SEPTEMBER 23-27 2024
19BMOS
BRAZILIAN MEETING ON ORGANIC SYNTHESIS
BENTO GONÇALVES, RS - BRAZIL

Synthesis of a series of Quinone-Fused Pyrrole Derivatives

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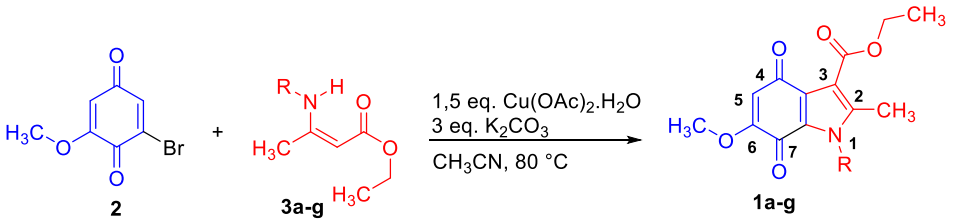
Keywords: *Quinone, Pyrrole, Cu-catalyzed synthesis*

ABSTRACT

Quinone derivatives are clinically known drugs for treating cancer. These compounds can exert their therapeutic effects due to their redox cycling, which reduces oxygen to reactive oxygen species (ROS), and their ability to act as electrophiles, forming covalent bonds with cellular nucleophiles.[1,2] Our research group has focused on the annulation of quinone with a pyrrole nucleus to develop novel antitumor compounds. Annulated compounds decrease the formation of semiquinones and reactive oxygen species, which are typically responsible for the cumulative cardiotoxicity side effects associated with various quinone derivatives.[2] This work describes the synthesis of a series of quinone-fused pyrrole derivatives **1a-g**, functionalized at the N-1, C-2, and C-3 positions of the heterocyclic ring, to evaluate their cytotoxic effects against several human tumor cell lines. The target compounds **1a-g** were synthesized via copper(II)-mediated annulation of bromobenzoquinone (**2**) with β-enamino esters (**3a-g**) (Scheme).[3]



1a: R = H, **75%**
1b: R = -CH_2CH_2OH, **67%**
1c: R = C_6H_5, **31%**
1d: R = 4-CH_3-C_6H_4, **50%**
1e: R = 4-OCH_3-C_6H_4, **40%**
1f: R = 4-Cl-C_6H_4, **37%**
1g: R = 4-F-C_6H_4, **38%**

Scheme: Preparation of quinone-fused pyrrole derivatives

ACKNOWLEDGEMENTS

CAPES, UFF, PPGQ-UFF, FAPERJ, PIBITI/CNPq.

REFERENCES

(1) da Silva, W.A.; da Silva, L.C.; Campos, V.R.; de Souza, M.C.; Ferreira, V.F.; Dos Santos, Â.C.; Sathler, P.C.; de Almeida, G.S.; Dias, F.R.; Cabral, L.M.; de Azeredo, R.B.; Cunha, A.C. Synthesis and antitumor evaluation of hybrids of 5,8-dioxo-5,8-dihydroisoquinoline-4-carboxylates and carbohydrates. *Future Med. Chem.*, **2018**, *10*(5), 527-540. DOI: 10.4155/fmc-2017-0173

(2) Dias, F.; Guerra, F.; Lima, F.; de Castro, Y.; Ferreira, V.; Campos, V.; Fernandes, P.; Cunha, A. Synthesis and Biological Evaluation of Benzo[f]indole-4,9-diones N-Linked to Carbohydrate Chains as New Type of Antitumor Agents. *J. Braz. Chem. Soc.*, **2021**,*32* (3), 476-489. DOI: 10.21577/0103-5053.20200202

(3) Leite, T. O.C.; Novais, J. S.; De Carvalho, B. L. C.; Ferreira, V. F.; Miceli, L. A.; Fraga, L.; Abrahim-Vieira, B.; Rodrigues, C. R.; Sá Figueiredo, A. M.; Castro, H. C.; Cunha, A. C. Synthesis, in vitro and in silico studies of indolequinone derivatives against clinically relevant bacterial pathogens. *Curr. Med. Chem.,* **2020**, *20*, 192-208. DOI: 10.2174/1568026620666191223110518