



2022 MELISSA CONFERENCE
8-9-10 NOVEMBER 2022

CREATING
A CIRCULAR
FUTURE

Extracellular conversion of CO₂ into sugars and other functional food ingredients: SweetAir

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Bioprocess Engineering Chair
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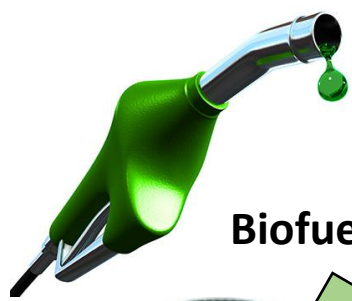


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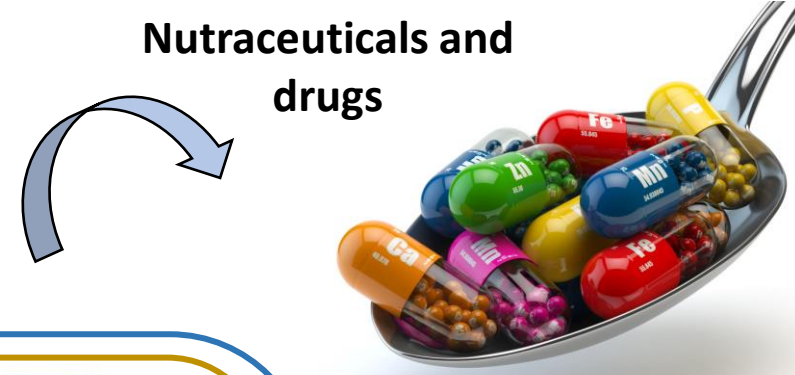
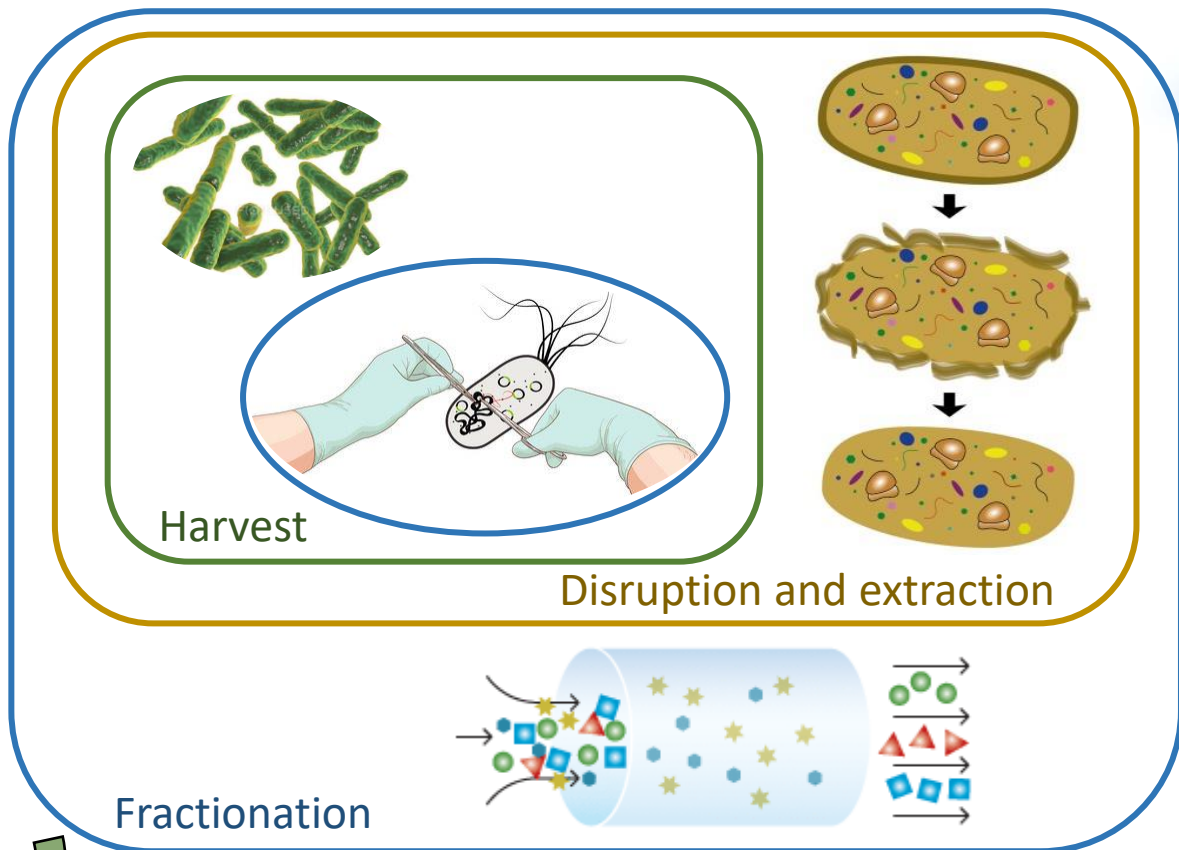
Opportunities



Novel food ingredients



Biofuels



Nutraceuticals and drugs



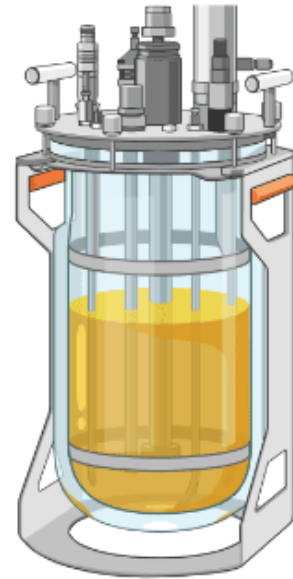
Feed



The problems



Carbohydrates



Microbial processes



Carbon emissions

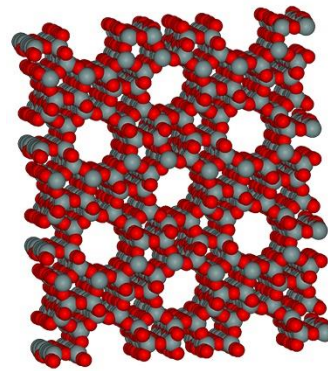
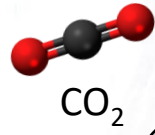
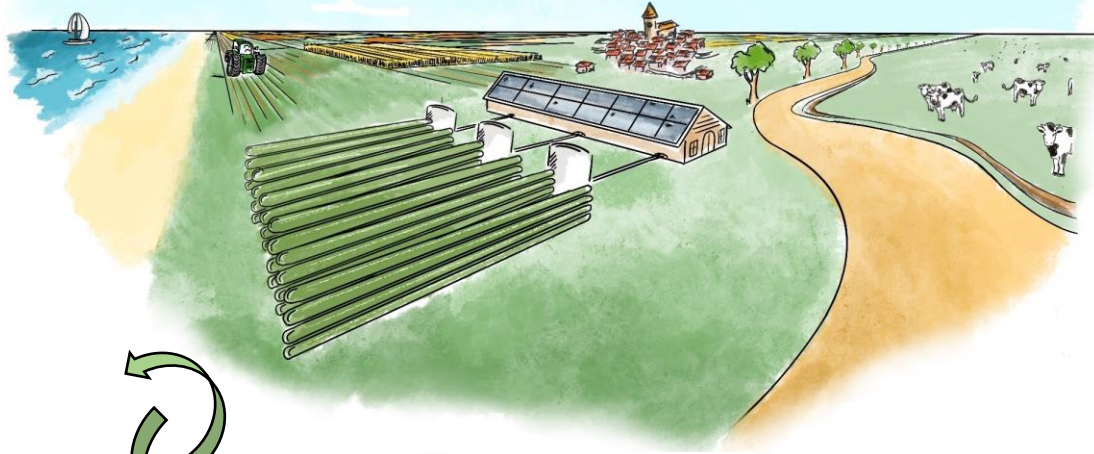


Deep-space missions



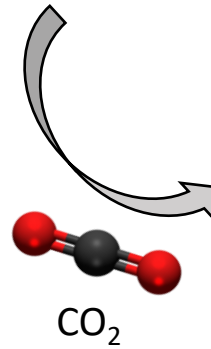
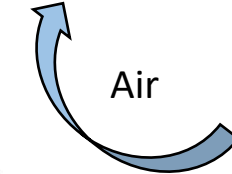
Potential solution

Microalgal farming

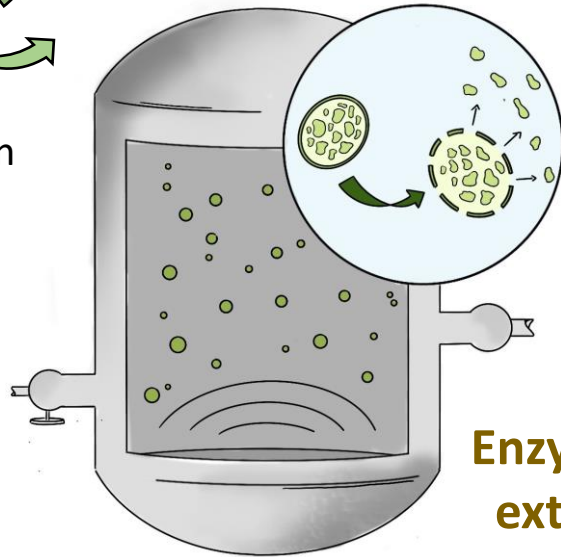
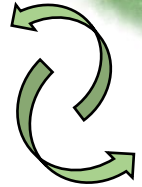


CO₂ scrubbers

Air

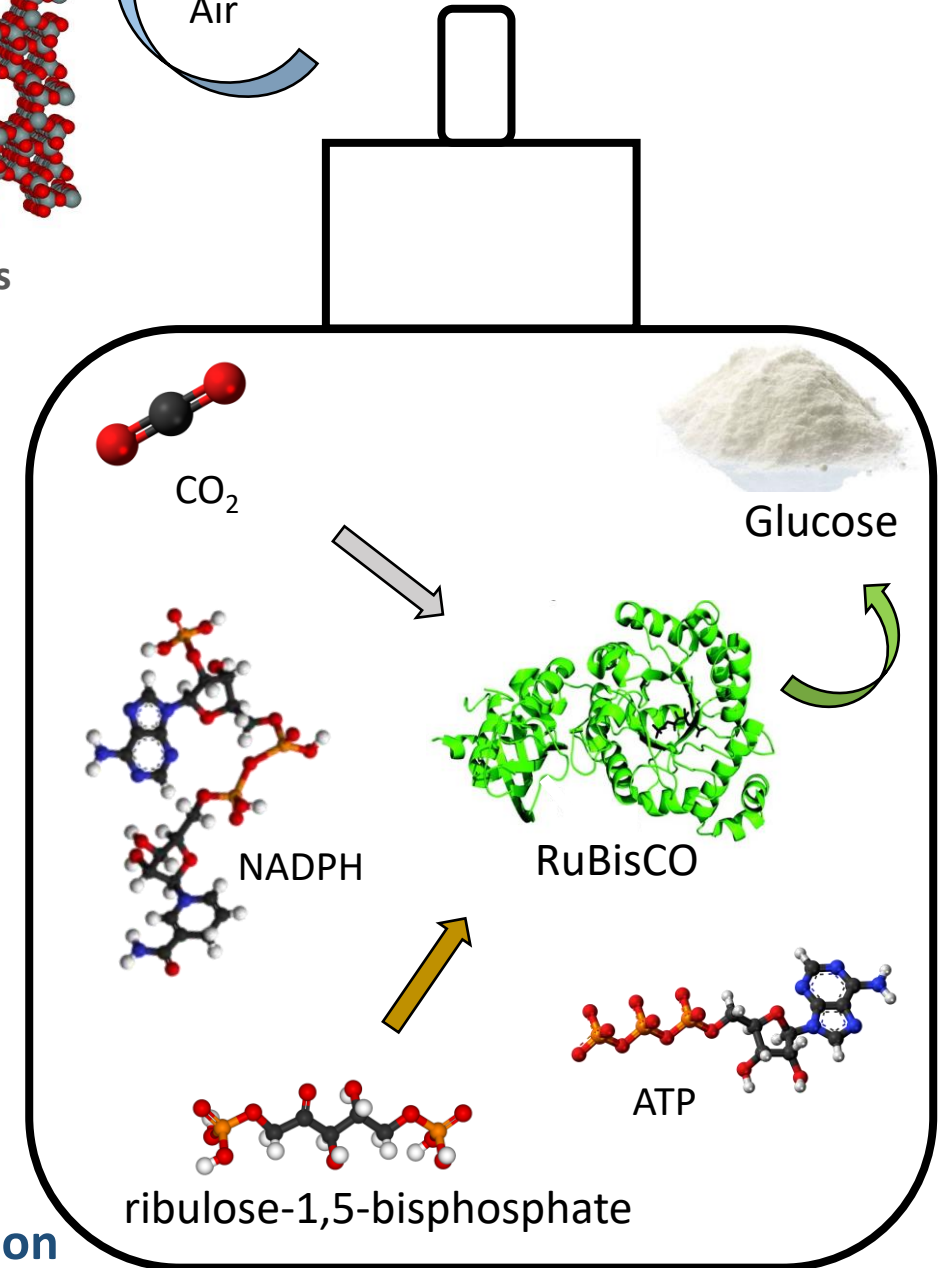


Biomass recirculation



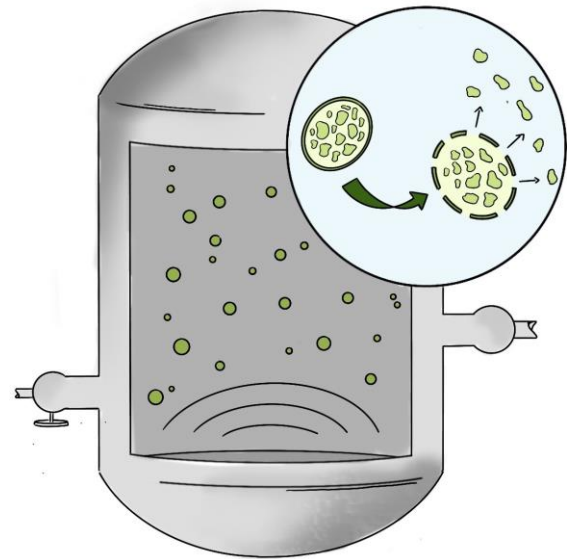
Enzymatic extracts

Cell-free sugar production

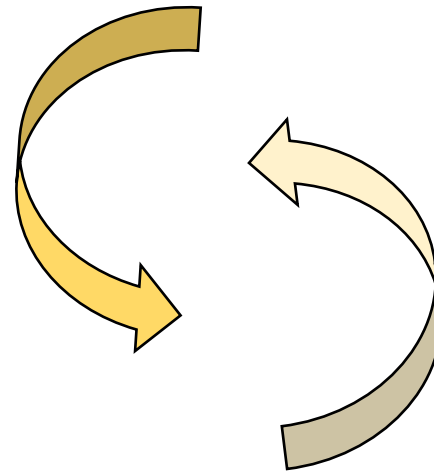




Secrete sauce



External fields



Designer natural solvents



Proteins



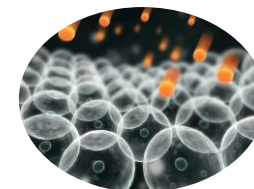
Sugars



Essential Oils



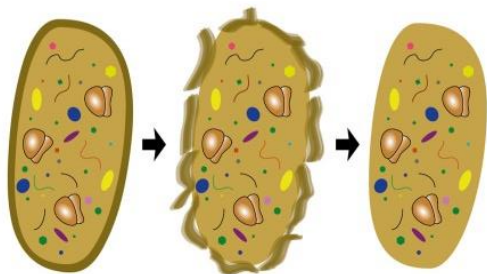
Pigments



Antioxidants

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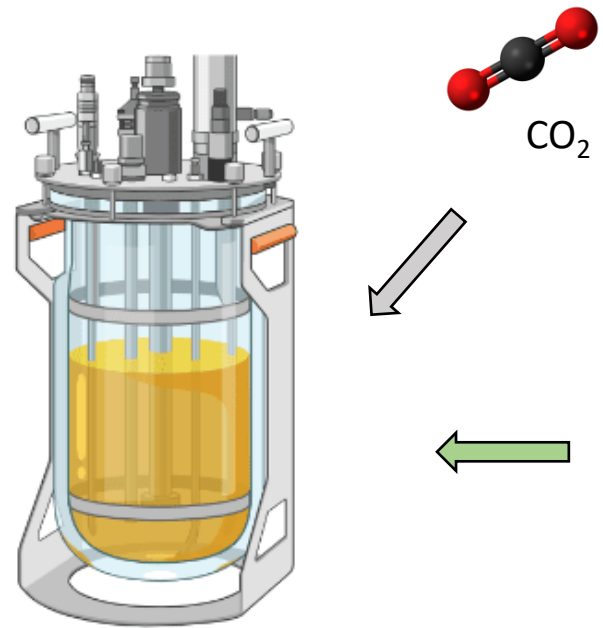
Challenges



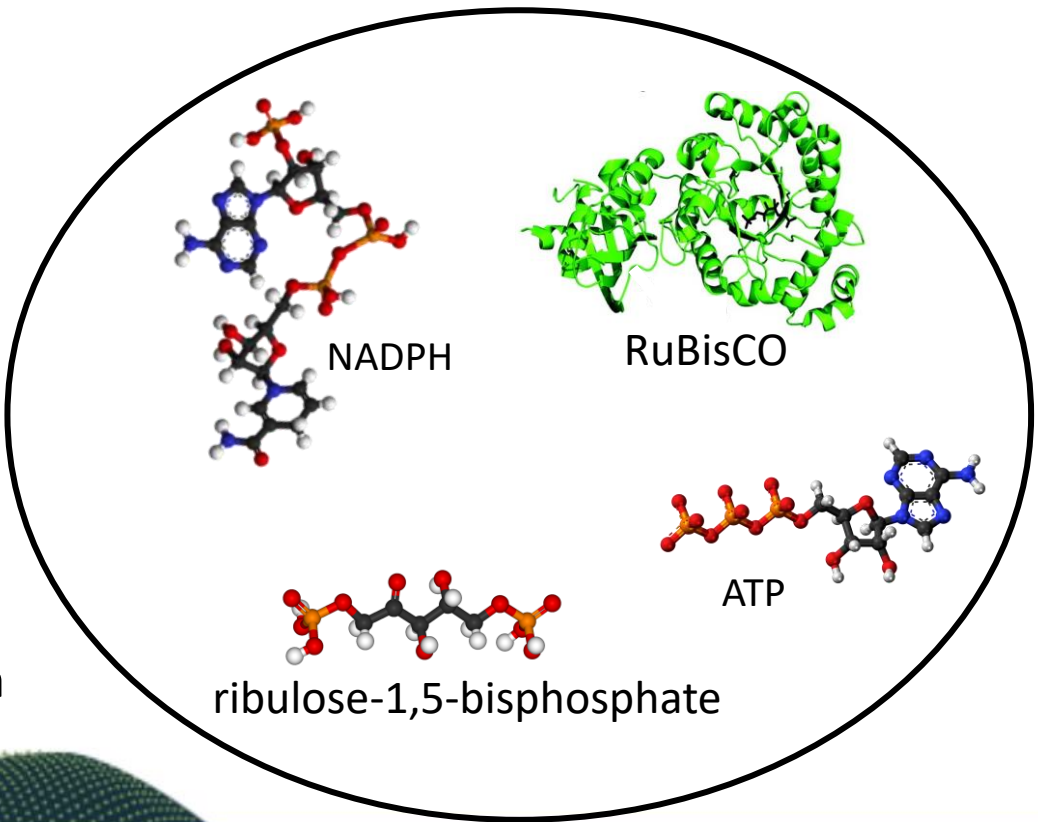
External fields + NaDES



Simple sugars



Cell-free production system

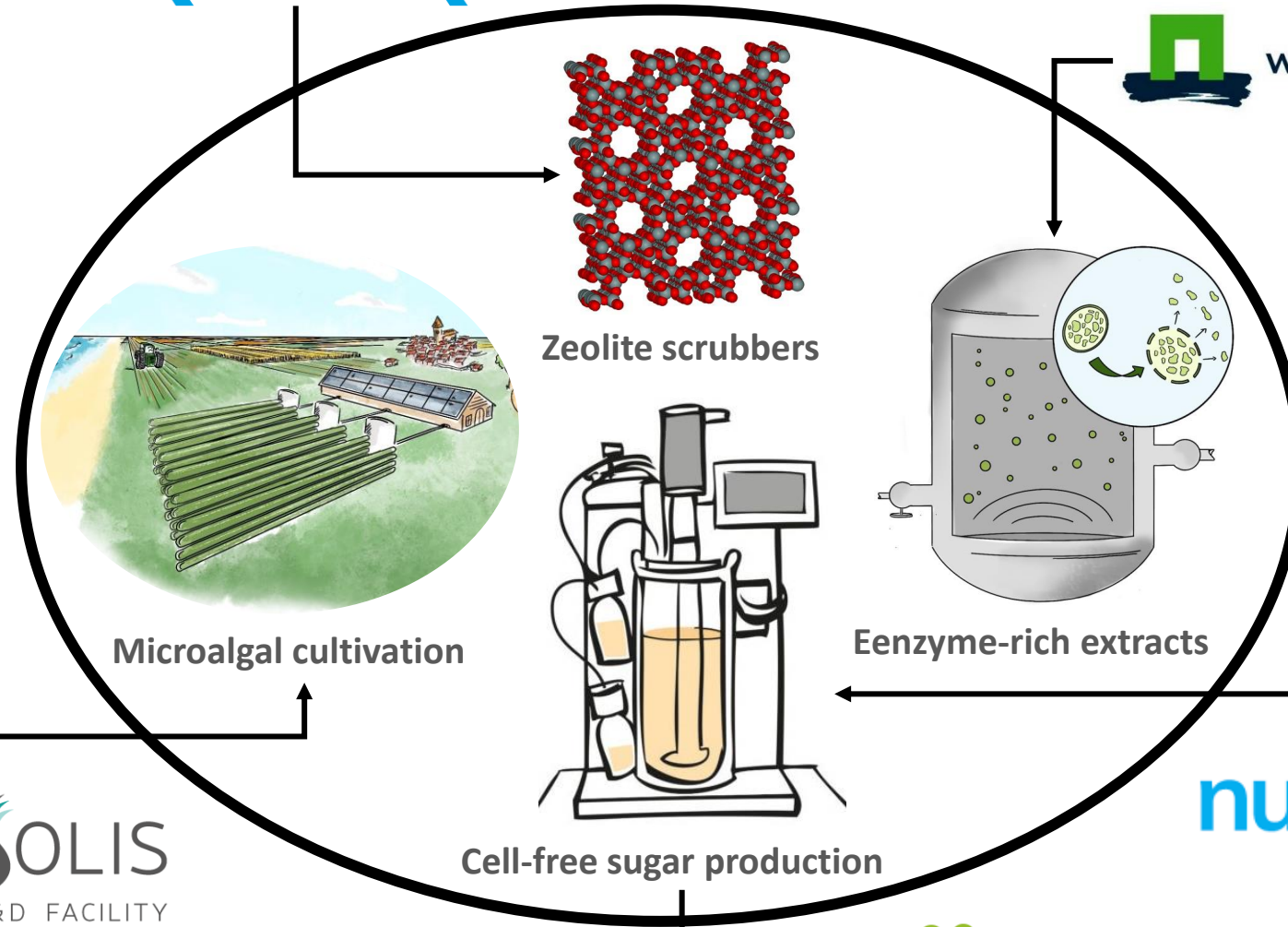




QinetiQ



Partners



ALGO SOLIS
MICROALGAE R&D FACILITY

Cell-free sugar production

Eenzyme-rich extracts

Zeolite scrubbers

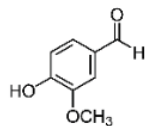
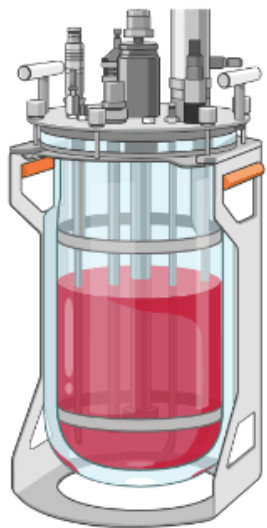
Microalgal cultivation

nuclera





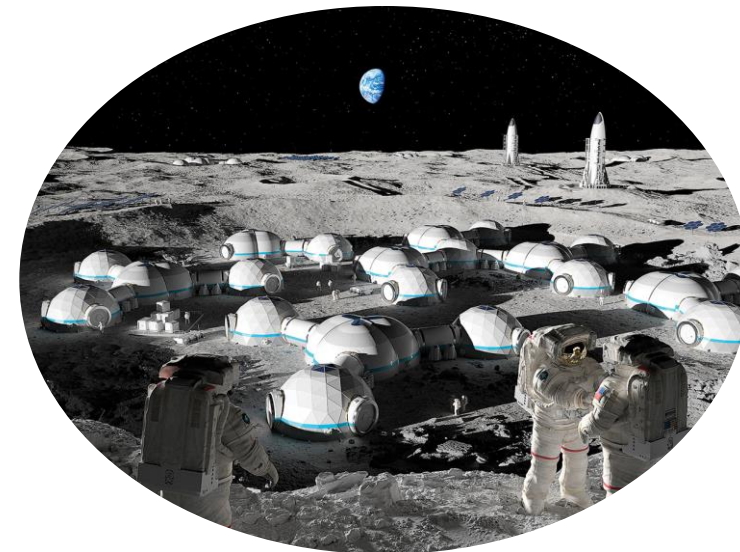
Impact



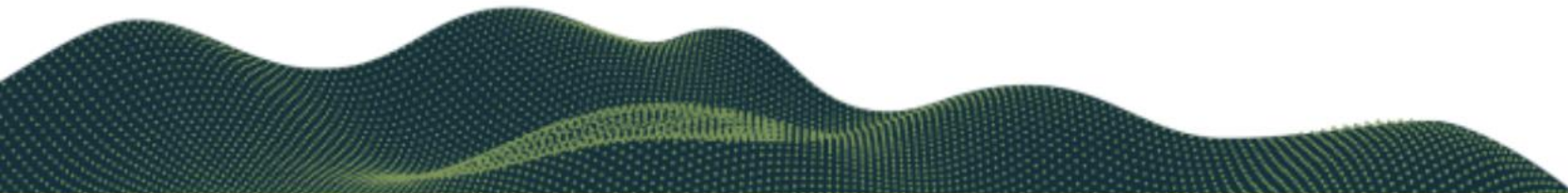
Cellular agriculture



Direct-air CO₂ capture and utilization



Deep-space missions and settlements





Funding

The European Space Agency

Campaign: New ideas for how space can boost Europe's green future

Category: Discovery activities - early technology development





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THANK YOU.

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