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Exploring the synthesis and the biological potential of new structurally diversified *N*-glycosyl compounds as nucleoside analogs or mimetics of glycosyl phosphates and nucleotides

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Nucleoside and nucleotide analogs or mimetics have attracted considerable attention as synthetic targets due to their ability to interfere with biological pathways in which their natural counterparts are involved, such as nucleic acid synthesis and cell division. Such physiological processes are deregulated in diseases such as cancer or viral infections and therefore these classes of compounds constitute potential anticancer or antiviral agents. Other biological effects that have been reported for nucleoside analogs include antimicrobial efficacies and cholinesterase inhibitory abilities. The access to structurally new analogs or mimetics of nucleosides and nucleotides and the exploitation of their biological profile remains of interest. In this communication, the synthesis of glucuronic acid and glucuronamide-derived *N*-glycosyl compounds, including derivatives containing potential bioisostere groups for phosphate functionality and nucleosides, will be presented. Molecules of higher structural complexity intended to mimic nucleotides were also prepared, namely glucuronamide-based hybrids containing both a benzyltriazole moiety and an anomeric sulfonamide or a phosphoramidate function and pyranosyl/furanosyl nucleoside phosphoramidates. The new compounds were subsequently evaluated for their cytotoxicity to cancer cells and for their inhibitory activities towards enzymes of therapeutic relevance, such as cyclin-dependent kinases, cholinesterases and carbonic anhydrase II. Some molecules were shown to be bioactive with inhibition constants or IC_{50} values in the micromolar concentration range. The synthetic work and the findings of the bioactivity evaluation will be disclosed.

Biography

Nuno Manuel Xavier has received a dual PhD degree in Organic Chemistry from the University of Lisbon and from the National Institute of Applied Sciences of Lyon in 2011. He was a Postdoctoral Research Fellow at the University of Natural Resources and Life Sciences of Vienna in the group of Prof. Paul Kosma. He has then returned to the University of Lisbon as a Postdoctoral Member until the end of 2013, whereupon he was awarded an Investigator Starting Grant from the Portuguese Foundation for Science and Technology (FCT). Since then, he is a Researcher (FCT Investigator) at the Faculty of Sciences, University of Lisbon. His research activities, reported in 25 publications, are focused on the synthesis of new carbohydrate-based molecules of therapeutic interest, for which he has been internationally recognized with various Young Scientist Awards. He is a Member of the IUPAC Carbohydrate Nomenclature Task Group.

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