

Analysis of bacterial carbonic anhydrase for accelerated carbon sequestration

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The growing population and industrialization have led to the emission of greenhouse gases, amongst which carbon dioxide is the most persistent in the environment. This gas causes an elevation in the earth's temperature with serious effects on health as well. The most convenient solution to this problem is carbon capture, utilization, and storage (CCUS). Carbon dioxide sequestration in the form of a stable, environmentally safe solid carbonate has obvious potential for long-term carbon dioxide storage. Microbial carbonic anhydrase (CA) catalyzes reversible carbon dioxide hydration and produces Ca/Mg carbonates that resemble weathering/carbonation in nature and are gaining merit for CCUS. The produced carbonates are environmentally stable. As a result, the variety and specificity of CAs from various microbes may be investigated for CCUS. To enable this, the present study enriched several different rock samples for bacterial growth to explore CAs for mineral carbonation. DNA and RNA are isolated to proceed with metagenomics, meta-transcriptomics, and targeted CA sequencing. Further, universal primers are currently being designed for CAs to amplify from the isolated DNA.

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