

Patient Name:	Health Status: Severe lichenification of skin under axil	Account #:
Owner's Name:	Ordered by:	Sample ID:
Breed: Dachshund Mix	Email:	Sample Type: Skin, armpit/groin area
Age: 10 years	Hospital:	Received Date: 10/06/21
Species: Canine	Location: Fullerton, CA	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
Corynebacterium auriscanis [1]	[Link]	52.7 %	2,900,000	0-2,600	● High
Staphylococcus pseudintermedius [2]	[Link]	7.5 %	410,000	0-65,000	● Intermediate
Staphylococcus schleiferi [3]	[Link]	6.9 %	380,000	0-0	● High
Porphyromonas gulae [4]	[Link]	4.2 %	230,000	0-13,000	● High
Neisseria shayegani [5][6]	[Link]	1.2 %	68,000	0-10,000	● High

2. Fungi

Species Detected	AID*	Percentage	Cells per Sample	Normal Range	Significance
Malassezia pachydermatis [7]	[Link]	71.7 %	470	0-22	● High

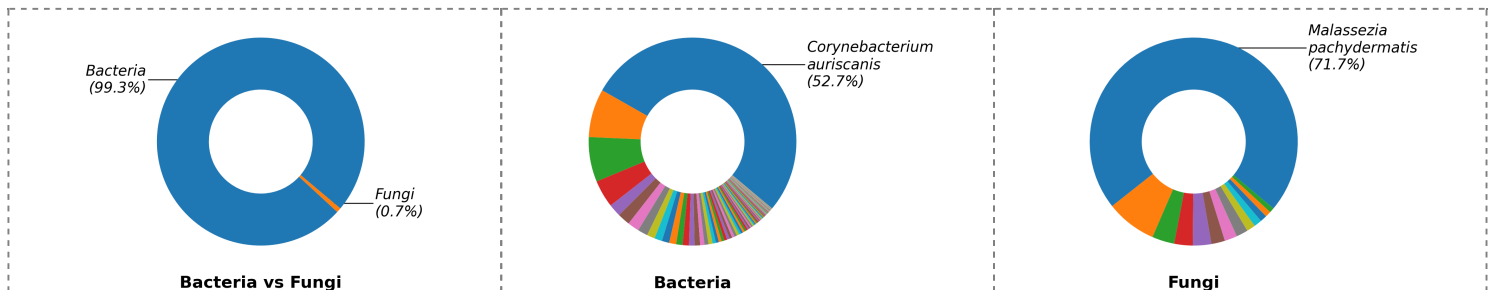
Abbreviation Key:

- **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.

Please find a tutorial about how to interpret a MiDOG report at: <https://www.youtube.com/watch?v=wsWUrZfnNb8>

Antimicrobial Resistance for Detected Clinically Relevant Microbes

The sample was screened for antibiotic resistance genes and intrinsic resistances. Please follow antimicrobial stewardship guidelines for cautious antibiotic use.

Drug Tiers*	Antibiotics	<i>Corynebacterium auriscanis</i> (52.7 %)	<i>Staphylococcus pseudintermedius</i> (7.5 %)	<i>Staphylococcus schleiferi</i> (6.9 %)	<i>Porphyromonas gulae</i> (4.2 %)	<i>Neisseria shayegani</i> (1.2 %)	Suggested Dose†	Drug Delivery
1st	Cefazolin	-	R	R	-	-	15 mg/kg, q 12 hrs	IV, SC
	Cephalothin	-	R	R	-	-	4-20 mg/kg, q 8 hrs	PO
	Cephalexin	-	R	R	-	-	22 mg/kg, q 12 hrs	PO
	Cefadroxil	-	R	R	-	-	22 mg/kg, q 12 hrs	PO
	Cefoxitin	-	R	R	G	-	15 mg/kg, q 12 hrs	IV, SC
	Penicillin	-	R	R	G	-	8-10 mg/kg, q 8 hrs	PO
	Penicillin G	-	R	R	G	-	--	--
	Oxacillin	-	R	R	-	-	22 mg/kg, q 8 hrs	IV
	Ampicillin	-	R	R	G	-	22 mg/kg, q 8 hrs	IV, SC
	Amoxicillin	-	R	R	-	-	22 mg/kg, q 8 hrs	PO
	Clavamox	-	R	R	G	-	13.75 mg/kg, q 12 hrs	PO
	Gentamicin	G	R	R	-	-	6 mg/kg, q 24 hrs	IV, SC
	Tobramycin	-	R	R	-	-	--	IV/Topical Use
	Neomycin	-	R	R	-	-	--	Topical Use
	Clindamycin	-	R	F	G	R	5.5 mg/kg, q 12 hrs	PO
	Lincomycin	-	R	F	-	-	15-25 mg/kg, q 24hrs	PO
	Doxycycline	-	R	G	-	-	5 mg/kg, q 12 hrs	PO
	Minocycline	-	R	G	-	-	10 mg/kg, q 12 hrs	PO
	Tetracycline	-	R	F	-	-	20 mg/kg, q 12 hrs	PO
	Sulfonamide	-	-	-	-	-	30 mg/kg, q 12 hrs	PO
2nd	Trimethoprim-sulfamethoxazole	-	G	G	-	-	15-30 mg/kg, q 24 hrs	PO
	Metronidazole	R	-	R	-	-	10 mg/kg, q 8 hrs	IV
	Cefovecin	-	R	R	-	-	8 mg/kg, once	SC
	Cefpodoxime	-	R	R	-	-	5 mg/kg, q 24 hrs	PO
	Ceftiofur	-	R	R	-	-	2.2 mg/kg, q 24 hrs	SC
	Timentin	-	R	R	-	-	--	Topical Use
	Azithromycin	-	R	F	-	-	5 mg/kg q 12 hrs	PO
3rd	Orbifloxacin	-	R	F	-	-	2.5-7.5 mg/kg, q 24 hrs	PO
	Chloramphenicol	G	R	R	-	-	35 mg/kg q 8 hrs	PO
	Florfenicol	-	R	R	-	-	20 mg/kg, q 12 hrs	PO
	Amikacin	G	R	R	-	-	15 mg/kg, q 24 hrs	IV, SC
	Rifampin	-	F	G	-	-	5-10 mg/kg, q 12 hrs	PO
	Imipenem	-	R	R	G	-	10 or 20 mg/kg, q 8 hrs	--
	Levofloxacin	-	R	F	-	-	10-30 mg/kg, q 24 hrs	IV/PO
	Marbofloxacin	-	R	P	-	-	2.75-5.5 mg/kg, q 24 hrs	PO
	Pradofloxacin§	-	R	F	-	-	3.0 mg/kg, q 24 hrs	PO
	Enrofloxacin	F	R	P	-	-	5 mg/kg, q 24 hrs	PO
	Ciprofloxacin§¶	-	R	F	-	-	--	Topical Use
	Ceftazidime	-	R	R	-	-	3-30 mg/kg, q 6-8 hrs	IV
	Mupirocin	-	-	F	-	-	--	Topical Use
	Nitrofurantoin	-	F	F	-	-	4.4-5mg/kg, q 24 hrs	PO
	Colistin	-	-	R	-	-	8-9g/kg, q 24 hrs	PO
	Ticarcillin	-	R	R	-	-	3.1 g, q 4-6 hrs	IV
	Piperacillin-Tazobactam	-	R	R	-	-	90 mg/kg, 30min q 8 hrs	IV

Drug Class	Antifungals	<i>Malassezia pachydermatis</i> (71.7 %)	Suggested Dose†	Drug Delivery
Triazole	Fluconazole	-	5-10mg/kg, q 24 hrs	PO,IV
	Itraconazole	-	5-10mg/kg, q 24hrs	PO
	Voriconazole	-	10mg/kg, 12hrs	PO
Polyene	Amphotericin B	-	0.5-1mg/kg, q 48 hrs	IV
	Caspofungin	R	1mg/kg, q 24hrs	PO
	Micafungin	R	1mg/kg, q 24hrs	PO
Echinocandin	Anidulfungin	-	1mg/kg, q 24hrs	PO
Fluoropyrimidine	Flucytosine	-	25-50 mg/kg, q 6-8hrs	PO
Allylamine	Terbinafine	-	10-30 mg/kg, q 24hrs	PO

Abbreviation Keys and Symbols:

R	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)
-	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
§	Contraindicated in animal patients
¶	Variable bioavailability in animal patients

Supplemental Data

Total Bacteria Composition



Species Detected	AID*	Percentage	Cells per Sample	Normal Range	Significance
<i>Corynebacterium auriscanis</i> [1]	[Link]	52.7 %	2,900,000	0-2,600	● High
<i>Staphylococcus pseudintermedius</i> [2]	[Link]	7.5 %	410,000	0-65,000	● Intermediate
<i>Staphylococcus schleiferi</i> [3]	[Link]	6.9 %	380,000	0-0	● High
<i>Porphyromonas gulae</i> [4]	[Link]	4.2 %	230,000	0-13,000	● High
<i>Propioniciclava</i> sp.	--	2.0 %	110,000	0-12,000	● Intermediate
<i>Fusobacterium</i> sp.	--	1.9 %	110,000	0-4,800	● High
(f) <i>Xanthomonadaceae</i> sp.	--	1.8 %	98,000	0-72,000	● Intermediate
<i>Gleimia</i> sp.	--	1.6 %	85,000	NA	NA

Total Fungal Composition



Species Detected	AID*	Percentage	Cells per Sample	Normal Range	Significance
<i>Malassezia pachydermatis</i> [7]	[Link]	71.7 %	470	0-22	● High
<i>Cladosporium</i> sp.	--	7.9 %	52	0-410	● Normal
<i>Heterotruncatella</i> sp.	--	3.5 %	23	NA	NA
<i>Cladosporium dominicanum</i>	--	2.9 %	19	0-280	● Normal
<i>Malassezia restricta</i>	--	2.9 %	19	0-14	● Intermediate
(o) <i>Pleosporales</i> sp.	--	2.1 %	14	0-40	● Normal
<i>Didymella glomerata</i>	--	2.0 %	13	0-12	● Intermediate
(o) <i>Hypocreales</i> sp.	--	1.8 %	12	0-31	● Normal

Donut plots above depict the relative abundance of all detected Bacterial or fungal species. Each color represents a different species. The larger the colored segment is, the more abundant that species is in the specimen.

The tables above lists top 8 bacterial/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.

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- **Normal.** Species detected within the reference range of clinically healthy animals.
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Antimicrobial Resistance Genes Detected

No Antimicrobial Resistance Genes Detected!

References

1. Bygott J. M., Malnick H., Shah J.J., Chattaway M.A., Karas J. A. First clinical case of *Corynebacterium auriscanis* isolated from localized dog bite infection. (2008) *Journal of Medical Microbiology*, 57: 899-900
2. 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
3. Cain C. L., Morris D. O., Rankin S. C. Clinical characterization of *Staphylococcus schleiferi* infections and identification of risk factors for acquisition of oxacillin-resistant strains in dogs: 225 cases (2003,2009). (2011) *Journal of the American Veterinary Medical Association*, 239(12): 1566-1573
4. Holden, J. A., O'Brien-Simpson, N. M., Lenzo, J. C., Orth, R. K., Mansell, A., & Reynolds, E. C. (2017). *Porphyromonas gulae* Activates Unprimed and Gamma Interferon-Primed Macrophages via the Pattern Recognition Receptors Toll-Like Receptor 2 (TLR2), TLR4, and NOD2. *Infection and Immunity*, 85(9). doi:10.1128/iai.00282-17
5. Bennett, John E., Raphael Dolin, and Martin J. Blaser. *Mandell, Douglas, and Bennett's Principles and Practice of Infectious Diseases E-Book*. Elsevier health sciences, 2019.
6. Sykes, Jane E., and Craig E. Greene. *Infectious Diseases of the Dog and Cat-E-Book*. Elsevier Health Sciences, 2013.
7. Meason-Smith, C., Diesel, A., Patterson, A. P., Older, C. E., Mansell, J. M., Suchodolski, J. S., & Rodrigues Hoffmann, A. What is living on your dog's skin Characterization of the canine cutaneous mycobiota and fungal dysbiosis in canine allergic dermatitis. (2015) *FEMS Microbiology Ecology*, 91(12):fiv139

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.

Customer Support

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You can request a veterinary consultation through your MiDOG portal account, by email, or by phone.

Have technical questions? Just give us a call to talk to our support team.