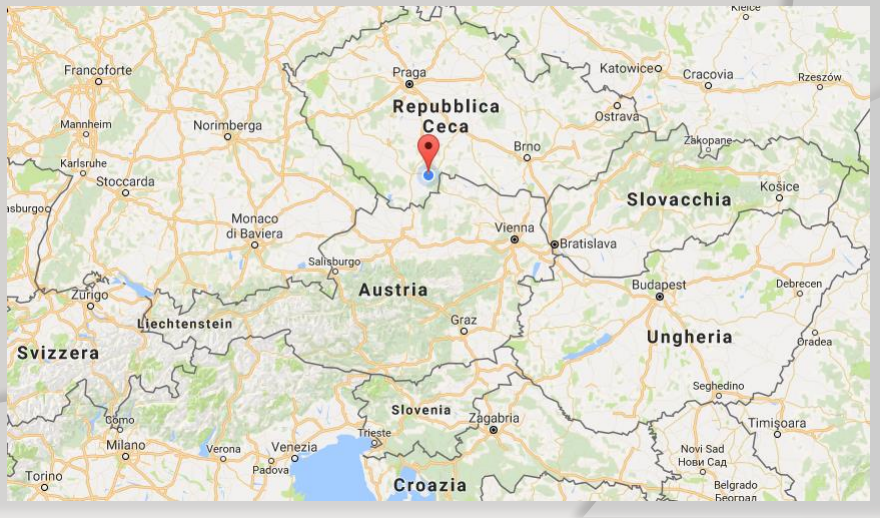
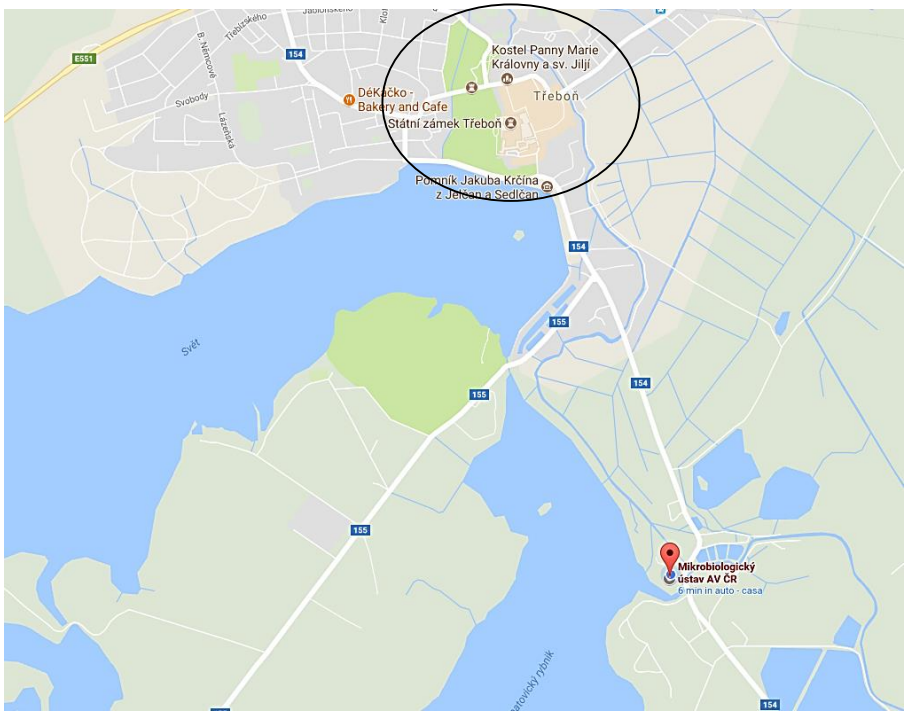
ALGATECH Centre for Algal Biotechnologies

Centre Algatech

Algatech Třeboň
Institute of Microbiology
Academy of Sciences of the Czech Republic
www.alga.cz





Algatech Třeboň

Prof.Ivan Šetlík 1928-2009

pioneer of algal biotechnology and photosynthesis research in Czechoslovakia

Algal research institute established in 1960 in Trebon

main goal – production r huma on

complex research in ogy
- collection and testing s
- genetics
- physiology thesis)
- cell biolo synchr
- biotechn

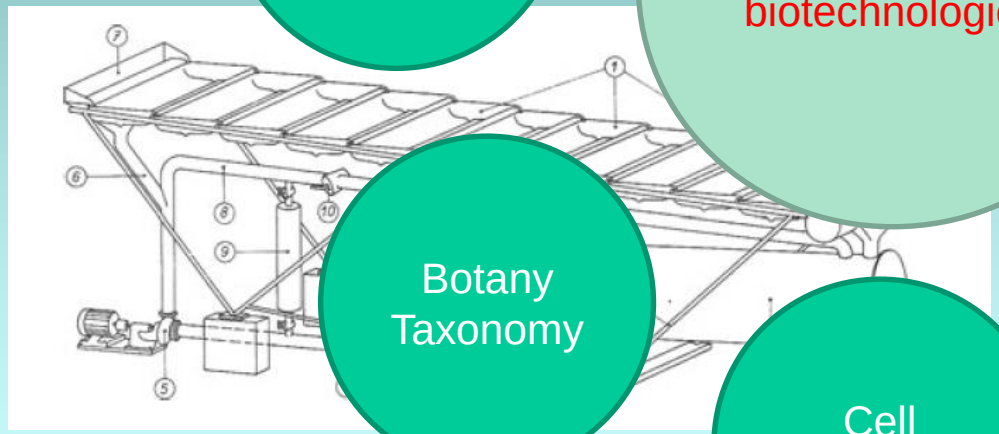
Physiology

Molecular biology

Genetics

Algal biotechnologies

Biophysics



Botany Taxonomy

Cell biology

Biochemistry

Algatech Třeboň in 2017

Laboratory of Algal Biotechnology
Laboratory of Algal Cell Cycles
Laboratory of Photosynthetic Bacteria
Laboratory of Photosynthesis

Laboratory of Algal Biotechnology in Třeboň

Research topics

- Design and construction of cultivation systems
- Heterotrophic growth of microalgae
- Screening and characterisation of microalgal strains
- Optimisation of culturing regimes for microalgae cultivation
- Development of analytical techniques
- Identification and characterisation of bioactive compounds (potential pharmacol. use)

1990s – thin-layer outdoor circulating cascades
One of the most efficient phototrophic systems for microalgae cultivation and biomass production

High productivity (per area & per volume)
Surface/volume ratio >100 m^{-1}

Thin-layer cascade - demonstration unit of 90 m^2

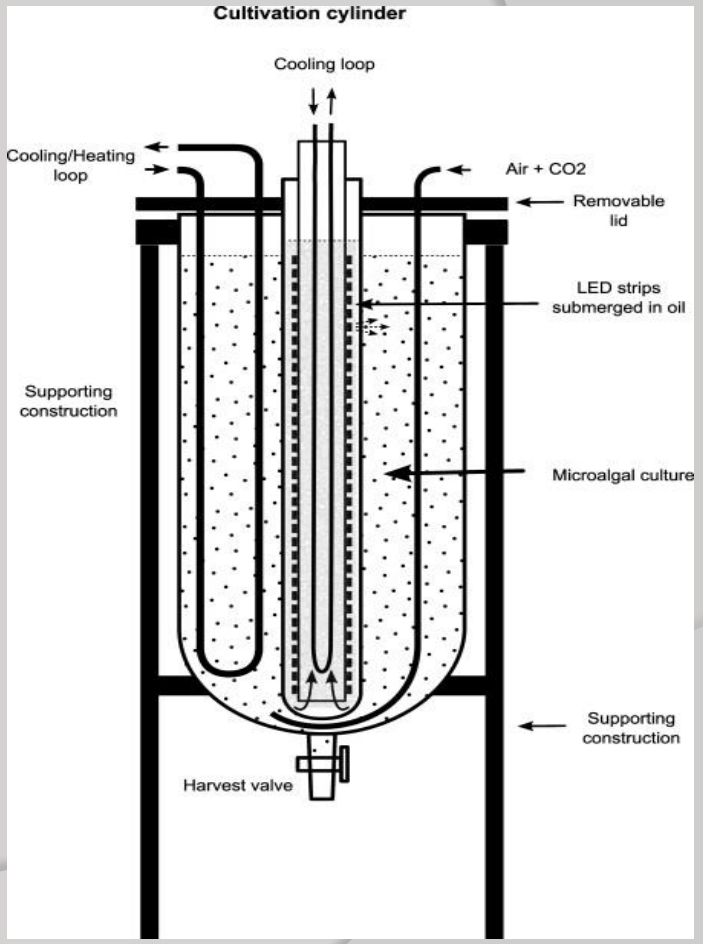
Phototrophic production of microalgal biomass
Třeboň 2014
made of corrosion-resistant materials

High-quality biomass used as health food:

- Grown under high-irradiance in thin-layer
- Drinking water
- Food grade chemicals
- Unpolluted environment

Column photobioreactor with internal LED illumination prototype built in 2013 - 100 litres

Cultivation of sensitive microalgal strains under controlled conditions
Modular system for large-scale production.



Laboratory of Algal Biotechnology
Institute of Microbiology AVČR, v.v.i., Třeboň
masojidek@alga.cz

ALGATECH

Biotechnology hall
Fermenters for heterotrophic production of microalgal biomass, IMIC Třeboň

Laboratory of Algal Biotechnology
Institute of Microbiology
Třeboň, Czech Republic

Identification and characterisation of bioactive compounds for pharmacological use

Culture collection

Cultivation

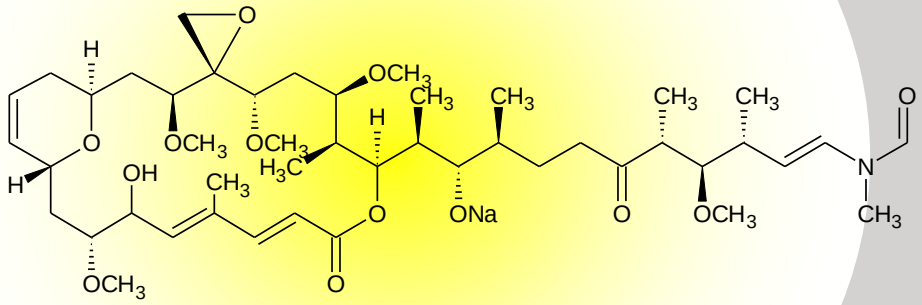
Extraction

Bioassay

Analysis
Fractionation
Purification

Structure

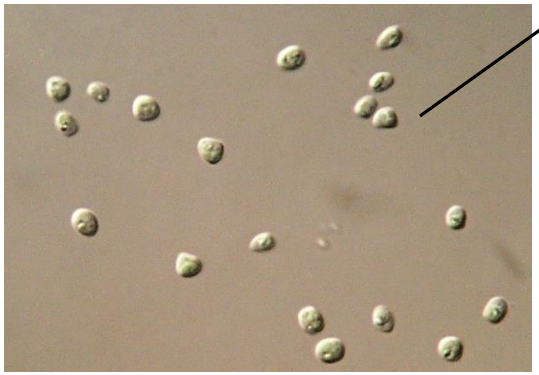
Cyanobacterial lipopeptides

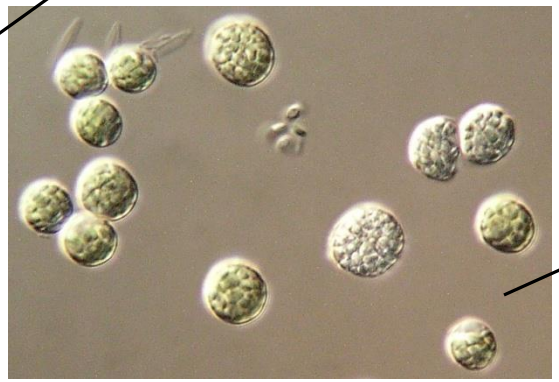


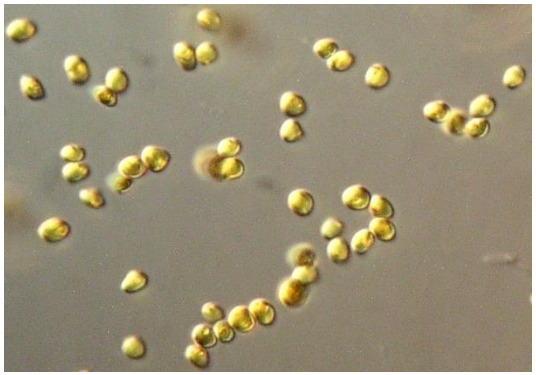
Tumor-lethal compound

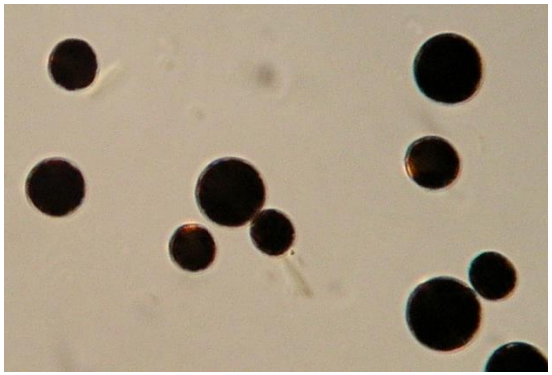
Laboratory of **Algal Cell Cycles**
Institute of Microbiology
Třeboň, Czech Republic

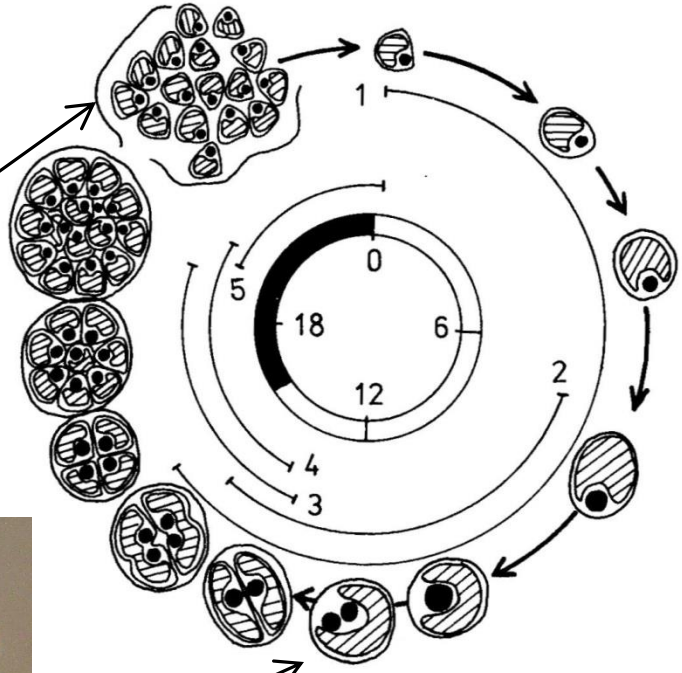
- Phase of cell cycle
- Intensity of illumination
- Presence of specific inhibitors
- Nutrient starvation











Cell Cycle Regulation

Starch content

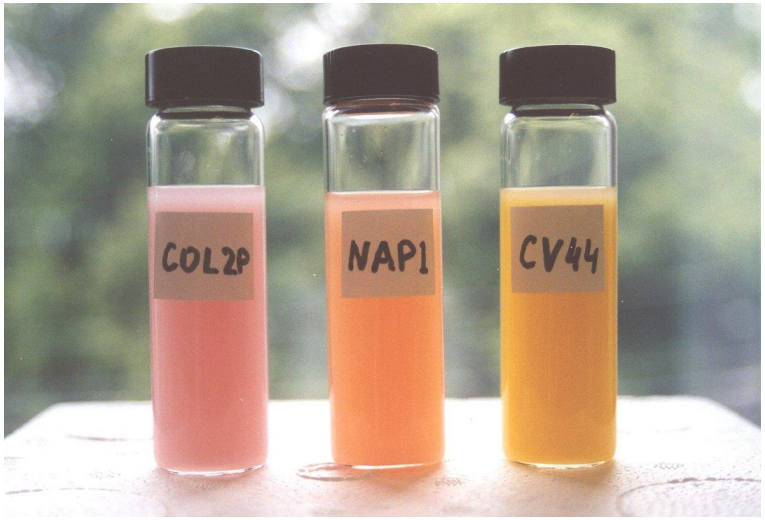
Laboratory of **Aerobic Anoxigenic phototrophs**
Institute of Microbiology
Třeboň, Czech Republic

Strict aerobes

Bacteriochlorophyll *a* (BChl *a*) + carotenoids

Photoheterotrophic metabolism

Proteobacteria



Lab photosynthesis

Prof.Josef Komenda

Photosystem II assembly / repair
Syn PCC6803

Dr. Roman Sobotka

Chlorophyll synthesis
Syn PCC6803

Prof. Ondřej Prášil

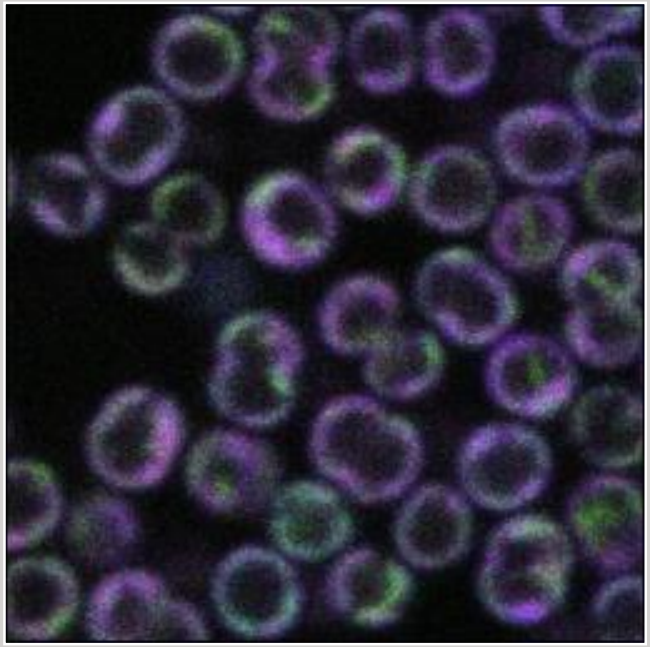
Algal ecophysiology

Dr. Radek Kaňa

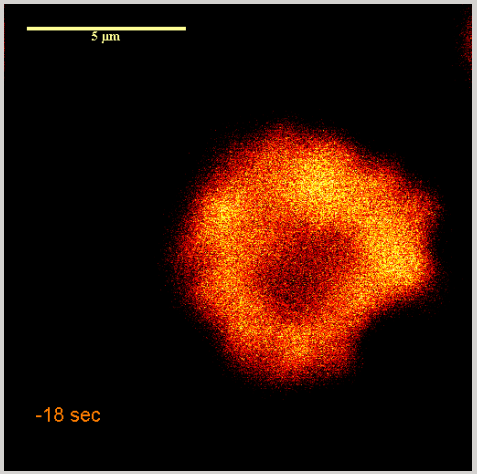
Dynamics of Photosynthetic Membranes

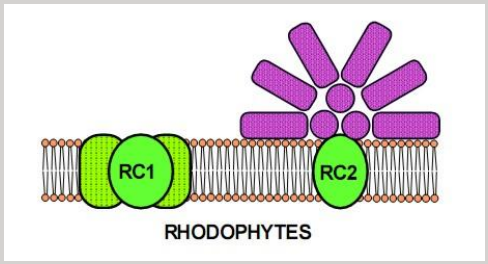
Dynamics of Photosynthetic Membranes

Structure ⟷ Dynamics ⟷ Function

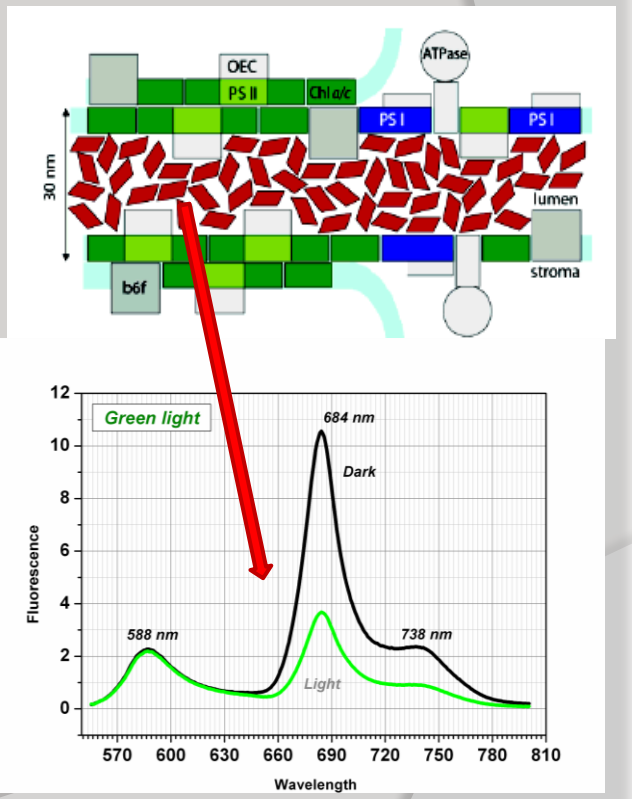


Thylakoid membrane structure





Protein mobility



Protein photoprotection - NPQ


THANKS FOR
LISTENING!!

ABSTRACT OF VACANCY CALL

Post-Doc position

"Photoprotective antenna protein dynamics: from live cells to algal proteoliposomes".

Research area: Membrane protein biochemistry, biophysics, photosynthesis, microscopy.

Deadline for applications: 1st of December 2017.

Interested applicants should send their CV plus motivation letter and names of 2 referees to: belgio@alga.cz