

Evaluation of a Rapid Immunoassay for Point-of-Care Detection of Bacteria in Cat Urine

Julie Byron

*Associate Professor, Companion Animal Internal Medicine
The Ohio State University College of Veterinary Medicine*

Lower urinary tract signs in cats (LUTS) are more frequently due to sterile inflammation rather than infection. Practitioners may forgo microbiological culture due to cost, and prescribe antimicrobial agents empirically, incurring unnecessary selection pressure and side effects on most patients. Therefore, a rapid screening test for detection of bacteria in cat urine could direct appropriate therapy.

A “dip-stick” style immunoassay to detect bacteria was performed on feline urine (n = 100) submitted for routine bacterial culture in a Veterinary Teaching Hospital. The immunoassay was performed according to manufacturer instructions and culture was performed quantitatively on Columbia agar with 5% sheep’s blood, with a maximum 72 hour incubation time at 35 °C in ambient air. Bacteria were identified using matrix-assisted laser-desorption time-of-flight mass spectrometry.

Eleven samples yielded $\geq 100,000$ cfu/ml in culture, ten of which (90.9%) were positive on the immunoassay, and consisted of *E. coli* (n = 5), *Enterococcus* spp. (n = 5), and *Staphylococcus felis* (n = 1). Three samples yielded ≤ 200 cfu/ml, one of which (33.3%) was positive on the immunoassay, and consisted of *E. coli* (n = 2), and *Staphylococcus felis* + *E. coli* (n = 1). The immunoassay was positive for two (2.3%) culture negative samples. The immunoassay correctly categorized the bacteria as gram-negative or gram-positive for eleven (100%) of the concordant samples.

When samples with ≤ 1000 cfu/ml were considered negative, sensitivity and specificity of the immunoassay were 90.9% and 96.6% respectively, with positive and negative predictive values of 76.9% and 98.9%. Given the low prevalence of bacterial cystitis in cats, these data suggest that the immunoassay is a useful screening tool for cats presenting with LUTS.

Dr. Byron is an Associate Professor in Small Animal Internal Medicine at The Ohio State University. She received her DVM from OSU in 1998, completed a rotating internship at VCA West Los Angeles Animal Hospital and completed her residency in Internal Medicine at OSU in 2004. She was a faculty member at University of Illinois College of Veterinary Medicine for 6 years and joined OSU's faculty in 2011. Her Master's research involved diagnosis and treatment of urinary incontinence, and she continues to be active in the field of urology and nephrology today. She has received a number of teaching honors, including the Norden/Pfizer Teaching Excellence Award in 2011 and The Dean's Award for Creativity in Teaching in 2015.

