All-in-One Microbial Test

Patient Name:		**Health Status:**	Other		**Account #:**	
Owner's Name:		**Ordered by:**			**Sample ID:**	MIU2040944
Breed:	Havanese	**Email:**			**Sample Type:**	Catheter
Age:	7	**Hospital:**			**Received Date:**	6/30/2023
Species:	Canine	**Location:**			**Report Date:**	07/07/23

Potential Clinically Relevant Microbes Detected:

Listed are those bacteria and fungi detected in the specimen that are of potential clinical relevance. Results from this report should be considered together with additional clinical data gathered by the veterinarian (physical examination, medical history, cytology, etc.) as the microbes detected may or may not be the cause of the clinical condition. For a comprehensive list of all microorganisms detected in this specimen see page 3 of this report. Please consider that even commensals can become pathogenic in certain patients under certain circumstances. Further, novel or extremely rare pathogens may be found on page 3 for your consideration and clinical diagnosis.
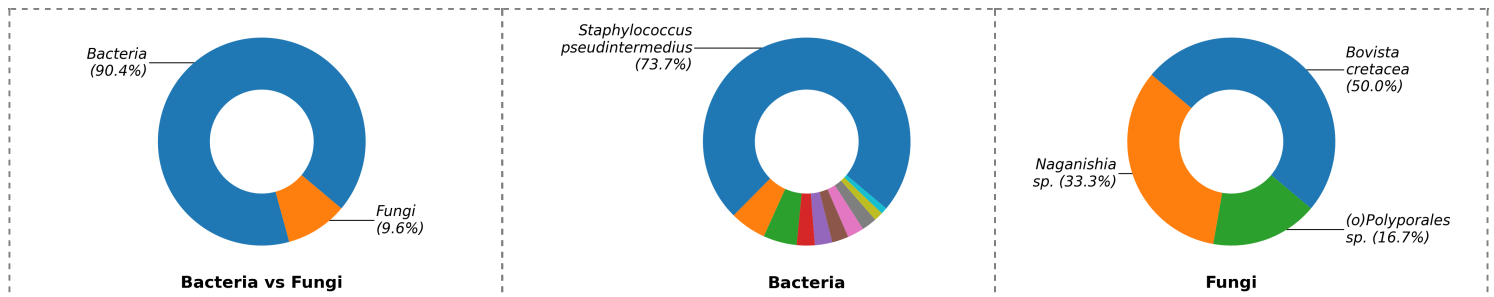
1.Bacteria

Species Detected	Percentage (%)	Cells per Sample
Staphylococcus pseudintermedius [1]	73.68	2,300
Acinetobacter lwoffii [2]	1.40	43
Acinetobacter radioresistens [3]	1.01	31

2.Fungi

No Known Fungal Pathogen Detected!

The number of cells per sample is subject to variations based on sampling technique applied to collect the sample. Following the sampling protocol closely is highly recommended. Less than 1000 cells of Bacteria or less than 10 cells of Fungi are often not clinically relevant unless poor sampling technique was applied, or lower sample volume was submitted.

Microbial Overview:

Bacteria vs Fungi: Bacteria (90.4%), Fungi (9.6%)

Bacteria: *Staphylococcus pseudintermedius* (73.7%)

Fungi: *Bovista cretacea* (50.0%), *Naganishia sp.* (33.3%), *(o)Polyporales sp.* (16.7%)

Bacteria vs Fungi: the relative abundance between Bacteria and Fungi. **Bacteria**: the percentage profile of bacterial species alone. **Fungi**: the percentage profile of fungi species alone. Each color represents a species. The larger the colored segment is, the more abundant the species is.

Antibiotic Resistance for Detected Clinically Relevant Microbes

The sample was screened for the presence of antibiotic resistance genes and intrinsic resistances of clinically relevant microorganisms. For this analysis more than 90 antibiotic resistance genes were screeened. The cautious use of any antibiotic drug is highly reccommended. Please follow the guidelines for antimicrobial stewardship in veterinary practice.

This table lists antibiotic sensitivities/resistances for the indicated bacteria based on detection of specific antibiotic resistance genes and naturally occurring, or intrinsic, resistance to specific antibiotics previously identified for that organism.

Drug Tiers*	Antibiotics	*Staphylococcus pseudintermedius* (73.7 %)	*Acinetobacter lwoffii* (1.4 %)	*Acinetobacter radioresistens* (1.0 %)	Suggested Dose†	Drug Delivery
1st	Cefazolin	F	NRD	NRD	15 mg/kg, q 12 hrs	IV, SC
	Cephalothin	NRD	NRD	NRD	4-20 mg/kg, q 8 hrs	PO
	Cephalexin	F	NRD	NRD	22 mg/kg, q 12 hrs	PO
	Cefadroxil	NRD	NRD	NRD	22 mg/kg, q 12 hrs	PO
	Cefoxitin	G	NRD	NRD	15 mg/kg, q 12 hrs	IV, SC
	Penicillin	NR	NRD	NRD	8-10 mg/kg, q 8 hrs	PO
	Penicillin G	NR	NRD	NRD	--	--
	Oxacillin	NR	NRD	NRD	22 mg/kg, q 8 hrs	IV
	Ampicillin	NR	NR	NR	22 mg/kg, q 8 hrs	IV, SC
	Amoxicillin	NR	NR	NR	22 mg/kg, q 8 hrs	PO
	Clavamox	NRD	NR	NR	13.75 mg/kg, q 12 hrs	PO
	Gentamicin	G	G	G	6 mg/kg, q 24 hrs	IV, SC
	Tobramycin	NRD	G	G	--	IV/Topical Use
	Neomycin	NRD	G	G	--	Topical Use
	Clindamycin	NR	NRD	NRD	5.5 mg/kg, q 12 hrs	PO
	Lincomycin	NR	NRD	NRD	15-25 mg/kg, q 24hrs	PO
	Doxycycline	NR	NRD	NRD	5 mg/kg, q 12 hrs	PO
	Minocycline	NR	NRD	NRD	10 mg/kg, q 12 hrs	PO
	Tetracycline	NR	NRD	NRD	20 mg/kg, q 12 hrs	PO
	Sulfonamide	NRD	NRD	NRD	30 mg/kg, q 12 hrs	PO
	Trimethoprim-sulfamethoxazole	G	F	F	15-30 mg/kg, q 24 hrs	PO
	Metronidazole	NRD	NR	NR	10 mg/kg, q 8 hrs	IV
	Cefovecin	NRD	NRD	NRD	8 mg/kg, once	SC
2nd	Cefpodoxime	NRD	NRD	NRD	5 mg/kg, q 24 hrs	PO
	Ceftiofur	NRD	NRD	NRD	2.2 mg/kg, q 24 hrs	SC
	Timentin	NRD	NRD	NRD	--	Topical Use
	Azithromycin	NR	NRD	NRD	5 mg/kg q 12 hrs	PO
	Orbifloxacin	NRD	F	F	2.5-7.5 mg/kg, q 24 hrs	PO
	Chloramphenicol	NRD	NRD	NRD	35 mg/kg q 8 hrs	PO
	Florfenicol	NRD	NRD	NRD	20 mg/kg, q 12 hrs	PO
3rd	Amikacin	F	G	G	15 mg/kg, q 24 hrs	IV, SC
	Rifampin	F	NRD	NRD	5-10 mg/kg, q 12 hrs	PO
	Imipenem	NRD	G	G	10 or 20 mg/kg, q 8 hrs	--
	Levofloxacin	G	F	F	10-30 mg/kg, q 24 hrs	IV/PO
	Marbofloxacin	NRD	F	F	2.75-5.5 mg/kg, q 24 hrs	PO
	Pradofloxacin§	NRD	F	F	3.0 mg/kg, q 24 hrs	PO
	Enrofloxacin	NRD	F	F	5 mg/kg, q 24 hrs	PO
	Ciprofloxacin¶	G	F	F	--	Topical Use
	Ceftazidime	NRD	G	G	3-30 mg/kg, q 6-8 hrs	IV
	Mupirocin	NRD	NRD	NRD	--	Topical Use
	Nitrofurantoin	F	NRD	NRD	4.4-5mg/kg, q 24 hrs	PO
	Colistin	NRD	NRD	NRD	8-9g/kg, q 24 hrs	PO
	Ticarcillin	NR	NRD	NRD	3.1 g, q 4-6 hrs	IV
	Piperacillin-Tazobactam	NRD	NRD	NRD	90 mg/kg, 30min q 8 hrs	IV

Abbreviation Keys:

NR	Not Recommended (Due to either Resistance Genes Detected, Intrinsic Resistance, or < 10% Effectiveness in Antibiogram Studies)	PO	Oral, by mouth
P	Poor Performance (< 50% Effectiveness in Antibiogram Studies)	IV	Intravenous Injection
F	Fair Performance (< 75% Effectiveness in Antibiogram Studies)	SC	Subcutaneous Injection
G	Good Performance (> 75% Effectiveness in Antibiogram Studies)	TU	Topical Use
NRD	No Antibiotic Resistance Detected Based on the MiDOG Antibiotic Target Panel	--	No Info

Symbols:

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*	Reference: Antimicrobial Resistance and Stewardship Initiative University of Minnesota, Antibiotic Drug Tiers and Selection List for Companion Animals.
†	Dosis may vary based on patient species and/or type of infection. Reference at: www.midogtest.com/antibiotics.
§	Variable bioavailability in canine patients.
¶	Contraindicated in canine patients.

Supplemental Data

Total Bacteria Composition

Charts below depict the relative abundance of all detected bacterial species. Each color represents a different bacterial species. The larger the colored segment is, the more abundant that species is in the specimen.

Staphylococcus
pseudintermedius
(73.7%)
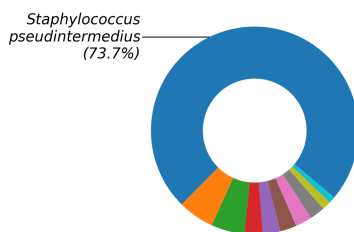
Your Sample

The table below lists top 8 bacterial species detected within the limit of detection. The absolute and relative abundances of each species is shown. Potential clinically relevant microbes are highlighted in red.

Species Detected	Percentage (%)	Cells per Sample
Staphylococcus pseudintermedius [1]	73.68	2,300
Massilia brevitalea	5.65	170
(f)Tissierellaceae sp.	5.23	160
(f)Corynebacteriaceae sp.	2.81	86
Blastococcus aggregatus	2.71	83
Corynebacterium casei	2.58	79
(o)Myxococcales sp.	2.58	79
Pseudomonas kuykendallii	2.35	72

Total Fungal Composition

Charts below depict the relative abundance of all detected fungal species. Each color represents a different fungal species. The larger the colored segment is, the more abundant that species is in the specimen.

Bovista
cretacea
(50.0%)

Naganishia
sp. (33.3%)

(o)Polyporales
sp. (16.7%)

Your Sample

The table below lists top 8 fungal species detected within the limit of detection. The absolute and relative abundances of each species is shown. Potential clinically relevant microbes are highlighted in red.

Species Detected	Percentage (%)	Cells per Sample
Bovista cretacea	50.00	3
Naganishia sp.	33.33	2
(o)Polyporales sp.	16.67	1

Antimicrobial Resistance Genes Detected

The table below lists antimicrobial resistance genes that are detected in this sample. For antibiotics usage guidance, please first refer to the "Antibiotic Resistance" table shown in Page 2. Use this table only as an additioanl resource when needed. Inferring antibiomicrobial resistance from the resistance genes detected should be cautious, espeically in a mixed microbial population.

AMR_Gene_Detected	Resistance_Against	Function
lnuA	lincosamide	lincosamide nucleotidyltransferase
mphC	macrolide	macrolide phosphotransferase
blaZ	penam	class A beta-lactamase
cmx	phenicol	chloramphenicol exporter
ermC	streptogramin, macrolide, lincosamide	23S rRNA methyltransferase
msrA	streptogramin, tetracycline,phenicol, macrolide, lincosamide	ABC-F ribosomal protection protein
tetK	tetracycline	tetracycline efflux pump

References

1. Pierezan, F., Olivry, T., Paps, J. S., Lawhon, S. D., Wu, J., Steiner, J. M., et al. The skin microbiome in allergen-induced canine atopic dermatitis. (2016) Veterinary Dermatology, 27(5):332-e82
2. Turton, Jane F., et al. Incidence of Acinetobacter species other than A. baumannii among clinical isolates of Acinetobacter: evidence for emerging species. Journal of clinical microbiology 48.4 (2010): 1445-1449.
3. Morrissey I., Moyaert H., de Jong A., El Garch F., Klein U., Ludwig C., Thiry J., Youala, M. Antimicrobial susceptibility monitoring of bacterial pathogens isolated from reiratory tract infections in dogs and cats across Europe: ComPath results. (2016) Veterinary microbiology, 191:44-51

Methods

The MiDOG® All-in-One Microbial Test is a targeted, Next-generation DNA sequencing testing service able to identify molecular signatures unique to the identity and character of a specific microorganism. This test relies on safeguarded preservation and transport of collected samples, thorough extraction of DNA from all microbes present in the specimen, select amplification of microbial DNA followed by Next-generation DNA sequencing using the latest technologies from Illumina (Illumina, Inc., San Diego, CA). Data handling is done via curated microbial databases to accurately align DNA sequences to ensure precise and accurate (species-level) identification of all bacteria and fungi present in the specimen.

When no Bacterial or Fungal Species are Detected:

When no bacterial or fungal species are detected in this test, this result may be due to a very low microbial load and/or low concentration of microbial DNA in the sample provided. In this case, we recommend re-sampling the area of interest and re-submitting specimen for analysis.

Phylogenetic Rank Abbreviations

If the detected bacterial or fungal taxon could not be identified down to the genus level, the closest phylogenetic rank identified is provided. An abbreviation indicating the level of the rank is displayed aside. The meaning of the abbreviations is shown as:(p) Phylum level, (c) Class level, (o) Order level, and (f) Family level.

Disclaimer

The information contained in this MiDOG® report is intended only to be factor for use in a diagnosis and treatment regime for the canine patient. As with any diagnosis or treatment regime, you should use clinical discretion with each canine patient based on a complete evaluation of the canine patient, including history, physical presentation and complete laboratory data, including confirmatory tests. All test results should be evaluated in the context of the patients individual clinical presentation. The information in the MiDOG ® report has not been evaluated by the FDA.

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