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## Qnr proteins: Structure and properties against quinolone inhibition of DNA gyrase

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Quinolones are commonly prescribed antimicrobial agents in clinical practice, although an increasing number of quinolone resistant strains have appeared in the last decade. Qnr proteins are spread among clinical isolates and contribute to quinolone resistance. Qnr proteins block quinolone inhibition of DNA gyrase and topoisomerase IV. Their beta-helical structure is interrupted by the loop A (8 amino acids) and loop B (12 amino acids), this last one with a significant role in quinolone resistance. The present study analyzed 168 sequences of different Qnr proteins that are available at several databases, together with our own results and those from previous studies that were obtained by using cloning, site-directed mutagenesis and determination of the fluoroquinolone MICs in strains with mutated Qnr proteins. The study was focused on the conserved residues within the positions Ser36 to Asp63 including Loop A and the positions Gln92 to Tyr123 including Loop B (following QnrB numbering). The analysis revealed that conserved amino acids with a more significant role in increasing fluoroquinolone MICs in *E. coli* strains were: Phe40, Phe56, Phe96, Phe101, Phe111, Cys43, Cys112, Gly53, Gly93, Leu121, Ser113, Ala114, Ile116 and Tyr123 in the 96 QnrB and 9 QnrD proteins, and their equivalent amino acids in the 28 analysed sequences of QnrA proteins, 23 of QnrS, 9 of QnrVC, 2 of QnrVV and 1 of QnrC protein. Notably, the comparison of QnrB1 with the remaining Qnr proteins showed that the 10 residues located at the C-terminal position with respect loop A and loop B showed 50-60% similarities.

### Biography

María M Tavío, MD completed her PhD at the age of 27 years from University of Las Palmas de Gran Canaria and Postdoctoral studies from The London Hospital Medical College, Queen Mary's University of London and the Faculty of Medicine of L' Aquila University. She is titular Professor at the University of Las Palmas de Gran Canaria. She has published more than 40 papers on quinolone and beta-lactam resistance including her article on QnrS1 protein characterization derived from her recent work at Harvard Medical School. She also serves as evaluator of national and European research projects on antimicrobial resistance.

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