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Derivatives of 1,2,4-triazoles: Synthesis and study of biological activity

Armen S Galstyan
Yerevan State University, Armenia

One of the most interesting classes of organic compounds such as nitrogen, oxygen, and sulfur-containing heterocycles have a wide range of practical use. In particular 1,2,4-triazol-ring included in the structures of different biologically active molecules, are used as drugs with broad spectrum action, e.g. antimicrobial (Fluconazole, Itraconazole), anticancer (Vorozole, Letrozole, Anastrozole), and some derivatives have antibacterial, antifungal, antitumour, anti-inflammatory, antitubercular, hypoglycemic, antidepressant, anticonvulsant, antiviral and analgesic activity. This work presents some synthetic possibilities of 3,4-disubstituted-5-mercapto-1,2,4-triazoles to obtain new potentially biologically active compounds. For functionalization of tria¬zoles, we carried out the cyanoethylation and (methoxy¬car¬bonyl)ethylation reactions in the reaction conditions. The basic and acid hydrolysis of the resulted compounds was realized, which led to the corresponding 3-heterylsubstituted propionic acids. Hydrazinolysis of synthesized esters of hydrazides were obtained. The last are given in 1,3,4-oxadiazoles and pyrazoles according to known methods. Sulfur-substituted 1,2,4-triazoles derivatives may also be interesting in biological viewpoint. This would enable the biological activities of free and substituted thiols to be compared. Therefore, 1,2,4-triazoles were alkylated by various aralkyl halides. In order to obtain the derivatives of thiazolo[2,3-c]-1,2,4-triazoles studied the bromination reaction of 4-allyl and 4-methallyl substituted triazoles. Preliminarily tests of compounds S-derivatives for antioxidant activity revealed that the latter exerts stabilizing effect on red blood cell membranes. Screening of some compounds revealed that they exhibit feebly marked antibacterial and anti-yeast activity. But 3-benzyl-1-(2-(5-mercapto-1,3,4-oxadiazol-2-yl)ethyl)-4-phenyl-1H-1,2,4-triazole-5(4H)-thione could inhibit the growth of Gram positive bacteria.

Biography

Armen S Galstyan has completed his PhD from Supreme Certifying Commission of the Republic of Armenia and Postdoctoral studies from Yerevan State University. He is Head of Educational Laboratory, Department of Organic Chemistry, YSU, and Research Associate of Research Laboratory, "Chemistry of N-, S-, O-containing Heterocyclic Compounds". He has published more than 45 international thesis, patents and articles in the reputed journals.

a_galstyan@ysu.am

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