Photochemical and Photophysical Studies of Coumarin and Carbazole Fluorophores Conjugated with Photochromic Subunits

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INTRODUCTION

The design and synthesis of *photoswitchable probes* through covalent attachment of fluorophores as *coumarin* and *carbazole* to oxazine photochrome has allowed the assembly of photochromic systems that exposed to several external stimuli have shown a reversible opening of the oxazine ring that bathochromically shifts the absorption of the fluorophores itself [1,2].

DESCRIPTION of the PROJECT

Study of a small library of *photoswitchable compounds in a mixture of organic solvent and water to pave the way to sensing applications in the biological realm.*

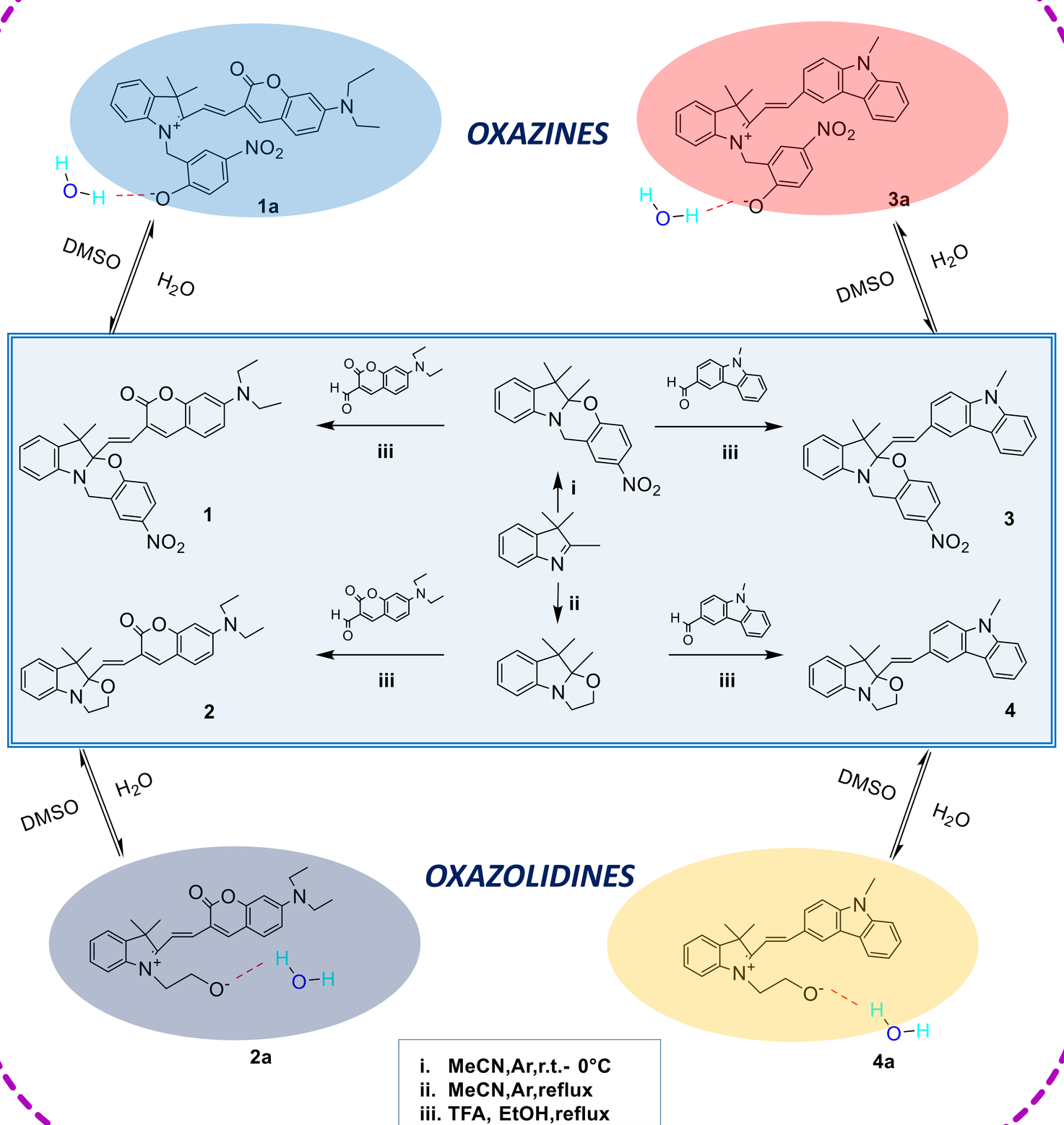
Scaffolds involved:

Photochromes: oxazine and oxazolidine

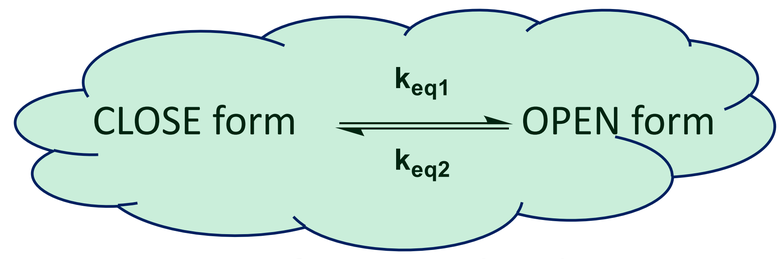
Fluorophores: coumarin and carbazole

--- EXPERIMENTAL RESULTS ---

Synthetic Scheme and Equilibria



Spectroscopic Investigations

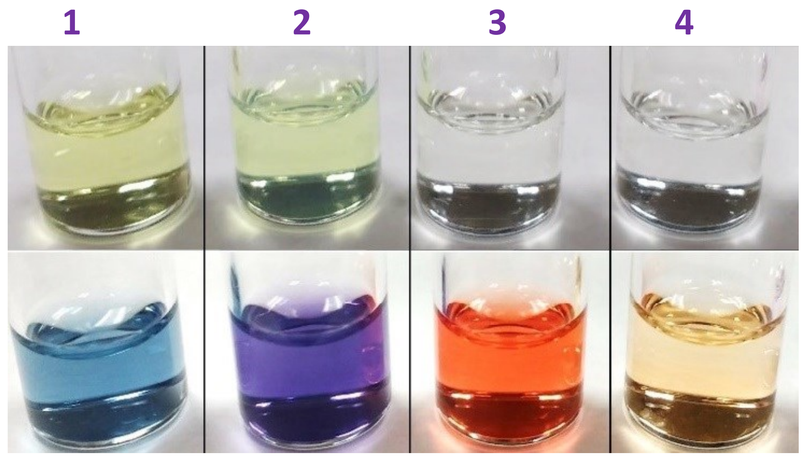


Spectroscopic features related to structural changes are studied in accurate chemical-physical conditions

UV-Vis absorption spectroscopy ✔
Fluorescence emission spectroscopy ✔
Confocal imaging analysis ✔

In aqueous media all the compounds tested exist in their *ring opened forms*, due to the formation of *Hydrogen Bonds*

- Absorption is *bathochromically* shifted
- Reversiblity of the process



CONCLUSIONS

The obtained preliminary evidences have identified these photoswitchable *probes* as potential candidates for the determination of *physical parameters* in *aqueous environments.*

REFERENCES

[1] Deniz, E.; Sortino, S.; Raymo, F. M. J. Phys. Chem. Lett. 2010, 1, 3506-3509.

[2] Garcia-Amorõs, J.; Swaminathan, S.; Sortino, S.; Raymo, F. M. Chem. - A Eur. J. 2014, 20, 10276-10284.

ACKNOWLEDGEMENTS

The National Science Foundation (CHE-1505885) *and Istituto Italiano di Tecnologia* are acknowledged for financial support.