Synthesis of α-branched heterocyclic ferrocenyl chalcones

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Chalcones scaffold shows multiple biological and medicinal properties. Clinical studies have demonstrated its excellent bioavailability and maximum tolerance in the human body. Therefore, many researchers are focused on synthesizing different analogues for the design and development of novel and more potent drugs. Moreover, it is documented that the incorporation of the ferrocene moiety in the chalcone scaffold improves its bioavailability and biological activity. Also, according to the literature, the incorporation of heterocyclic rings such as 1,2,3-triazole, furan, or electrodonating groups as part of the scaffold and substitution at the α carbon of the α,β-unsaturated ketone results in enhancement of its biological activity as anti-cancer agent. Our hypothesis states that ferrocenyl chalcones bearing the aforementioned functionalities will lead candidates with enhanced anti-cancer activity. To prove this hypothesis, this research work will pursue three specific aims:

(a) to develop an efficient methodology for the synthesis of ferrocenyl chalcones containing heterocycles and electrodonating groups as substituents at the α carbon of the α,β-unsaturated ketone.

(b) to perform spectral characterization of the new chalcones.

(c) to perform collaborative-based anti-cancer bioassays screening in multiple cell lines.