

PathoSense, a novel nanopore sequencing-based veterinary diagnostic platform for infectious diseases

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1. Introduction

Disease problems in animals are often complex and frequently multiple pathogens are involved. The veterinarian who wants to make a final diagnosis of the cause of the disease is blocked when traditional, pathogen-specific diagnostics are used:

1. There is a need to make a prior selection with traditional Dx
2. Strain information is lacking, hampering treatment & prevention
3. Sample collection is not standardized > poor quality samples

About PathoSense

PathoSense is a Belgian spin-off from Ghent University, Faculty of Veterinary Medicine. PathoSense aims to make complete diagnostics of infectious diseases for veterinary medicine accessible for all veterinary stakeholders across the globe.



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2. Methods



PathoSense developed a complete, nanopore-based diagnostic platform for infectious disease in veterinary medicine

1. **On-site collection & pathogen purification** with novel sampler
2. **Mobile app** collects clinical sample information
3. **All viruses & bacteria** can be detected using nanopore seq
4. **Semi-quantitative reporting of pathogens, with interpretation**
5. **Real-time epidemic and educational data** become available

3. Results

Advantages of ad-random veterinary pathogen Dx

- **Full knowledge:** all viruses & bacteria identified
- **Discovery** of novel or poorly characterized pathogens
- **Strain information** enables **tailored prevention/treatment**
- Real-time **genomic epidemiology** insights
- Future: rapid assessment of **antimicrobial resistance**

TechPepCon - Novel insights in swine diseases and the interactions between pathogens, environment & biosecurity

In this **European project (BE, PL, HU, IT, GR)** coordinated by Ghent University, the PathoSense technology is used to give a broad overview of viruses and bacteria that infect swine from birth till the early fattening stages. Clinical & infectious disease data are linked to environmental data which are streamed in real-time from the Healthy Climate Monitor. Together with the BioCheck.UGent insights on biosecurity, better preventive & therapeutic actions can be installed.



Neonatal diarrhea in piglets

- Onset problem: summer 2021
- Traditional Dx: **NEGATIVE**
- PathoSense, 11/2021: Rotavirus B **✓**
- Actions: tailored hygiene & feedback strategy



Some selected Dx success cases

> 20 animal species tested

Infectious eye problem in cats

- Purulent eye infections
- Rapid spread between different cats in house
- PathoSense: *Chlamydia felis* **✓**
- Actions: treatment adaptation > faster healing

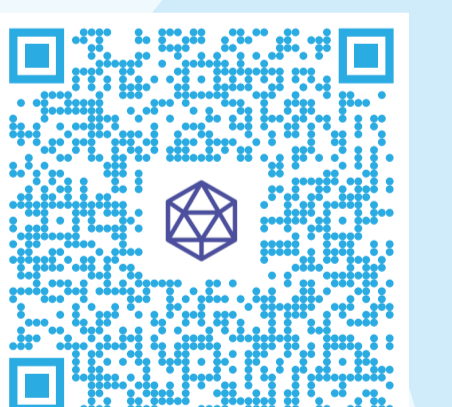


Bovine respiratory disease complex

- *Mycoplasma bovis* is a major problem
- Good Dx Se/Sp for *M. bovis* compared to qPCR & culture (Bokma & Vereecke, 2021, JCM)
- Simultaneous detection of other viruses (corona, RSV, influenza D...)
- Ability to assess AMR for *M. bovis* (Bokma & Vereecke, 2021, Microbiology Spectrum)



Want to learn more?



4. Discussion & future perspectives

- Powerful & **complete diagnostics** at an affordable price
- **Real insights** in complex infectious disease problems > concrete actions
- Pathogen genomics will be used to provide **real-time epidemiological insights** for veterinary professionals, authorities & pharmaceutical industry

Acknowledgments



Let's connect



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