P0303

Paper Poster Session II

Focus: Acinetobacter, Pseudomonas and other nonfermenters

IS*Aba27* disrupts *bla*OXA-23 in *Acinetobacter baumannii*

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Objectives: Carbapenem resistance in *A. baumannii* is usually conferred by carbapenem-hydrolysing oxacillinases (OXA). Therefore detection of the respective genes by real-time PCR has been suggested as a rapid indicator of resistance (Huang et al., J Med Microbiol, 2012; 61: 1532-7). To date six OXA subclasses have been identified in *A. baumannii*; the intrinsic OXA-51 and the acquired OXA-23, -40, -58, -143 and -235. OXA-23 variants are globally the most prevalent acquired OXA in carbapenem-resistant *A. baumannii* isolates. As part of a larger study, including 879 *Acinetobacter* isolates with worldwide origin, we detected one that was $bla_{\text{OXA-23-like}}$ positive but was susceptible to carbapenems (AF-777). Therefore the aim of the present study was to analyse the absence of carbapenem resistance in this isolate.

Methods: Species identification and typing was performed by *gyrB* multiplex PCR and rep-PCR based DiversiLab. Imipenem and meropenem susceptibility was investigated by Etest. Presence of OXA genes was determined by multiplex PCR. $bla_{\text{OXA-23-like}}$ was amplified using a reverse primer which included the stop codon of the gene and a forward primer which was specific for an upstream located IS*Aba1* element. The resulting PCR product was sequenced by primer walking.

Results: Isolate AF-777 was identified as *A. baumannii* belonging to the international clonal lineage (IC) 2. Multiplex PCR detected the presence of OXA-51-like and OXA-23-like genes. Susceptibility testing revealed imipenem and meropenem MICs of 0.5 and 0.25 mg/L, respectively. Instead of the expected 1 kb product, $bla_{\text{OXA-23-like}}$ PCR resulted in a 1.9 kb amplicon. Sequencing revealed insertion of a novel IS element 9 bp downstream of the start codon of $bla_{\text{OXA-23}}$, which was assigned IS*Aba27* by the IS database (Figure 1). The IS element was 885 bp in size and harbored one transposase gene, as well as 18 bp terminal inverted repeats. The insertion sequence was flanked by single bp direct repeats (Figure 1). BLAST search revealed the presence of IS*Aba27* in other *A. baumannii*, e.g. as part of plasmid pMMA2.

Conclusion: This is the first report of IS-mediated disruption of $bla_{\text{OXA-23}}$ in *A. baumannii*. Plasmid association underlines the potential of IS*Aba27* to spread in the species. Our results showed that detection of $bla_{\text{OXA-23}}$ not always correlates with carbapenem resistance.

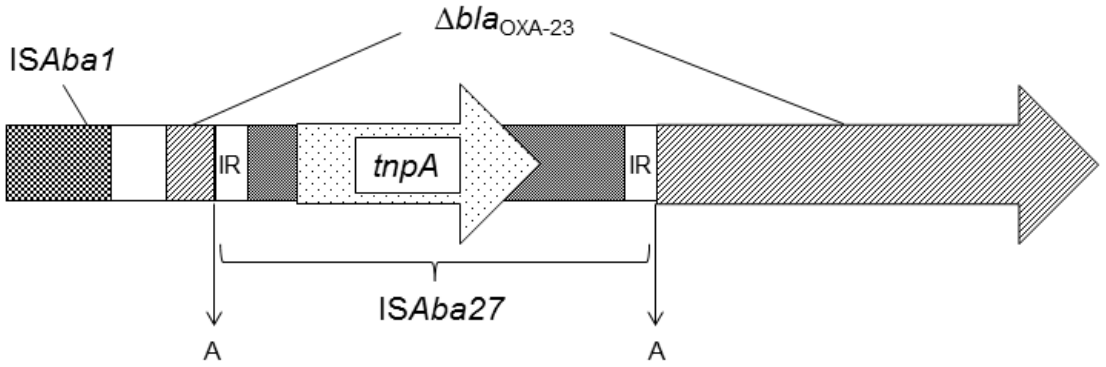

Figure 1: *bla*$_{OXA-23}$ disrupted by IS*Aba27* (target site duplication: A). IS, insertion sequence; IR, inverted repeat; *tnpA*, transposase gene