Synthesis of New Derivative of pyrazolo[4,5-b]quinoxaline Bearing imidazolidine-2,4-dione as a Potential Anticancer Agent

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Abstract

Introduction: Among heterocyclic anticancer compounds, quinoxalines and imidazolidine-2,4-dione are the most prominent since they constitute important classes of natural products and synthetic pharmaceuticals. In general, they are used as valuable intermediates and building blocks in pharmaceutical synthesis. Therefore, much attention has been paid to the synthesis of quinoxaline derivatives bearing imidazolidine-2,4-dione either by classic methods or by multicomponent reactions.

Methods and Results: The title compound was prepared through a three- step procedure. In the first step, equimolar amounts of *D*-glucose and *o*-phenylenediamine were reacted with phenyl hydrazine in the presence of acetic acid, to form the pyrazolo[4,5-b]quinoxaline derivative.

The second step involved oxidation of the resulted compound by use of sodium metaperioddate.

Finally, the related aldehyde was condensed by imidazolidine-2,4-dione to yield the corresponding 3-alkylidene pyrazolo[4,5-b]quinoxaline .

Conclusions:

The procedure applied in this study established a convenient method for the preparation of the title compounds. The process was straight forward and it used abundant and readily available staring materials. Due to its chemical structure, and in particular the presence of the quinioxaline ring, which is a commonly encountered motif in compounds of medicinal interest, the prepared product is expected to show anticancer activity.

Key words: Imidazolidine-2,4-dione; Anticancer activity; Pyrazolo[4,5-b]quinoxaline; 3-alkylidene pyrazolo[4,5-b]quinoxaline.