Many researchers hope their work will someday help human lives. For Dr. Jennifer Sones, that day came earlier than most, and the lives it touched were close to home.

A love of horses and reproductive physiology first brought her to Cornell as a visiting veterinary student through the Havemeyer Foundation Fellowship Program, which provides an opportunity for veterinary students interested in research careers to get a taste of equine research at the College. Inspired by her summer with Dr. Douglas Antczak and his laboratory at Baker Institute for Animal Health performing equine breeding management and reproductive genomics, she returned there for a year-long post-DVM research fellowship and applied to pursue a PhD at Cornell.

"Within weeks of being admitted to Cornell's graduate school, I discovered I was pregnant," said Dr. Sones. "Because of my knowledge of reproductive physiology through my time in research, I knew immediately that mine was a high-risk pregnancy—my chronic kidney disease made me especially vulnerable to developing preeclampsia."

One of the most common causes of death in mothers and babies, preeclampsia affects up to 10 percent of pregnancies. Without warning it strikes suddenly, spiking blood-pressure and kicking kidney function into a downward spiral. By the time symptoms show, as early as the 20th week of gestation, the only treatment is to deliver the fetus.

"I took my pregnancy into my own hands," said Dr. Sones. "I went to specialists, lowered my salt intake, monitored my blood pressure daily, and had my kidney function assessed regularly. Through my research I knew that I was at risk; this knowledge helped my daughter and me get through our pregnancy. The impact of research is rarely so tangible."

Few women get Dr. Sones' chance to plan ahead. By the time preeclampsia's spontaneous symptoms manifest, the mother and baby are already in danger. Dr. Robin Davison's lab is working to change this. She and her team have discovered the world's first known genetic line of mice that spontaneously develop preeclampsia's principle features, opening new doors to discovery. In her second year in graduate school Dr. Sones joined Davison's lab and is applying her reproductive knowledge
gleaned from years of equine medical research to learn things from these mice that could save human lives.

"Our research focuses on detection and prevention," said Dr. Sones. "We know something goes wrong in the placenta, and we think it begins during the earliest stages of pregnancy, when the embryo first interacts with the mother's uterus. This happens before people even know they're pregnant. But in these mice we can time pregnancies and monitor them to allow us to evaluate events during that crucial window of implantation."

Coming full circle, Dr. Sones is now raising her healthy daughter while researching ways to identify other women who may be vulnerable to the disease that once threatened them both.

"Women aware of their predisposition to preeclampsia can use preventative strategies to give themselves the best chance for successful pregnancies," said Dr. Sones. "Veterinarians don't always have the opportunity to impact human health, but I am now using my veterinary background in the context of an animal model that can be directly translated to improving human medicine."

Dr. Davison's dual appointment at the College of Veterinary Medicine and Weill Cornell Medical College readily enables such translation, letting her lab collaborate with human doctors working at the bedside of patients with risks for developing preeclampsia.

"Doctors at Weill videocall with us every two weeks," said Dr. Sones. "We can investigate mechanisms in mice that they can't evaluate during human pregnancy, so they provide us with human samples that we can use to validate our findings in mice."

Through this collaboration, Dr. Davison's lab recently identified a potential biomarker for preeclampsia that can be detected in circulation. New non-invasive tests may soon be able to find this red flag, identifying patients who are developing the disease before serious symptoms strike.

"I was very fortunate that by returning to research, it educated me about my vulnerability to developing preeclampsia," said Dr. Sones. "I hope my research will help empower at-risk women to do all they can to make their pregnancies successful as well. The ability to benefit both animal welfare and human health through biomedical research makes me proud to be a veterinarian."