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UNIVERSITEIT GENT

INVITATION PUBLIC DEFENSE

From Diagnosis to Prognosis: Microbial Identification and Risk Factors for Sepsis and Mortality in Critically ill Dogs and Foals

Donatienne Castelain
04 November 2025

PROMOTORS

Prof. dr. B. Pardon
Faculty of Veterinary Medicine, UGent

Prof. dr. D. Paepe
Faculty of Veterinary Medicine, UGent

Dr. F. Boyen
Faculty of Veterinary Medicine, UGent

Curriculum Vitae

Donatienne Castelain was born on November 11th, 1996, in Wilrijk, Belgium. She obtained her Bachelor's degree in Veterinary Medicine from the University of Antwerp in 2017, followed by her Master's degree in Veterinary Medicine with a specialization in Small Animals from the University of Ghent.

After graduation, she completed a rotating internship at the Small Animal Department of Ghent University, working in different disciplines (emergency and critical care, hospitalization, internal medicine,...). Subsequently, she pursued a PhD at the same institution, focusing on sepsis in dogs and foals, with emphasis on rational antimicrobial use. Her doctoral research was conducted under the supervision of Prof. dr. Bart Pardon, Prof. dr. Dominique Paepe, and Dr. Filip Boyen, and contributed to the RATIOSEP project (Belgian Federal Public Service Health, Food Chain Safety and Environment, contract RF 21/6351).

She is (co-)author of several (inter)national peer-reviewed publications and has presented her research at multiple (inter)national scientific conferences.

Where?

The defense will take place on Tuesday, **04 November 2025, 17.30h**

Auditorium A (entrance 12)

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

How to attend?

If you would like to attend the reception, please confirm before 22 October by email to donatienne.castelain@ugent.be
Please let me know if you are a vegetarian or have any food allergies.

Members of the Jury

Prof. dr. E. Claerebout
Head of the Jury
Faculty of Veterinary Medicine, UGent

Dr. N. Devriendt
Secretary
Faculty of Veterinary Medicine, UGent

Prof. dr. S. Schauvliege
Faculty of Veterinary Medicine, UGent

Prof. dr. S. Schuller
Vetsuisse Faculty, Bern, Switzerland

Dr. F. Dal Pozzo
Coordinator AMCRA vzw, Brussels, Belgium

Dr. J. Bokma
Dierenkliniek Venhei, Kasterlee
Faculty of Veterinary Medicine, UGent

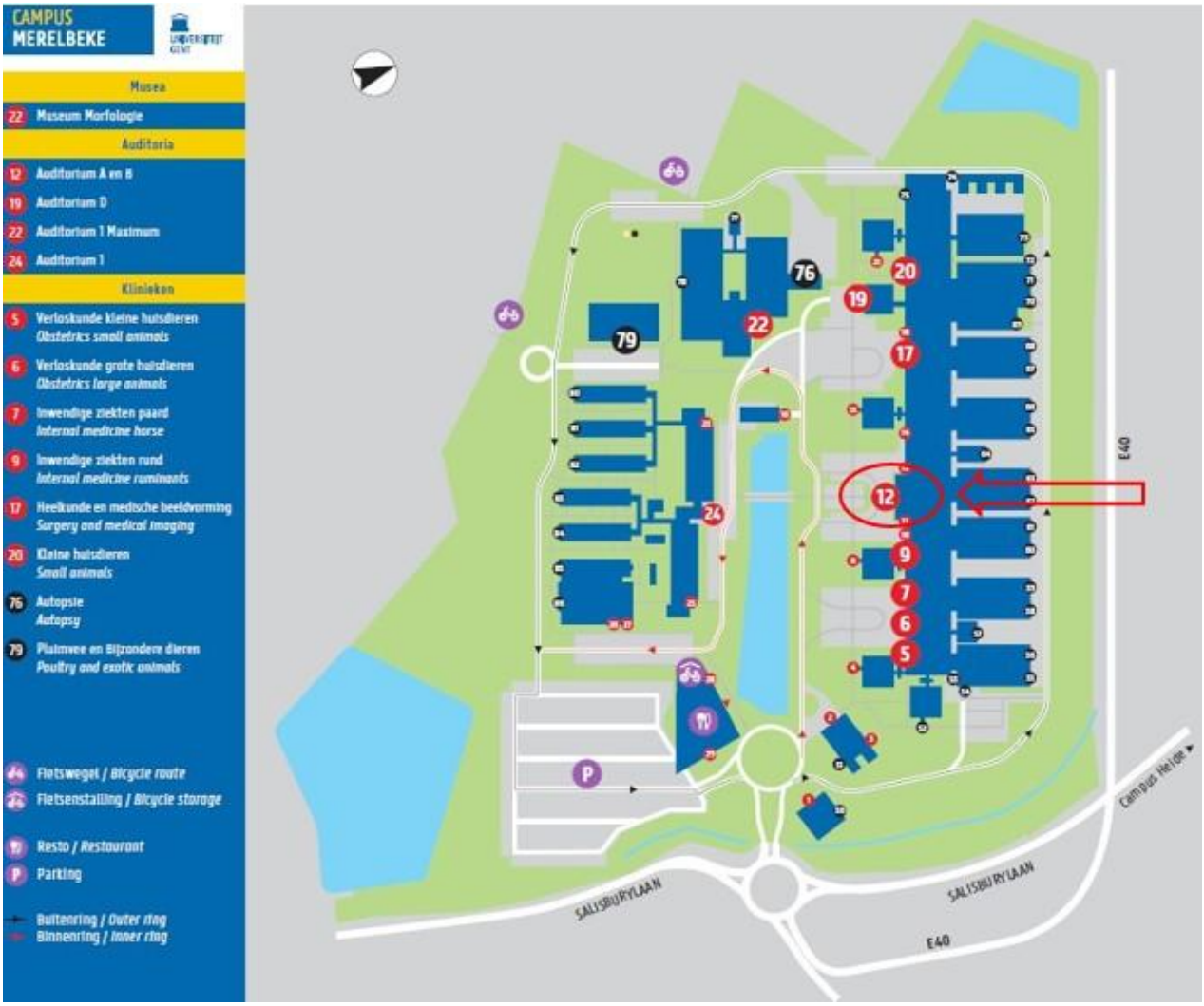
Summary

Sepsis, a life-threatening organ dysfunction caused by a dysregulated host response to infection, is a major cause of morbidity and mortality in human and veterinary medicine. Despite considerable progress in veterinary care, important research gaps remain in the diagnostic approach and prognostic estimation. These gaps hinder timely and accurate management of septic animals, leading to potentially inappropriate antimicrobial use and a worse prognosis. Rational use of (critically important) antimicrobials is essential to limit the development of antimicrobial resistance and safeguard the efficacy of these products for future generations.

While risk factors have been extensively described in human medicine to aid in the timely recognition of sepsis, they are largely unexplored in veterinary species. In dogs, identifying clinical and laboratory variables associated with sepsis could facilitate earlier diagnosis. For neonatal foals, such variables may serve as important prognostic risk factors to estimate survival outcomes. Time-consuming processing of blood cultures and identification of pathogens hinders the timely administration of pathogen-specific antimicrobial treatment, highlighting the need for more rapid bacterial identification methods. Innovative diagnostic techniques, such as matrix-assisted laser desorption/ionization time-of-flight mass spectrometry (MALDI-TOF MS), are promising for accelerating microbial identification in bloodstream infections.

The overall aim of this thesis was to address gaps in the antimicrobial decision-making process and to enhance sepsis management in critically ill dogs and hospitalized neonatal foals. This was achieved through the identification of risk factors for both sepsis and mortality in dogs and foals, respectively. Additionally, the diagnostic accuracy of Sepsityper® MALDI-TOF MS methods for more rapid microbial identification in sepsis-suspected dogs, foals, and calves was evaluated.

Firstly, risk factors for sepsis in critically ill dogs were identified. Secondly, the APPLE FAST score was associated with both sepsis and mortality in this population. Thirdly, the Sepsityper® Extraction method, having a substantially reduced time to identification compared to the conventional culture method, showed promise for more rapid bacterial identification. Fourth, bacterial pathogens commonly isolated in septic dogs and foals were identified. Fifth, risk factors associated with mortality in hospitalized neonatal foals were identified. Finally, the findings of this doctoral thesis were combined into an integrated guideline to support veterinarians in the diagnosis and treatment of septic dogs, and a critical reflection on their potential to contribute to the rationalization of antimicrobial use was made.


CAMPUS
MERELBEKE
Musea
22 Museum Morfologie
Auditoria
12 Auditorium A en B
19 Auditorium D
22 Auditorium 1 Maximum
24 Auditorium 1
Klinieken
5 Verloskunde kleine huisdieren
Obstetrics small animals
6 Verloskunde grote huisdieren
Obstetrics large animals
7 Inwendige ziekten paard
Internal medicine horse
9 Inwendige ziekten rund
Internal medicine ruminants
17 Heelkunde en medische beeldvorming
Surgery and medical imaging
20 Kleine huisdieren
Small animals
76 Autopsie
Autopsy
79 Pluimvee en Bijzondere dieren
Poultry and exotic animals
Fietsweg / Bicycle route
Fietsenstalling / Bicycle storage
Resto / Restaurant
Parking
Buitenring / Outer ring
Binnenring / Inner ring
E40
Campus Heide
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