

Microalgae Technology for the future

Zoltan Kerenyi, Kornel Burg, Silvia Fluch

AIT Austrian Institute of Technology GmbH, Health & Environment Department, Seibersdorf, Austria

zoltan.kerenyi.fl@ait.ac.at

Silvia.Fluch@ait.ac.at

INTRODUCTION

Microalgae biotechnology is one of the most promising applications which uses living cells for production of valuable materials such as biodiesel or pigments. Further advantage of this system is the possibility of CO₂ sequestration. Although micro algae biotechnology has a long history, its scientific background is very deficient. There are many fundamental questions unanswered.

The Alga Technology Lab established is part of the Department of Health & Environment in AIT. The main goal of the Lab is to support the algae biotechnological industry by molecular and biological R&D activities. Our overall objective is to select and/or develop alga strains with high economical impact suitable for industrial applications.

R&D in microalgae biotechnology

- Production of new materials
- Improving/optimizing existing systems
- Solving technological difficulties.

Biological elements of microalgae

- Microalgae strains from different environments
- Setups to impact the metabolism of the algae cells

General Algae R&D activities at AIT

- Algae strain collections
- Culturing technology at different scales
- Biotechnology & Molecular analytics
- Physiological measurements
- Compound analytics

Services and Know-How

- Isolation of microalgae strains from the environment
- Screening of the strains for the desired traits
- Optimize environmental conditions for higher production rate of a desired product
- Development of molecular diagnostic tools
- Strain improvement using classical genetic techniques
- Strain improvement by genetic engineering techniques



Current projects

- Setup and characterize an alga culture collection
- DNA barcoding of strains of green algae
- Measuring the storage lipid production capability of alga strains existing in the culture collection
- Identification and characterization of genes that play role in the storage oil synthesis of green algae

Future plans

- Further characterization of our alga strains (e.g. growing rate, CO₂ capturing capacity, production of ω -3 polyunsaturated fatty acids)
- Work out new and fast lipid measurement techniques capable for high throughput screening
- Mutagenesis and mutant screens
- Close co-operation with biotechnological companies and the end users

