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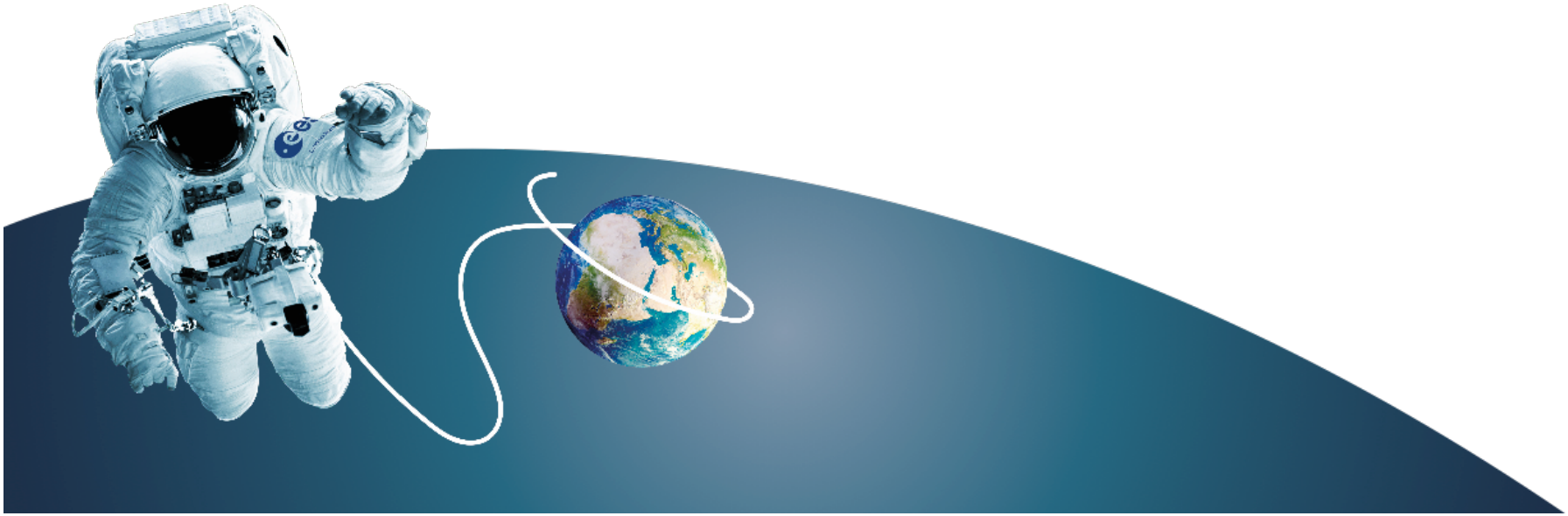
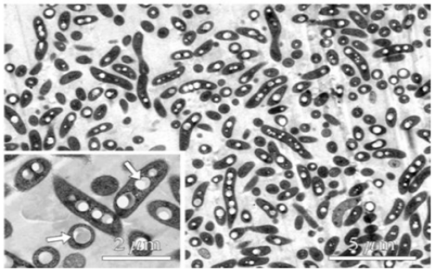
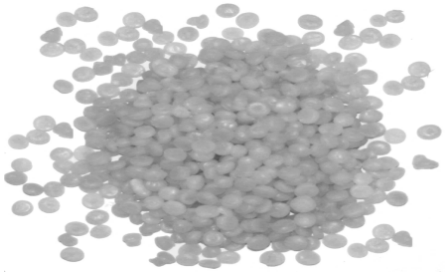
CREATING A CIRCULAR FUTURE

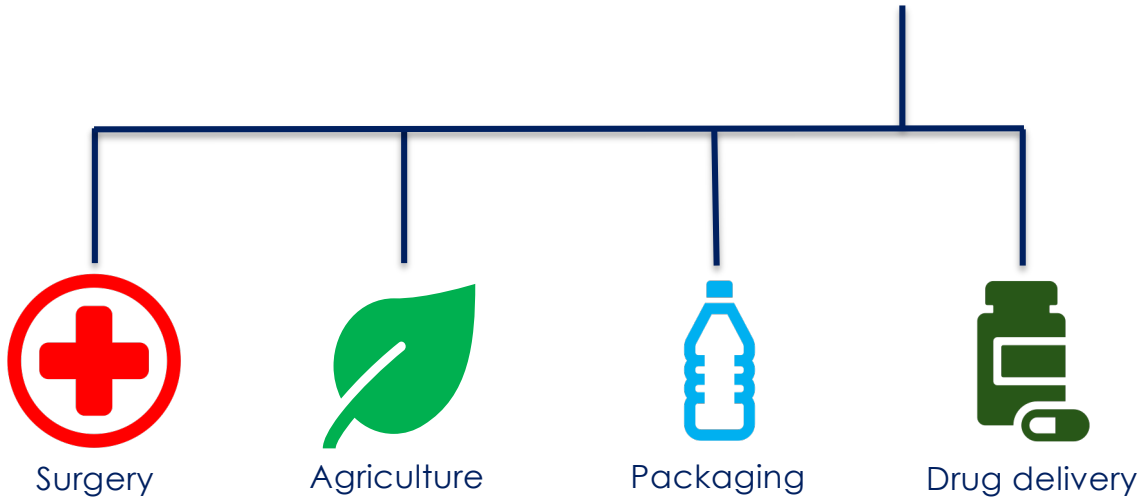
Impact of carbon source and light intensity on the production of PHA by *Rs. rubrum*



The polyhydroxyalkanoates







Current production

Contents lists available at ScienceDirect

Journal of Biotechnology

journal homepage: www.elsevier.com/locate/jbiotec

Polyhydroxyalkanoates production with *Ralstonia eutropha* from low quality waste animal fats

Sebastian L. Riedel[a,b,*], Stefan Jahns[a], Steven Koenig[a], Martina C.E. Bock[a], Christopher J. Brigham[c], Johannes Bader[d], Ulf Stahl[a,e]

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Process Biochemistry

journal homepage: www.elsevier.com/locate/procbio

Fatty acid composition and polyhydroxyalkanoates production by *Cupriavidus eutrophus* B-10646 cells grown on different carbon sources

Natalia Zhila[a,*], Galina Kalacheva[a], Tatiana Volova[a,b]

Journal of Polymer Research (2018) 25: 131
https://doi.org/10.1007/s10965-018-1521-7

ORIGINAL PAPER

Biosynthesis of polyhydroxyalkanoates using *Cupriavidus necator* H16 and its application for particleboard production

Piyaporn Khunthongkaew[1] · Paramasivam Murugan[2] · Kumar Sudesh[2] · Jutarut Iewkittayakorn[1]

Contents lists available at ScienceDirect

Algal Research

journal homepage: www.elsevier.com/locate/algal

Polymer accumulation in mixed cyanobacterial cultures selected under the feast and famine strategy

Dulce María Arias[a], Joana C. Fradinho[b], Enrica Uggetti[a], Joan García[a], Adrian Oehmen[b], Maria A.M. Reis[b,*]

Contents lists available at ScienceDirect

Water Research

journal homepage: www.elsevier.com/locate/watres

Insights into Feast-Famine polyhydroxyalkanoate (PHA)-producer selection: Microbial community succession, relationships with system function and underlying driving forces

Long Huang [a], Zhiqiang Chen [a], Qinxue Wen [a, *], Lizhi Zhao [a], Duu-Jong Lee [b, c], Lian Yang [a], Yao Wang [a]

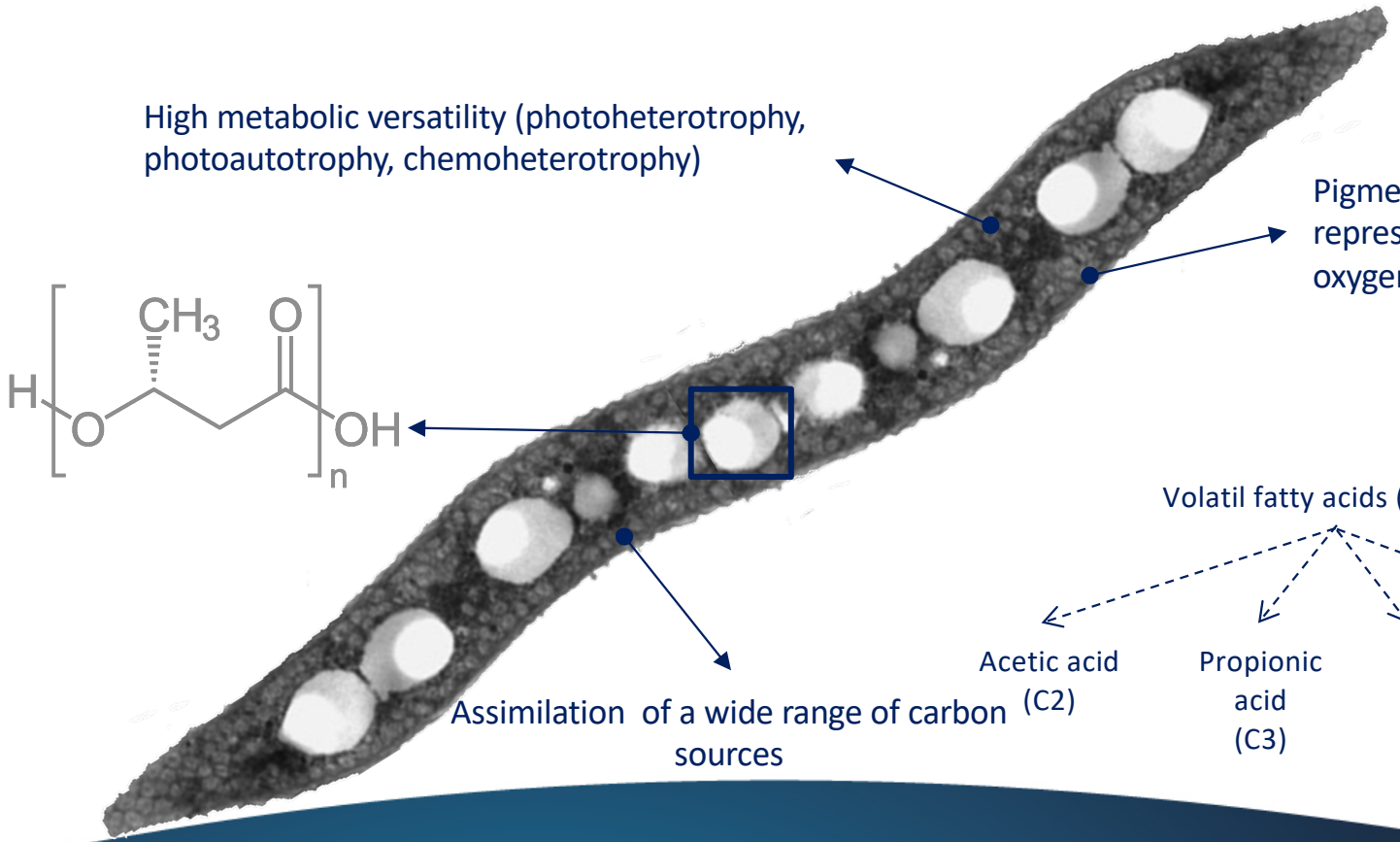
Applied Microbiology and Biotechnology (2018) 102:3133–3143
https://doi.org/10.1007/s00253-018-8799-6

BIOTECHNOLOGICAL PRODUCTS AND PROCESS ENGINEERING

Selecting optimal feast-to-famine ratio for a new polyhydroxyalkanoate (PHA) production system fed by valerate-dominant sludge hydrolysate

Jiuxiao Hao[1] · Hui Wang[1] · Xiujin Wang[1]

PHA production by *Rs. rubrum*



High metabolic versatility (photoheterotrophy, photoautotrophy, chemoheterotrophy)

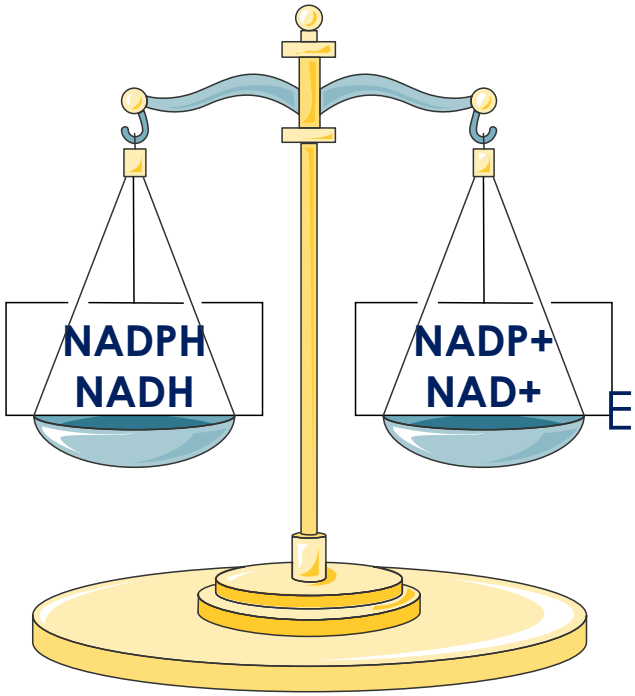
Pigment synthesis is repressed by the presence of oxygen

Assimilation of a wide range of carbon sources

Volatil fatty acids (VFAs)

- Acetic acid (C2)
- Propionic acid (C3)
- Butyric acid (C4)
- Valeric acid (C5)

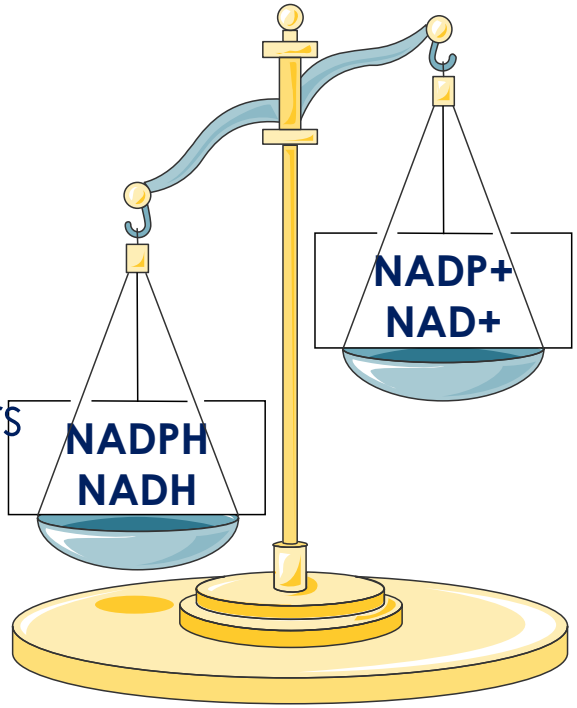
PHA production by *Rs. rubrum*



Intracellular balance between oxidised and reduced cofactors

Environmental factors

Electron sinks

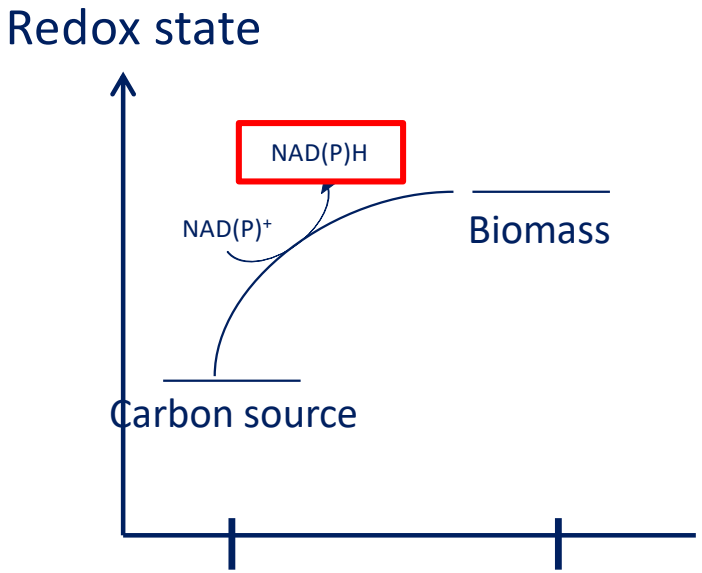


Intracellular imbalance between oxidised and reduced cofactors

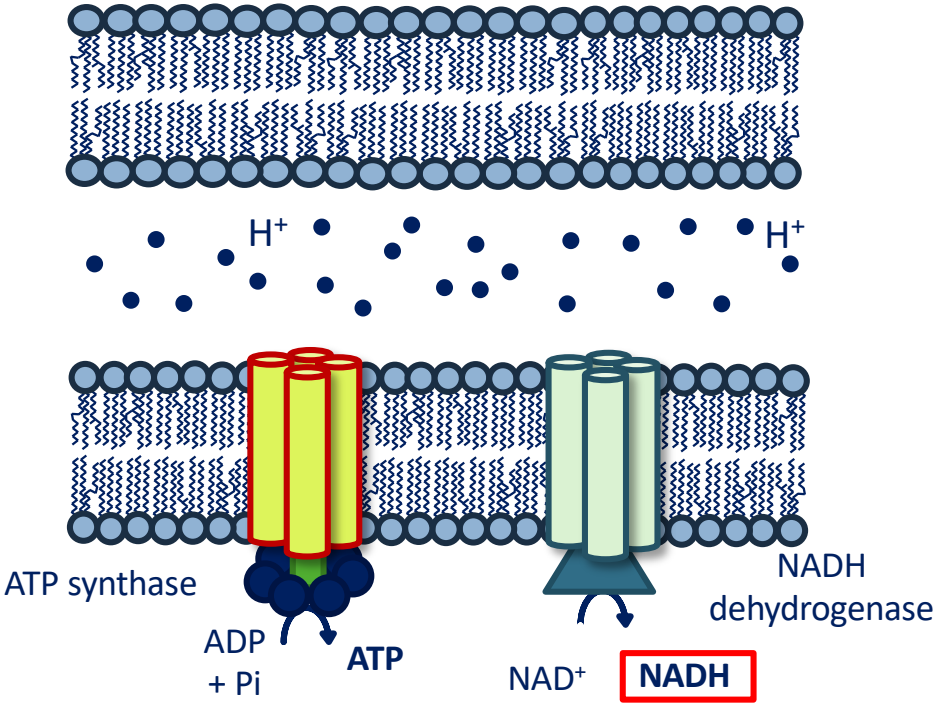
= Redox stress

PHA production by *Rs. rubrum*

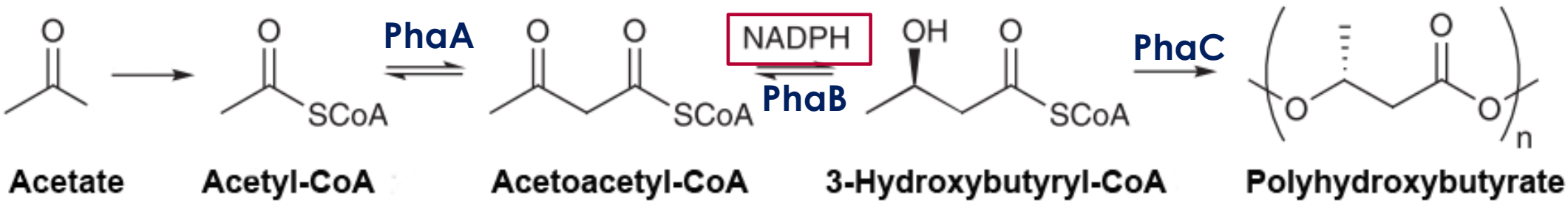
Reduced carbon sources



Photoreduction of NAD+



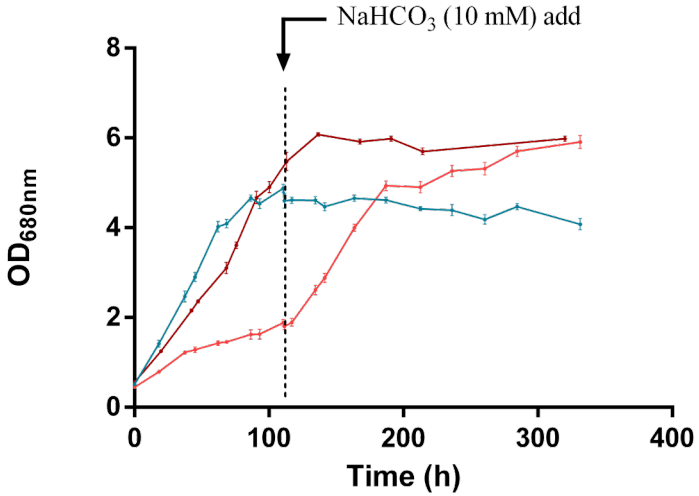
PHA production by *Rs. rubrum*

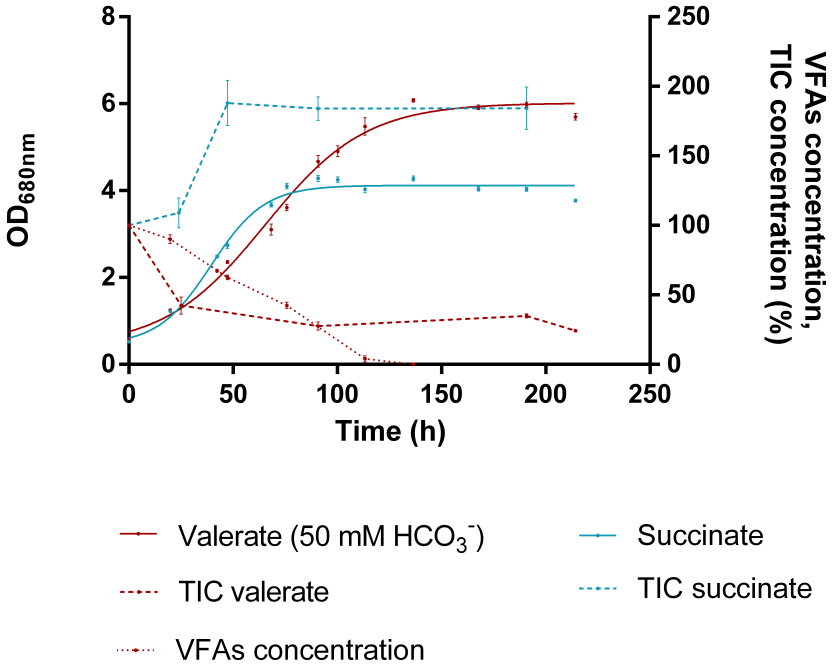


Use of reduced carbon source

Compounds	*Formule*	*Redox state*
Malate	$C_4H_6O_5$	+2
Pyruvate	$C_4H_6O_4$	+1
Acetic acid	$C_2H_4O_2$	0
Biomass	$CH_{1.7}O_{0.4}N_{0.2}S_{0.003}P_{0.01}$	-0,45
Propionic acid	$C_3H_6O_2$	-1
Butyric acid	$C_4H_8O_2$	-2
Valeric acid	$C_5H_{10}O_2$	-3

The assimilation of valerate



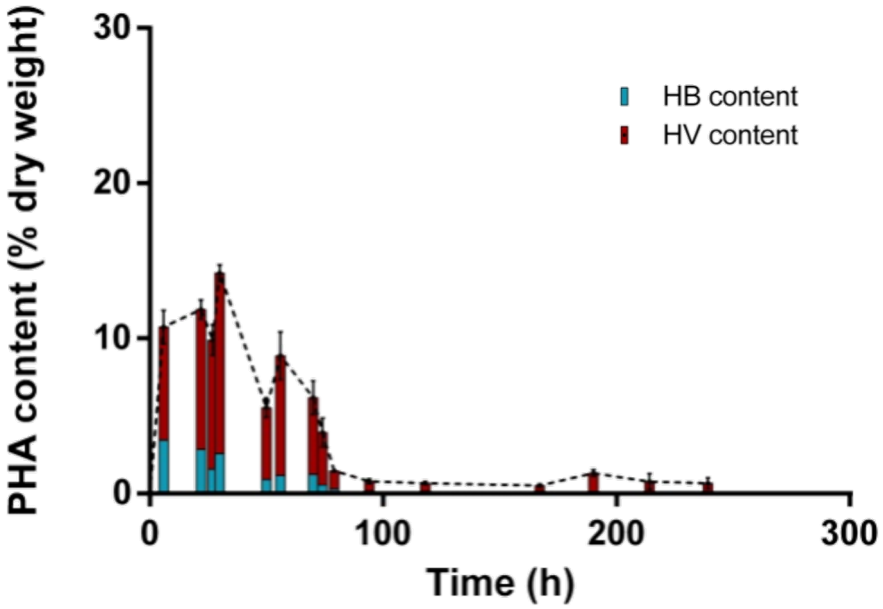


➡ Excess of HCO_3^- is mandatory for *Rs. rubrum* growth is presence of valerate

Scan to discover !

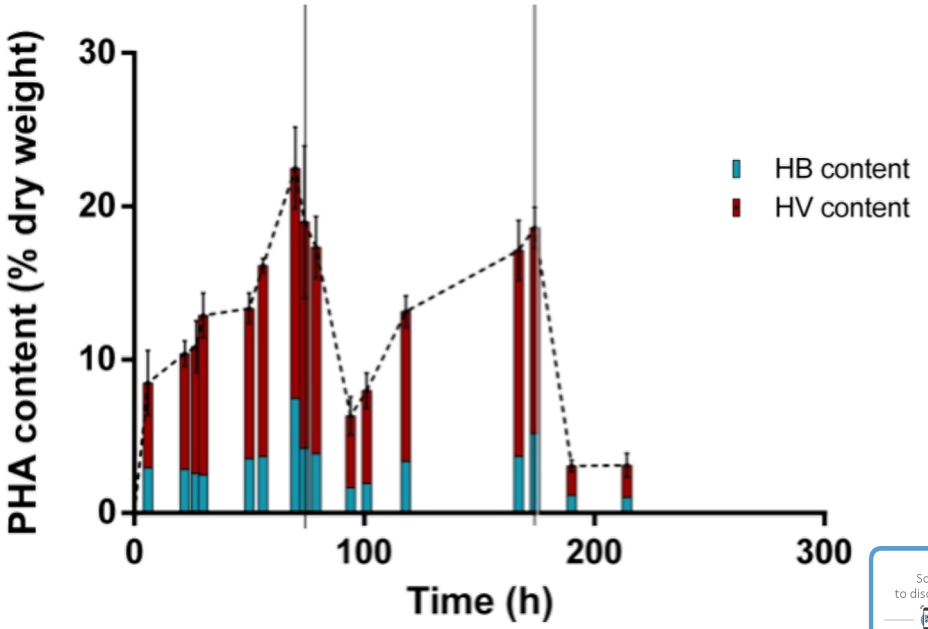
The assimilation of valerate

Excess of HCO_3^-



Progressive adding of HCO_3^-

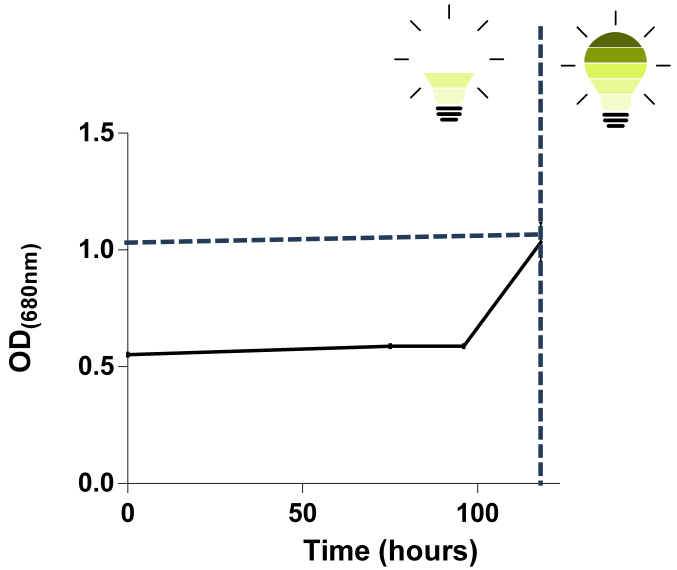
3mM HCO_3^- 3mM HCO_3^-



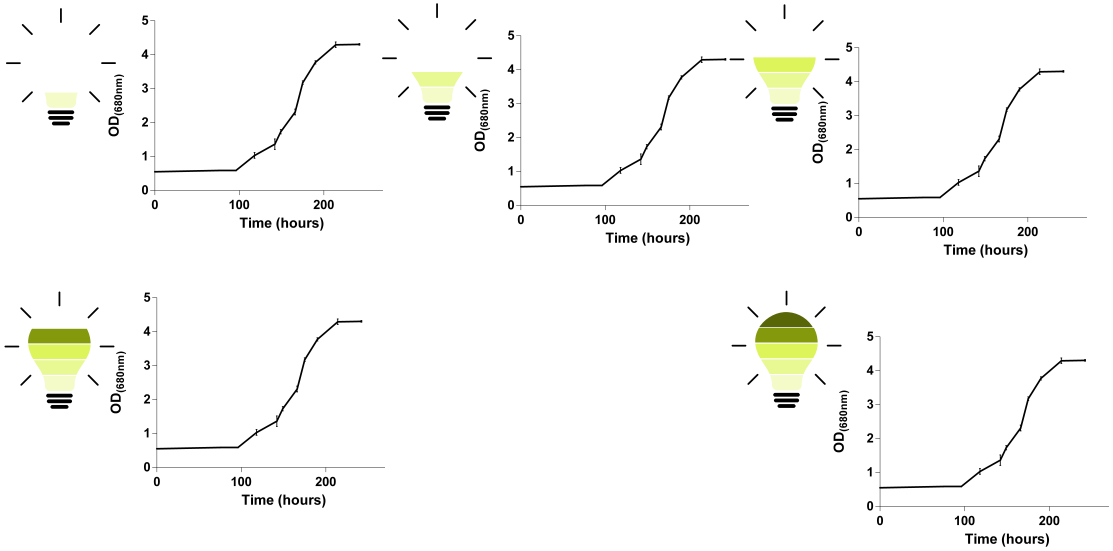
Scan to discover !

Impact of the light regime

Light stress experiment

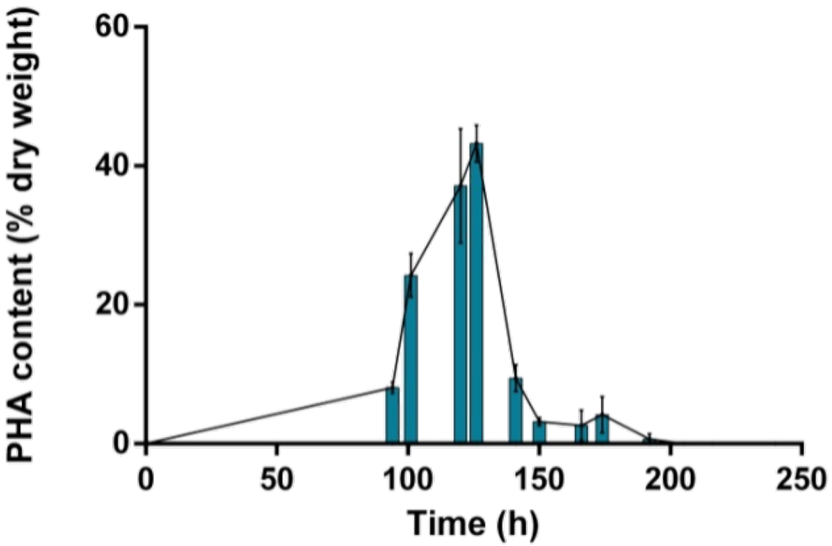


Different light intensities experiment

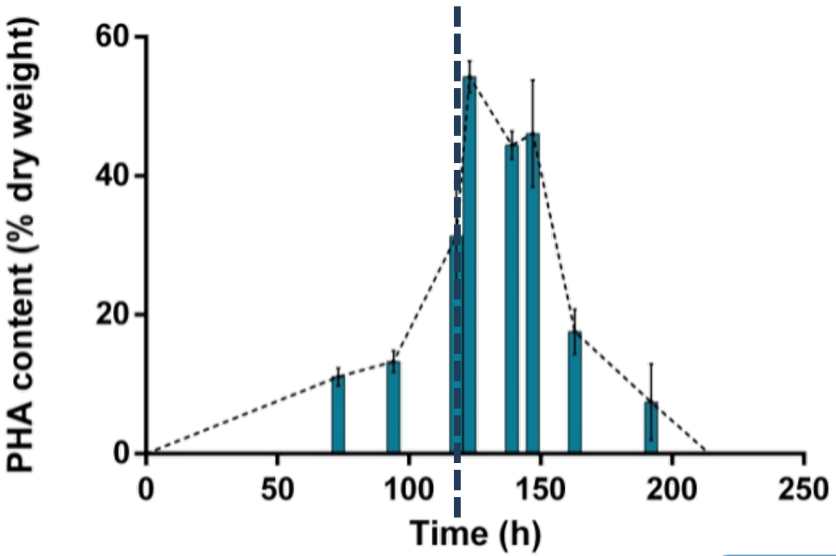


The light stress experiment

50µmol photons/m² s

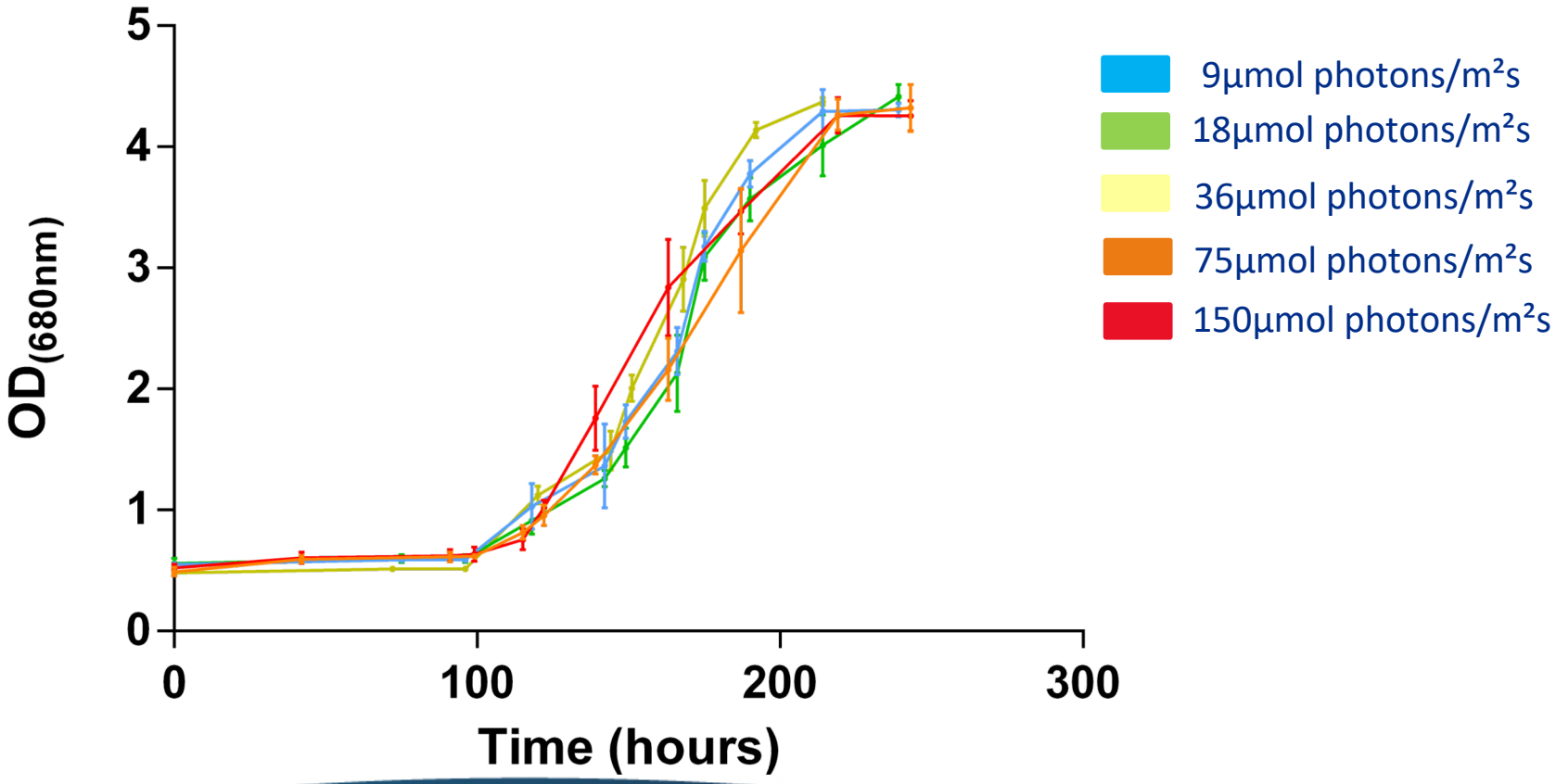


50 → 150µmol photons/m²s

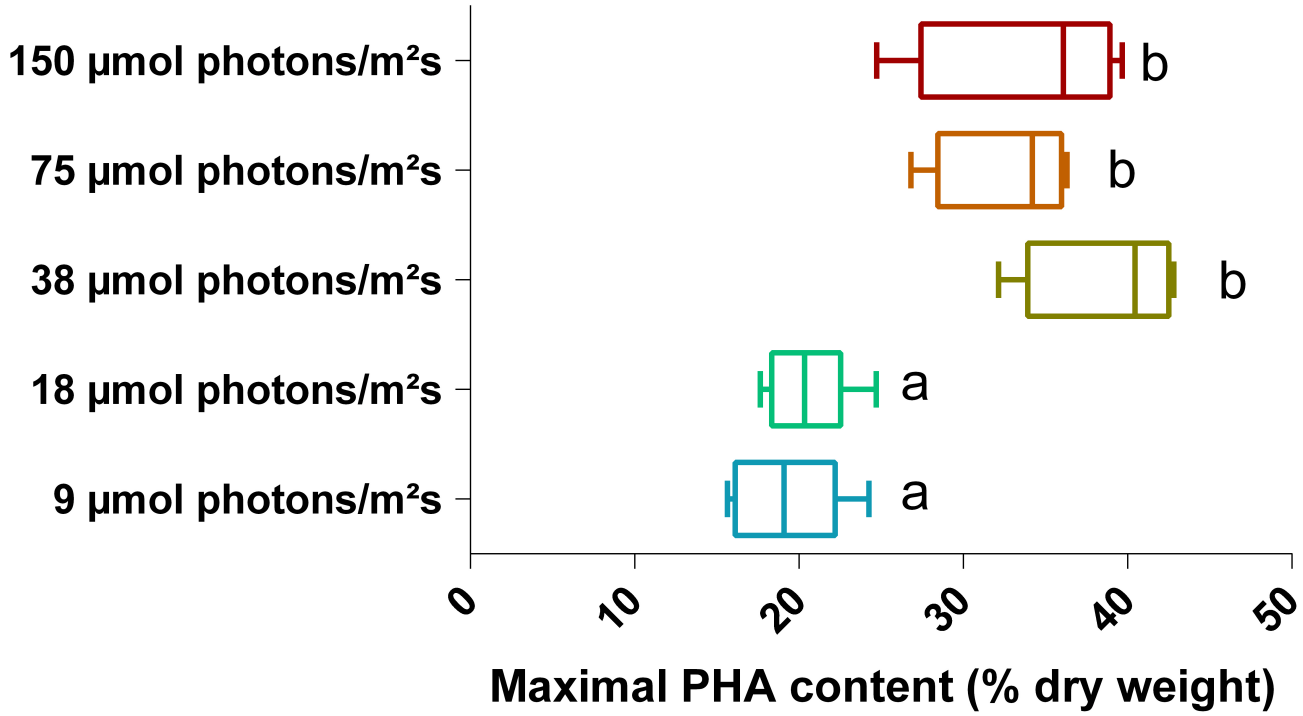


Scan
to discover !

Different light intensities



Different light intensities



Impact of a mix of VFAs

Contents lists available at ScienceDirect

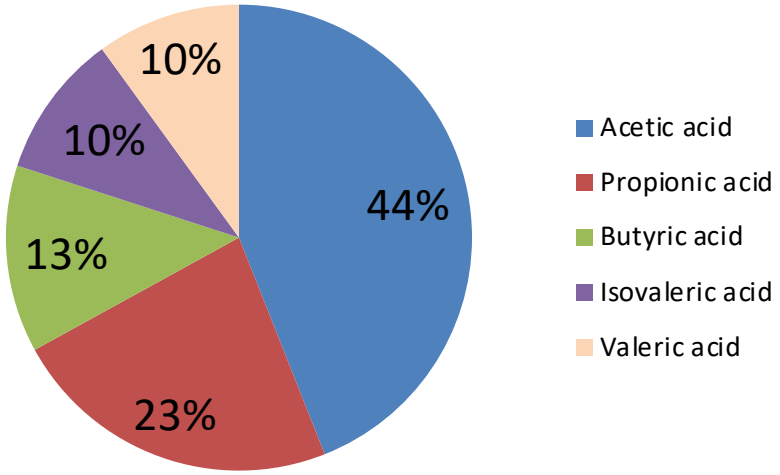
Bioresource Technology

journal homepage: www.elsevier.com/locate/biortech

Production of carboxylates from high rate activated sludge through fermentation

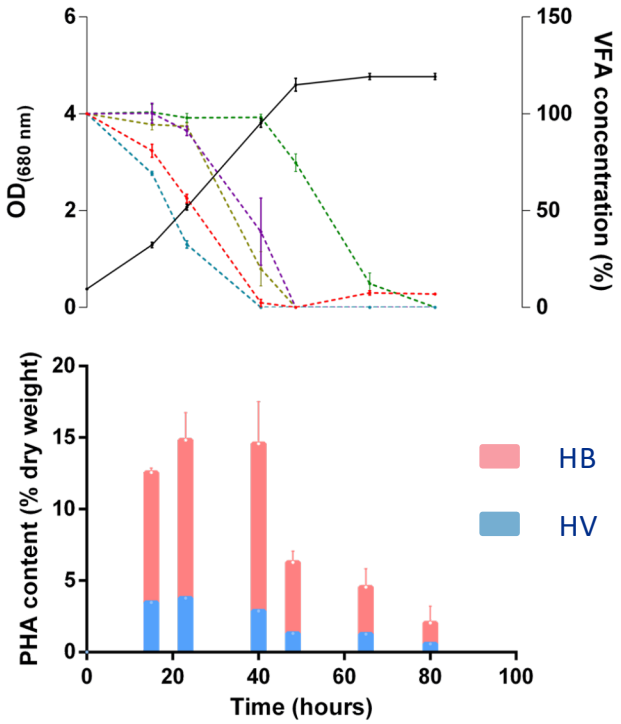
C. Cagnetta [a], M. Coma [a,1], S.E. Vlaeminck [a,b], K. Rabaey [a,*]

[a] Laboratory of Microbial Ecology and Technology (LabMET), Ghent University, Coupure Links 653, B-9000 Ghent, Belgium
[b] Research Group of Sustainable Energy, Air and Water Technology, University of Antwerp, Groenenborgerlaan 171, 2020 Antwerpen, Belgium

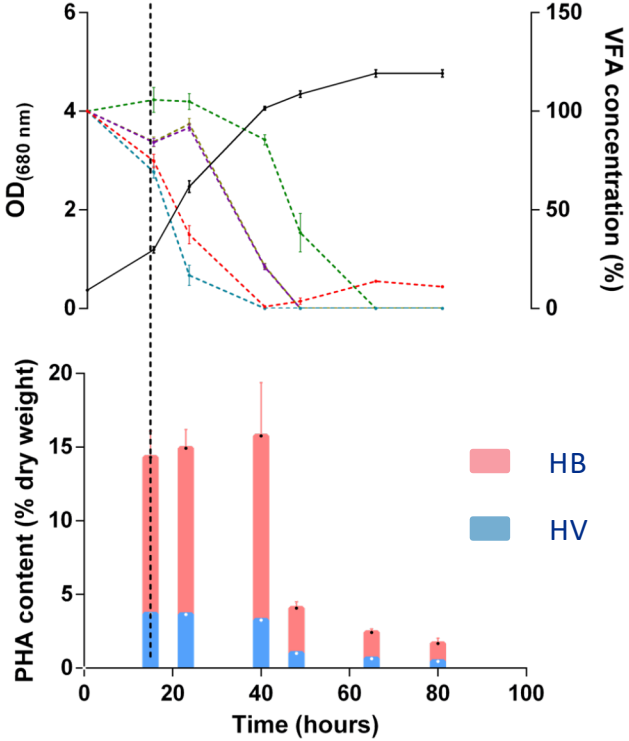


Impact of a mix of VFAs

50µmol photons/m² s

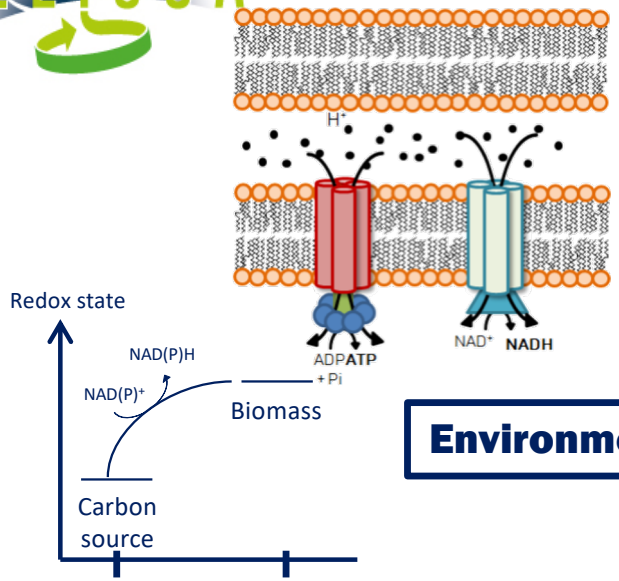


50 → 150µmol photons/m²s

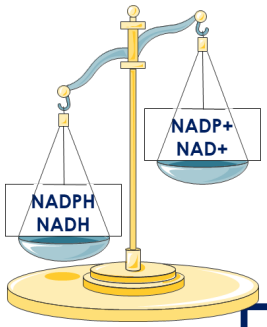


Conclusion and perspectives

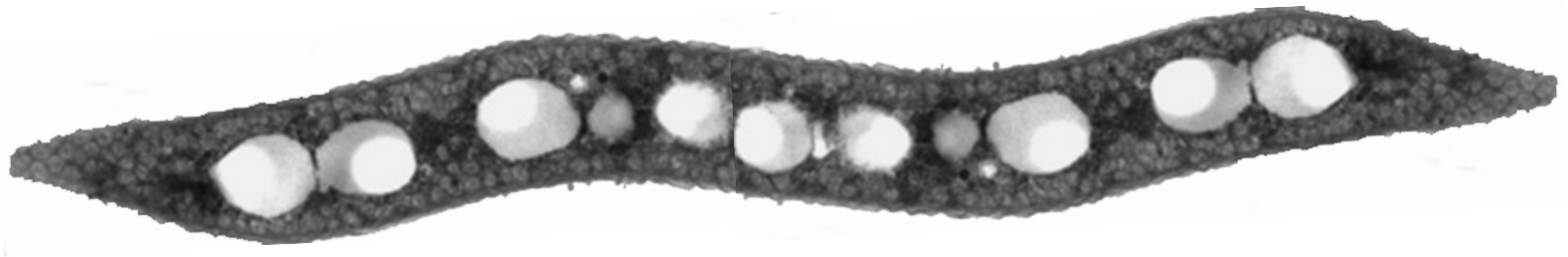
Conclusion



Environment

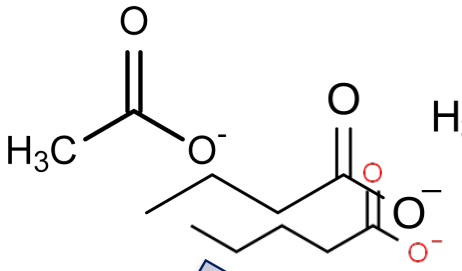


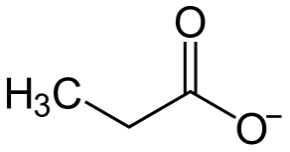
Intracellular redox state



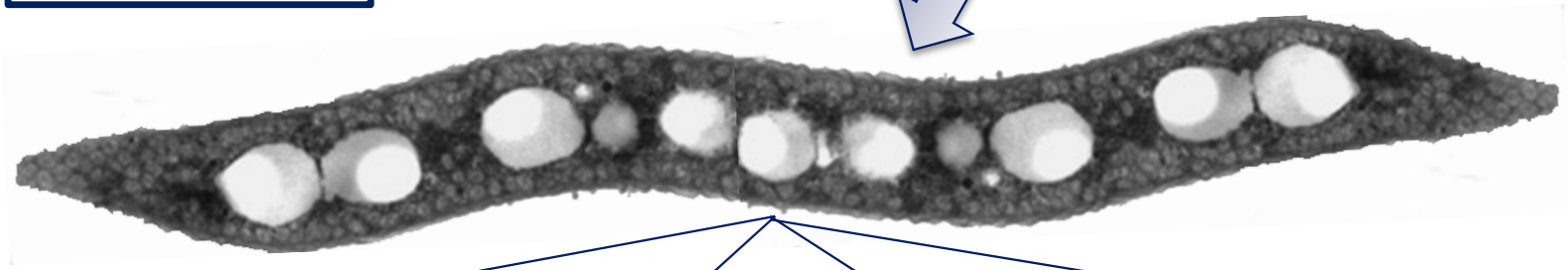
Perspectives

Fermentation phenomenon





Volatile fatty acids



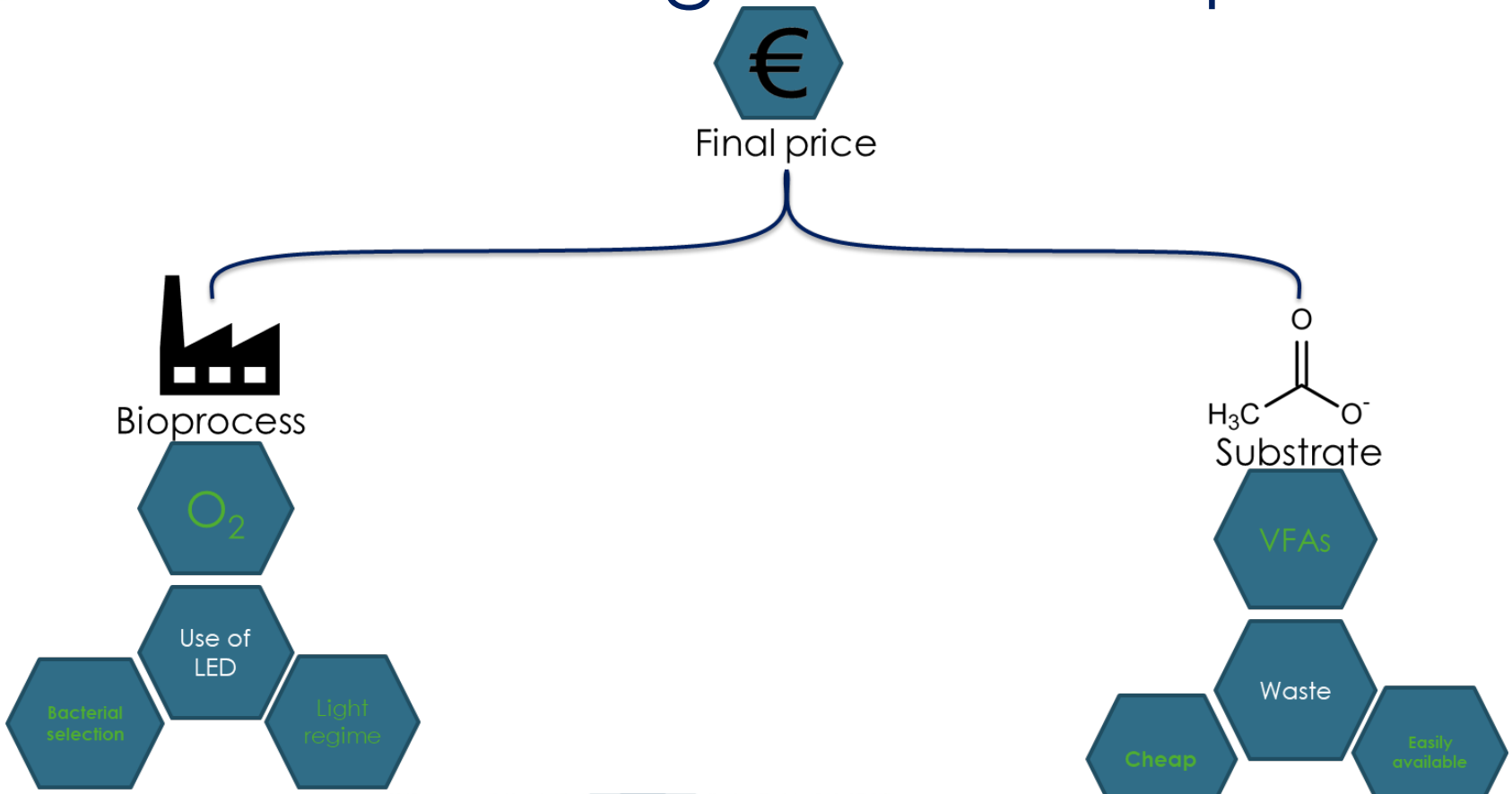
PHAs

Pigments

Biomass

5-aminolevulinic acid

The advantage of our bioprocess



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THANK YOU.

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