

**BIOMEDICAL & VETERINARY SCIENCES
GRADUATE PROGRAM**



ANNOUNCES

The Doctor of Philosophy Seminar
and Examination of

E. Kristobal Gudenschwager Basso

**“Characterization of the expression of
angiogenic factors in in the feline placenta
during development and in feline cutaneous
squamous cell carcinoma”**

Monday September 10, 2018

2:00 pm

VMIA Classroom 220

Bio



Kristobal is from Villarrica, a town in the south of Chile. He studied Veterinary Medicine in The Austral University in Valdivia – Chile. While in the 4th year of his program, he came to the VMCVM to do an internship in Dr. Eystone's lab, studying the expression of the prion protein in bovine embryos. After finishing his DVM program, he worked at the Chilean Department of Agriculture helping with the implementation an agropecuary program that aimed to provide aid, tools, and training for indigenous communities in the south of Chile. Then he join Dr. Huckle's lab in the BMVS PhD program to study the VEGF family and other angiogenic genes during physiological placentation as well as in pathologies like squamous cell carcinoma in cats. Kristobal also is a part of ViTALS in the VTH, where he works part time as a necropsy technician, allowing him to learn from pathology cases. Finally, Kristobal is married to Valentina Stevenson, and they have a very active, almost 3-year-old girl named Emma.

Funded by

Virginia Maryland College of Veterinary Medicine

Research and Graduate Studies Internal Research Competition

Lay Language Abstract

Angiogenesis is the process of blood vessel formation. Proper angiogenesis in the placenta is key to normal fetal development, requiring precise regulation of expression of agents that modulate this process; otherwise pathologies of the pregnancy like preeclampsia may occur. The placenta is composed of different layers of tissue, including the trabecular (TZ), junctional (JZ) and glandular (GZ) zones, each with a vascular morphology attuned to its function. We hypothesize that higher expression of pro-angiogenic factors is associated with increased morphological metrics in the TZ, the major vascularized zone. Analysis of tissue sections under the microscope from different stages of pregnancy revealed increased thickness of the TZ, especially from mid-gestation (~30d) to term, at which sections look rich in capillaries and full of materno-fetal interdigitations. Gene expression analysis of placenta revealed upregulation of the pro-angiogenic factor VEGF-A in mid pregnancy, followed by a steady decline toward term, consistent with morphologic changes in the TZ. In contrast, another pro-angiogenic factor, PIGF, showed a marked increase toward term. Increased PLGF:VEGF-A expression may contribute to JZ proliferation in the last trimester. Relative expression of the anti-angiogenic gene thrombospondin 1 fell after day 20, returning to initial levels at term. Our findings are consistent with creation of a pro-angiogenic state during mid-gestation. We postulate that elucidation of the mechanisms of placental vascularization will allow design of improved strategies to treat vascular-based complications of pregnancy.

Publications

Gudenschwager, E.K., Abbott, J.A., LeRoith, T. (2018) Dilated cardiomyopathy with endocardial fibroelastosis in a juvenile Pallas cat (*Otocolobus manul*). Case report for *J Vet Diagn Invest.* (under revision after initial review).

Gudenschwager, E.K., Frydman, G., Weerakoon, S., Andargachew, H., Martin, C., Huckle, W.R. Morphological development of the feline placenta and its association with dynamics of VEGF family gene expression during gestation. (in preparation)

Gudenschwager, E.K., Stevenson, V., Huckle, W.R. Characterization of the expression of angiogenic factors in feline cutaneous squamous cell carcinoma. (in preparation)

Presentations

Gudenschwager, K., Stevenson, V., Huckle, W.R. (2018) Characterization of the expression of angiogenic factors in feline cutaneous squamous cell carcinoma. Virginia-Maryland College of Veterinary Medicine 29th Annual Research Symposium and Graduate Student Assembly research symposium, Blacksburg, Virginia, March 15, 2018.

Gudenschwager, K. Angiogenesis during placental development in the cat. BMVS Research in progress Seminar, March 29th, 2017.

Gudenschwager, K., Huckle, W.R. (2017) Morphological development of the feline placenta and its association with dynamics of VEGF family gene expression during gestation. Virginia-Maryland College of Veterinary Medicine 28th Annual Research Symposium, Blacksburg, Virginia, March 16, 2017.

Gudenschwager, K., Huckle, W.R. (2016) Morphological development of the feline placenta and its association with dynamics of VEGF family gene expression during gestation. 19th International Vascular Biology Meeting, Boston, Massachusetts, October 30-November 3, 2016.

Gudenschwager, K., Huckle, W.R. (2016) Gene Expression Dynamics of Vascular Endothelial Growth Factor Family Members in the Feline Placenta. Virginia-Maryland College of Veterinary Medicine 27th Annual Research Symposium, Blacksburg, Virginia, March 17, 2016.

Weerakoon, S., G. Frydman, C. Martin, **K. Gudenschwager,** W.R. Huckle (2015) Isoforms of VEGF-A in the Developing Feline Placenta, Experimental Biology 2015, Boston, Massachusetts, March 28-April 1, 2015.

Weerakoon, S., G. Frydman, C. Martin, **K. Gudenschwager,** W.R. Huckle (2015) Isoforms of VEGF-A in the Developing Feline Placenta, 2nd Annual Virginia Tech Carilion School of Medicine Medical Student Research Symposium, Roanoke Virginia, March 27, 2015.

Gudenschwager, K. Understanding Vascular Development Through Feline Placentation. BMVS Research in Progress Seminar, April 1, 2015.

Gudenschwager, K., Huckle, W.R. (2015) Detection of feline Placental Growth Factor variants in placental tissue, Virginia-Maryland Regional College of Veterinary Medicine 26th Annual Research Symposium,

Blacksburg, Virginia, March 19, 2015.

Gudenschwager, K., G. Frydman, Huckle, W.R. (2014) Expression of placental growth factor variants in feline placenta, *Angiogenesis* 17:954 (Vascular Biology 2014, Pacific Grove, California, October 19-23, 2014).

Gudenschwager, K., W.R. Huckle (2014) Detection of feline Placental Growth Factor variants in placental tissue. Virginia-Maryland Regional College of Veterinary Medicine 25th Annual Research Symposium, Blacksburg, Virginia, March 20, 2014.

Gudenschwager, K., W.R. Huckle (2013) Study of Angiogenesis During Feline Placental Development, Virginia-Maryland Regional College of Veterinary Medicine 24th Annual Research Symposium, Blacksburg, Virginia, March 21, 2013.

Awards and Academic Achievements

Graduation with the highest distinction, Austral University, Valdivia, Chile, November 3, 2010.

Best poster presentation award; Seventh International Congress of the Chilean Society of Andrology and Gametology. Pucon-Chile, January 2009.

Examination Graduate Committee

Major Advisors/Co-Chairs:

William R. Huckle, MS, PhD
Associate Professor
Department of Biomedical Sciences & Pathobiology

Graduate Advising Committee Members:

Sherrie Clark, DVM, PhD
Associate Professor
Department of Large Animal Clinical Sciences

Willard H. Eyestone, MS, PhD
Adjunct Associate Professor
Department of Large Animal Clinical Sciences

J. Claudio Gutierrez, DVM, PhD

Assistant Professor

Department of Clinical Anatomy, Physiology & Cell Biology

School of Veterinary Medicine, UC-Davis

External Examiner

Ondine Cleaver, PhD

Professor

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