



Alginet

Investigate the potential of algae
Kick-off meeting Porto, Feb 03

- Summarize data on european algal culture collections
- Investigate current industrial applications and the use of microalgae on the global market
- Detail the requirements of end users
- Investigate current barriers to the use of microalgae
- Make results available on a central webpage
- Annual and biannual meetings



Collaborators

- Culture collections (Göttingen,)
- Few University labs
- Companies from Portugal, Spain, France, UK, Greece, Israel ... most of them running mass cultures of microalgae for the production of astaxanthin, other pigments, lipids (PUFAs, DEA), Vitamins (E),
- NIO, AWI
- Managed by the TTZ in Bremerhaven



Funding for 3 years

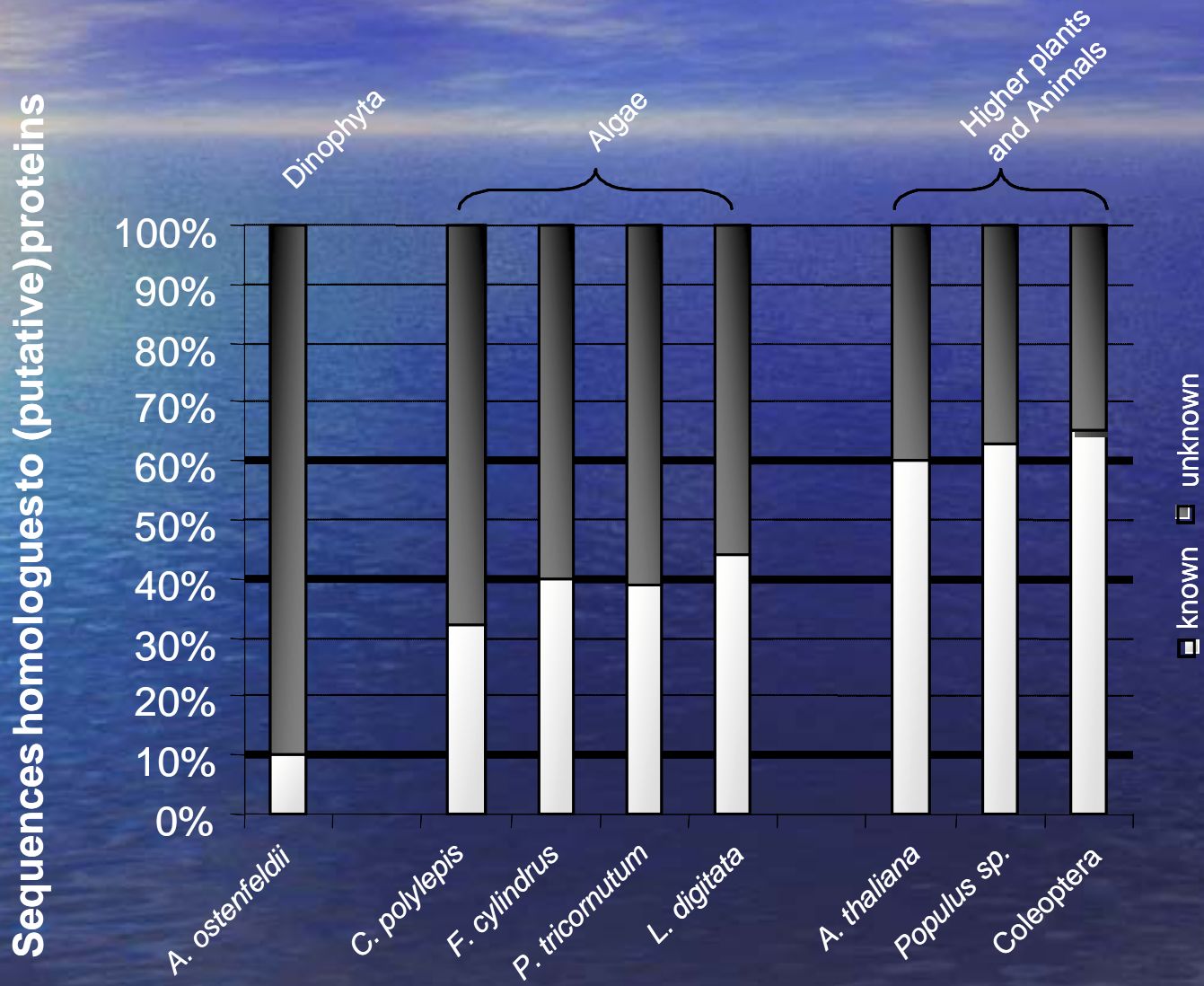
- Salaries (AWI: 1.5 mm)
- Travel, (yearly internal) meetings
- Managment (TTZ)
- NO research money (i.e. supplies or equipment)

Economic potential

- Increasing markets for pigments and vitamins
- PUFAs: MARTEC expects to increase its sellings to 150 Mio \$ next year, experts see a potential of more than a billion within the next 5 years (value of MARTEC stock grew 5fold during the last 1-2 years)



The potential of marine algal genomes



Contribution of the AWI

- Stated in the proposal:

Provide expertise on marine phytoplankton phylogeny and blooms???

- My plans:

Use the salary money to pay a student in computer sciences for the establishment of a web-based databank on algal genes, linked to biochemical pathways (e.g. KEGG), the culture collection databank, and the patent and application databank.

Example: you are interested in lipids

Go to pathways menu, click on lipids: A KEGG page appears showing the lipid biosynthesis pathway

Click on an enzyme of interest: get a list of sequenced algal genes for this enzyme

Click on one of the entries: get the genbank entry and a description of the species, see whether the gene is related to a patent

Click on the species name: see where you can order the culture, which other genes are known from this alga etc.

The potential of Microalgae

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Collaborators

- Linda Medlin, group leader
- Uwe John, toxic algae
- Katja Kerkmann, DNA chips
- Thomas Mock, EST analyses
- Gernot Glöckner (Jena), Genomics/EST



Harmful Algal Blooms (HAB)



Currents work at the AWI:

- Biogeography of HAB strains
- Oligo-based early warning systems („hand-held device“, DNA chips)
- Molecular basis of Toxicity (EST analysis)

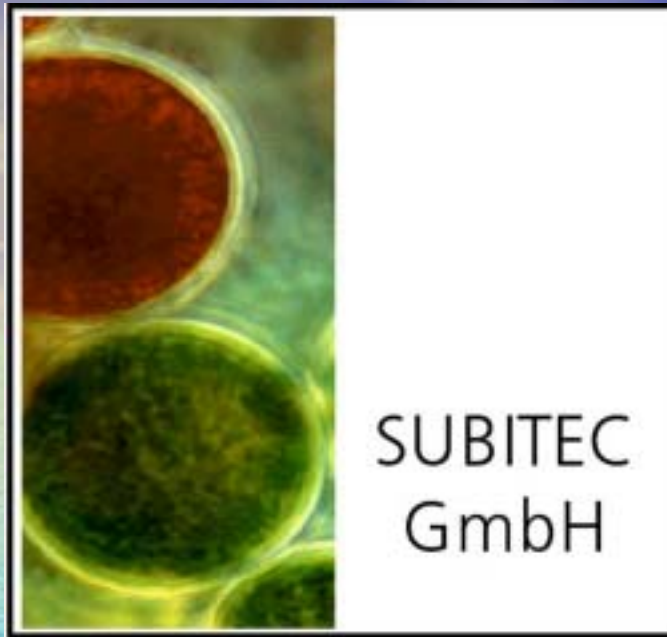


Establishment of new algal cultures

- The european PICODIV project (WWW.SB-Roscoff.fr)
- Samples taken on a monthly basis at Helgoland
- More than 1000 precultures started
- Several hundred well-growing cultures established
- Routine screening of cultures by SSCP and partial sequencing



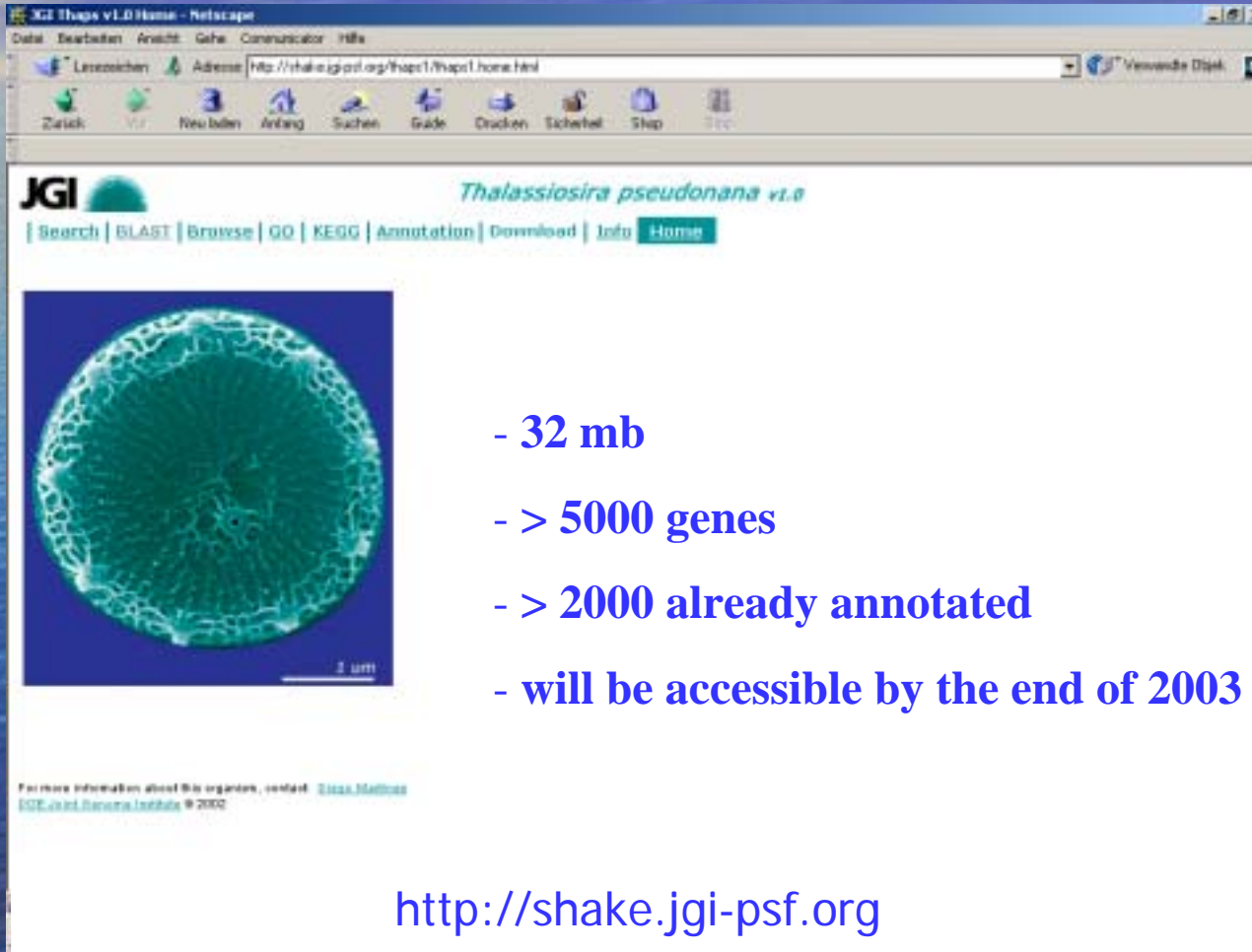
Collaboration on the screening of microalgae – search for commercially interesting components



- Cheap mass-culturing system established
- Commercial production of astaxanthin

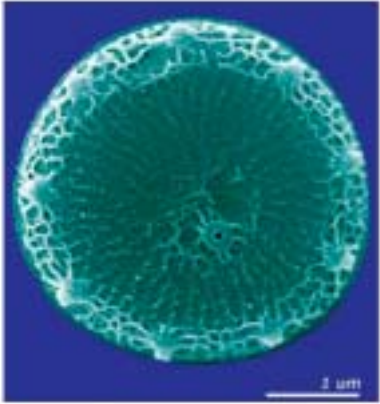


Genomics in marine algae – the *Thalassiosira pseudonana* project



JGI *Thalassiosira pseudonana v1.0*

| Search | BLAST | Browse | GO | KEGG | Annotation | Download | Info | **Home**



- 32 mb
- > 5000 genes
- > 2000 already annotated
- will be accessible by the end of 2003

For more information about this organism, contact [Eddy.Delong](mailto:Eddy.Delong@scripps.edu)
JGI and Scripps Institution of Oceanography 9/2002

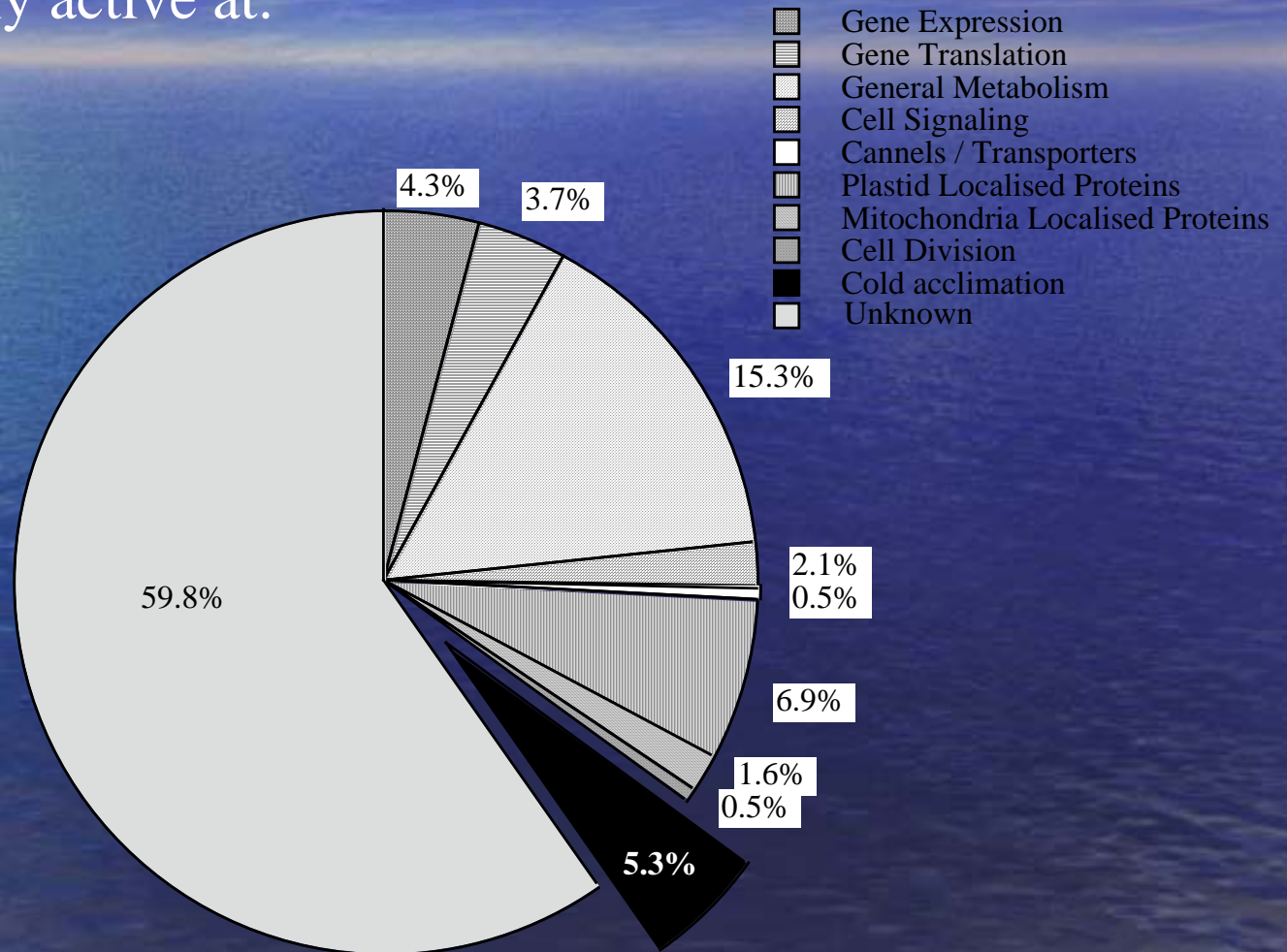
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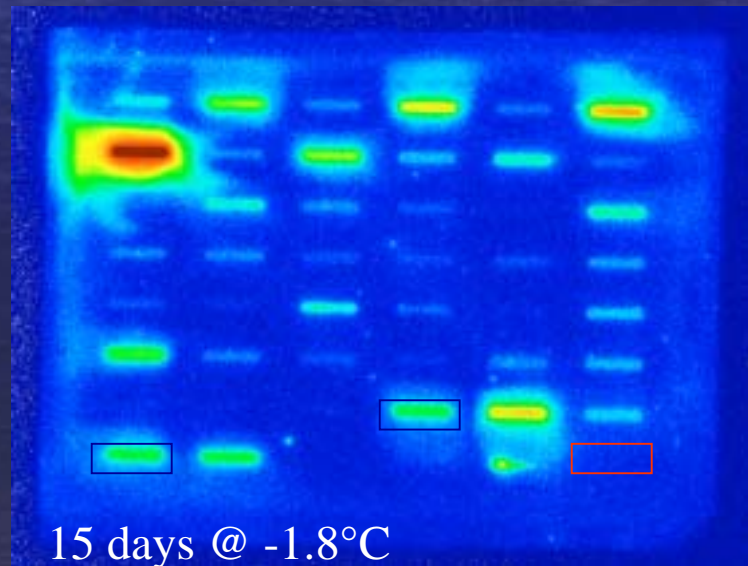
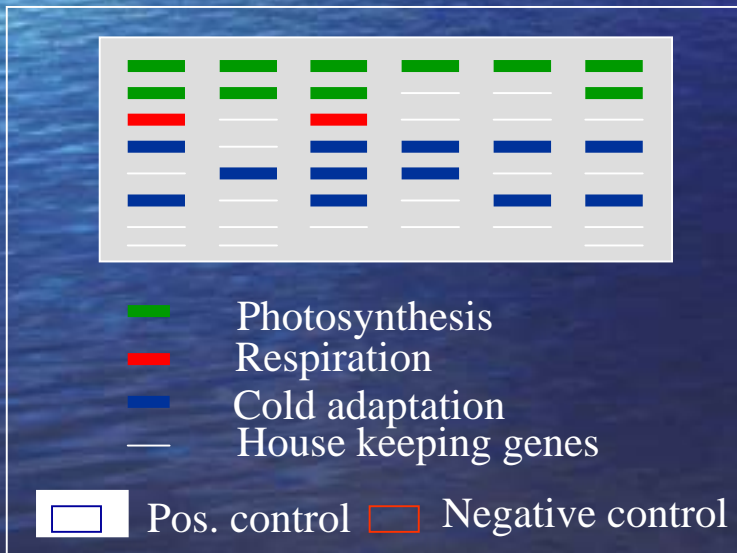
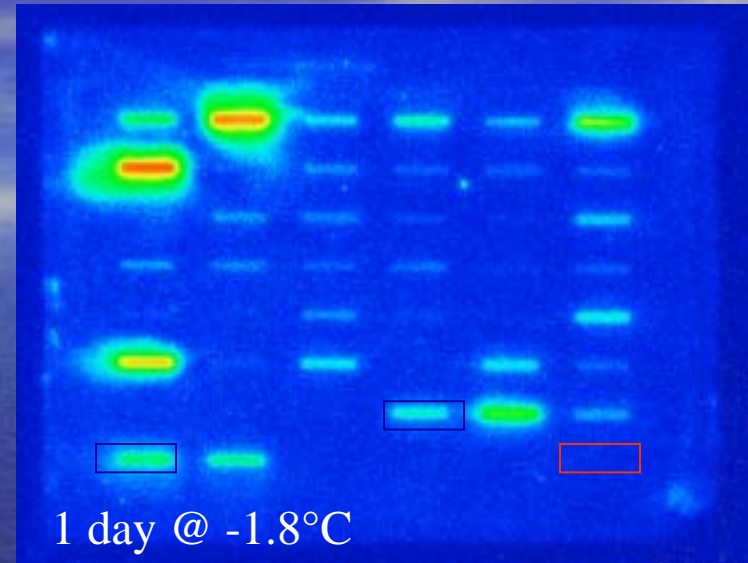
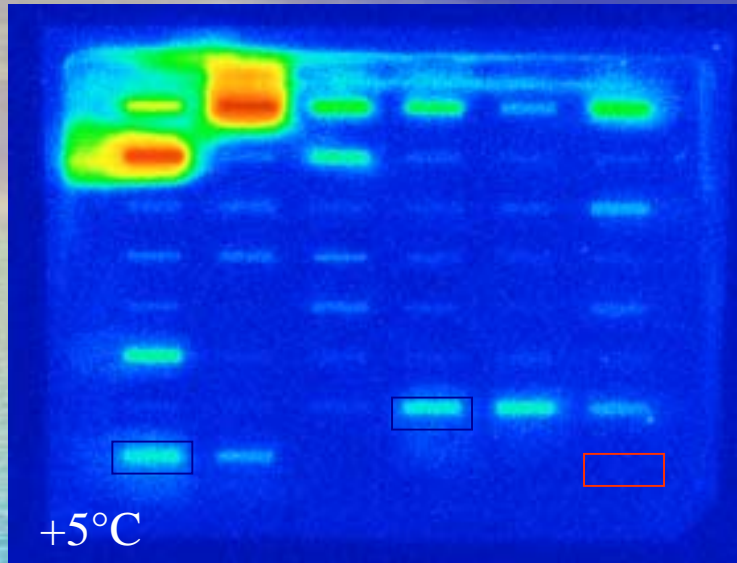
The *Fragilariopsis cylindrus* EST project

Physiologically active at:

- +8 to -15°C
- 0 – 150 PSU
- 1 – 150 μE



Cold shock induced gene expression in *F. cylindrus*



Potential of EST/expression analyses

- Identify genes and expression profiles related to physiological and environmental conditions.
- Use this information to screen strains for their potential for aquaculture.
- Transfer desirable abilities to commercial cultures.



Gene expression in polar microalgae – a macroarray approach

