

Pharmacodynamics of piperacillin/tazobactam in *cfiA*-carrying *Bacteroides fragilis*

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The anaerobic bacterium *Bacteroides fragilis* is a very common species in the human gut flora, and the most common anaerobic bacterium causing invasive infections. *B. fragilis* has high rates of antibiotic resistance, but is usually susceptible to the broad spectrum antibiotic meropenem, as well as piperacillin/tazobactam, which is extensively used in Norway to treat anaerobic infections. However, a proportion of *B. fragilis* produce metallo-beta-lactamase (MBL), an enzyme that can degrade these antibiotics, and the prevalence of such strains is reported to be increasing internationally.

Even if a *B. fragilis* strain carries the *cfiA* gene encoding the MBL enzyme, the actual amount of enzyme produced varies widely. As a result, *B. fragilis* carrying this gene may be susceptible to meropenem and piperacillin/tazobactam when tested using standard methods. This relationship and the underlying mechanisms have been characterised for meropenem, but data are lacking on whether the presence of a *cfiA* gene impairs the efficacy of piperacillin/tazobactam in ways that are not detectable by standard susceptibility testing methods. The project will examine the effect of piperacillin/tazobactam on *cfiA*-carrying *B. fragilis* using pharmacodynamic models, with the intention of allowing microbiology laboratories to provide better guidance to clinicians on treating infections with *cfiA*-carrying *B. fragilis*.