Photorelease of glycine and β-alanine from (7-bromocoumarin-4-yl)methyl cages

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In recent years, remarkable research in photocleavable protecting groups (PPGs) has given rise to a variety of structures suitable for masking a broad range of chemically and biologically relevant molecules. These groups can be easily removed by irradiation at a suitable wavelength, releasing the desired active compound. Notice that for bioapplications the chosen wavelength must be harmless to cells, ideally as close as possible to the visible spectrum.[1]

Among the most interesting PPGs are coumarin derivatives that generally present high molar extinction coefficients at high wavelengths, good stability and fast release rates. Furthermore, these molecules can display fluorescence that allows following the spatial distribution and depletion of the bioactive compound.[2-4]

With the goal of evaluating the efficiency of 4-chloromethyl-7-bromocoumarin as phototrigger for amino acid neurotransmitters glycine and β-alanine, the corresponding ester conjugates were synthetized. Their irradiation at different wavelengths (254, 300, 350 and 419 nm) in a Rayonet RPR-100 photochemical reactor, in methanol/HEPES buffer (80:20) was carried out. The photolysis process was followed by HPLC with UV detection. Results will be discussed in comparison with those obtained when 4-chloromethyl-7-aminocoumarin was used in the photorelease of glycine and β-alanine.[5]

References

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