Abstract

Due to excessive and inappropriate use of antibiotics, their effectiveness decreases dramatically, as the result of increasing resistance of pathogens to current therapies. There is a need to search for therapeutic substances of different structure and new mechanisms of action. The technique, which has been used for a long time in many research units to search for substances with antibacterial activity, involves examining a wide range of potentially active substances. For many years, the Department of Organic Chemistry of the Medical University of Lublin has been conducting research on synthesis of new compounds with antibacterial activity. So far, the most active compounds that have been obtained are thiosemicarbazide and triazole derivatives derived from chlorobenzoic acid. It is known from the literature that fluoroorganic compounds have the greatest therapeutic potential. Therefore, it was decided to synthesize thiosemicarbazide and s-triazole derivatives derived from fluorobenzoic acids and to assess the antibacterial activity of new synthetics. As a result of conducted reactions, I obtained 96 derivatives (48 linear compounds and the same number of cyclic analogues), out of which 39 were not yet described in the literature. The structure of all synthesized derivatives was confirmed by the method of nuclear magnetic resonance spectroscopy. Antimicrobial potential was studied in relation to Gram-positive and Gram-negative bacteria strains. 22 of the synthesized compounds were found to have good antimicrobial activity against Gram-positive strains. Furthermore, I conducted cytotoxicity studies of selected derivatives. None of the compounds tested showed anticancer activity. The I-3j compound showed no cytotoxic effect in normal WS1 and IMR90 cell lines, at a concentration at which it showed bacteriostatic properties (15.63μg/ml), so it may be used as a medicinal substance.