

# **Marine calcifying microalgae and their applications in nanotechnologies**

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The study of microalgae applications in the nanotechnological field is still pioneering, but provides many possibilities to explore newly nature-based technologies. Studies on microalgae producing mineral exoskeletons such as the diatoms (microalgae with a silicate shell) opened up towards using the complex structures produced by these organisms within the nanotechnologies. Although different species of microalgae have been taken into account and sometimes used in nanotechnologies, there is a group with a great potential that remains poorly studied, the coccolithophores. They are unicellular marine calcifying microalgae, representing an interesting resource for identifying new biogenic products to be introduced in the industrial fields. Coccolithophores have the peculiarity to naturally produce exoskeleton composed of calcium carbonate crystals with an elevated complexity that cannot be artificially reproduced in laboratory. Their peculiar exoskeleton opens up new and relevant applications within the field of nanotechnologies that so far have been only theoretically explored but never tested in laboratory. Moreover, the organic compounds of these specific microalgae are still unknown, but coccolithophores are capable to produce a wide spectrum of pigments and bioactive products, still under-studied and with a big potential in many fields from nutraceutical to cosmetics.

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