The long-term objective of this laboratory is to improve knowledge in this area and translate findings to the human by building on our previous and ongoing in vivo and in vitro studies in the pregnant baboon demonstrating the important role of estrogen in controlling placental-fetal communication by regulating [1] placental angiogenesis and structural maturation, [2] remodeling of maternal uterine spiral arteries by extravillous trophoblast critical to uteroplacental blood flow dynamics, [3] maturation of fetal-organ systems including the adrenal gland, ovary and testis as well as tissues controlling metabolic function, and establishing the impact of these intrauterine programming actions of estrogen on physiological processes (e.g. insulin sensitivity, vascular and reproductive function) in adulthood.