy is the renin-angiotensin system (the RAS). While this system can directly mediate increases and decreases in BP, pregnancy causes specific alterations to the system that attenuate the ability of the system to increase pressure, but potentiate the ability to decrease pressure. It has been shown that alterations to the vasoconstrictive portion of the RAS (specifically, angiotensin II production and tissue responsiveness to this hormone) during pregnancy are mostly due to the effects of estrogen and/or progesterone. It is the goal of this research project to evaluate the hypothesis that sex steroids are the cause of alterations in the production of, and vascular responsiveness to, the vasodilatory portion of the RAS (specifically the hormone angiotensin 1-7) during pregnancy, and further to examine the mechanisms of action of this peptide at the tissue level. Blood vessels from steroid-manipulated rats will be used in vascular reactivity experiments, blood will be analyzed for angiotensin 1-7 and steroid content, and tissues will be analyzed for specific enzyme and receptor content. Collectively, this project will provide the candidate multidisciplinary training opportunities in molecular, RIA, in vivo, in vitro, and in silico techniques, and will significantly contribute to his training for a career in the pharmacological sciences. Finally, results from these studies will contribute to our knowledge of the cardiovascular changes that occur during pregnancy, and provide insight into possible mechanisms leading to the pathological state of pre-eclampsia.