GHENT UNIVERSITY

FACULTY OF VETERINARY MEDICINE
accredited by EAEVE

Equine Cardioteam Ghent

INVITATION PUBLIC DEFENCE

Applied cardiac anatomy to improve diagnosis and treatment of equine supraventricular arrhythmias

Lara Ibrahim

28th of January 2026
17h Auditorium D

PROMOTORS

Prof. dr. Pieter Cornillie
Faculty of Veterinary Medicine, UGent

Prof. dr. Gunther van Loon
Faculty of Veterinary Medicine, UGent

Prof. dr. Wim Van den Broeck
Faculty of Veterinary Medicine, UGent

Curriculum Vitae

Lara Ibrahim was born in Lebanon on April 22, 1992. She pursued her passion for veterinary medicine at the University of Veterinary Medicine Budapest, where she graduated in 2017 with a Doctor of Veterinary Medicine degree (equine track). During her studies, she completed externships in a range of international, cross-cultural settings. After working for a year as a small animal general practitioner in Beirut, Lara completed a small animal rotating internship at the University of Liège in 2019.

In 2020, Lara transitioned to academia, to a position as a PhD candidate and assistant academic staff member at the Morphology lab within the Faculty of Veterinary Medicine at Ghent University. Under the guidance of Prof. Pieter Cornillie and Prof. Gunther van Loon, her research focused on bridging the gap between applied anatomy and equine cardiology. Alongside her research, Lara has been involved in teaching and mentorship. She was actively involved in teaching anatomy practical sessions to Bachelor's students and demonstrated a strong commitment to mentoring, supervising nine Master's theses and guiding six Biotechnology students through their internship. She also served on multiple thesis defence juries.

Lara is the first author of three published peer-reviewed A1 journal articles, and one manuscript currently under revision. She is also a co-author of three additional peer-reviewed publications. Lara has delivered five oral and two poster presentations at international conferences in veterinary anatomy and equine medicine, including meetings of the EAVA, YGVA, BEVA, and AVEF. Lara serves as a peer reviewer for international A1 scientific journals in the field of anatomy and histology, particularly Anatomia Histologia Embryologia.

Where?

The public defence will take place on **Wednesday 28th of January 2026, at 17h.**

Auditorium D
Faculty of Veterinary Medicine
Ghent University, Campus Merelbeke
Salisburylaan 133, 9820 Merelbeke

The defence can also be followed online.

After the defence a reception will take place in the Morphology Museum.

How to attend?

If you would like to attend the reception, please register **before January the 16th** via Lara.Ibrahim@ugent.be.
The online link is available via the same email.

Members of the Jury

Prof. dr. Siska Croubels
Chair of the Jury
Faculty of Veterinary Medicine, UGent

Prof. dr. Annelies Decloedt
Secretary of the Jury
Faculty of Veterinary Medicine, UGent

Prof. dr. Pascale Smets
Faculty of Veterinary Medicine, UGent

Prof. dr. Catrin Rutland
School of Veterinary Medicine and Science, University of Nottingham, United Kingdom

Prof. dr. Zoltán Bakos
University of Veterinary Medicine, Budapest, Hungary

Summary

Supraventricular arrhythmias, particularly atrial tachycardia and atrial fibrillation, are clinically important in horses, compromising athletic performance and posing a potential risk to both horse and rider. Although medical or electrical cardioversion can restore sinus rhythm, recurrence is common because the underlying arrhythmogenic substrate often remains. New techniques such as three-dimensional electro-anatomical mapping and catheter ablation offer the potential to identify and eliminate arrhythmogenic tissue, yet their safe and effective use in horses depends on accurate, equine-specific anatomical knowledge.

The overall aim of this PhD was to provide a comprehensive anatomical and histological foundation for atrial structures that are essential for electrophysiological studies and catheter ablation in horses. Using post-mortem adult equine hearts, the work focused on the coronary sinus and great cardiac vein, the myocardial sleeves of the cranial and caudal venae cavae, the interatrial septum as the target for transseptal puncture, and the pulmonary veins as potential ablation targets.

The coronary sinus and great cardiac vein were characterised to guide catheter placement, electrogram interpretation, and explore potential arrhythmogenic features. Multiple valves and nearby venous openings likely contribute to catheterisation difficulties and malpositioning. This work also describes, for the first time, myocardial sleeves extending into the coronary sinus and several centimetres into the great cardiac vein, including muscular connections with adjacent left atrial myocardium. Importantly, the spatial relationship between the great cardiac vein and neighbouring myocardium changes along its course, identifying the mid great cardiac vein as the most suitable location for recording left atrial signals and pacing. Myocardial sleeves were also demonstrated for the first time in both the caudal and cranial venae cavae and displayed pro-arrhythmogenic features, including myocardium-free islands that provide a structural basis for conduction block and macro-reentry observed during clinical atrial tachycardia mapping. The interatrial septum showed marked species-specific variation, with a consistent right-sided septal pouch and a layered wall composition that may be relevant for transseptal puncture technique. Finally, pulmonary vein myocardial sleeve distribution and veno-atrial wall thickness varied substantially by ostium, with ostium III showing the most extensive sleeve architecture, supporting an ostium-tailored approach to ablation planning. A dorsal interatrial myocardial connection was histologically found at the level of the interatrial septum, between the caudal vena cava and the pulmonary vein III myocardial sleeves. This interatrial connection could potentially undermine the durability of ostium III isolation procedures.

This dissertation establishes equine-specific anatomical and histological features with direct relevance to clinical electrophysiology. The quantitative, clinically contextualised findings support improved coronary sinus catheterisation, interpretation of mapped activation patterns, safer transseptal puncture, and more durable, equine-specific ablation strategies for supraventricular arrhythmias in the horse.