



Species Spotlight: *Citrobacter koseri* & *Citrobacter amalonaticus*

Enterobacterales which harbor chromosomal encoded [ampC](#) genes are at risk for developing resistance while on treatment with common beta-lactams like ceftriaxone and piperacillin-tazobactam. Cefepime is suggested to treat invasive infections due to Enterobacterales at moderate risk of clinically significant AmpC production, even when more narrow spectrum agents test susceptible (e.g. ceftriaxone).¹ Historically, certain acronyms such as ‘SPACE’ or ‘SPICE’ have been used to help remember which organisms may be at risk for AmpC mediated resistance. The ‘C’ stands for ‘Citrobacter,’ but does that include all *Citrobacter* spp?

Which common *Citrobacter* spp. are at risk for AmpC mediated resistance?

The most commonly encountered *Citrobacter* spp. at moderate risk for AmpC production is *Citrobacter freundii*. Therefore, cefepime is preferred over ceftriaxone for invasive infections due to *Citrobacter freundii*.¹

Other commonly encountered *Citrobacter* spp are *Citrobacter koseri* and *Citrobacter amalonaticus*, which **do not** harbor a chromosomally encoded AmpC beta-lactamase.² Therefore, susceptibility testing can be used to guide treatment for infections due to *Citrobacter koseri* and *Citrobacter amalonaticus*.³

Key Takeaway: Unlike *Citrobacter freundii*, *Citrobacter koseri* and *Citrobacter amalonaticus* do not harbor a chromosomal *ampC* gene and is therefore not at risk for developing resistance while on treatment with beta-lactams such as ceftriaxone or piperacillin-tazobactam. Susceptibility results can be used to guide treatment of invasive infections caused by *Citrobacter koseri* and *Citrobacter amalonaticus*.

References:

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4. Deveci A, Coban AY. Optimum management of *Citrobacter koseri* infection. *Expert Rev Anti Infect Ther*. 2014;12(9):1137-1142. doi:10.1586/14787210.2014.944505