



PHOSPHORUS DENDRIMERS AS CARRIERS FOR ANTI-INFECTIOUS DRUGS: SYNTHESIS, CHARACTERIZATION AND POTENTIAL BIOLOGICAL ACTIVITY.

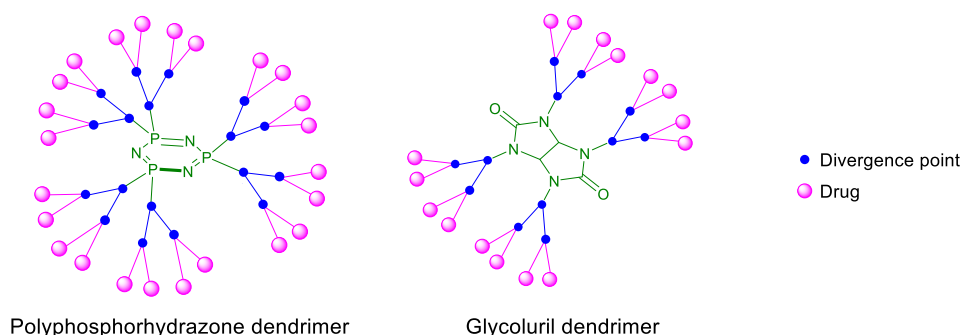
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Dendrimers have attracted the interest of the scientific community in recent decades due to their various potential applications. These perfectly defined hyperbranched structures have been widely studied in biology and many examples of dendrimers used for bioimaging, biomaterials, drug delivery or as drug by themselves have been reported¹.

The use of dendrimers as nanocarriers of biologically active molecules appears to be a promising strategy to overcome solubility or cytotoxicity issues while enhancing biological activity both through cooperative or multivalent effects, and by facilitating cell targeting and cell membrane penetration. To the best of our knowledge, no phosphorus dendrimers (PDs) covalently conjugated to drugs have been reported to date. PDs are attractive for the precise and efficient monitoring of each step of their synthesis by ³¹P NMR, giving access to compounds with well-defined structure and high purity. Furthermore, they have many functional groups at their periphery making them good candidates for carrying drugs^{2,3}.

The aim of this presentation is to illustrate the synthesis of a series of PDs bearing anti-infectious drugs on their surface. Different drugs were covalently attached by cleavable linkers on the surface of well-known cyclotriphosphazene-cored and newly developed glycoluril-cored dendrimers. The introduction of polar motifs in the structure of the dendrimers was also considered in order to make them more compatible with physiological media by improving the hydrophilic/hydrophobic balance. The synthesis and characterization of these phosphorus dendrimer-drug conjugates will be presented.



References:

¹ Nikzamir, M., Hanifehpour, Y. *et al.* Applications of Dendrimers in Nanomedicine and Drug Delivery: A Review. *J Inorg Organomet Polym*, 31. (2021) 2246-2261.

² Caminade, A. M. Phosphorus dendrimers for nanomedicine. *Chem Commun*, 53, 9830. (2017).

³ Turrin, C.O. Majoral, J.P. Phosphorous dendrimers in biology and nanomedicine – synthesis, characterization and properties, Jenny Stanford Publishing Pte. Ltd. (2018).