ARTIFICIAL GLUCOSINOLATES AS MASKED ISOTHIOCYANATES FOR ENZYMATICALLY PROMOTED *IN SITU* BIOCONJUGATION

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Glucosinolates are sulfur-containing secondary metabolites whose structures are based on a *β*-D-glucopyranose unit linked through an *O*-sulfated (Z)-thiohydroximate function to a variable aglycon. They are part of the defence mechanism [1] of cruciferous vegetables, such as broccoli, mustard, or wasabi. Myrosinase, a specific *β*-thioglucohydrolase, hydrolyses the anomeric C-S bond, leading to the formation of an isothiocyanate species (ITC). This hydrolysis allows the shift from stable non-toxic and water-soluble precursors to a toxic electrophile, highly reactive, difficult to prepare, to store in most cases and also water insoluble [2]. This unique system can be explored as an alternative bioconjugation tool for labelling with diverse applications such as grafting carbohydrates onto carrier protein [3] to generate neoglycoproteins, or selective protein labelling with fluorophores for target detection (Figure 1).

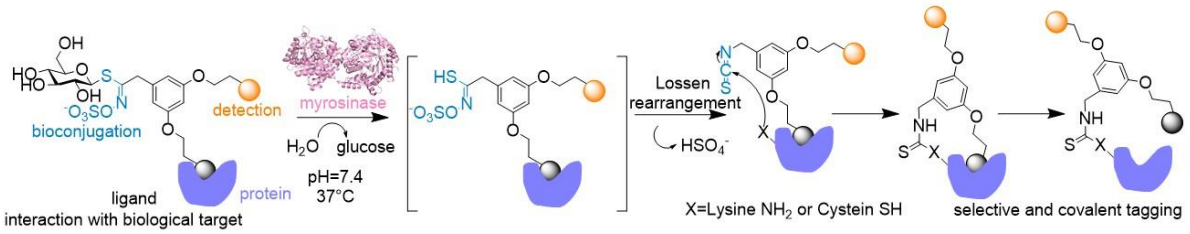

Figure 1. Myrosinase-Glucosinolates system for selective protein labelling

In this context, we describe our recent results on the design, synthesis and reactivity of artificial glucosinolates. We show that those compounds are substrates of recombinant myrosinase and can be efficiently hydrolysed into their corresponding ITCs. In addition, we will describe our currently developed approaches to the synthesis of pluri-functional glucosinolates, specifically designed to selectively label proteins such as lectins, with the use of a recombinant myrosinase.

References:

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