

Design and Synthesis of Next Generation of UV Filters with Enhanced Efficacy, Safety and Antioxidant Properties

Leonardo López-Cóndor, Víctor Pozo-Gavara, Raúl Losantos, Diego Sampedro

Department of Chemistry, Instituto de Investigación en Química de la Universidad de La Rioja (IQR), Universidad de La Rioja, Madre de Dios, 53, 26006 Logroño, Spain.

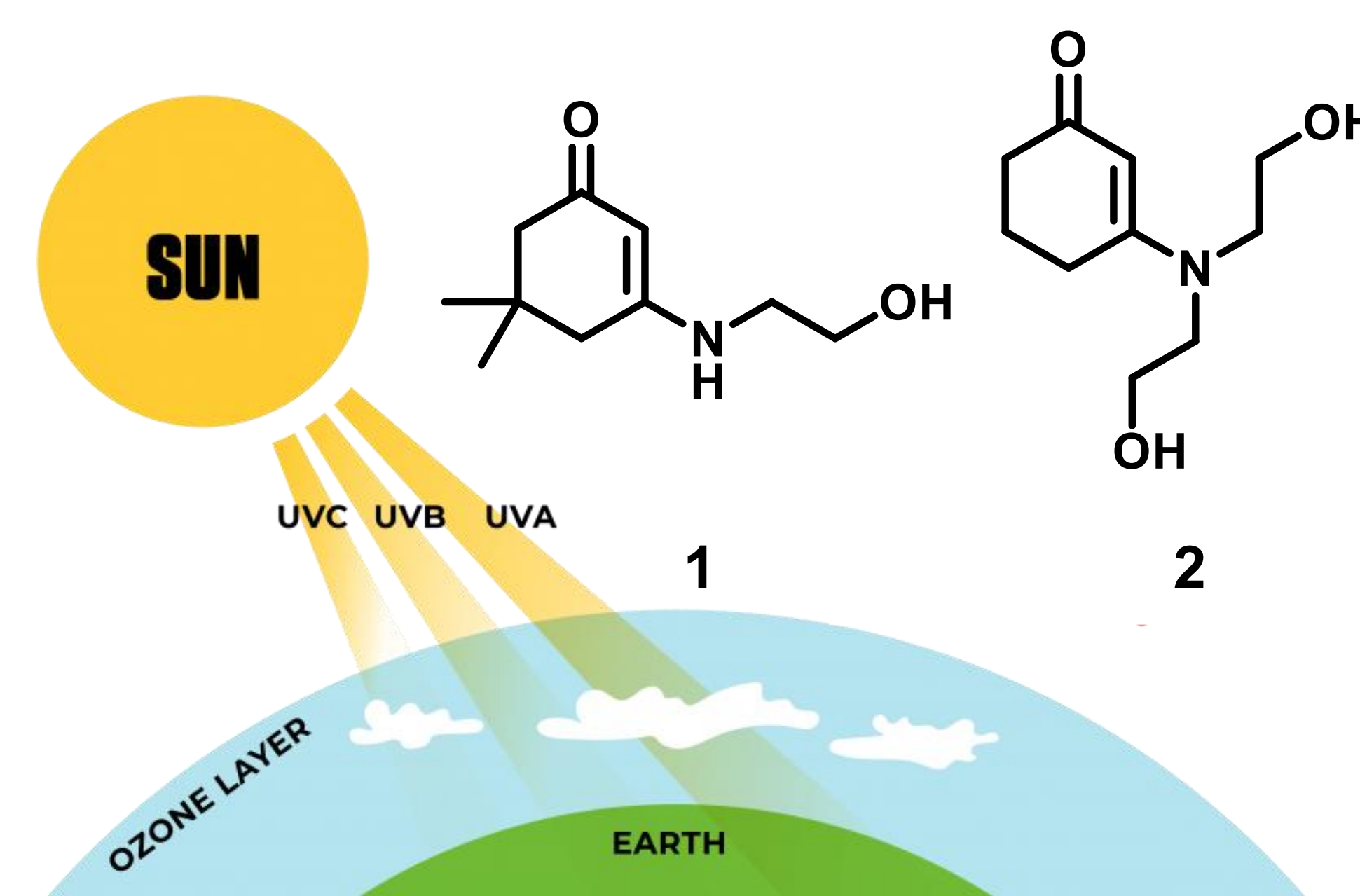
leonardo-andre.lopez@unirioja.es

INTRODUCTION

Solar radiation is essential for life on Earth, but it can also cause detrimental effects. Among these, UV radiation can produce biological reactions that can lead to various diseases, such as skin aging, hyperpigmentation, and skin cancer. Current sunscreens can mitigate these effects, but they present latent risks to both humans and the environment.

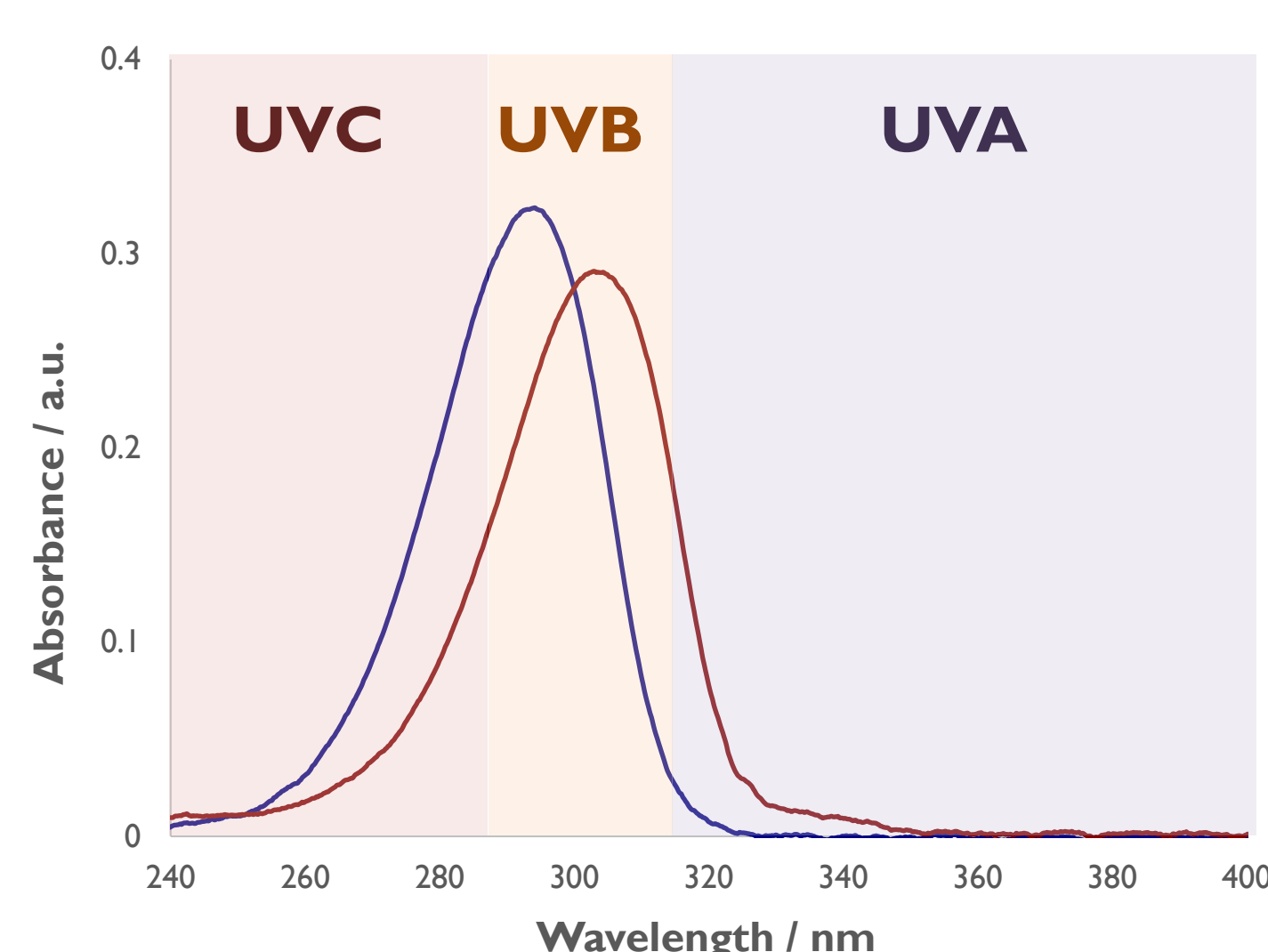
In this context, there is a necessity to develop alternative UV filters that protect us from solar radiation damage while also being low-toxicity and biodegradable.

In this communication, two compounds inspired by Mycosporine-like amino acids (MAAs) have been synthesized and evaluated for photoprotection, antioxidant capacity, and toxicity.

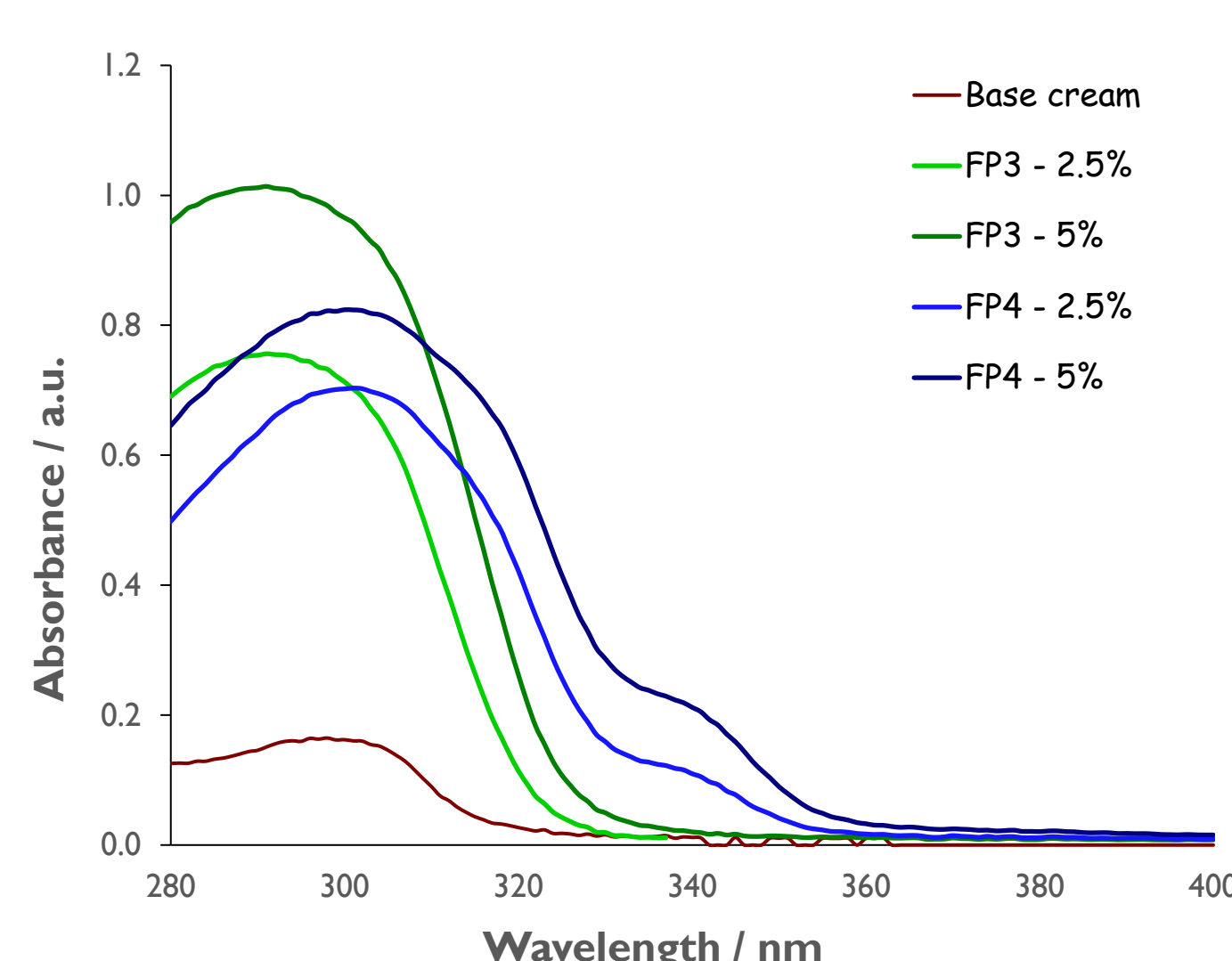


RESULTS

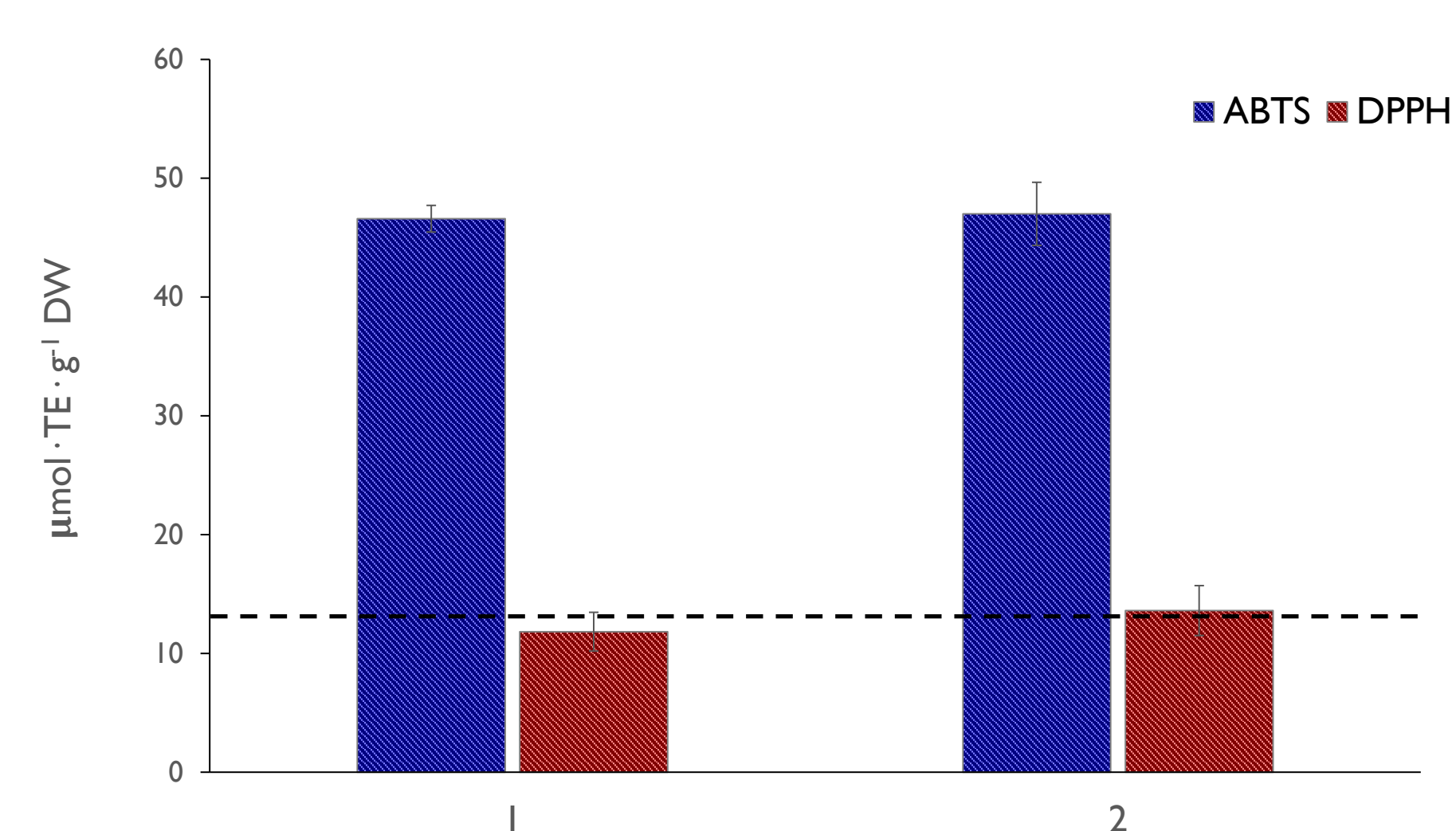
PHOTOPROTECTIVE PROPERTIES



✓ STRONG UVB ABSORPTION (290-315 nm)



ANTIOXIDANT CAPACITY

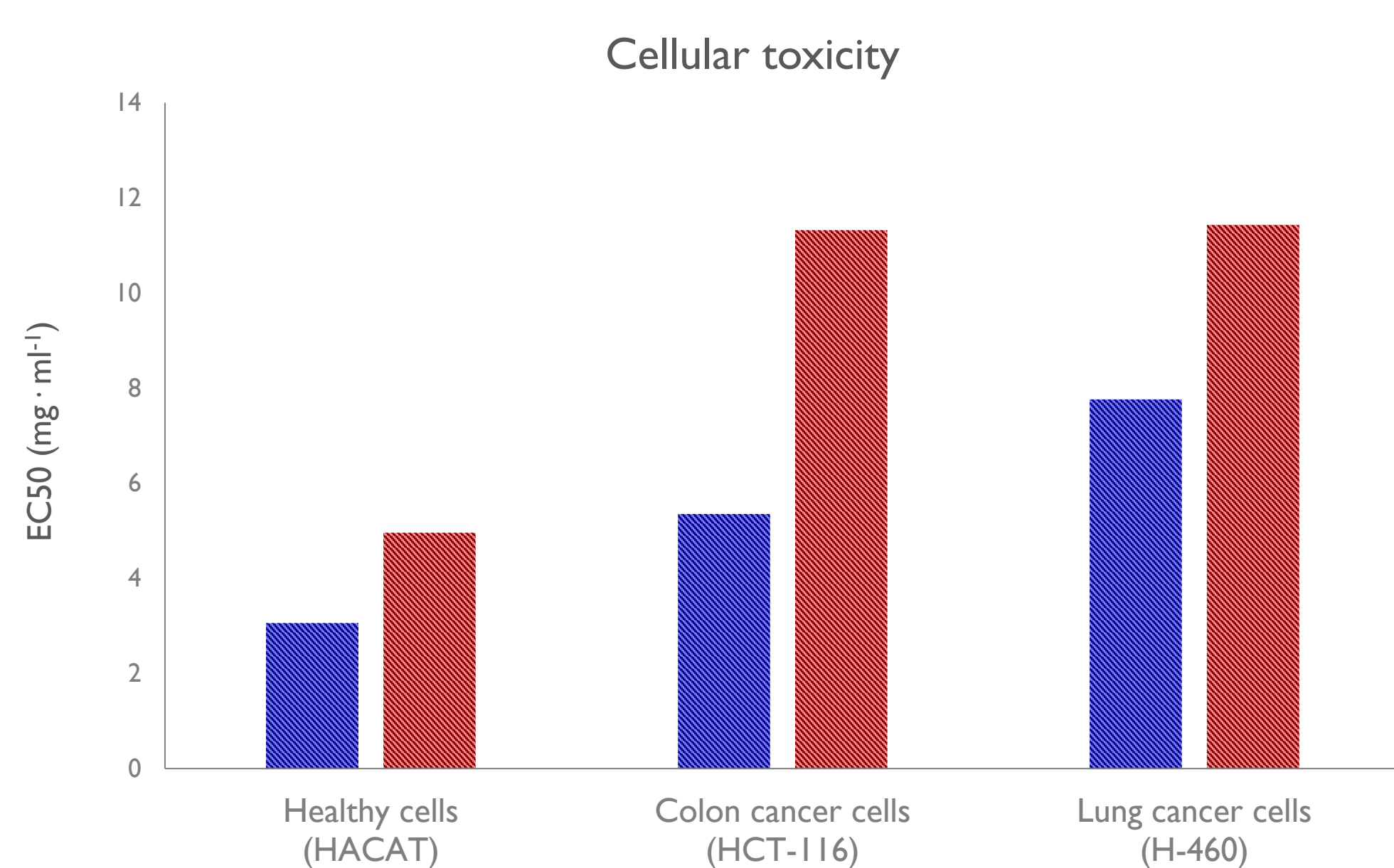


The dashed line represents the values of antioxidant capacity for MAAs algae extracts

✓ GREAT ANTIOXIDANT CAPACITY

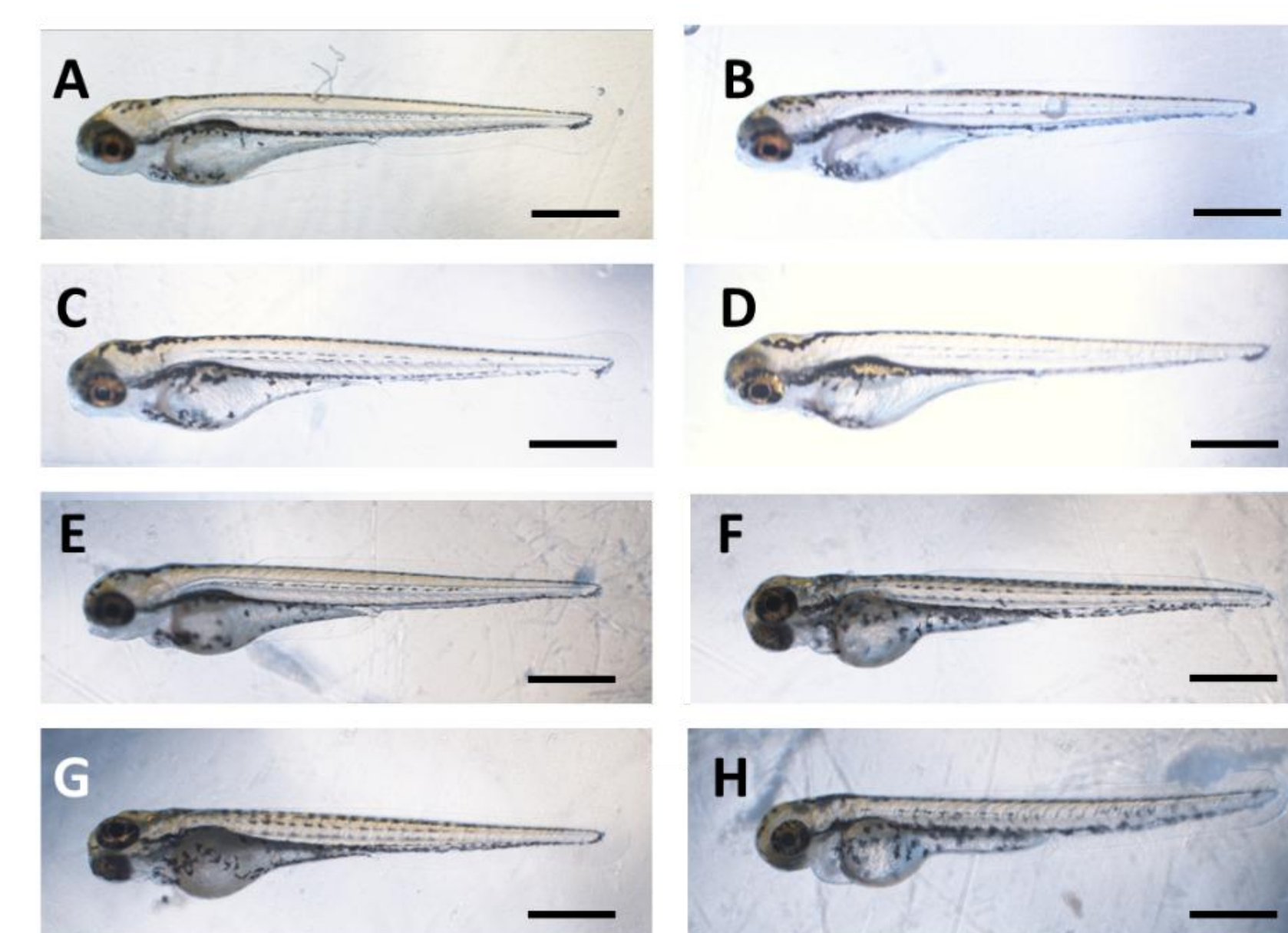
TOXICITY ASSAYS

In vitro



- ✓ LOW TOXICITY IN HEALTHY CELLS
- ✓ SIGNIFICANT SELECTIVITY ON CANCER CELLS
- ✓ LOW OR ABSENCE OF TOXICITY
(1 = no detected, 2 = over 30 mg/ml)

In vivo



CONCLUSIONS

Two synthetic MAA analogues were successfully synthesized and characterized. These compounds demonstrate excellent photoprotective properties, possess strong antioxidant capacity, and exhibit no toxic effects *in vitro* or *in vivo*.

REFERENCES/ACKNOWLEDGMENTS

1. Losantos, R.; Funes-Ardoiz, I.; Aguilera, J.; Herrera-Ceballos, E.; García-Iriepa, C.; Campos, P. J.; Sampedro, D. *Angew. Chem. Int. Ed.* **2017**, *56*(10), 2632–2635.
 2. Figueroa, F. L.; Castro-Varela, P.; Vega, J.; Losantos, R.; Peñín, B.; López-Cóndor, L.; Pacheco, M. J.; Redoli, S. L.; Mari-Beffa, M.; Abdala-Díaz, R.; Sampedro, D. *J. Photochem. Photobiol. B, Biol.* **2024**, *261*, 113050
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