In vitro activities of omadacycline against rapidly growing mycobacteria

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INTRODUCTION
Mycobacterium abscessus (MA), Mycobacterium chelonae (MC), and Mycobacterium fortuitum (MF) infrequently cause disease in healthy humans. When infections from these organisms do occur, they are difficult to treat and do not respond well to antimicrobial agents conventionally used in clinical practice.

METHODS
Drugs. OMC, TIG, DOX and AMK were obtained from Paratek Pharmaceuticals (Boston, MA), Carbonsynth (San Diego, CA), Sigma Chemical Co. (St Louis, MO) and Bristol Meyers Squibb (Princeton, NJ), respectively. OMC, TIG, DOX, and AMK were prepared as stock solutions and frozen until used.

Each isolate was tested at least in duplicate with one isolate of each species in distilled water and sterile filtered prior to freezing at -20°C. AMK was dissolved in DMSO prior to evaluation against a larger sample of clinical isolates of MA N=24, MF N=22, and MC N=20.

RESULTS
The MIC50 and MIC90 for MA of OMC, DOX, and AMK were 1µg/ml and 2µg/ml, >64 µg/ml and >64 µg/ml, respectively (Table 1).

TIG was tested against a subset of isolates, and the MIC50 and MIC90 were 1µg/ml and 2µg/ml, respectively (Table 1).

In vitro evaluation against a larger sample of clinical isolates of MF N=24, OMC, TIG, DOX, and AMK were 0.125 µg/ml and 0.25 µg/ml, 0.06 µg/ml and 0.125 µg/ml, 0.06 µg/ml and 0.125 µg/ml, 0.06 µg/ml and 0.125 µg/ml, 32 µg/ml and 64 µg/ml, and 4 µg/ml and 8 µg/ml, respectively (Table 2).

The MIC50 and MIC90 for MC N=22 of OMC, TIG, DOX, and AMK were 0.125 µg/ml and 0.25 µg/ml, 0.06 µg/ml and 0.125 µg/ml, and 4 µg/ml and 8 µg/ml, respectively (Table 2).

CONCLUSIONS
OMC and TIG performed similarly against MA, MC and MF in vitro. The MICs of OMC were significantly lower than those of DOX and were less than or equal to AMK for all of the isolates tested. Further in vitro evaluation against a larger group of isolates would be useful as an in vivo study in a murine test system. OMC has the potential to significantly improve therapy for infections caused by rapidly growing mycobacteria.