

NEW DRUG PROFILE: TEIXOBACTIN – A SHORT COMMUNICATION

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INTRODUCTION

Several antibiotics which have been discovered from the natural environment, and the microorganism that produces the antibiotic and its derivatives, are resistant to the antibiotic itself.^[1-3] Teixobactin is a recent novel antibiotic discovered without detectable resistance. Teixobactin in a major break of 30 years belongs to a new class of soil dwelling bacterium, provisionally named *Eleftheria terrae*.^[4] It was the first new class of antibiotic isolated with iChip technology which allowed the environmental bacterium to grow and produce, the isolated bacterium were identified subsequently.

iChip technology

iChip technology is a novel method used to isolate and characterize microbes from uncultivated environment. iChip is an assemble of three flat hydrophobic plastic polyoxymethylene plates containing multiple through-holes and polycarbonate membranes to compose an array of miniature diffusion chambers.^[5] Each chamber is expected to capture a single cell when the assembly was dipped into appropriately diluted bacterial mixture plates. The soil sample was collected and diluted with agar. Nutrients and growth factors diffusing from the ambient soil into each culture cell through the membranes nurture growth of the bacterium into a colony that is then self-sustaining in vitro. This arrangement allows growth of only one species in some of the cells.

Spectrum of activity

Teixobactin has potent *in-vitro* activity against Gram-positive organisms including *Staphylococcus aureus*, methicillin resistant *S.aureus*, *Streptococcus pneumoniae* and *Mycobacteria* with a novel mode of action inhibiting peptidoglycan biosynthesis and production of peptidoglycan which result in the lysis of susceptible bacteria. Teixobactin was found to be more vigorous against mutation of the target pathogens as it binds with less mutable fatty molecules. It has been effective in sepsis, pneumonia and soft tissue infection in animal model with a very low PD50 (50% protective dose) for MRSA in comparison to Vancomycin.^[4] Since it has no deleterious action against mammalian cells due to lack of target sites and not been found to cause serious toxicity, haemolysis or DNA damage, it is likely to have wide therapeutic window. However, it has to prove its safety in human clinical trials.

CONCLUSION

Teixobactin is a step forward to answer to all medicines based on the bacterial and resistance concerns. All Phases of clinical trials are needed and far better practicality on the part of farmers, medical professionals and patients were requisite in limiting the use of antibiotics to only serious relevant infections. Pharmaceutical companies have been averse to make such investments in new antibiotics, because their extensive and competitive prescription is likely to be discouraged in order to impede development of resistance, which has come to be considered almost inexorable.

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