**DOTTORATO DI RICERCA IN BIOLOGIA CELLULARE E DELLO SVILUPPO**

**XXXIX CYCLE**

**Project proposal for a Sapienza PhD scholarship**

**Other research line**

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**Title: Isolation and characterization from extreme environments of microorganisms effective for carbon biomineralization.**

Carbon dioxide (CO2) emitted into the atmosphere due to some anthropogenic activities is one of the main causes of global warming and climate change. Microorganisms, thanks to enzymatic activities such as urease, carbonic anhydrase and rubisco, have the ability to react with atmospheric CO2 with the formation of calcite, a process defined as biomineralization (Okyay et al., 2016; Castro-Alonso et al., 2019).

The research activity will focus on harnessing the power of microbes for Next-Gen Carbon Capture by exploring extremely CO2-rich environments for the isolation and characterization of microorganisms that have evolved to be hyper-effective at capturing the CO2. Through cultivation techniques, the ability to produce calcite with consequent reduction of carbon dioxide will be highlighted. Furthermore, the ability to rapidly deposit calcite can be used for biotechnological purposes such as the capture of pollutants harmful to human health (Chen et al., 2021).

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