Synthesis, characterization and applications or thienoguanosine (thG) an outstanding isomorphic fluorescent analogue of guanosine

Samuel Kanj*[1]

[1]Laboratoire de Bioimagerie et Pathologies – université de Strasbourg, Centre National de la Recherche Scientifique – France

Résumé

Thienoguanosine (thG) is an isomorphic fluorescent analogue of guanosine. Its structure is very close to guanosine and as a result it can be inserted in a DNA or RNA sequence without remarkably perturbing the structure. Moreover, it possesses a high quantum yield and two tautomers that can provide additional information on its environment. The fluorescence of thG remain significantly high even when incorporated in nucleic acids. All of this makes thG an outstanding probe for DNA and RNA study, as a recent study on G-quadruplexes (G4) has proven (Singh et al., 2026). G4 are non-canonical secondary structures resulting of the folding of G rich DNA or RNA sequences, in the presence of a cation. We focused on the telomeric sequence hTel22 G4, in which 9 of the 12 G residues have been substituted one by one by thG, in order to map the conformational dynamics of hTel22 G4. thG has been introduced into hTel22 thanks to solid-phase synthesis of oligonucleotides with the phosphoramidite method. Currently we are testing other kinds of functionalisation.

Mots-Clés: Fluorescent guanosine analogues, Nucleic acids, Fluorescence, G, quadruplexes

*Intervenant