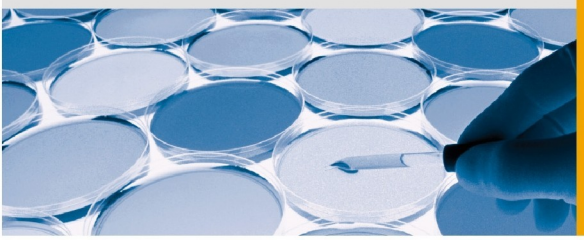
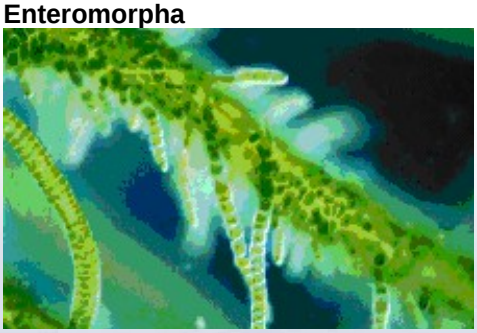
MBM SCIENCE BRIDGE GMBH

Where Science meets Business



Culture Collection of Algae (SAG) of the University of Göttingen

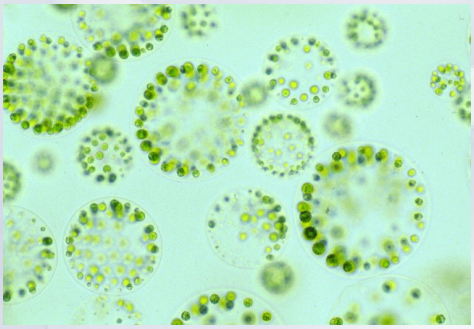
Enteromorpha



Micrasterias

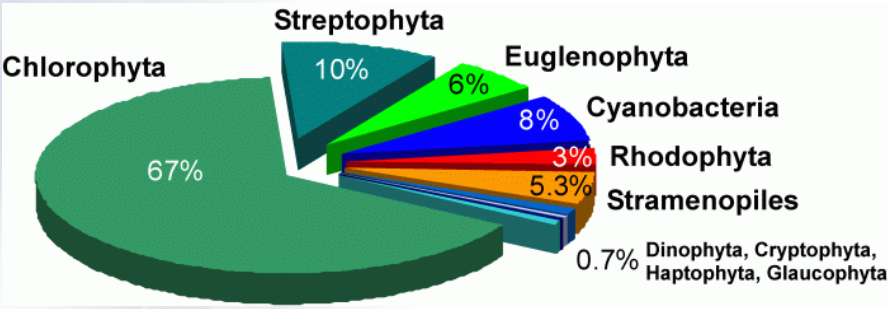
Arthrospira (former Spirulina)

Pleodorina



The Culture Collection of Algae at the Georg August University Göttingen (SAG; www.epsag.uni-goettingen.de) is one of the three largest collections of living microscopic algae. Founded in 1954, the SAG collection today comprises around **2400 strains** (representing **538 genera** and **1424 species**) from almost all evolutionary lineages of algae and cyanobacteria, mainly from freshwater or terrestrial habitats, but also marine algae and microscopic stages of some seaweeds are available. The **Euglenophyta** may form one speciality of the SAG collection because almost all genera (coloured and colourless taxa) of this relatively small group are represented here.

Diversity of taxonomic groups of microalgae as represented in the SAG culture collection



Uses of Algae

- **Energy source** (Biodiesel, Hydrogen, Biomass)
- **Pollution control** (wastewater treatment, capture fertilizers, algae bioreactors to reduce CO2)
- **Nutritional value** (as food, nutritional supplement – unsaturated fatty acids, Iodine, vitamins and minerals)
- **Pharmaceuticals** (Carotenoids and Tocopherole as Antioxidantien, tissue protection against carcinogenesis, Zeaxanthin, DHA, EPA)

In the context of a European research project, "COBRA", promising new methods for the **preservation** of microalgae at ultralow temperatures have been established at the SAG. Deep-frozen algal cultures can be maintained almost infinitely and the same time genetically stable. At SAG, a molecular fingerprinting technique with high resolution, **AFLP** (Amplified Fragment Length Polymorphism), is employed to unravel the unequivocal genetical signatures of algal culture strains. This is a prerequisite for high quality standards in biotechnological applications.

signo Hochschulen
Schutz von Ideen für die gewerbliche Nutzung

Ein Programm des Bundesministeriums für Wirtschaft und Technologie

Niedersachsen

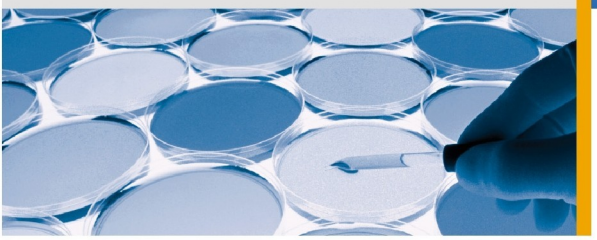
MBM ScienceBridge GmbH www.sciencebridge.de
Georg-August-Universität Göttingen

Bereich Biotechnologie
Hans-Adolf-Krebs-Weg 1
37077 Göttingen-Germany

Dipl.-Biol. Christiane Bolli
Tel.: +49 (0) 551 307 24156 · Fax +49 (0) 551 307 24155
E-Mail: cbolli@sciencebridge.de

MBM SCIENCE BRIDGE GMBH

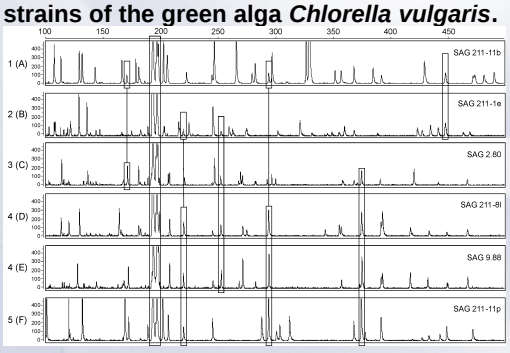
Where Science meets Business



View into culture rooms at the SAG

Genetically stable preservation of micro-algal cultures at -178 °C in liquid nitrogen

Genetical fingerprints (AFLPs) of various strains of the green alga *Chlorella vulgaris*.



Current research at SAG mainly aims at assessing algal **biodiversity** in particular unusual habitats. The new algal isolates derived from this research are characterized by their patterns of ingredients/valuable compounds in collaboration with other groups, e.g. the Department of Plant Biochemistry at Göttingen University. One project analyzes algae and cyanobacteria which produce **exopolymeric substances** (EPS) and are involved in stone-forming calcification processes. The spatial distribution of microalgae in the calcifying biofilms is explored using **Fluoreszenz-in situ-Hybridization (FISH)**. Molecular culture-independent techniques (**rDNA cloning and sequencing, DGGE)** and traditional culture techniques are combined in this and other research projects.

Another project focuses on subaerial green algae that dwell in **biofilms** on artificial hard substrates such as house facades and roof tiles. These algae considerably contribute in **biodeterioration** of buildings and monuments. They provide promising **biocoenoses** at extreme habitats to discover and exploit new compounds that are involved in **dessication**- and **UV light-resistance**.

The **diversity of terrestrial green alga** from desert soils and other arid areas in southern Africa is explored in another research project. Novel green algae that for example are unique by their accumulation of **carotenoids**, are isolated and genetically characterized. In addition, a new green algal species with a particular high concentration of **Lutein** was discovered and described (in collaboration with the Universidad de Almería, Spain) which led to an **international patent**.

It is generally accepted that around 400,000 species of algae exist. A huge variety of valuable **secondary compounds** and their **cost-efficient exploitation** make algae very interesting and promising suppliers of **renewable resources**. However, only about 160 algal species are commercially used until now. There is an increasing interest in microalgae as "**cell factories**", e.g. for the production of **pigments, lipids, polyunsaturated fatty acids** and a large variety of other pharmaceutically important substances. There are plenty of more interesting substances waiting to be discovered and commercialized.

We are now looking for companies which are interested in **licensing, developing and commercializing** our approach.

signo Hochschulen
Schutz von Ideen für die gewerbliche Nutzung

Ein Programm des Bundesministeriums für Wirtschaft und Technologie

Niedersachsen

MBM ScienceBridge GmbH www.sciencebridge.de
Georg-August-Universität Göttingen

Bereich Biotechnologie
Hans-Adolf-Krebs-Weg 1
37077 Göttingen-Germany

Dipl.-Biol. Christiane Bolli
Tel.: +49 (0) 551 307 24156 · Fax +49 (0) 551 307 24155
E-Mail: cbolli@sciencebridge.de