MiDOG
Animal Diagnostics

All-in-One Microbial Test

Patient Name:	Harley	**Health Status:**		**Account #:**	
Owner's Name:		**Ordered by:**		**Sample ID:**	Mi232460002492
Breed:	Belgian Malinois	**Email:**		**Sample Type:**	Ear, left
Age:	9	**Hospital:**		**Received Date:**	
Species:	Dog	**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 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. The purpose of Significance is to highlight those species that are outside the expected range for the average clinically healthy animals. 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	Normal Range	Significance
Pseudomonas aeruginosa [1][2][3]	[Link]	37.1 %	17,000,000	0-250	🔴 High
Corynebacterium jeikeium [4]	[Link]	25.8 %	12,000,000	0-450	🔴 High
Neisseria shayeganii [1][2]	[Link]	8.2 %	3,700,000	0-4,100	🔴 High
Escherichia coli [5][6][7]	[Link]	3.4 %	1,500,000	0-470	🔴 High
Proteus mirabilis [8]	[Link]	2.8 %	1,300,000	0-0	🔴 High

2.Fungi

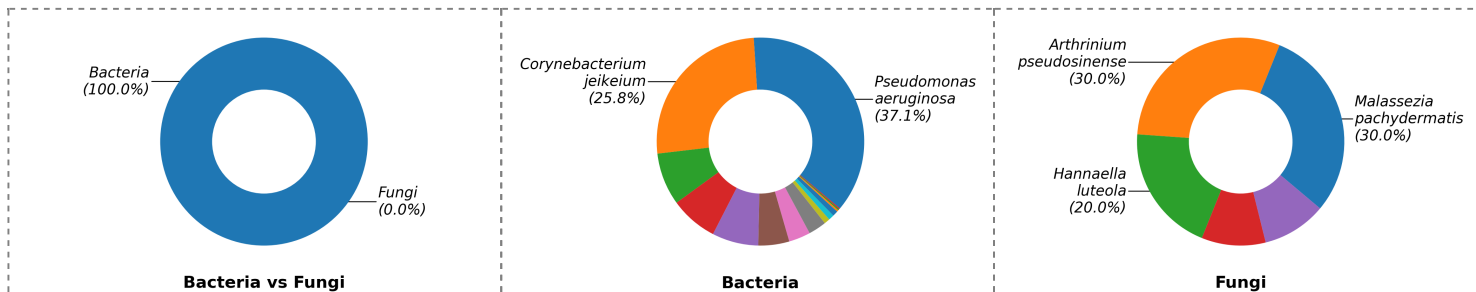| Species Detected	AID*	Percentage	Cells per Sample	Normal Range	Significance
Malassezia pachydermatis [9]	[Link]	30.0 %	3	0-2,900	🟢 Normal

Abbreviation Key:

🟢 **Normal.** Species detected within the reference range of clinically healthy animals.
⚫ **Intermediate.** Species detected outside the reference range of clinically healthy animals.
🔴 **High.** Species detected significantly higher than the reference range of clinically healthy animals.

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. The cautious use of any antibiotic drug is highly reccommended. Please follow the guidelines for antimicrobial stewardship in veterinary practice.

Drug Tiers*	Antibiotics	*Pseudomonas aeruginosa* (37.1 %)	*Corynebacterium jeikeium* (25.8 %)	*Neisseria shayeganii* (8.2 %)	*Escherichia coli* (3.4 %)	*Proteus mirabilis* (2.8 %)	Suggested Dose†	Drug Delivery
1st	Cefazolin	NR	NR	NRD	G	F	15 mg/kg, q 12 hrs	IV, SC
	Cephalothin	NR	NR	NRD	NR	G	4-20 mg/kg, q 8 hrs	PO
	Cephalexin	NR	NR	NRD	G	G	22 mg/kg, q 12 hrs	PO
	Cefadroxil	NR	NR	NRD	F	F	22 mg/kg, q 12 hrs	PO
	Cefoxitin	NR	NR	NRD	G	G	15 mg/kg, q 12 hrs	IV, SC
	Penicillin	NR	NR	NRD	NR	NR	8-10 mg/kg, q 8 hrs	PO
	Penicillin G	NR	NR	NRD	NR	NR	--	--
	Oxacillin	NR	NR	NRD	NR	NR	22 mg/kg, q 8 hrs	IV
	Ampicillin	NR	NR	NRD	P	NR	22 mg/kg, q 8 hrs	IV, SC
	Amoxicillin	NR	NR	NRD	F	F	22 mg/kg, q 8 hrs	PO
	Clavamox	NR	NR	NRD	F	G	13.75 mg/kg, q 12 hrs	PO
	Gentamicin	F	NR	NRD	G	G	6 mg/kg, q 24 hrs	IV, SC
	Tobramycin	F	NR	NRD	F	F	--	IV/Topical Use
	Neomycin	NR	NR	NRD	F	F	--	Topical Use
	Clindamycin	NR	NR	NR	NR	NR	5.5 mg/kg, q 12 hrs	PO
	Lincomycin	NR	NR	NRD	NR	NR	15-25 mg/kg, q 24hrs	PO
	Doxycycline	NR	NR	NRD	G	NR	5 mg/kg, q 12 hrs	PO
	Minocycline	NR	NR	NRD	F	NR	10 mg/kg, q 12 hrs	PO
	Tetracycline	NR	NRD	NRD	G	NR	20 mg/kg, q 12 hrs	PO
	Sulfonamide	NRD	NRD	NRD	NRD	NRD	30 mg/kg, q 12 hrs	PO
	Trimethoprim-sulfamethoxazole	NR	NR	NRD	G	G	15-30 mg/kg, q 24 hrs	PO
	Metronidazole	NR	NR	NRD	NR	NR	10 mg/kg, q 8 hrs	IV
	Cefovecin	NR	NR	NRD	G	G	8 mg/kg, once	SC
2nd	Cefpodoxime	NR	NR	NRD	G	G	5 mg/kg, q 24 hrs	PO
	Ceftiofur	NR	NR	NRD	F	G	2.2 mg/kg, q 24 hrs	SC
	Timentin	F	NR	NRD	G	G	--	Topical Use
	Azithromycin	NR	NR	NRD	F	NR	5 mg/kg q 12 hrs	PO
	Orbifloxacin	F	NRD	NRD	G	G	2.5-7.5 mg/kg, q 24 hrs	PO
	Chloramphenicol	NR	NR	NRD	G	G	35 mg/kg q 8 hrs	PO
	Florfenicol	NR	NRD	NRD	F	NR	20 mg/kg, q 12 hrs	PO
3rd	Amikacin	G	NR	NRD	G	G	15 mg/kg, q 24 hrs	IV, SC
	Rifampin	NR	F	NRD	NR	NR	5-10 mg/kg, q 12 hrs	PO
	Imipenem	G	NR	NRD	G	F	10 or 20 mg/kg, q 8 hrs	--
	Levofloxacin	F	NRD	NRD	G	G	10-30 mg/kg, q 24 hrs	IV/PO
	Marbofloxacin	F	NRD	NRD	G	G	2.75-5.5 mg/kg, q 24 hrs	PO
	Pradofloxacin§	F	NRD	NRD	F	F	3.0 mg/kg, q 24 hrs	PO
	Enrofloxacin	P	NRD	NRD	G	G	5 mg/kg, q 24 hrs	PO
	Ciprofloxacin¶	F	NR	NRD	G	G	--	Topical Use
	Ceftazidime	G	NR	NRD	G	G	3-30 mg/kg, q 6-8 hrs	IV
	Mupirocin	NR	NRD	NRD	NR	NR	--	Topical Use
	Nitrofurantoin	NR	NR	NRD	F	NR	4.4-5mg/kg, q 24 hrs	PO
	Colistin	F	F	NRD	F	F	8-9g/kg, q 24 hrs	PO
	Ticarcillin	F	NR	NRD	F	G	3.1 g, q 4-6 hrs	IV
	Piperacillin-Tazobactam	G	NR	NRD	G	G	90 mg/kg, 30min q 8 hrs	IV

Drug Class	Antibiotics	*Malassezia pachydermatis* (30.0 %)	Suggested Dose†	Drug Delivery
Triazole	Fluconazole	NRD	5-10mg/kg, q 24 hrs	PO,IV
	Itraconazole	NRD	5-10mg/kg, q 24hrs	PO
	Voriconazole	NRD	10mg/kg, 12hrs	PO
Echinocandin	Caspofungin	NR	1mg/kg, q 24hrs	PO
	Micafungin	NR	1mg/kg, q 24hrs	PO
	Anidualfungin	NRD	1mg/kg, q 24hrs	PO
Polyene	Amphotericin B	NRD	0.5-1mg/kg, q 48 hrs	IV
Fluoropyrimidine	Flucytosine	NRD	25-50 mg/kg, q 6-8hrs	PO

Abbreviation Keys and Symbols:

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 Analysis

PO — Oral, by mouth

IV — Intravenous Injection

SC — Subcutaneous Injection

TU — Topical Use

-- — No Info

* — Antibiotic Drug Tiers for Companion Animals, Antimicrobial Resistance and Stewardship Initiative, University of Minnesota

† — 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.

Your Sample

Corynebacterium jeikeium (25.8%)
Pseudomonas aeruginosa (37.1%)

Clinically Healthy Reference

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	Normal Range	Significance
Pseudomonas aeruginosa [1][2][3]	[Link]	37.1 %	17,000,000	0-250	🔴 High
Corynebacterium jeikeium [4]	[Link]	25.8 %	12,000,000	0-450	🔴 High
Neisseria shayeganii [1][2]	[Link]	8.2 %	3,700,000	0-4,100	🔴 High
Parvimonas micra	[Link]	7.4 %	3,400,000	0-240	🔴 High
Haemophilus sp.	--	7.2 %	3,300,000	0-2,200	⚫ Intermediate
Haemophilus haemoglobinophilus	--	4.8 %	2,200,000	0-380	🔴 High
Escherichia coli [5][6][7]	[Link]	3.4 %	1,500,000	0-470	🔴 High
Proteus mirabilis [8]	[Link]	2.8 %	1,300,000	0-0	🔴 High

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.

Your Sample

Arthrinium pseudosinense (30.0%)
Malassezia pachydermatis (30.0%)
Hannaella luteola (20.0%)

Clinically Healthy Reference

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	AID*	Percentage	Cells per Sample	Normal Range	Significance
Arthrinium pseudosinense	--	30.0 %	3	NA	NA
Malassezia pachydermatis [9]	[Link]	30.0 %	3	0-2,900	🟢 Normal
Hannaella luteola	--	20.0 %	2	NA	NA
Vishniacozyma foliicola	--	10.0 %	1	0-42	🟢 Normal
Vishniacozyma victoriae	--	10.0 %	1	0-130	🟢 Normal

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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
ermX	streptogramin, macrolide, lincosamide	ribosomal RNA methyltransferase
ermB	streptogramin, macrolide, lincosamide	ribosomal methylase
msrD	streptogramin, tetracycline,phenicol, macrolide, lincosamide	ABC-F ribosomal protection protein
tetWNW	tetracycline	ribosomal protection protein

References

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4. Puskar M, Lemons C, Papich MG, Vaden SL, Birkenheuer A. Antibiotic-resistant Corynebacterium jeikeium urinary tract infection in a cat. J Am Anim Hosp Assoc. 2007 Jan-Feb;43(1):61-4. doi: 10.5326/0430061. PMID: 17209087.
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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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