Table 1. Characteristic Morphologic Features of, and Availability of Serologic Tests for, Fungal Organisms Reported to Cause Fungal Granulomas in the Equine Upper Respiratory Tract

<table>
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<th>Agent</th>
<th>Cytologic Morphology</th>
<th>Serologic Test</th>
<th>Cost and Laboratory</th>
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</table>
| *Cryptococcus neoformans* | Round, thin-walled, yeast-like fungus (5–10 µm) with a large heteropolysaccharide capsule (1–30 µm) that does not take up common cytologic stains. The capsule is best stained with mucicarmin stain. The organisms show narrow-based budding and lack endospores. | Capsular antigen ELISA (antigen)  
Latex agglutination (antigen)  
Immunodiffusion is highly sensitive and specific. A decreasing titer correlates with disease resolution in horses. | $16 at UGA  
$18 at NMDA  
$20 at CSU  
$30 at UT |
| *Conidiobolus coronatus* | Broad, thin-walled, highly septate, irregularly branched hyphae (5–13 µm); often surrounded by acidophilic-staining, glycoprotein antigen–antibody complexes known as Splendore-Hoeppli material. | Immunodiffusion is highly sensitive and specific. A decreasing titer correlates with disease resolution in horses. | Serologic testing is not widely available. |
| *Pseudallescheria boydii* | Hyaline, nonpigmented, septate, randomly branched hyphae (2–5 µm) with regular hyphal contours. The asexual form has nonbranching conidiophores with terminal conidia. The sexual form in culture has a cleistothecium (large, round body) and ascospores. | — | — |
| *Coccidioides immitis* | Relatively large, round spherules (20–80 µm; up to 200 µm) with a double-contoured cell wall. The mature spherules are called *sporangiospores* (2–5 µm). | Agar gel immunodiffusion (antibody) for IgM and IgG  
CF (antibody) may have some false-positive results | $8 at NMDA  
$12 at CSU  
$15 at UT |
| *Aspergillus* spp | Broad (2–4 µm), septate hyphae with parallel sides and acute, right-angled branching. | Aspergillus Galactomannan enzyme immunoassay:  
80.7% sensitive and 89.2% specific; some reactivity to *Penicillium*, *Alternaria* and *Paecilomyces* spp  
Agar gel immunodiffusion (antibody): A. fumigatus only | Plateia *Aspergillus* antigen enzyme immunoassay by MDL  
$15 at UT |
| Fungal panel | — | Agar gel immunodiffusion | $28 at MDL  
(Aspergillus, *Blastomyces*, *Coccidioides*, and *Histoplasma* spp)  
$40 at CSU  
$55 at CU |

* CF = Complement fixation.
* CSU = Colorado State University College of Veterinary Medicine and Biomedical Sciences. Phone 970-297-1281; fax 970-297-0320; www.dlab.colostate.edu.
* MDL = MiraVista Diagnostics Laboratory, Indianapolis, IN. Phone 317-856-2681; fax 317-856-3685; www.miravistalabs.com.
* NMDA = New Mexico Department of Agriculture Veterinary Diagnostic Services. Phone 505-841-2576; www.nmda.nmsu.edu/animal-and-plant-protection/veterinary-diagnostic-services.
* UGA = The University of Georgia College of Veterinary Medicine. Phone 706-542-5568; fax 706-542-5233; www.vet.uga.edu/dlab/index.php.
* UT = University of Tennessee College of Veterinary Medicine. Phone 856-974-5639; fax 865-946-1788; www.vet.utk.edu/diagnostic/bacteriology.