

[CVM HOME](#)
[OVERVIEW](#)
[ACADEMICS](#)
[SCHOLARSHIPS](#)
[GRADUATE STUDIES](#)
[RESEARCH](#)
[HOSPITAL](#)
[DIAGNOSTIC LAB.](#)
[SERVICE UNITS](#)
[PEOPLE](#)

[PRINTER FRIENDLY](#)
[A to Z INDEX](#)

Comparative Orthopedic Research Laboratory (CORL)

[Facilities/Technology](#)

[Current and Past Research Projects](#)

[Personnel](#)

[Contact Information](#)

[Donations to CORL](#)



Facilities/Technology

Diagnostics

The Gait Analysis Laboratory

The CORL supports and operates a kinetic gait lab to assess ground reaction forces produced by dogs and humans utilizing an AMTI OR6-6 strain gage-based force plate. The integration of our forceplate with the current version of Aquire® allows for the measurement of the three orthogonal ground reaction forces: mediolateral (Fx), craniocaudal (Fy), and vertical (Fz). We also anticipate the addition of Video-based Kinematic Gait Analysis in the near future.



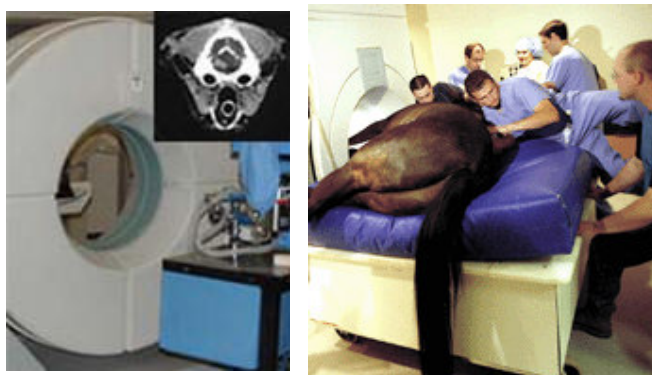
Dual Energy X-Ray Absorptiometry (DXA)

The CORL supports and operates a Hologic QDR4500A fan beam dual-energy X-ray absorptiometer for assessment of lean body mass (muscle), fat, and bone composition analysis. Our unit's software allows for a diversity of animal subject analysis. Sub-regions of interest can also be identified and analyzed within the individual. We are also certified to perform human scans as well. All serial scans can be compared to previous scans with an extremely low covariance factor.



Diagnostic Radiology and Megavoltage Therapy Services

[Imaging services](#) available to the CORL through the Veterinary Teaching Hospital at WSU include the use of Radiography, C-Arm digital Fluoroscopy, Computed Tomography (CT), Magnetic Resonance Imaging (MRI), Nuclear Scintigraphy and Ultrasonography. A linear accelerator is also available for megavoltage therapy requirements for oncologic-based projects.



Material Testing Analysis

The CORL has at its disposal the use of a complete materials testing laboratory through the School of Mechanical Engineering and Material Sciences at WSU. Indentation, 4-point bending, torsional, axial compression analysis; both static and cyclic, can be performed on bone and composite materials. The CORL can also perform in vivo and ex vivo cartilage stiffness analysis using an Artscan® hand-held indentation unit.



Physical Therapy

Treadmill

Desmo, Woodway® medical grade treadmill used for: controlled exercise programs and post surgical rehabilitation purposes.



Swimming/Recovery Hydropool

The hydropool is used for equine anesthesia recovery and canine physical therapy swimming purposes.



Anesthesia/Surgery

Anesthesia

State of the art anesthesia and patient monitoring equipment. Anesthesia machines are equipped with ventilators, anesthetic gases that include halothane, isoflurane, desflurane, and sevoflurane. Monitoring devices include Dynamap®, Doppler, ECG, direct blood pressure transducer, HP patient monitoring system, end tidal volume, blood gases and pulse oximeter.

Surgery

State of the art surgical facilities, surgical equipment, and surgical expertise. Complete surgical services for veterinary-based orthopedic surgery (including, but not limited to, arthroscopy, fracture based-implants, total joint replacement (cemented and non-cemented) are available.



Current Clinical Recruitment Opportunities: NO recruitments needed at this time.

Past Research Projects

Spinal Fusion – Evaluation and comparison of the osteogenic effects between several interferential stimulation devices intended for adjunct use to enhance surgically based spinal fusion.

Diet and Osteoarthritis – Evaluation of the effect of a special dietary formulation on the clinical expression of osteoarthritis in dogs with chronic hip dysplasia.

New Bone Forming Products – Evaluation of the osteogenic potential of a new castor bean polymer to an autogenous cancellous bone graft in the dog.

Fracture Fixation - A study to compare the properties of stiffness and strength of fiberglass/acrylic composite bars to solid acrylic connecting bars used in Type I ESF designs in veterinary orthopedics.

Effects of New Dietary Supplements on Osteoarthritis - Evaluation of the effects of a special dietary formulation on the clinical expression of chronic osteoarthritis in dogs.

Obesity and Osteoarthritis – Evaluation of the effect of obesity on the clinical expression of osteoarthritis in dogs with chronic hip dysplasia.

Treatment of Pain After Orthopedic Surgery - Several clinical studies evaluating the use of a non-steroidal anti-inflammatory drug on the treatment of pain associated with cranial cruciate ligament surgery.

Personnel

[Steven A. Martinez, DVM, MS, Diplomate ACVS](#)

Co-director

Dr. Martinez received his Masters of Science degree in comparative pathology from the University of California at Davis in 1984 and received a Doctorate of Veterinary Medicine degree from the University of California at Davis in 1985. He completed a small animal internship at California Animal Hospital Inc., Los Angeles, in 1986. Dr. Martinez entered a surgical residency at Michigan State University, which he completed in 1989. For one year following residency, he was an assistant professor of small animal surgery at the University of Prince Edward Island in Canada. In 1990 he became an assistant professor of small animal surgery at Michigan State University until 1997. In 1993 Dr. Martinez became a Diplomate of the American College of Veterinary Surgeons. In 1997, he accepted a position at Washington State University as assistant professor of small animal orthopedic surgery where he is still currently employed. He also has been an adjunct professor at Mississippi State University since the end of 2001.

Research Interests: Arthrology, surgical and non-surgical treatment of osteoarthritis, orthopedic patient rehabilitation, gait analysis, and DXA applications in orthopedics.

[James D. Lincoln, DVM, MS](#)

Co-director

Associate Professor, Small Animal Orthopedic Surgery

Dr. Lincoln received his Doctorate of Veterinary Medicine from Colorado State University in 1974. He was in a small animal practice for three years in Denver, Colorado, followed by a residency and graduate program in small animal surgery at Washington State University, which he completed in 1979. Dr. Lincoln became board eligible in 1985 upon completion of requirements set by the American College of Veterinary Surgeons.

Research Interests: Gait analysis, lameness in small animals, hip dysplasia and pain management.

David McCormick BVSc

Research Associate

David McCormick graduated from Massey University, New Zealand in 1999 with a Bachelor of Veterinary Science degree. He spent 5 years as a veterinarian in private clinical practice before completing an internship at Purdue University.

Kelly Hughes

Research Assistant

Kelly Hughes graduated from WSU in 2003 with a degree in Animal Science with emphasis in veterinary medicine. As an undergraduate she began working in the CORL part time starting in 2002. After graduation she

returned to Seattle and worked in private practice for a year but then returned to the CORL when a staff position opened. She has been working in the veterinary field for 7 years now.

Lloyd V. Smith, PhD

Adjunct Personnel

Lloyd V. Smith, PhD, Associate Professor; School of Mechanical and Materials Engineering (SMME), WSU. Dr. Smith has been with WSU since 1996; Ph.D. in Mechanical Engineering from University of Utah in 1994; specialties: damage, durability and characterization of composite materials, processing science of laminated, textile and randomly oriented polymeric composites, multiaxial testing and failure criteria, finite element modeling of material microstructures, environmental degradation of polymeric materials. Dr. Smith oversees the operation of the materials testing laboratory in the SMME.

Contact Information

If interested in finding out more about research opportunities through the Comparative Orthopedic Research Laboratory at WSU, please call 1-800-498-9459 or e-mail the [Comparative Orthopedic Research Laboratory](#)