

BIOMEDICAL & VETERINARY SCIENCES

GRADUATE PROGRAM



ANNOUNCES

The Master of Science Seminar and Examination of

Ronald Olsen, DVM

"Bead size has a greater effect on in vitro elution from antimicrobial-impregnated calcium sulfate beads than drug concentration"

Friday, April 21st, 2023 4:00PM

Zoom Only:

<https://viriniatech.zoom.us/j/81755113668>



Bio

Dr. Olsen is from Henderson, Nevada and attended Brigham Young University prior to acceptance into the Oregon State University College of Veterinary Medicine, where he graduated in 2018. After graduating he moved to Blacksburg with his wife and two sons where he completed a small animal rotating internship at the Virginia-Maryland College of Veterinary Medicine. He then completed a surgical internship at a private specialty practice in Austin, Texas before returning to Blacksburg for a Small Animal Surgery Residency and concurrent Master's in Biomedical and Veterinary Sciences program. He is completing his final year of residency at the Texas A&M School of Veterinary Medicine and plans to return to the Las Vegas area following his residency where he will be building a mobile surgery practice.

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Awards and Academic Achievements

- Johnson Memorial Award 2023—Texas Veterinary Medical Foundation

Lay Language Abstract

Localized bacterial infections that are resistant to systemic administration of antibiotics can be effectively treated with local antibiotic administration. This is commonly performed using antibiotic-impregnated calcium sulfate beads, which gradually release the antibiotic in the local environment over a prolonged period. This has two primary advantages. Firstly, the antibiotic reaches extremely high local concentrations, giving it excellent effectivity against even highly resistant bacteria, while the concentration of the antibiotic throughout the rest of the body is practically undetectable, minimizing the risk for side effects. Secondly, these high local concentrations can be maintained for around one to two weeks. Despite these advantages, there is little guidance on how to effectively use these antibiotic impregnated materials.

Other studies have demonstrated how different antibiotics are released from the beads, but no studies have examined how the beads themselves are made to determine how to maximize the concentrations reached and maintain a therapeutic concentration for as long as possible. In this in vitro study, we created antibiotic-impregnated calcium sulfate beads using a combination of high and low concentrations of the antibiotic and three different bead sizes, resulting in six experimental groups, all containing the same total mass of amikacin (150 mg). The groups were submerged in a saline solution that was sampled at 14 time points over a 28-day period. The samples were tested using ultra-performance liquid chromatography and mass spectrometry to determine how the concentration of the amikacin changed over time for each group between each sampling period. We found that smaller beads released higher peak concentrations of the antibiotic than the larger beads, but the larger beads, particularly with among the high-concentration groups, maintained a therapeutic concentration for a longer period than small beads. There was not a significant difference between the high and low concentrations in terms of peak concentrations or therapeutic duration. While more studies are needed, these findings may guide veterinarians in selecting the bead configuration that will best suite their needs and maximize the chances of successful outcomes with clinical patients.

Publications

Olsen D, **Olsen RS**. Flail chest. In: Monnet E (ed.) Small Animal Soft Tissue Surgery, 2nd edition. 2023 May 12:366-74.

Olsen, RS, Sawyere, DM, Davis, JL, Lanz, OI, & Werre, SR. Bead size has a greater effect on in vitro elution from antimicrobial-impregnated calcium sulfate beads than drug concentration, American Journal of Veterinary Research April 2023. doi.org/10.2460/ajvr.22.12.0216

Olsen R, Lanz OI. Revision of a canine Zürich cementless total hip replacement using a “cupless” system. Vet Rec Case Rep 2020;8:e001035. doi:10.1136/vetreccr-2019-001035

Kimbrell TL, Milovancev M, **Olsen R**, Löhr CV. Comparison of diagnostic accuracy of laparoscopic 3 mm and 5 mm cup biopsies to wedge biopsies of canine livers. J Vet Intern Med. 2018;32:701–706.

Presentations

Olsen R. Renal Transplants: Case selection and perioperative management. 2 December 2022. Department of Small Animal Clinical Sciences Seminar Series. Texas A&M School of Veterinary Medicine and Biomedical Sciences.

Olsen R. Effect of bead size and drug concentration on in vitro elution of antibiotic impregnated calcium sulfate beads. 2 June 2022. House Officer Seminar Presentation. VA-MD College of Veterinary Medicine.

Olsen R. Diagnostic accuracy of clinician-selected splenic biopsies compared to whole-spleen submission for the diagnosis of splenic tumors: Preliminary Results. 14 January 2022. House Officer Seminar Presentation. VA-MD College of Veterinary Medicine.

Olsen R. Course Lecture: Oropharyngeal and Gastric Surgery. Small Animal Surgical Diseases & Techniques course, Third year DVM Curriculum. 7 October 2021.

Olsen R. Integrating Implants: Advantages of hydroxyapatite in orthopedics. 4 June 2021. House Officer Seminar Presentation. VA-MD College of Veterinary Medicine.

Olsen R. Flail Chest: A surgical emergency? 13 November 2020. House Officer Seminar Presentation. VA-MD College of Veterinary Medicine.

Olsen R. Perioperative Management of Surgical Adrenal Disease. 1 May 2020. Staff Doctor Lecture. Central Texas Veterinary Specialty and Emergency Hospital.

Olsen R. Surgical Conditions of the Thoracic Wall. 31 Oct 2019. Staff Doctor Lecture. Central Texas Veterinary Specialty and Emergency Hospital.

Olsen R. Antibiotic Impregnated Materials in the Context of Post-Traumatic Osteomyelitis. 12 October 2018. House Officer Seminar Presentation. VA-MD College of Veterinary Medicine.

Olsen R. PU/PD in an Old Labrador...It's Gotta be Cushing's, Right? A Case Report. 22 March 2019. House Officer Seminar Presentation. VA-MD College of Veterinary Medicine.

Roeder BL, Boyce TT, **Olsen RS**, et al. Fecal lipidomic biomarkers in production-related metabolic disease (PRMD) resistant and susceptible dairy cows. 20 September 2013. Poster Presentation, Annual conference of the American Association of Bovine Practitioners, Milwaukee, WI.

Examination Graduate Committee

Major Advisor/Chair:

Otto Lanz, DVM, DACVS
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Department of Small Animal Clinical Sciences

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Associate Surgeon
Metropolitan Veterinary Specialists

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