

Abstract

Molybdenum cofactor deficiency is a lethal, hereditary metabolic disease, which can be treated by supplementing the cyclic pyranopterin monophosphate (cPMP). In this work, new approaches for the synthesis of cPMP and related structures were developed. The skeletal structure of simplified analogues, consisting of a quinoxaline or quinoline instead of the reduced pterine and a pyran-ring, was synthesized by two different synthetic routes. The synthesis was possible starting from sugar derivatives from the chiral pool, and through enantioselective organocatalysis. In both cases, an intramolecular *Heck* reaction is the key step. The exocyclic olefins, resulting from this reaction, showed promising cytotoxic properties against the tumor cell lines HepG2, MOLT-3, A549 and HuCCA-1.