CYANONEWS

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CYANONEWS is intended to provide cyanobacteriologists with a forum for rapid informal communication, unavailable through journals. Everything you read in this newsletter is contributed by readers like yourself. If you have a new result, if you know of an interesting meeting, if you have a post-doctoral opening, if you want strains, if you've published/submitted an article,... why not tell us about it? It's news to us. Please send all contributions to the address listed on the last page. DEADLINE for the next issue is JULY 1, 1987.

The name of the CORRESPONDENT for each item in this newsletter is capitalized, so you know who to write to for more information. The CORRESPONDENT'S ADDRESS appears at the end of the newsletter.

The 1987 DIRECTORY OF CYANOBACTERIOLOGISTS will be distributed with the next issue. If your address, telephone number, or research interests have changed, please let me know by JULY 1, 1987.

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Meetings this summer:

June 8-10 MOLECULAR BIOLOGY OF PHOTOSYNTHETIC PROCARYOTES. Madison, Wisconsin, U.S.A. Contact: Photosynthetic Procaryote Symposium, Department of Biochemistry, University of Wisconsin at Madison, 420 Henry Mall, Madison, WI 53706 U.S.A.

July 17-19 WORKSHOP ON THE MOLECULAR BIOLOGY OF CYANOBACTERIA. St. Louis, Missouri, U.S.A. Contact: Lou Sherman, Div. of Biological Sciences, Universiy of Missouri, Tucker Hall, Columbia, MO 65211 U.S.A.

July 20 GENETIC AND MOLECULAR GENETIC STUDIES ON CYANOBACTERIA. St. Louis, Missouri, U.S.A. (Part of the annual meeting of the American Society of Plant Physiologists).

Sept 20-25 EMBO WORKSHOP ON OXYGENIC AND UNOXYGENIC ELECTRON TRANSPORT SYSTEMS IN CYANOBACTERIA (BLUE-GREEN ALGAE). Cape Sounion Beach Resort (near Athens), Greece. Contact: G.C. Papageorgiou, EMBO Workshop, NRC Demokritos, Dept. of Biology, Athens 153 10, Greece.

Here are details on the September EMBO WORKSHOP:

PROGRAM: I. Molecular biology and genetics
II. Energy coupling and pigment organization.
III. Photosynthetic and respiratory electron transport.
IV. Localization of electron transport systems and their relation to C, H, and N metabolisms.
V. Response of cyanobacteria to environmental stress.
VI. Biotechnological prospects of cyanobacteria.

SPEAKERS:

D.S. Bendall	G.A. Codd	W. Lockau	G.C. Papageorgiou	H. Zuber
P. Böger	A.R. Holzwarth	L.R. Mur	L.A. Sherman	
H. Bothe	F. Joset	N. Murata	E. Tel-Or	
N.G. Carr	D.W. Krogmann	L. Packer	J.G.K. Williams	

FEES: A registration and accomodations fee of $200 US in the form of a bank draft made to Dr. George C. Papageorgiou must accompany each application. The fee covers sleeping (2 per bungalow) breakfast and lunch for 5 days (20 through 24 September) and airport transportation. Accompanying persons pay the same fee. Fees will be returned if for any reason the applicant is not accepted (registration will be limited to 60 participants). Single rooms cost $50 US extra. A limited number of fellowships covering partial costs is available. Application should include biographical and scientific documentation and the title of the poster presentation.

DEADLINES: Applications: May 31, 1987. Abstracts: June 30, 1987.

The 7th INTERNATIONAL CONGRESS ON NITROGEN FIXATION will take place March 13th to 20th, 1988 in Cologne, West Germany. The meeting will celebrate the 100th aniversary of the discovery of nitrogen fixation by Hellriegel and Wilfarth and the 600th anniversary of the University of Cologne. The total cost (including hotel room, meals, registration, and abstracts) is expected to be about US $450, less for those willing to share a double room or stay at the Cologne youth residence.
DEADLINE: Applications and abstracts: November 30, 1987.
APPLY TO: H. BOTHE, Universität zu Köln, Botanisches Institut, Gyrhofstrasse 15, D-5000 Köln 41, West-Germany.

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A volume of Methods in Enzymology on cyanobacteria is in preparation, co-edited by L.PACKER and A.N. Glazer.

WILLIAM DIETRICH is currently mapping the large plasmid of Phormidium luridum var. alivocecie.

CROSS-HYBRIDIZATION OF PLASMIDS FROM TOXIC MICROCYSTIS

TOM BÖRNER and coworkers have isolated two plasmids (pMa1,pMa2) of 2.9 and 8.5 kb, respectively, from the toxic Microcystis strain HUB 5-2-4 (HUB stands for Humboldt-Univ. Berlin) and used them as probes in several hybridization studies. pMa1 shows a weak hybridization with pMa2, both hybridize weakly to the chromosomal DNA of this strain but not with the chromosomal DNA of a non-toxic strain (HUB 042) and not with chromosomal DNA of A. nidulans R2. They show strong hybridization with analogous plasmids of another toxic strain (HUB 63) which are also of the same size. Interestingly, there was no hybridization with the plasmids of PCC 7813 and PCC 7820 (also reported to be toxic) and no hybridization with the plasmids of R2. pMa2, but not pMa1, forms oligomers (results of A. Weihe, W.Schwabe,Th.Börner, J.G. Kohl).

REQUESTS FOR TOXIC MICROCYSTIS

TOM BÖRNER would be interested in getting more toxic Microcystis strains for further comparative analysis of the type described above. JÜRGEN WECKESSER also would like to find axenic, toxic Microcystis strains or cells, to study questions concerning toxins and lipopolysaccharide. Finally, GEOFFREY CODD made a similar request for strains in these pages several issues ago. If you have have any such strains, you obviously have a very valuable commodity that these people would like to know about.

FLUORESCENT STAIN FOR POLYPHOSPHATES

DAPI (4'-6-diamidino-2-phenylindol) at concentrations higher than used for DNA staining (5-10 ug/ml), gives a wonderful yellow fluorescence on binding to cellular structures that disappear if the cells (Microcystis, Oscillatoria) are starved for phosphate. The same structures are also stained by tolouidine blue. Therefore, DAPI may be useful as a sensitive indicator for the presence of polyphosphate. A.Mahr, M.Henning, and TH.BÖRNER found this by chance and thought it might interest blue-green people, if it isn't already known.

BLUE-GREEN CAROTENOID TO CURE CANCER?

SEBASTION THOMAS reports that extracts of Spirulina (phycotene) rich in carotenoids and chlorophyll is being studied by the Dept. of Oral Medicine and Oral Pathology of Harvard School of Dental Medicine, Boston, MA, looking at the inhibition and regression of cancer in animal models. The extract is manufactured by Microalgae International. Preliminary studies with oral cancer tumors in hamsters indicate that spirulina extracts are more effective (20-25 times) than synthetic beta carotene in killing cancer cells. Phycotene is being tested in an AIDS model system by NIH (Dept. of Allergy

and Infectious Diseases), and Memorial Sloan Kettering Cancer Hospital, New York is planning a large clinical trial of phycotene as a treatment for cancer of the colon.

REMARKABLE OSCILLATORIA

BEN DE WINDER sent in news about a special cyanobacterium. It is a flat cyanobacterium isolated from a sandcrust. This flat band-shaped cyanobacterium was isolated from a cyanobacterial crust on a dune-sand from the inner coast of The Netherlands. The organism is sheathless and non-motile. Its breadth is 8-10u and trichome extends up to 100u. The thickness of the organism is about 2u. According to the Rippka system it should belong to the Oscillatoria group (Section 3). He is studying the the physiological responses of the organism to conditions found in its natural habitat. If anyone knows anything more about such extraordinary cyanobacteria, please contact Ben.

NORSE MEETING ON TOXIC CYANOBACTERIA SUMMARIZED

Twenty-two scientists (one of which was correspondent OLAV SKULBERG) gathered on 24-25 September 1986 to present the results of research on toxic cyanobacteria. The meeting took place at Husö Biological Station, the field station on Åland belonging to Åbo Akademi and was a follow-up to an Oikos symposium on the same theme, held in Copenhagen in 1984.

During the workshop results from recent national surveys were presented. as well as papers dealing with toxin production of cyanobacteria, the toxicology of the toxins, and the ecological impact of toxic cyanobacteria. The national surveys demonstrated that toxic cyanobacteria are quite common in lakes in Norway, Sweden, and Finland. Forty to fifty percent of the samples from lakes with cyanobacterial blooms contained toxic strains. These have been found in the genera Microcystis, Anabaena, Oscillatoria, Nodularia, and Aphanizomenon. In Denmark, Norway, Sweden, and Finland, toxic cyanobacteria have been implicated in several cases of illness and death among domestic and wild animals. The toxins of several strains have been isolated and investigations have been started to clarify the mode of action of these toxins.

The following were appointed members of a Nordic committee for further cooperation in this research field: Hanne Kaas (Denmark), Per-Edvin Person (Finland), Olav Skulberg (Norway; coordinator), and Torbjö Willén (Sweden).

The workshop was sponsored by Äbo Akademi and Stiftelsen för Forsknings-institut. The abstracts of the papers read during the workshop can be ordered from John Eriksson (Dept. of Biology, Äbo Akademi, SF-20500 Äbo, Finland).

UPDATED DIRECTORY TO TOXIC CYANOPHYTE LITERATURE

OLAV M. SKULBERG has updated a directory to toxic cyanophyte literature from the Nordic countries (Denmark, Finland, Norway, and Sweden). Entries range from 1933 to 1986.

IMPROVED SHUTTLE VECTOR FOR FREMYELLA DIPLOSIPHON

JOHN COBLEY, Edward Zerweck, and Heidi Jaeger describe an improved shuttle vector designed for the chromatically adapting cyanobacterium Fremyella diplosiphon. The vector totally lacks sites for the known restriction enzymes of F. diplosiphon and is efficiently transferred by conjugation from E. coli. A fragment from Tn903 provides strong selection for neomycin- or geneticin-resistance. Selection for chloramphenicol-resistance (also determined by the vector) is only adequate, but expression of the gene can be easily quantitated in extracts of F. diplosiphon, thus may serve as a reporter of gene expression. The lab intends to use the vector to identify and characterize genes that complement mutations in F. diplosiphon defective in chromatic adaptation.

MUTANT OF PHOTOHETEROTROPH CONSTRUCTED THAT LACKS Q-ß PROTEIN OF PHOTOSYSTEM II

CHRISTER JANSSON tells us that he along with Rick Debus, Heinz Osiewacz, Mickey Gurevitz, and Lee McIntosh have managed to construct a well-defined mutant of the cyanobacterium Synechocystis PCC6803 that lacks the Q-ß-binding polypeptide encoded by psbA. This is a major step towards understanding the function of the polypeptide and its interaction with other photosystem II components. psbA appears in three copies in Synechocystis PCC6803. Each gene was inactivated by in vitro insertion of drug

resistence markers and each altered gene put back into the cyanobacterial chromosome by gene replacement. Inactivation of all three psbA genes gave a mutant that is an obligate photoheterotroph. This mutant lacks the ability to evolve oxygen but retains PSI activity. Room temperature measurements of chlorophyll-a fluorescence induction demonstrated that the mutant exhibits a high fluorescence yield with little or no variable fluorescence. Immunoblot analysis showed complete loss of the Q-ß-binding polypeptide from thylakoid membranes of the mutant. However, the extrinsic 33-kDa polypeptide of the water-splitting system of PSII is still present.

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