# A new strategy for the synthesis of non-symmetrical naphthoquinones and their cytotoxic effect over PC3 prostate cancer cells

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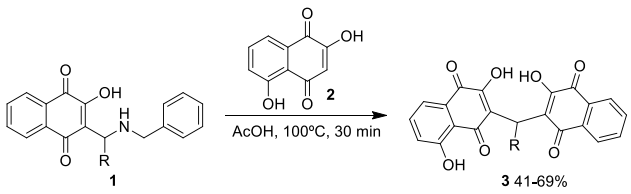
## Introduction

A novel method of synthesis of non-symmetrical 3,3'-(aryl/alkyl-methylene)bis-2-hydroxy-1,4-naphthoquinones was developed using Mannich adduct of naphthoquinone and their reaction with another moiety of 2-hydroxy-1,4-naphthoquinone. This new method produces for the first time non-symmetrical 3,3'-(aryl/alkyl- methylene)bis-2-hydroxy-1,4-naphthoquinones. In a preliminary study, these compounds were evaluated regarding their effect over on the viability of PC3 metastatic prostate cancer cells using MTT assays at 100 μM. Three out of these compounds presented relevant cytotoxic effect at 72 h post-treatment.

## Results and Discussions

The current literature has pointed that the usual method for the synthesis of these bis-2,5-diene-2,6-diol compounds is the domino Knovenagel condensation of an enol with aldehydes, followed by a Michael reaction conducted with different acid catalysts.[1] Up to now, there are no efficient methods for the preparation of 3,3'-(methylene)bis-2-hydroxy-1,4-naphthoquinones with different naphthoquinones.[2,3] A novel method for the synthesis of non-symmetrical 3,3'-(aryl/alkyl-methylene) bis-2-hydroxy-1,4-naphthoquinones was developed, which was used to prepare the compounds 3a-i in moderate to good yields (Scheme 1).




**Scheme 1.** Synthetic route used for the preparations of naphthoquinone **3a-i** derivatives

## Conclusions

Preliminary screening of these compounds regarding their effects over PC3 metastatic prostate cancer cell viability by MTT assays at 100 μM revealed that three compounds present promising activities over this cancer cell line.

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