Project Title – DST SERB

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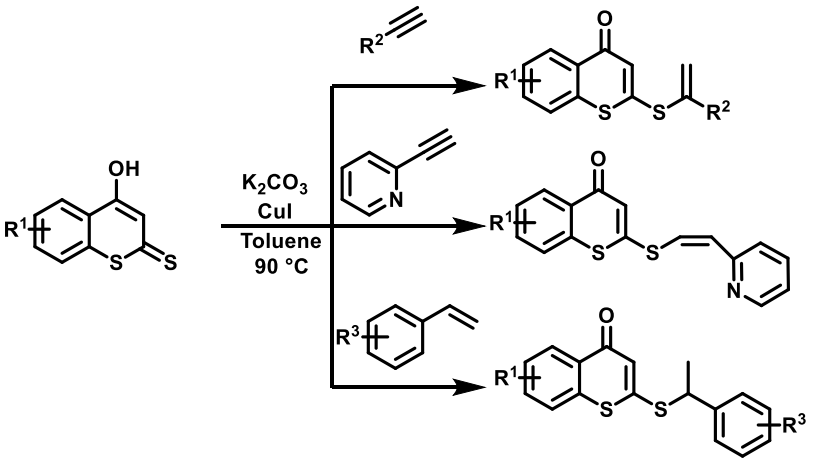
4-Hydroxydithiocoumarin is a potent molecule and it can exist in three tautomeric forms. Using the reactivity of 4-hydroxydithiocoumarin, Majumdar *et al.* and our research group have demonstrated the synthesis of various new heterocyclic compounds as well as other bioactive molecules.

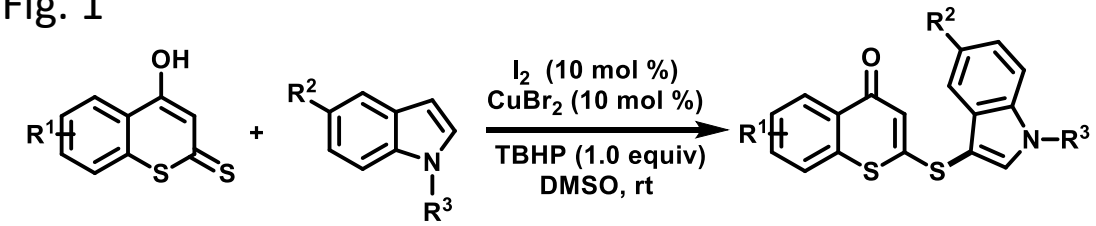
- An expedient synthetic method was developed for OCDCR between 4-hydroxydithiocoumarin and indole at the C-3 position regio-selectively. Some of the compounds exhibit anti-cell proliferative activity on breast cancer (MCF7) cells. (Fig. 1)
- Newly synthesized 1,4-oxathiin derivatives are accomplished in a single pot from 4-hydroxydithiocoumarins, arylacetylenes and dimethyl sulfoxide in the presence of 10 mol% CuI and K_2CO_3 in an oil-bath at 70 °C. The novelties of the present protocol are: (i) selective C-H functionalization at the C-3 position of 4-hydroxydithio-coumarin, (ii) regioselective hydrothiolation with arylacetylenes and (iii) concomitant cyclisation. A few compounds have been studied for anticancer activity against human breast cancer cell line (MCF-7) and cervical cancer cell line (HeLa).(Fig 2)
- Synthesis of vinyl sulfides and thioethers, exclusive Markovnikov products, are reported by using copper(I) iodide catalyzed regioselective hydrothiolation reaction of terminal alkynes/alkenes and 4-hydroxydithiocoumarin. However, anti-Markovnikov hydrothiolation products were obtained in the case of 2-ethynylpyridine, with exclusive *Z* selectivity in good yields. (Fig. 3)

Fig. 3



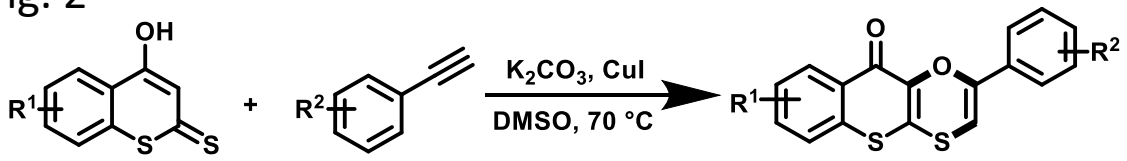
Org. Biomol. Chem., 2021, **19**, 9223

Fig. 1



Org. Biomol. Chem., 2020,**18**, 4104

Fig. 2



Org. Biomol. Chem., 2021, **19**, 5818