ABSTRACT

Modified nucleosides and nucleic acid bases have been extensively investigated due to their potential activity, as antivirals, enzyme inhibitors, and antitumor agents. Covalent modification of the purine and pyrimidine bases is an important strategy for the synthesis of these adducts. Palladium-catalyzed cross-coupling is a powerful method to attach groups to the heterocyclic base through the formation of new carbon-carbon and carbon-heteroatom bonds. The present PhD thesis is mainly focused on the synthesis of base modified nucleosides containing pyranosyl rings.

On the basis of the above findings along with previously reported data that: a) alkynyl-modified nucleosides and especially pyrimidine derivatives substituted at *C*5 and purine derivatives substituted at *C*8, have been shown to possess interesting biological properties, b) many glucose analogues can act as inhibitors of glycogen phosphorylase and c) thiopurines have the reputation of effective anti-cancer and immunosuppressive drugs, it was intriguing to design and synthesize a new series of C5-alkynyl pyrimidine pyranonucleosides, as well as C8-alkynyl purine pyranonucleosides bearing a variety of alkyne substituents, which include linear alkyl chains, substituted benzene rings and polycyclic aromatic hydrocarbons. Finally, it was of great interest to synthesise novel thiopurine pyranonucleosides.

The target nucleosides were evaluated for their antiviral and cytostatic properties using several virus strains and cancer cell lines as well as for their antidiabetic properties.