EFFECTS OF N-BENZOTHIAZOL-2-YL-BENZENSULFONAMIDE AND ITS DERIVATIVES ON THE SYNTHESIS OF BACTERIAL S-ADENOSYLMETHIONINE

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The objective was to assess the impact of N-benzothiazol-2-yl-benzensulfonamide synthesis precursor signal molecules of quorum sensing in bacteria - S-adenosylmethionine (SAM).

The bacteria *Staphylococcus aureus*, *Salmonella enteritidis* and *Pseudomonas aeruginosa* were cultured in Hiss medium containing 2% glucose at 37 ° C for 24 hours. After incubation the cells were pelleted by centrifugation and their wet weight determined. SAM extracted with 1 M formic acid for 1 hour at 4 ° C. The content of SAM were determined using HPLC. Studies were performed on liquid chromatograph «Gilson» (France).

Earlier we have shown, that N-benzothiazol-2-yl-benzensulfonamid (compound I) and its derivatives with nucleophilic substituents on the phenyl ring: Cl (II), F (III) and NO2 (IV) to inhibit the processes controlled system intercellular communication (quorum sensing) in Gram-positive and Gram-negative bacteria.

Gene expression in quorum sensing system is provided by signaling molecules which having different chemical nature, and for each type of bacteria characterized by its own set of autoinducers. At the same time, these molecules may have a similar structure (e.g., gram-negative bacteria acyl-homoserine lactone) or be common to gram-negative and gram-positive bacteria - the so-called autoinducer 2 (AI-2). Acyl-homoserine lactone AI-2 and synthesized from a common precursor - S-adenosylmethionine.

It is shown that in the control cells *S. aureus*, *S. enteritidis* and *P. aeruginosa* SAM content is 73,4 ± 5,2; 57,6 ± 4,1 and 62,5 ± 4,6 nmol/g wet weight, respectively. Derivatives of N-benzothiazol-2-yl-benzensulfonamide significantly reduce the level of S-adenosylmethionine in the cells of all organisms studied. The degree of inhibition depends on the concentrations of the studied compounds. At a concentration of 0.4 μM SAM content is reduced by 15-24%. The inhibitory effect increases with increasing concentrations of N-benzothiazol-2-yl- benzensulfonamide and analogues thereof. In the presence of 80 μM of these compounds in a number of SAM cells *S. aureus, S. enteritidis* and *P. aeruginosa* is reduced in 2-5,4 times depending on the structure of the analog.

Simultaneously for *P. aeruginosa* showed significant reduction in major autoinducer acyl-homoserine lactone nature: N- (3-oxo-dodecanoyl) homoserine (3-oxo-C12-HSL) and N-butyryl-homoserine (C4 -HSL).

It is assumed that the contents of SAM decreases in bacterial cells due to folate deficiency, which synthesis is inhibited by analogues sulfonamides.