How does glucose affect the photoisomerisation of a quinazolinone-based glycoconjugate?

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Changes in molecular structures induced by UV or visible light play an important role in various biological processes [1]. This transformation, often accompanied by bond rotation, from a more energetically favourable conformation (*anti*-form) to a less energetically favourable conformation (*syn*-form) is called photoisomerisation. The photochemical process is very often associated with conjugated systems containing heteroatoms such as oxygen and nitrogen. There are a large number of nitrogen-containing heterocyclic compounds, including Schiff bases, which have highly conjugated systems with aromatic substituents bound to the aliphatic chain. Particular attention has been focussed on compounds possessing N=C and N=N bond systems [2].

We present a novel glycoconjugate consisting of two β-glucopyranoses attached to a quinazolinone-like structure, which has an interesting photochemical property. The new derivative exhibits photoisomerization around the −N−N= and =CH−C− bonds of the −N−N=CH−C− linkage simultaneously ("crankshaft rotation") upon exposure to UV light. Experimental high-resolution NMR spectroscopy, combined with DFT calculations, revealed that the attachment of carbohydrate residues to photoactive compounds [3,4] can significantly change the isomerization process, while the overall molecular structure remains virtually unchanged.

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