

PHYSICAL-CHEMISTRY PROGRAMME – PROJECT 17

CONVERTING CO₂ AND CH₄ TO BIOPRODUCTS

Prof. Dr. Elen Aquino Perpetuo

Prof. Dr. Cláudio Augusto Oller do Nascimento

Dr. Bruno Karolski

Dr. Louise Hase Gracioso

MSc. Priscila da Costa Carvalho de Jesus

MSc. Letícia Oliveira Bispo Cardoso

Bruna Bacaro Borrego



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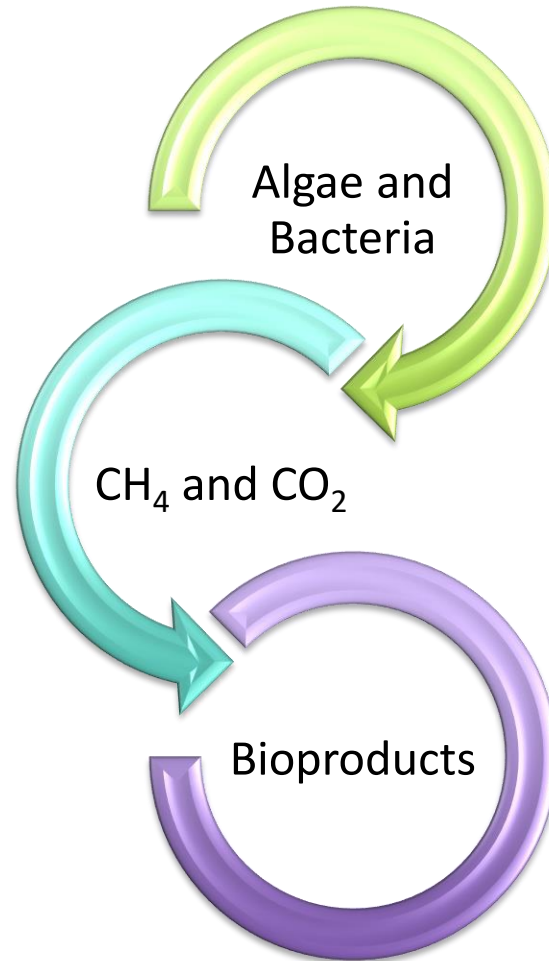
MITIGATION OF CO₂ AND CH₄ USING MICROBIAL CONSORTIUM (ALGAE AND BACTERIA)



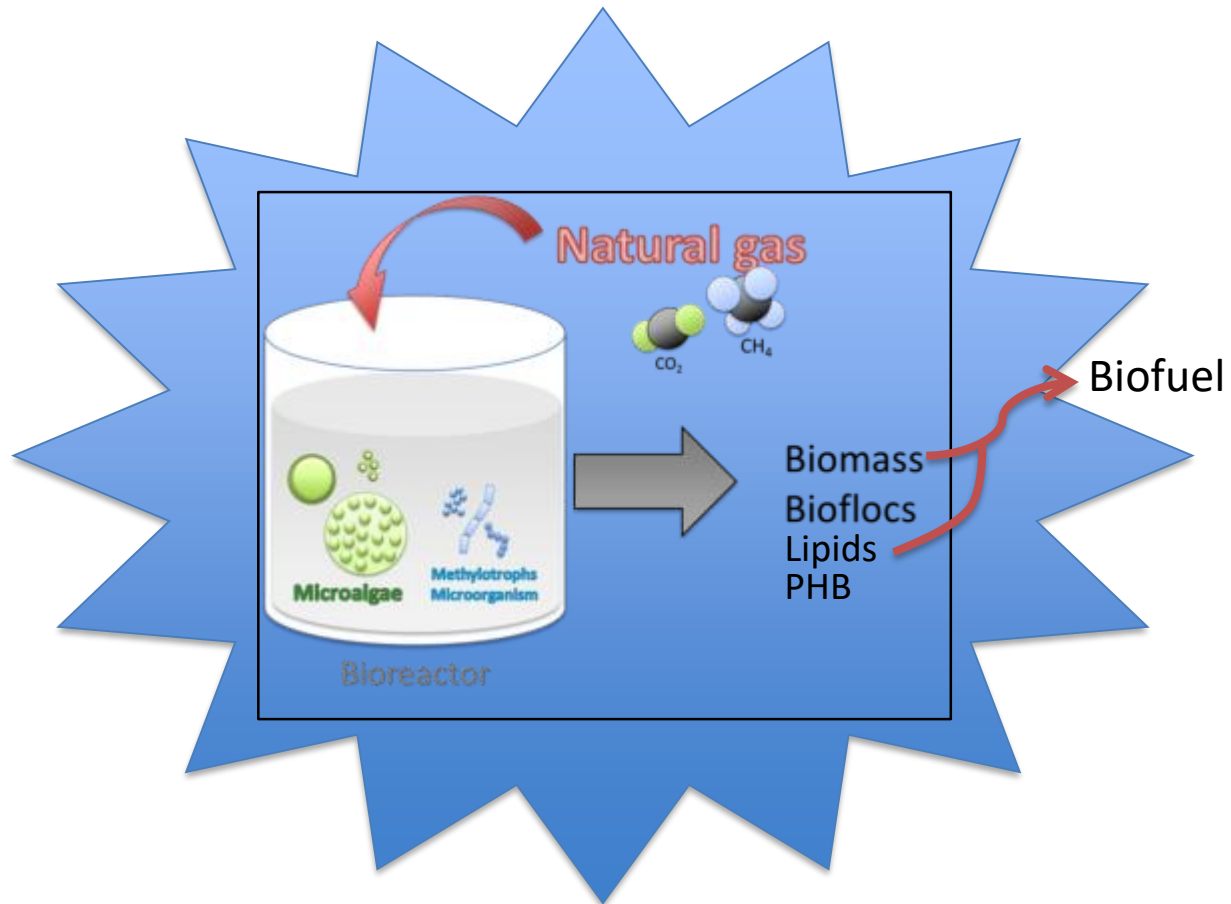
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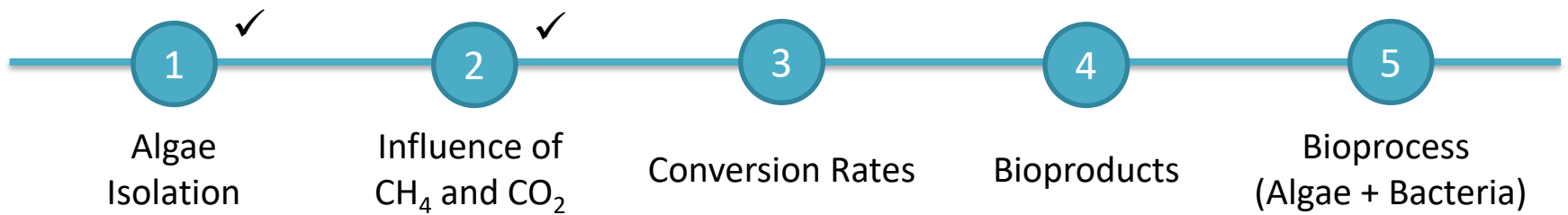
Goal



PLANNED ACTIVITIES



PLANNED ACTIVITIES

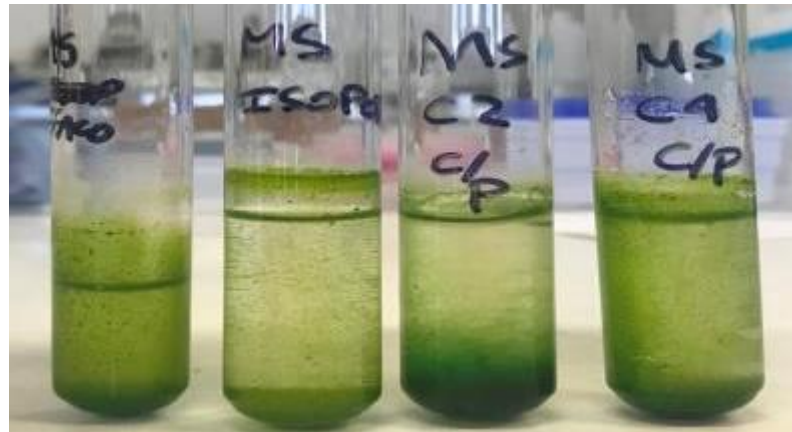


Microalgae isolated from mangroves

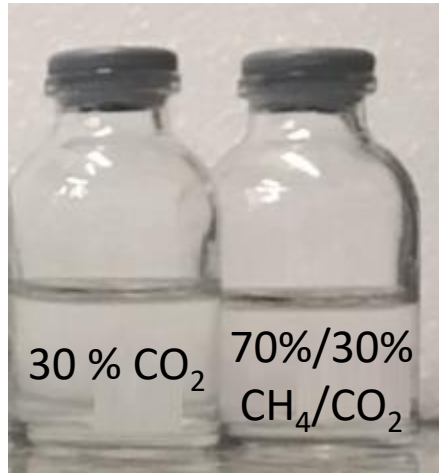
Cubatão



Santos



Scheme of microalgal growth



White, red and blue lights

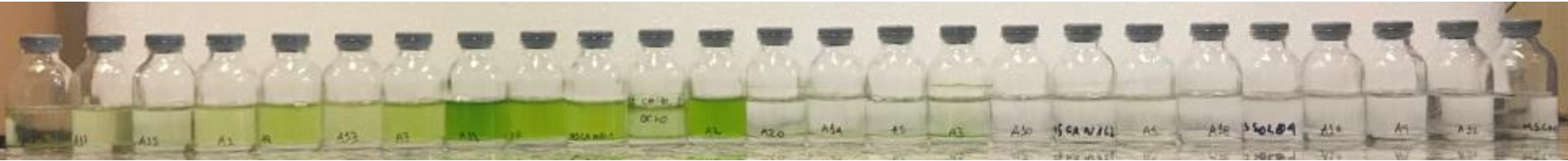


$\lambda = 680 \text{ nm}$

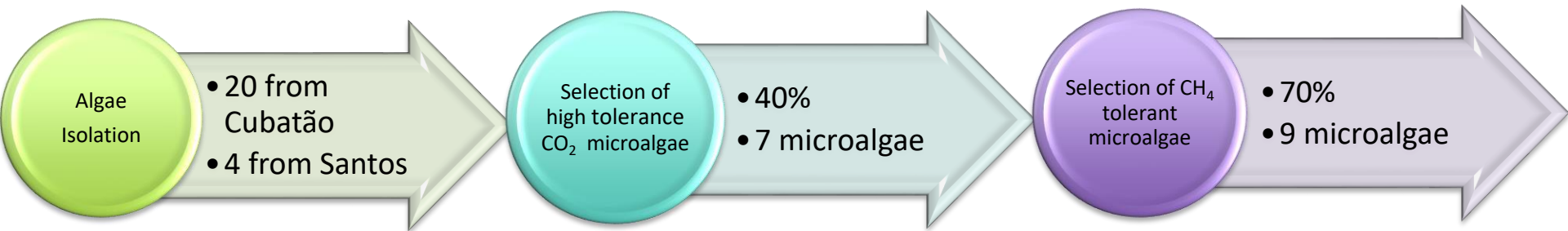


RESULTS

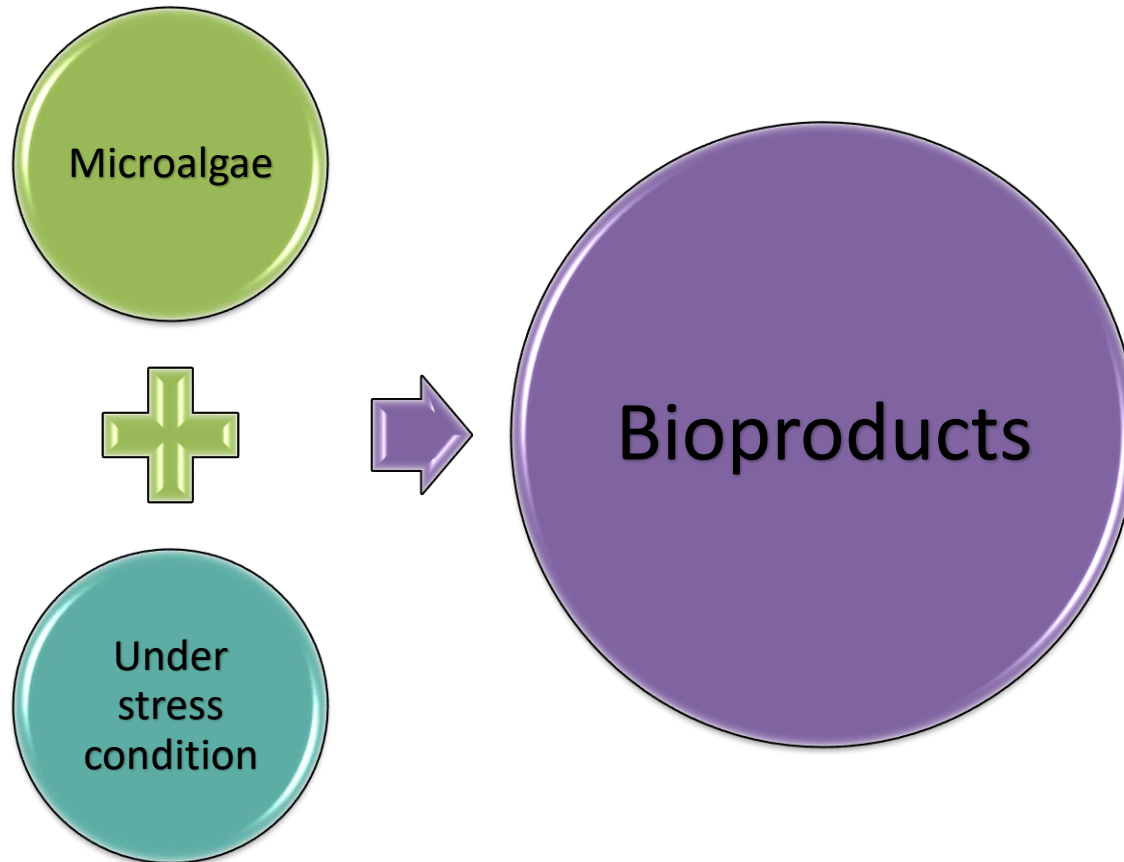
24 algae
isolated



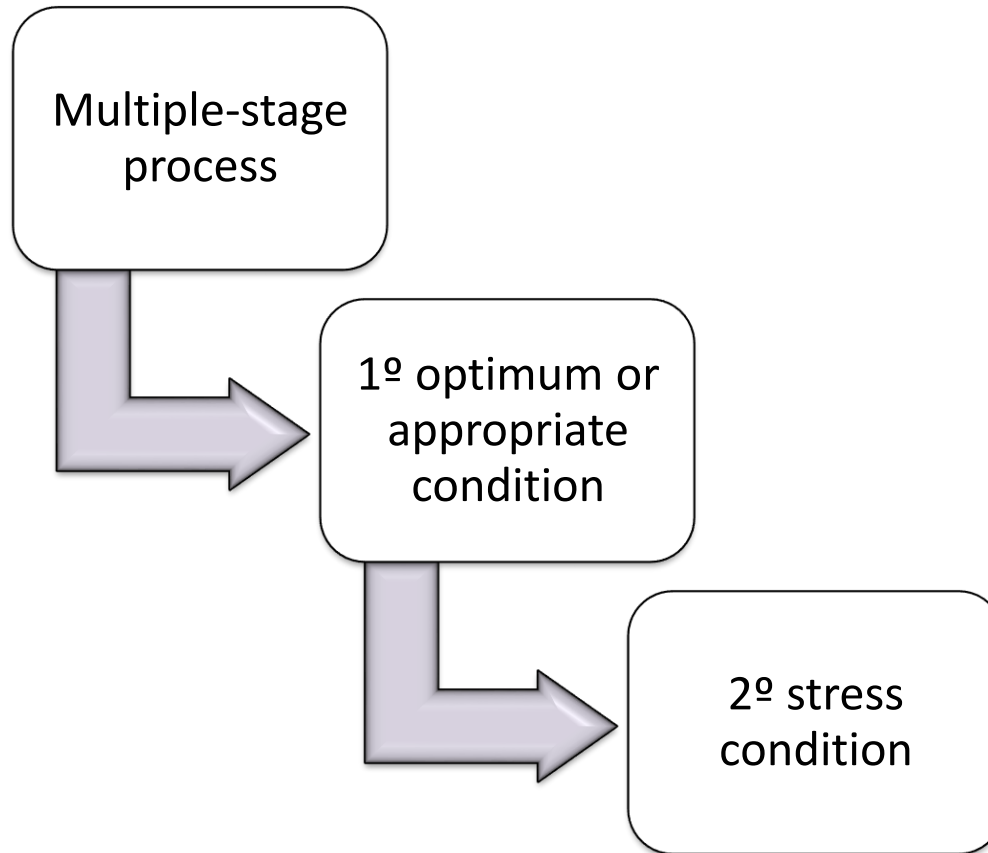
PLANNED ACTIVITIES



Parameters growth



Parameters growth

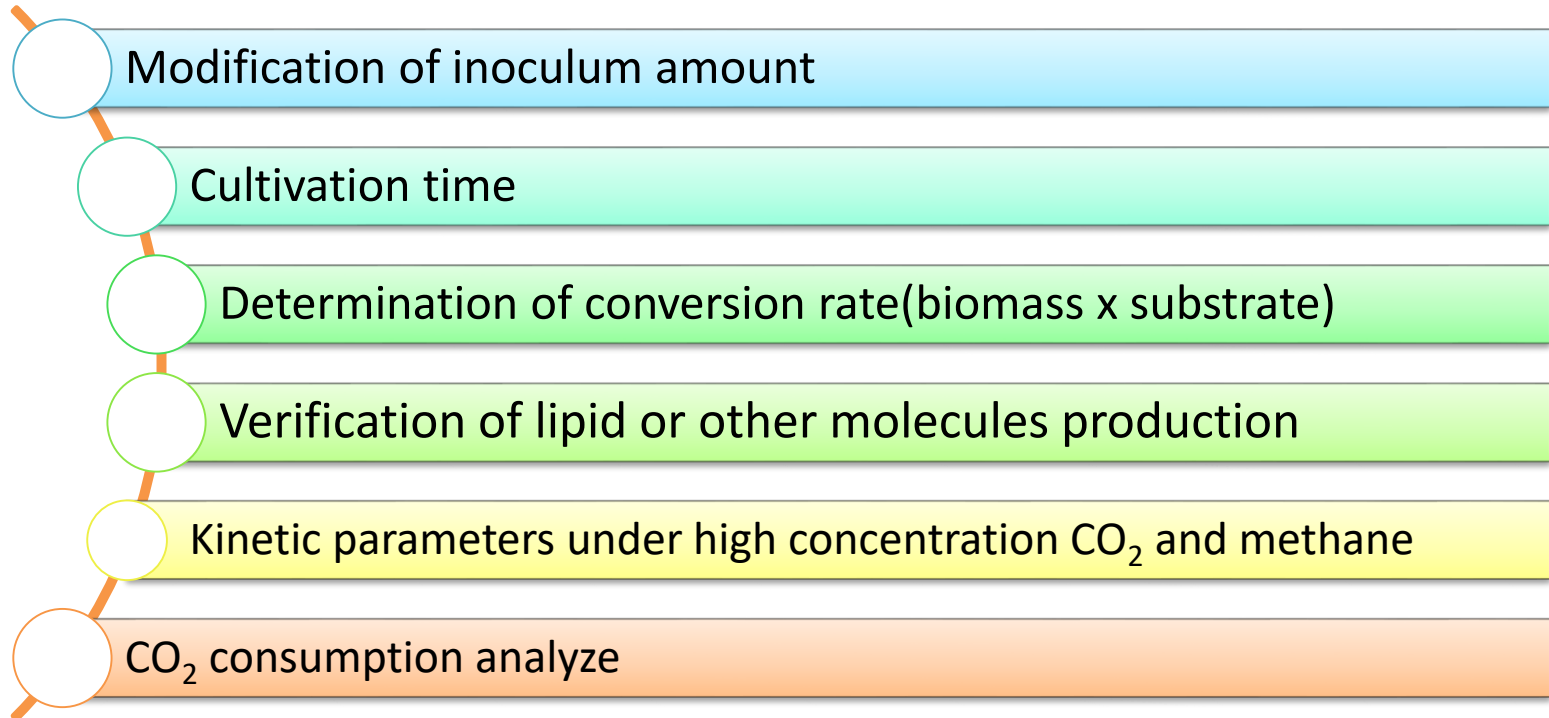


PLANNED ACTIVITIES

Culture parameters of microalgae

- Different medium;
- Variation of light intensity;
- Modification of inoculum amount;
 - Cultivation time;
- Determination of conversion rate (biomass x substrate)
 - Verification of bioproducts

Next steps



University of Padova (Italy)



- FAPESP – BEPE (2018/10811-0);
- One year (January 06th 2019 – January 05th 2020);
- Tomas Morosinotto;
- Optimization of growing conditions to induce production of high value molecules from algae.
 - Lipid
 - PHB
 - Carbohydrate



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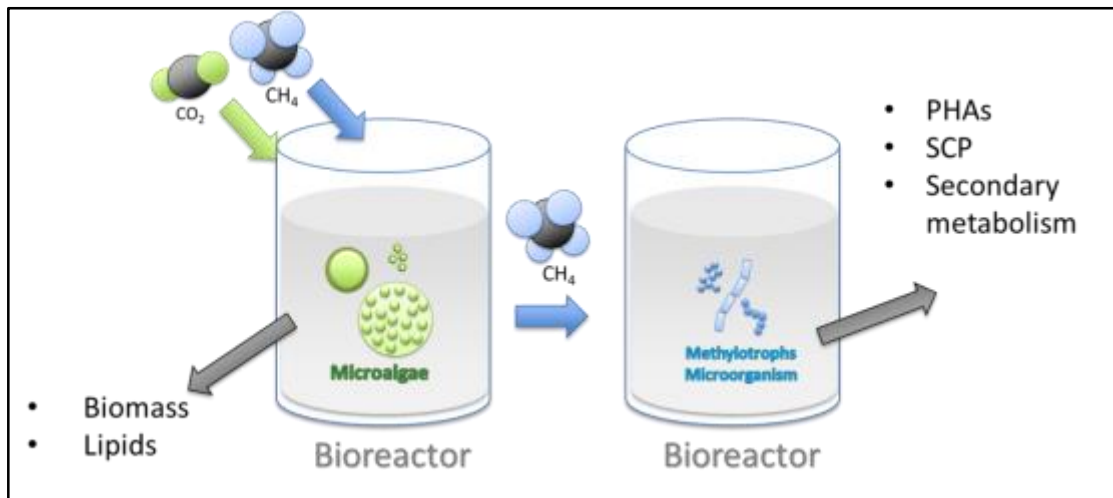


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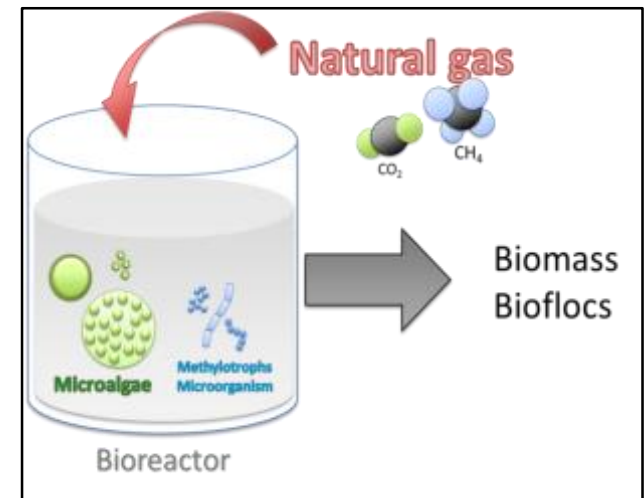
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Microalgae + bacteria

- **Separate culture**



- **Co-culture**





SELECTION OF HIGH CO₂ TOLERANT MICROALGAE

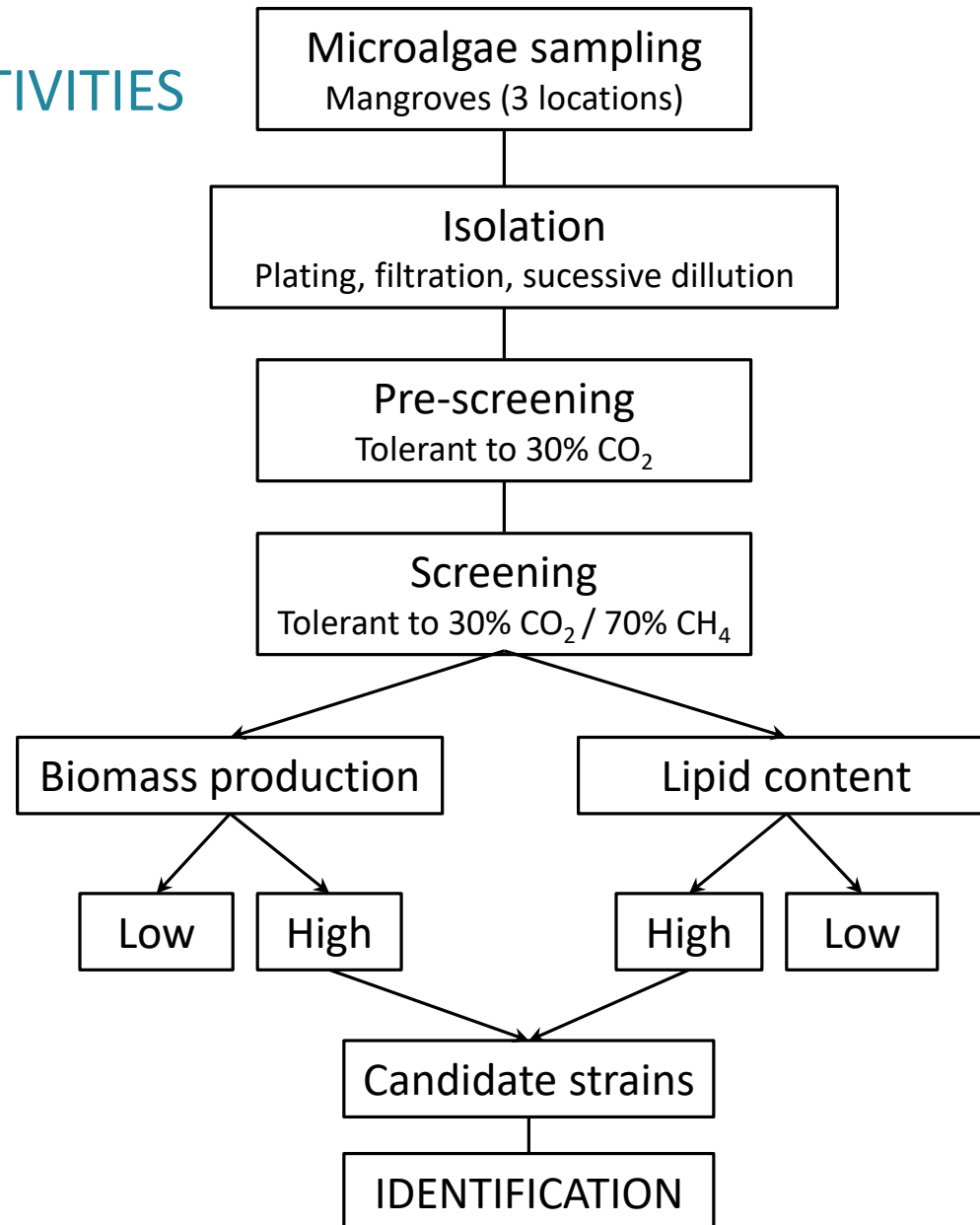


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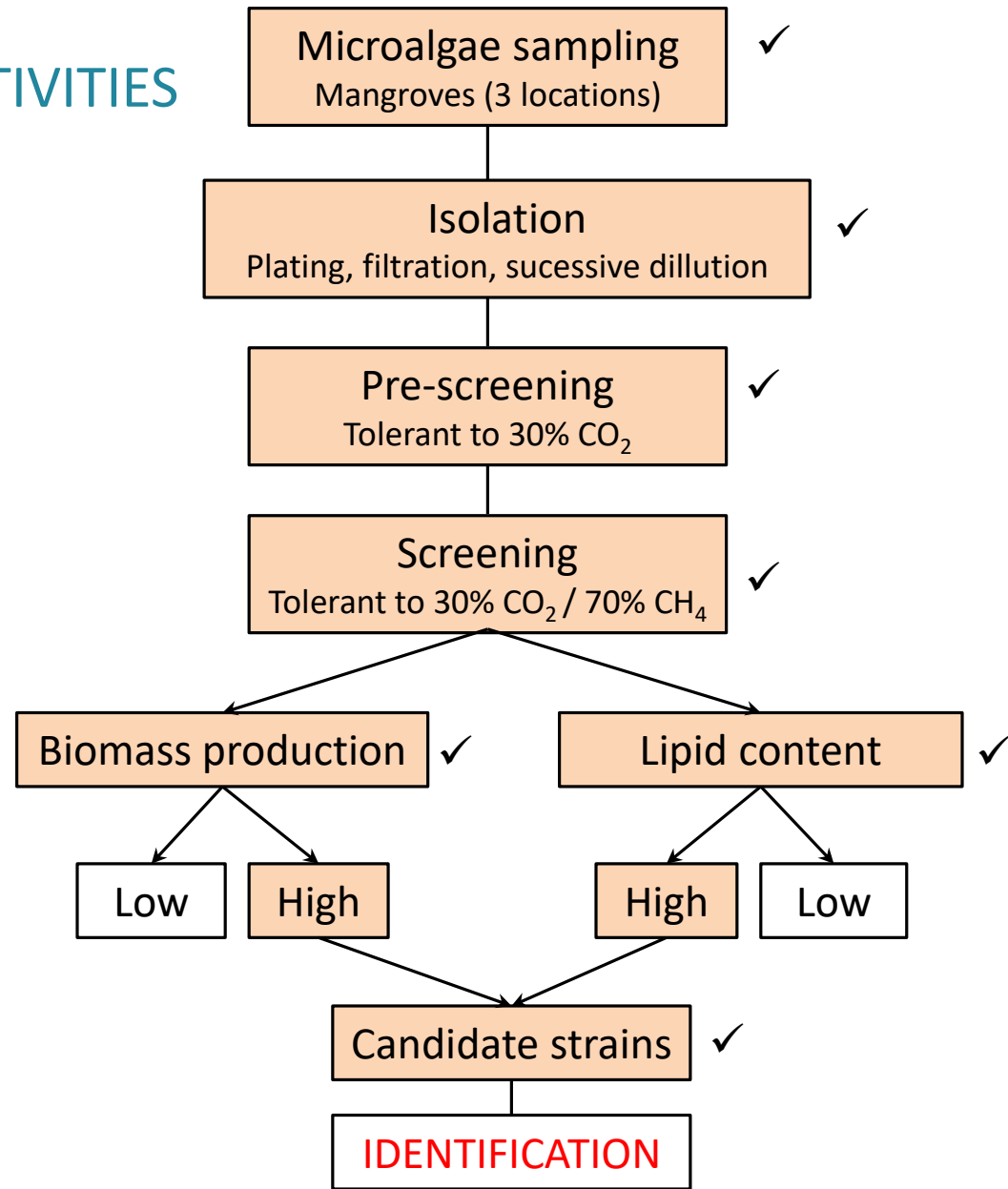
PLANNED ACTIVITIES

Part 1



PLANNED ACTIVITIES

Part 1



Scheme of microalgae isolation

Mangrove Collection



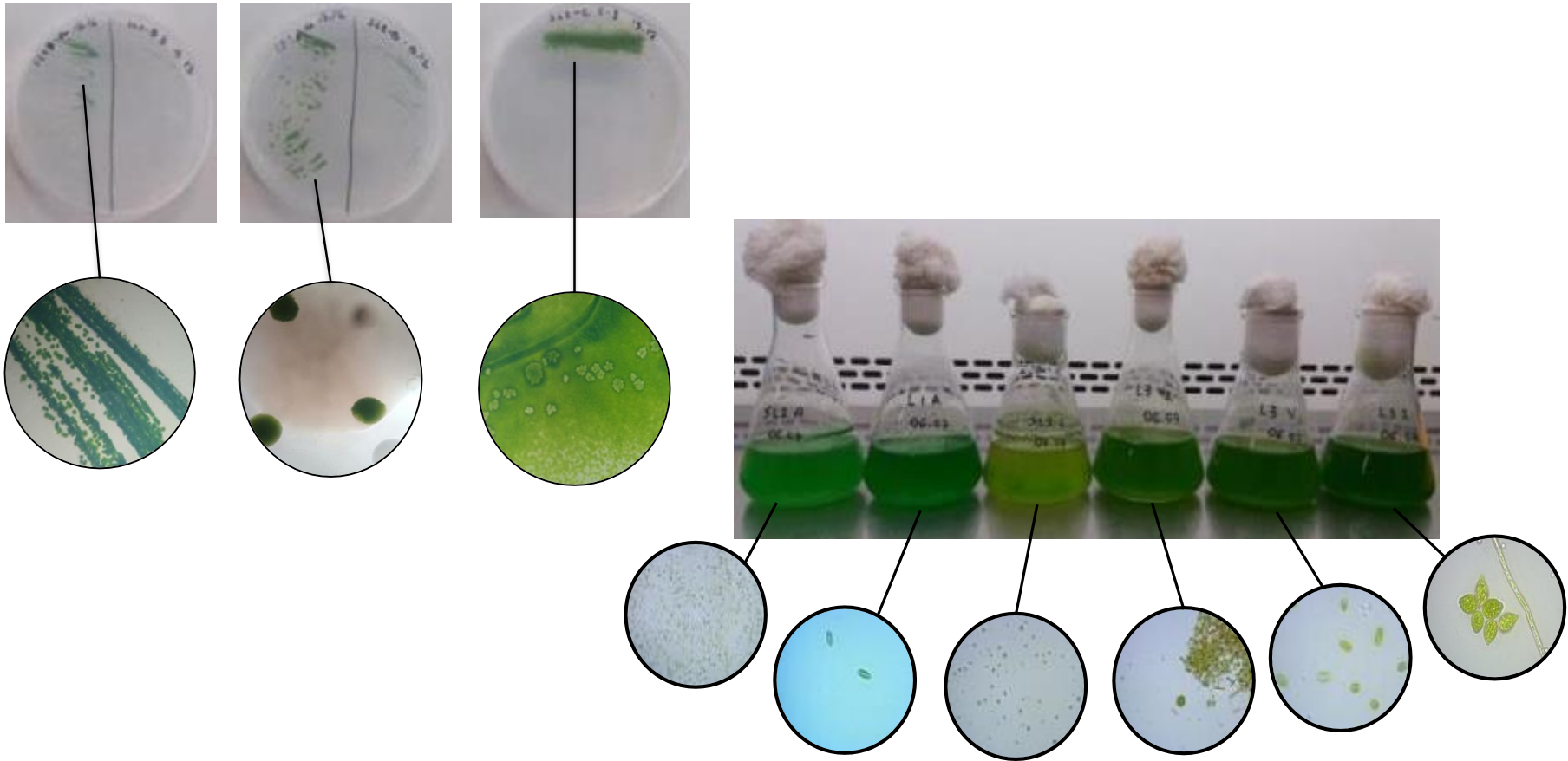
1 mL or 1 g



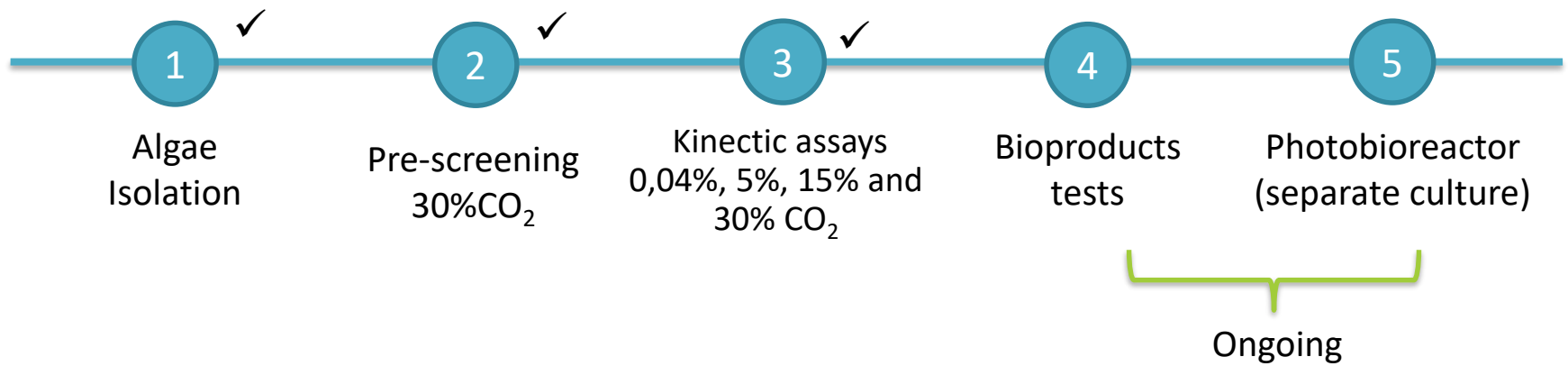
Cultivation in algae medium after growth



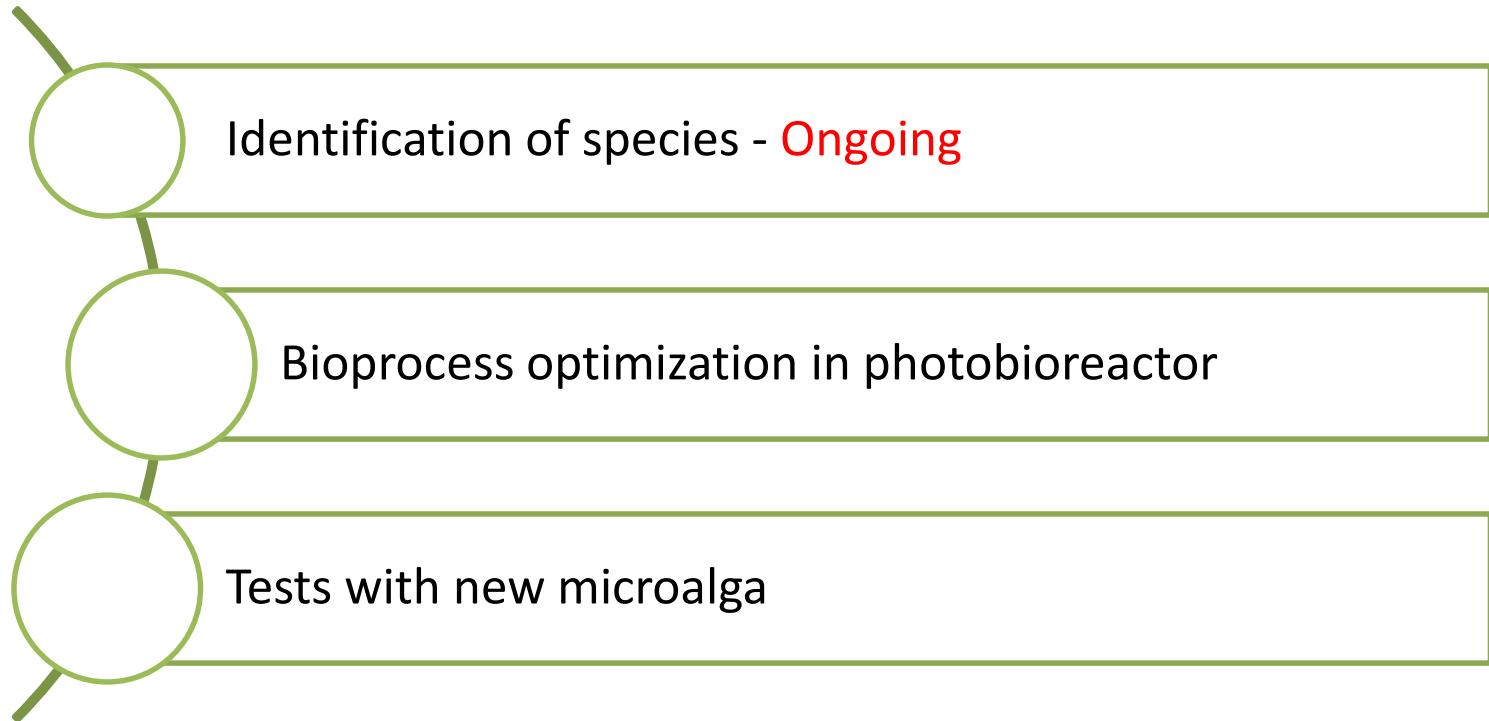
Microalgae culture in Petri dishes and small-scale flasks



PLANNED ACTIVITIES



Next steps





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