Oral Communication 2

Applications of ^{19}F NMR techniques with artificial nucleic acids

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Nucleic acids incorporating fluorine modifications at the pentose C2' position have attracted considerable attention because of their enhanced stability and their applicability in the clinic [1]. In addition, since ^{19}F NMR signals in these positions are exquisitely sensitive to structural changes, these artificial nucleic acids can be very powerful tools in several applications, like detection conformational dependent binding events, or development of new nanosensors.

In this communication, we report first our ongoing studies on the use of ^{19}F NMR spectroscopy to study structure-selective molecular recognition processes. Secondly, we describe how to use pH dependent conformational transitions to develop a ^{19}F NMR detected pH-sensor. In these two applications we take profit of the peculiar properties of a non-canonical DNA structure: the i-motif.

The i-motif is a four-stranded intercalated structure stabilized by the formation of hemiprotonated C:C$^+$ base pairs between parallel oriented strands [2]. The need of partial cytosine protonation for the formation of hemiprotonated C:C$^+$ base pairs makes the stability of these structures strongly dependent on the pH.

[1] R. El-Khoury, M. J. Damha, *Acc. Chem. Res.* ***54***, (2021) 2287.
[2] B. Mir, I. Serrano, D. Buitrago, M. Orozco, N. Escaja, and C. González, *J. Am. Chem. Soc.* ***139***, (2017) 13985.