

IN SITU MONITORING OF VANCOMYCIN RESISTANCE GENES IN SURFACE WATERS BY OLIGONUCLEOTIDE PROBES

M. Nakipoglu, F. Yilmaz, B. Içgen

Middle East Technical University

mustafanakipoglu@gmail.com

Abstract:

Vancomycin and teicoplanin resistance is a major cause of nosocomial infections worldwide. It is caused by various van genes located on either chromosome or transposons such as Tn1549 and its homologues. They encode proteins responsible of the moiety change on terminal pentapeptide bridge in peptidoglycan layer that eventually hinders the effectiveness of vancomycin up-to 1000 times. Although van genes are mostly found on enterococci, their homologues with high similarity are also ubiquitous in the vancomycin resistant surface water isolates other than enterococci. Previous studies revealed in our laboratory that the transfer of van genes from enterococcal to non-enterococcal isolates might frequently occur in surface waters. These findings makes the van genes a viable biomarker for the monitoring of vancomycin-resistant isolates in these waters. Therefore, this study aimed at monitoring of van harboring surface water isolates by using van-specific oligonucleotide probes. For that purpose, water samples collected from a river during the period of a year was monitored with van-specific oligonucleotide probes through in situ fluorescent hybridization technique and the images were analyzed by fluorescent microscopy. The results indicate that the van-specific oligonucleotide probes might be a potential molecular tool for in situ monitoring of vancomycin resistant isolates in surface waters.

Keywords: Vancomycin, Teicoplanin, Van Genes, Oligonucleotide Probes, Surface Waters