Leona Zieglerova et al., Clin Microbiol 2016, 5:5(Suppl)
http://dx.doi.org/10.4172/2327-5073.C1.025

The role of *vanZ* expression for efficiency of glycopeptides against *Staphylococcus aureus*

Leona Zieglerova, G Novotna, V Vimberg and J Janata
Czech Academy of Sciences, Czech Republic

Glycopeptide antibiotics are used as last choice antibiotics for treatment of infections, caused by Gram-positive bacteria. But, increasing occurrence of glycopeptide resistant strains in recent years rapidly decreases the range of treatment options of the bacterial infections. The glycopeptide resistance may be connected to expression of van resistance gene cluster, which alters the binding site of the glycopeptides. *vanZ*, one gene, from this cluster, expressed in Enterococcus faecalis confers specific resistance to teicoplanin without expressed other genes from this cluster. *vanZ* orthologs, forming big *vanZ* like protein family, are present in many bacterial genomes and their function is unknown. In this study, we compared the ability of two orthologous genes, *vanZ* from the vanRSHAXYZ cluster (vanZTei) and *vanZ* from the genome of *Enterococcus faecium* (vanZg), to confer resistance to glycopeptides, when expressed in *Staphylococcus aureus* RN4220. We have shown that VanZg, but not VanZTei, decreases 4 times sensitivity of *S. aureus* to teicoplanin. Rate of resistance depends on the level of induction of gene expression. Both genes were not able to confer resistance to vancomycin or other non-glycopeptide antibiotics; however, they affect decrease bacteria sensitivity to dalbavancin using lipoglycopeptide. We tested antibacterial activity of four novel semisynthetic lipoglycopeptides against *S. aureus*, expressing *vanZ*. Expression of *vanZ* decreased sensitivity of *S. aureus* RN4220 to three lipoglycopeptides. All glycopeptides that decreased their activity against *S. aureus* had lipophilic tails. This suggests that decreased sensitivity to glycopeptides caused by *vanZ* expression may be associated with the presence of lipid tail in the structure of antibiotic.

Biography

Leona Zieglerova is currently a PhD student from Faculty of Science, Charles University in Prague. She works in the Laboratory for Biology of Secondary Metabolism, Institute of Microbiology of the Czech Academy of Sciences and Biotechnology and Biomedicine Center of the Academy of Sciences and Charles University in Vestec. Since 2015 she is a Member of Czechoslovak Society for Microbiology.

leona.zieglerova@biomed.cas.cz

Notes: