MiDOG Animal Diagnostics

All-in-One Microbial Test

Patient Name:		**Health Status:**		**Account #:**	
Owner's Name:		**Ordered by:**		**Sample ID:**	Mi233376005010
Breed:	Devon Rex	**Email:**		**Sample Type:**	Pharanx
Age:	0.9	**Hospital:**		**Received Date:**	
Species:	Cat	**Location:**		**Report Date:**	

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	AID*	Percentage (%)	Cells per Sample
Pasteurella multocida [1]	[Link]	62.83	2,300,000
Helicobacter marmotae [2]	--	29.68	1,100,000
Mycoplasma sp. [3][4]	[Link]	0.11	4,100

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.

* AID stands for Animal Infection Database. It is a resource center to provide more information for microbes in animal microbiome settings.

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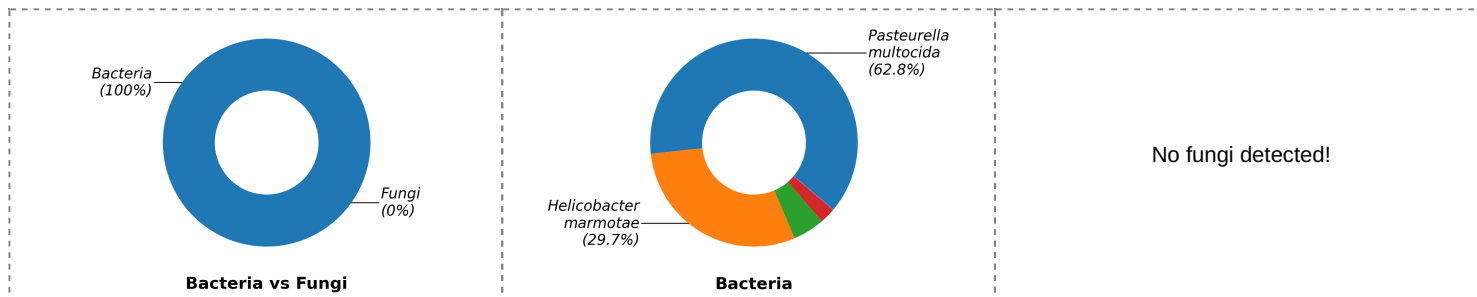
Bacteria vs Fungi: the relative abundance between Bacteria and Fungi. **Bacteria**: the percentage profile of bacterial species alone. **Fungi**: the percentage profile of fungi species alone. Each color represents a species. The larger the colored segment is, the more abundant the species is.

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	*Pasteurella multocida* (62.8 %)	*Helicobacter marmotae* (29.7 %)	*Mycoplasma sp.* (0.1 %)	Suggested Dose†	Drug Delivery
1st	Cefazolin	NRD	NRD	NR	15 mg/kg, q 12 hrs	IV, SC
	Cephalothin	NRD	NRD	NRD	4-20 mg/kg, q 8 hrs	PO
	Cephalexin	NRD	NRD	NR	22 mg/kg, q 12 hrs	PO
	Cefadroxil	G	NRD	NR	22 mg/kg, q 12 hrs	PO
	Cefoxitin	NRD	NRD	NR	15 mg/kg, q 12 hrs	IV, SC
	Penicillin	G	NRD	NR	8-10 mg/kg, q 8 hrs	PO
	Penicillin G	G	NRD	NR	--	--
	Oxacillin	NRD	NRD	NR	22 mg/kg, q 8 hrs	IV
	Ampicillin	G	NRD	NR	22 mg/kg, q 8 hrs	IV, SC
	Amoxicillin	G	G	NR	22 mg/kg, q 8 hrs	PO
	Clavamox	NRD	NRD	NR	13.75 mg/kg, q 12 hrs	PO
	Gentamicin	NR	NRD	G	6 mg/kg, q 24 hrs	IV, SC
	Tobramycin	NR	NRD	G	--	IV/Topical Use
	Neomycin	NR	NRD	NR	--	Topical Use
	Clindamycin	NRD	NRD	G	5.5 mg/kg, q 12 hrs	PO
	Lincomycin	NRD	NRD	G	15-25 mg/kg, q 24hrs	PO
	Doxycycline	NR	NRD	G	5 mg/kg, q 12 hrs	PO
	Minocycline	NR	NRD	NRD	10 mg/kg, q 12 hrs	PO
	Tetracycline	NR	NRD	G	20 mg/kg, q 12 hrs	PO
	Sulfonamide	NRD	NRD	NRD	30 mg/kg, q 12 hrs	PO
	Trimethoprim-sulfamethoxazole	NRD	NRD	NR	15-30 mg/kg, q 24 hrs	PO
	Metronidazole	NRD	NRD	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	G	5 mg/kg q 12 hrs	PO
	Orbifloxacin	NRD	NRD	NRD	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	NR	NRD	G	15 mg/kg, q 24 hrs	IV, SC
	Rifampin	NRD	NRD	NRD	5-10 mg/kg, q 12 hrs	PO
	Imipenem	NRD	NRD	NR	10 or 20 mg/kg, q 8 hrs	--
	Levofloxacin	NRD	NRD	G	10-30 mg/kg, q 24 hrs	IV/PO
	Marbofloxacin	NRD	NRD	G	2.75-5.5 mg/kg, q 24 hrs	PO
	Pradofloxacin§	NRD	NRD	G	3.0 mg/kg, q 24 hrs	PO
	Enrofloxacin	NRD	NRD	G	5 mg/kg, q 24 hrs	PO
	Ciprofloxacin¶	NRD	NRD	G	--	Topical Use
	Ceftazidime	NRD	NRD	NR	3-30 mg/kg, q 6-8 hrs	IV
	Mupirocin	NRD	NRD	NRD	--	Topical Use
	Nitrofurantoin	NRD	NRD	NRD	4.4-5mg/kg, q 24 hrs	PO
	Colistin	NRD	NRD	NRD	8-9g/kg, q 24 hrs	PO
	Ticarcillin	NRD	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)
P	Poor Performance (< 50% Effectiveness in Antibiogram Studies)
F	Fair Performance (< 75% Effectiveness in Antibiogram Studies)
G	Good Performance (> 75% Effectiveness in Antibiogram Studies)
NRD	No Antibiotic Resistance Detected Based on the MiDOG Antibiotic Target Panel

PO	Oral, by mouth
IV	Intravenous Injection
SC	Subcutaneous Injection
TU	Topical Use
--	No Info

Symbols:

|	
*	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 animal patients.
¶	Contraindicated in animal 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.

Pasteurella multocida (62.8%)

Helicobacter marmotae (29.7%)

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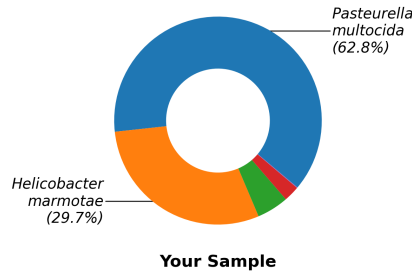
The table below lists top 8 bacterial species detected within the limit of detection. The absolute and relative abundances of each species is shown. Potential clinically relevant microbes are highlighted in red.

Species Detected	AID*	Percentage (%)	Cells per Sample
Pasteurella multocida [1]	[Link]	62.83	2,300,000
Helicobacter marmotae [2]	--	29.68	1,100,000
(c)Chitinophagia sp.	--	4.94	180,000
(f)Defluviitaleaceae sp.	--	2.44	89,000
Mycoplasma sp. [3][4]	[Link]	0.11	4,100

Total Fungal Composition

No Fungi Detected!

* AID stands for Animal Infection Database. It is a resource center to provide more information for microbes in animal microbiome settings.

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
APH(6)-Id	aminoglycoside	aminoglycoside phosphotransferase
APH(3')-Ia	aminoglycoside	aminoglycoside phosphotransferase
APH(3')-IIIa	aminoglycoside	aminoglycoside phosphotransferase
APH(3")-Ib	aminoglycoside	aminoglycoside phosphotransferase
ANT(2")-Ia	aminoglycoside	aminoglycoside nucleotidyltransferase
mphD	macrolide	macrolide phosphotransferase
mphC	macrolide	macrolide phosphotransferase
mecA	monobactam, carbapenem, cephalosporin, cephamycin, penam, penem	penicillin-binding protein 2a
ermX	streptogramin, macrolide, lincosamide	ribosomal RNA methyltransferase
ermB	streptogramin, macrolide, lincosamide	ribosomal methylase
sul1	sulfonamide	dihydropteroate synthase
tetWNW	tetracycline	ribosomal protection protein

References

1. Muller and Kirk's small animal Dermatology, 7th edition Elsevier
2. Kubota-Aizawa, Sanae, et al. Epidemiological study of gastric Helicobacter spp. in dogs with gastrointestinal disease in Japan and diversity of Helicobacter heilmannii sensu stricto. The Veterinary Journal. 225 (2017): 56-62.
3. Ramos R., Ramos C., Araujo F., Oliveira R., Souza I., Pimentel D., Galindo M., Santana M., Rosas E., Faustino M., Alves L. Molecular survey and genetic characterization of tick-borne pathogens in dogs in metropolitan Recife (north-eastern Brazil). (2010) Parasitology Research, 107(5):1115-1120
4. Kaczorek, Edyta, et al. Prevalence of reiratory pathogens detected in dogs with kennel cough in Poland. (2017) Acta Veterinaria Brno 85(4):329-336.

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 animal patient. As with any diagnosis or treatment regime, you should use clinical discretion with each animal patient based on a complete evaluation of the animal 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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