Introduction:

The investigation of compounds designed to treat both acute and chronic pain is challenging in pharmaceutical research as pain is in fact a very important problem present in more than 90% of diseases, from the simple back pain to pain associated with different forms of cancer. The classical therapies for pain treatment are mainly the nonsteroidal anti-inflammatory drugs (NSAIDs) and opiates, whose leading compounds, acetylsalicylic acid and morphine, respectively, were isolated in 19th century. NSAIDs show side effects such as gastrointestinal irritation and lesions, renal toxicity and inhibition of platelet aggregation, while the use of opioids is limited to severe pain because of adverse secondary reactions as respiratory depression, dependence, sedation, and constipation. Hence there is always a need for those drugs which have improved analgesic activity and less adverse effects.

Nitrogen containing heterocyclic ring such as Pyrimidine is a promising structural moiety for drug design. Pyrimidine derivatives form a component in a number of useful drugs and are associated with many biological and therapeutically activities. Condensed Pyrimidine derivatives have been reported as anti-microbial, analgesic, anti-viral, anti-inflammatory, anti-HIV, anti-tubercular, anti-tumour, anti-neoplastic, anti-malarial, diuretic, cardiovascular agents. Pyrimidine compounds are also used as hypnotic drugs for the nervous system, calcium-sensing receptor antagonists and also for antagonists of the human A2A adenosine receptor. Like Pyrimidine, coumarin also exhibits diverse biological properties.

Dihydropyrimidinone and dihydropyrimidine derivatives have broad biologically activities. Many synthetic samples have been studied as antibacterial, antiviral, antihypertensive, and anticancer agents and the natural products containing these heterocyclic moieties have been studied as new leads for AIDS therapies. The Biginelli reaction of a β-keto ester, an aldehyde, and urea is considered as one of the most efficient ways to synthesize dihydropyrimidinone. This acid-catalyzed reaction can be conducted under conventional or microwave heating.