Proteins from micro- and macro-algae

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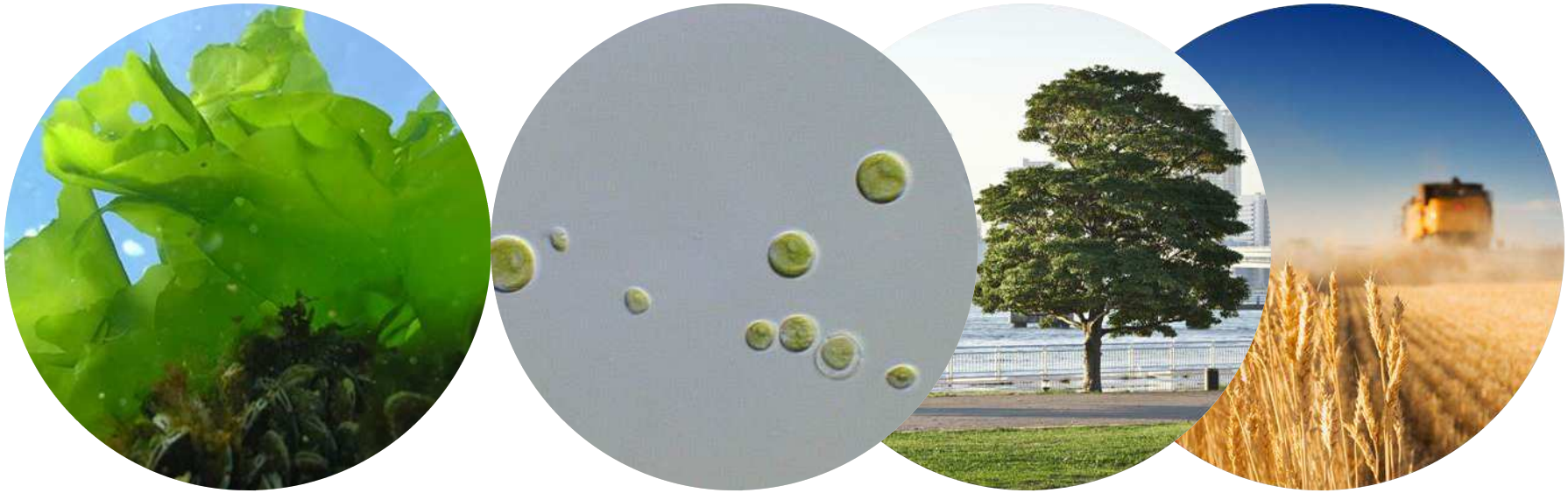

Content

- Background: Who is Richard?
- Introduction
- Aim of PhD
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Background

BASc Internship and Thesis:
E. coli cultivation
and immobilized affinity chromatography

MSc Thesis:
Modeling growth of *Chlorella sorokiniana*

MSc Internship:
Re-use versus Single-use TFF cassettes for Ultrafiltration / Diafiltration

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From oil...

€/kg

Diesel: € 0.50 L^{-1} (1)

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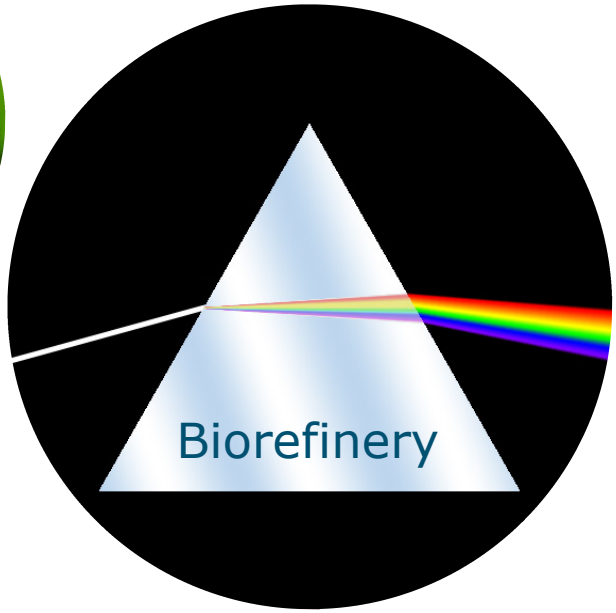
(1) Wijffels, R.H. et al. (2010)

... to Green Sources



Algae: € 4 kg^{-1} (1)

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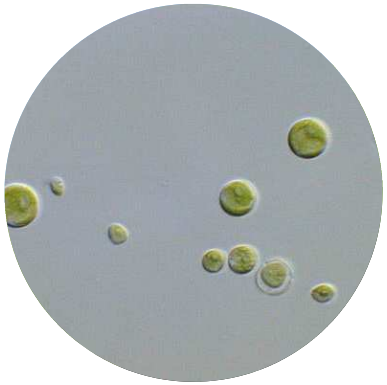
(1) Wijffels, R.H. et al. (2010)

Green source composition

	Lipids (wt%)	Proteins (wt%)	Carbohydrates (wt%)
Macroalgae (*Ulva*)	5	20	40
Microalgae (*Chlorella*)	15	50	25
Microalgae (*Chlorella*) [N-stress]	50	15	25

Aim of PhD

Development of a mild, continuous, scalable disruption and protein extraction technology with minimal energy requirements



Soluble

Insoluble

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Approach: Biomass

Macro-algae

- *Ulva lactuca*
  - PRI; group of Willem Brandenburg
  - Tanks in greenhouse

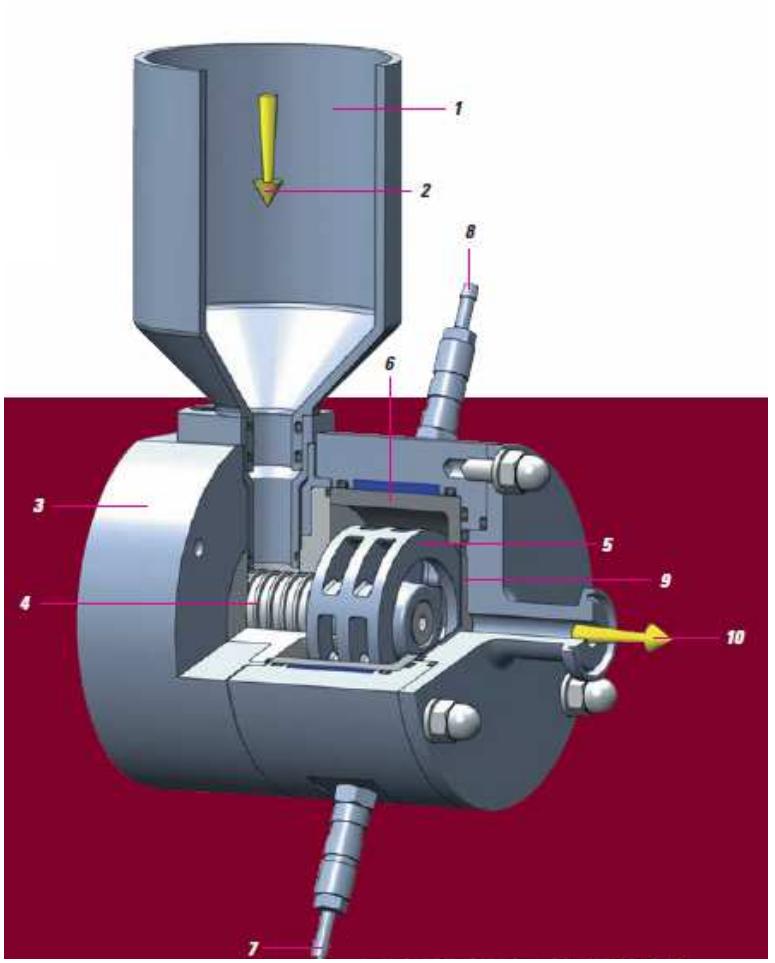
Microalgae

- *Chlorella vulgaris*
  - In-house at BPE
  - Batch cultivation
  - 15 L stirred tank reactor

1st half PhD: Mild disruption technology

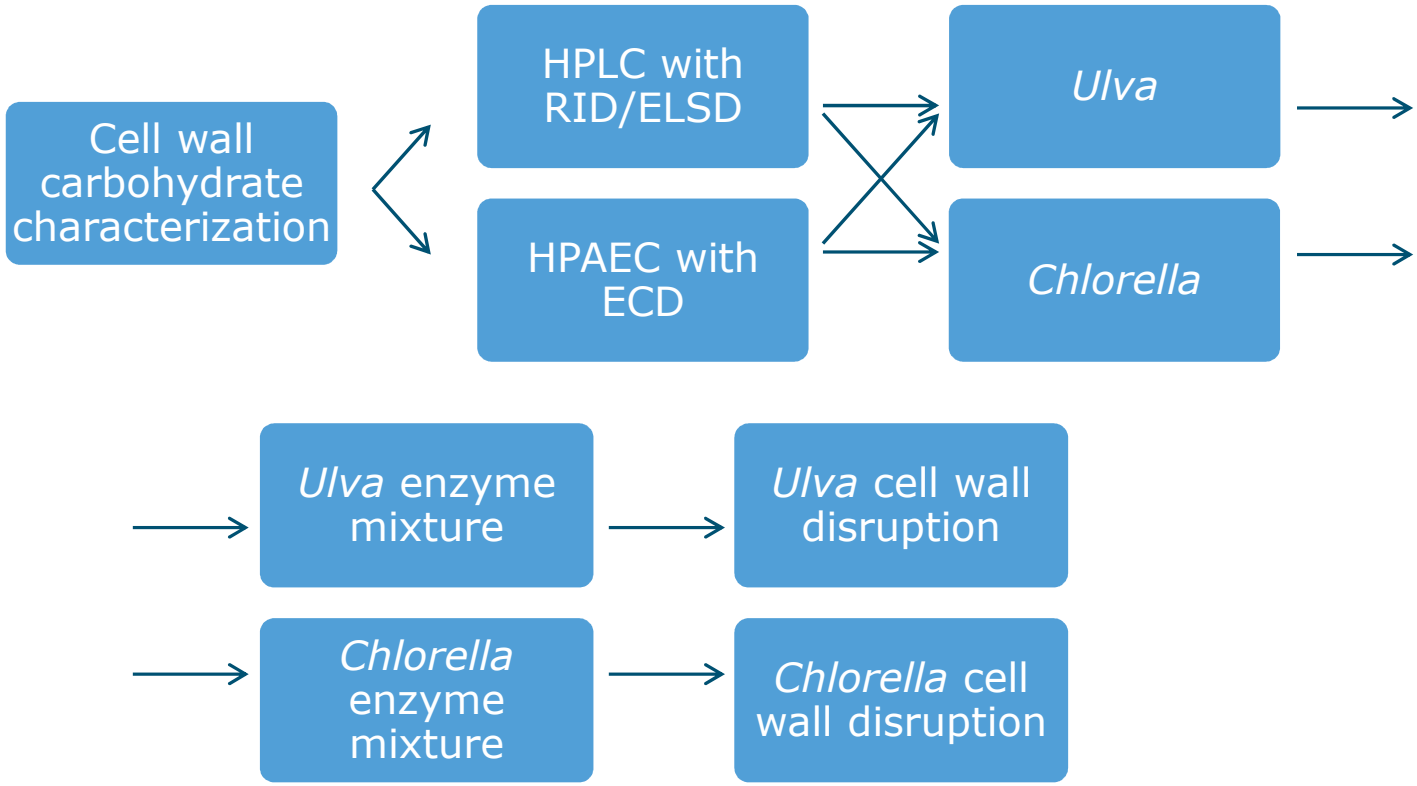
- Bead milling

Particle size	X
Bead size	~8-10 * X
Chlorella vulgaris	2-3 µm
Beads	20-30 µm



1st half PhD: Mild disruption technology

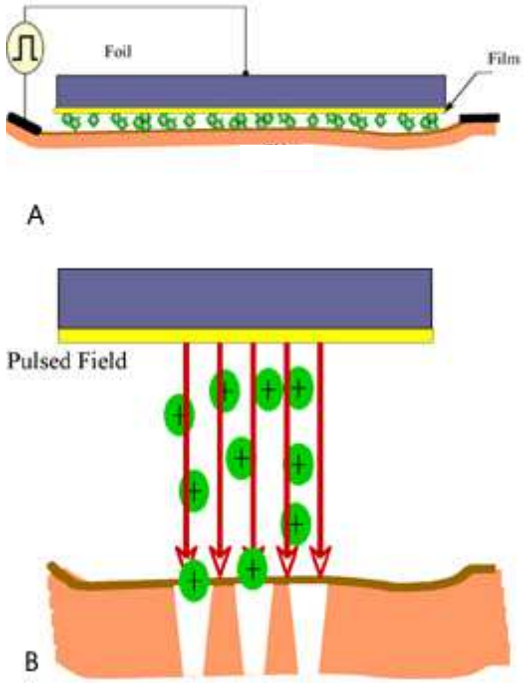
- Enzymatic disruption



1st half PhD: Mild disruption technology

- Pulsed Electric Field

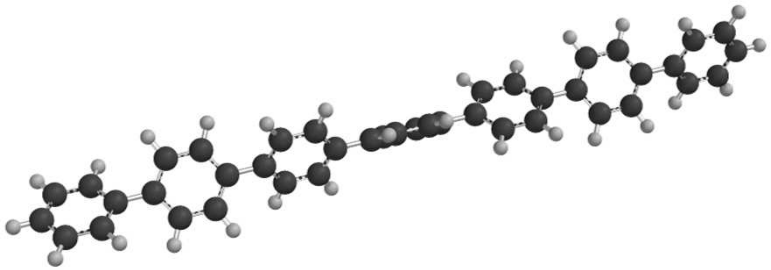
Parameters to be optimized
Biomass concentration
Electric Field strength
Exposure time to electric field
Conductivity of biomass



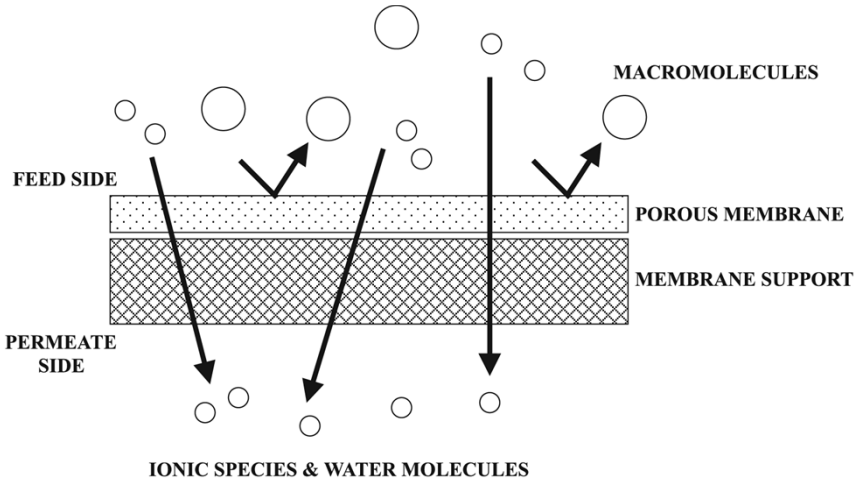
2nd half PhD

- Mild protein extraction
- Recovery of extractant
- Economical feasibility

Precipitation with polymers



Ultrafiltration



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Thank you for your attention

Are there any questions?