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Synthesis of 2-amino-4H-chromenes catalyst-free and evaluation of biological activity in tumor cells

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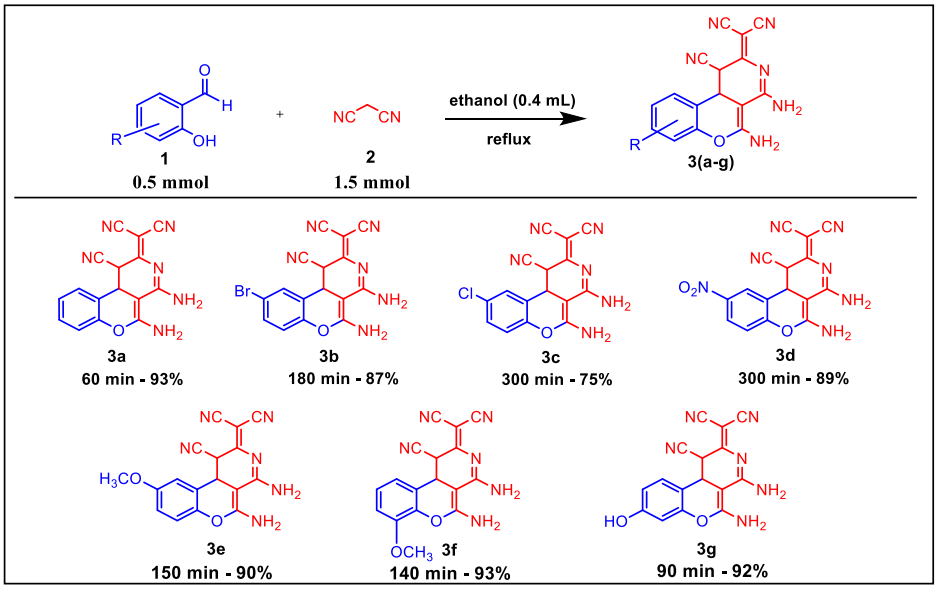
ABSTRACT

This study focuses on the selection of solvents for the catalyst-free synthesis of 2-amino-4H-chromenes from salicylaldehydes (1) and malononitrile (2) via the sequential Knoevenagel-Michael (**Scheme 1**). Ethanol under reflux was the solvent that provided the highest yield and the shortest time to obtain 3a (60 min – 93% yield). Several 2-amino-4H-chromenes 3(b-g) were obtained under these optimized conditions with high isolated yields (75-93%) and short reaction time (90-300 min), including four new compounds (3b, 3d, 3e, 3g) [1].



Scheme 1. The synthesis of 2-amino-4H-chromenes 3(a-g) from salicylaldehydes and malononitrile in ethanol under reflux.

Virtual screening on H-116 and K-562 cells identified 3e as most promising in antitumor activity. In vitro assays confirmed its potential, in line with in silico results. Molecular docking suggested inhibition of the T315I Abl mutant protein, linked to imatinib resistance in chronic myeloid leukemia. This pioneering study explores the biological activity of these compounds, indicating potential for new antitumor agents.

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