BIOSOURCED AND BIOINSPIRED FLUORESCENT COMPOUND: β-CARBOLINES

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The β-carbolines belong to the alkaloid class and are characterized by a tricyclic structure formed by the fusion of an indole nucleus with a pyridine.[1] This molecular architecture is widespread in nature, where it is associated with a variety of remarkable biological properties such as intercalation of DNA and antitumoral properties.[2] Additionaly, β-carbolines are known for their intense blue fluorescence, making them targets of interest for a variety of applications.

Our research aims to synthesize these structures from biosourced products, with the objective of modulating their photophysical properties. This approach is supported by theoretical calculations, which enable us to target our synthetic goals more precisely. The synthesis of β-carbolines begins with tryptamine, a secondary metabolite from the plant kingdom.[3] The first key step in this synthesis is the Pictet-Spengler reaction, in which tryptamine condenses with a carbonyl derivative to form tetrahydro carbolines. This intermediate structure is then subjected to a crucial oxidation for aromatization, followed by halogenation to introduce various substituents. This strategy enables us to carry out an in-depth study of the structure-photophysical property relationships of the β-carbolines obtained.[4]

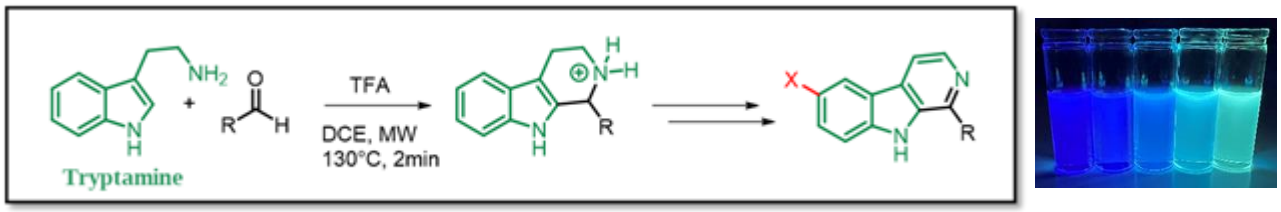

Figure 1 – Synthesis route for β-carbolines derivatives.

Reference(s)

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