

Rational Design and Synthesis of Efficient Sunscreens to Boost the Solar Protection Factor

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Skin cancer incidence has been increasing in the last decades, but most of the commercial formulations used as sunscreens were designed to protect only against solar burn. Majority of those sunscreens are structurally similar, for that, all show common critical weaknesses, such as low stability and toxicity. Thus, the development of more efficient components is an urgent health necessity and an attractive industrial target.

Inspired on natural compounds, we have rationally designed a new family of molecules with increased photoprotective capacities and a new energy dissipation mechanism.^[1] Based on that, we have synthesized a series of compounds with tunable properties suitable for their use in sunscreens, and enhanced properties in terms of stability, light energy dissipation, and toxicity. Finally, we tested some representative compounds including them in final sunscreen formulations and a relevant solar protection factor boost was measured.^[2]

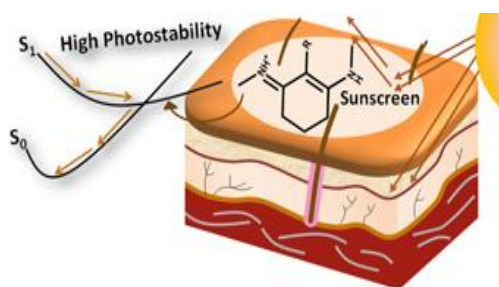


Figure 1. Schematic representation of our compounds, core similar to Mycosporines.

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References:

- [1] D. Sampedro, *Phys.Chem.Chem.Phys.*, **2011**,13,5584
- [2] R. Losantos, I. Funes-Ardoiz, J.Aguilera, E. Herrera-Ceballos, C. Garcia-Iriepea, P.J. Campos, D. Sampedro, *Angew.Chem.Int.Ed.*, **2017**,56,2632