

Message from the President



As 2022 comes to a close, I would like to take this opportunity—on behalf of the entire NovaVive team—to thank our partners for their continuing support.

NovaVive is a small, private animal health immunobiology company headquartered in Ontario, Canada (with products manufactured in Georgia, USA).

Despite our diminutive corporate footprint, we offer world-class products that have critical importance for the well-being of horses, dogs and cows. Our immunotherapeutics represent alternatives to traditional treatments like antimicrobials (for viral and bacterial infections) and chemotherapies (for cancer).

Immunotherapy works by stimulating the body's natural immune system to work more efficiently to address the invading disease.

In these times of global concern from new and devastating invasive organisms like COVID-19, we are proud to play a small role in offering safe, effective and affordable alternative therapies to veterinarians,

livestock producers and horse and dog guardians.

We will continue to play our role in the advancement of animal health in 2023, our 9th year of business. We wish you the very best for an enjoyable Christmas and healthy, happy new year.



Immunocidin Equine saves an eye: A case study

Eleida is an 8-year-old Hanoverian dressage mare in Ohio, USA who was diagnosed with small periocular sarcoid in 2020.

A veterinarian performed a surgical debulking of the tumor and implanted Cisplatin beads. The tumor doubled in size following treatment.

A consultation with Ohio State University resulted in a suggestion for radiation treatment. OSU performed surgical debulking and created an autologous vaccine. The vaccine was unsuccessful, so radiation therapy followed. The tumor appeared to regress after 6 rounds of radiation, but recurred within one month of ending treatment.

Electrochemotherapy was recommended by OSU, but 3 rounds of this treatment (one in combination with Cisplatin) caused severe swelling, discomfort and inappetence.



after surgery, Cisplatin, radiation and electrochemotherapy (before Immunocidin Equine)

Additionally, the eyelid became deformed and Eleida could no longer blink. The tumor recurred—at double the size—within two months.

At this point, OSU recommended removal of the eye, but Eleida's owner did not wish to proceed with this approach. Instead, the owner—

Christina Bingham—searched and found Immunocidin® Equine. After four intratumoral injections of this product over a period of 10 weeks, the tumor completely regressed. Christina reports, "Eleida has responded amazingly. She had some swelling but was not in any real discomfort and acted quite happy and normal. I saw a

response within 12 hours of the first dose. Within 6 days, the first nodule separated and fell off. After the second dose, the second, larger nodule separated and fell off. The entire time I was able to continue with riding and training."

Immunocidin Equine is the only regulator-approved therapy for equine sarcoids in North America.



after Immunocidin Equine

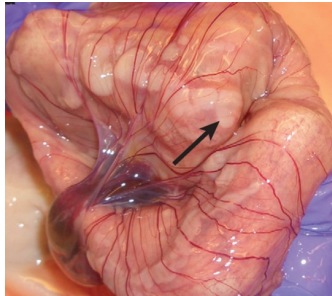
Settle offers a treatment option for endometrial cups

Data from a study with our immune-therapy for the treatment of equine endometritis – Settle® - was presented at the American Association of Equine Practitioners (AAEP) Annual Convention in San Antonio, TX in November.

The study, “Decreased equine chorionic gonadotropin secretion following hysteroscopic-guided injection of an immunomodulator”, was conducted by researchers at the Gluck Equine Research Center at the University of Kentucky in collaboration with Rood & Riddle Equine Hospital and was presented by Dr. Maria Schnobrich (Rood & Riddle).

Endometrial cups are specialized placental tissues that invade the uterine lining and secrete the hormone equine chorionic gonadotropin (eCG). This hormone results in the prolonged suppression of estrus and false pregnancy in the mare. Pregnancy loss after the development of endometrial cups often leads to the inability to breed mares back for the remainder of the breeding season.

To date, no treatment has been found effective in the early reduction/elimination of endometrial cups following pregnancy loss. In the past,



Source: Antczak et al., 2013

chemical curettage (tissue removal) with kerosene has been used, with limited efficacy.

Treatment involved intra-endometrial injection of diluted Settle (1ml per endometrial cup, with any excess volume being injected peripherally into the endometrial stroma surrounding the cups). Blood was obtained prior to hysteroscopy, in addition to weekly post-treatment to measure eCG as a marker of endometrial cup viability, and this continued for eight weeks.

It should be noted that, in follow-up research, a regimen of two injections of a larger dose of Settle one week apart was shown to significantly improve outcomes and the majority of treated returned to

heat. Further research is planned to validate these outcomes.

Hysteroscopic-guided injection of the immunomodulator Settle led to a significant reduction of eCG concentration in comparison to placebo-treated mares. This reduction in eCG concentration was most pronounced at seven days following treatment, with a diminished response noted throughout the remainder of the study. Return to cyclicity could not be assessed under the confines of this study, as mares were treated in late fall of Central Kentucky, and therefore became acyclic due to winter anestrus.

Researchers have determined that further research is merited to determine the clinical ramifications of this decrease in eCG concentrations following treatment with the immunomodulator MCWF. We look forward to these new research collaborations.

In other research studies, Settle has proven effective for persistent breeding-induced endometritis, for the production of uterine nitric oxide, as an anti-inflammatory in susceptible mares, for pathogenic endometritis, as a non-antibiotic antibacterial in mares with uterine infection, for post-partum endometritis and for improving mare fertility.

Equimune works in foals ... and saves money

Equimune® is our immunotherapy for equine respiratory disease complex (ERDC). It works by stimulating a horse's innate and specific immune responses for several days. This is critical in situations where the animal is stressed and more vulnerable to infection from pathogens.

If infection occurs, Equimune - as a solo IV therapy - has been proven to help the equine athlete recover from viral respiratory disease quickly and completely.

We've recently heard about a success story demonstrating how Equimune works in foals! Hilldale Farm, a family-operated equine breeding facility in Brashear, TX, was having a difficult time with *Streptococcus zooepidemicus* infection in foals (in fact, they were seeing chronic respiratory infection in their foal population). The operators were at their wit's end when even a veterinarian-prescribed treatment regimen of

chloramphenicol and rifampin was not working to get rid of the *Strep zoo*.

Farm owner Tammye Hutton decided to give Equimune a try last year. "We added it to the tail end of our chloramphenicol and rifampin regimen, but we couldn't tell how much it helped," says Tammye. "This year, we started our 27 foals on Equimune on its own every 2 weeks for 12 weeks. We had no *Strep zoo* this year. It's been really strange not doctoring foals!" Tammye used 0.75ml (half the mature horse dose) for each foal treatment, administered by IV injection.

Tammye reports that they began the Equimune program this year before the foals became sick, and none have become sick as a result (despite 100° heat for 30 days' straight). "It's really amazing that we don't have any sick foals. We tell all our customers about Equimune and what good



luck we've had with it. It's really a great product!"

Each foal also gets a dose of Equimune before departing Hilldale Farm for their new home to ensure they stay well during the trip. Tammye estimates they have saved approximately \$47,000 this year by switching to Equimune!