# New application of halophilic bacteria: molecular characterization of xenobiotic resistance of halophilic bacteria.

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## Summary

We have isolated many halophilic bacterial strains from natural habitats, and found that some of them exhibited high resistance to biocides, such as heavy metals and ethidium bromide (EtBr). We attempted to elucidate the molecular mechanisms of the observed high resistance and to explore the possible application of halophilic bacteria for bioremediation.

We recently isolated spontaneous ofloxacin resistant mutants of moderately halophilic bacteria, which showed a 2 to 16-fold increased resistance to structurally diverse compounds such as antimicrobial agents and EtBr compared with the wild type strain. These mutants exhibited a more efficient energy-dependent extrusion of EtBr than did the wild type cells. These mutants also showed tolerance to organic solvents and were found to produce an elevated level of 58 kDa outer membrane protein. We have cloned *omp58* gene encoding this 58 kDa protein and found that the deduced amino acid sequence of Omp58 possessed a limited degree of sequence similarity to that of *E. coli* TolC. The *E. coli* TolC is a periplasm/outer membrane tunnel protein of *E. coli* multi-drug extrusion pump that has been extensively characterized. Disruption of the *omp58* gene rendered the cells more susceptible to several biocides. Thus, Omp58 is the first isolated outer membrane component of xenobiotic extrusion pump from moderately halophilic eubacteria.