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THE "NEW" AND "OLD" ANTIBIOTICS – MECHANISMS OF ACTION AND STRATEGIES FOR DEVELOPMENT OF NOVEL ANTIBACTERIAL AGENTS

Summary

Constantly increasing resistance of bacteria to available antibiotics is a real clinical problem. In recent years we observed a dramatic increase in number of multi resistant, so called MDR and XDR strains, causing some bacteria to become resistant to all classes of antibiotics. One recent example is the raise of collistin resistant strains while collistin has been an antibiotic of last resort in treatment of infections caused by bacteria resistant to β-lactam antibiotics. Currently available classes of antibiotics have various cellular targets. They may affect cell envelope, processes such as replication, transcription and translation and affect cellular metabolism. Today's situation reminds the Red Queen's Race when we try to develop new antibiotics, but constantly deal with antibiotic resistance. However, new strategies are being applied to develop active antimicrobial substances. Such strategies include: (i) better use of "old" antibiotics by using them in synergistic combinations or in combinations with small molecule additives, (ii) search for new active substances, and for new cell targets, and (iii) lowering of bacterial virulence during the infection.