

Doctoral Student Receives 2020 USDA–NIFA–AFRI Merit Award

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Ana Silva, a doctoral student in the Department of Animal, Dairy and Veterinary Sciences (ADVS), recently received the 2020 USDA–NIFA–AFRI Merit Award. The award recognizes her abstract, *Effect of bovine trophoblast cell derived extracellular vesicles on gene expression profiles of immune cells*. She will be presenting her research virtually at the Society for the Study of Reproduction's annual meeting this summer.

The national pregnancy rate of dairy cattle in the U.S. is only 15%. Most aborted pregnancies are embryonic losses and may be related to an abnormal immune response from the maternal system. Adequate materno-fetal communication is important to modulate the maternal immune response toward the fetus. Silva's research focuses on analyzing the effect of placental nanovesicles on immune cells checking if these vesicles are responsible for modulating the maternal immune system. These vesicles can be compared to little capsules of cellular content produced by placental cells.

"As a first step, we had to characterize the vesicles, mainly measuring their size distribution and their biochemical components," Silva explained. "Then, using an in vitro system, we have observed that these vesicles can change the gene expression profile of different immune cell populations and may be pivotal for the establishment of a successful pregnancy."

She expressed surprise at receiving the award, but went on to say that it's "rewarding to be reassured that the project is important to enhance our knowledge on reproduction and it may help to improve the production of agriculturally relevant species."

Silva earned a bachelor's degree in biotechnology from the Federal University of Ceara in Brazil and received further training in molecular biology at the Oswaldo Cruz Foundation (Fiocruz) before deciding to come to Utah State University to study animal reproduction and work with Assistant Professor Heloisa Rutigliano. Silva began

as a master's degree student in the ADVS department but decided to transfer to the Ph.D. program as her interest in reproductive immunology grew and experiments expanded.

When it comes to research, Silva's broad focus is on the communication between placenta and maternal tissues, mainly the maternal immune tissues, and how this interaction must work to produce a successful gestation. All of her projects at USU have been related to the immunology of pregnancy and/or the study of extracellular vesicles in cattle. She is interested in understanding the causes of low pregnancy rates in dairy cattle, as well as in using bovine cells to elucidate some molecular aspects of immune cell modulation during pregnancy. A more detailed study of the pregnant uterus is under development to help achieve the latter goal.

Of her time at USU Silva said, "In my experience, life is happier when you get personally involved with your work. I mean not only performing your experiments and showing up to meetings, but also trying to help people around and trying to come up with ideas that may benefit the laboratory, the program, or the department itself."

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