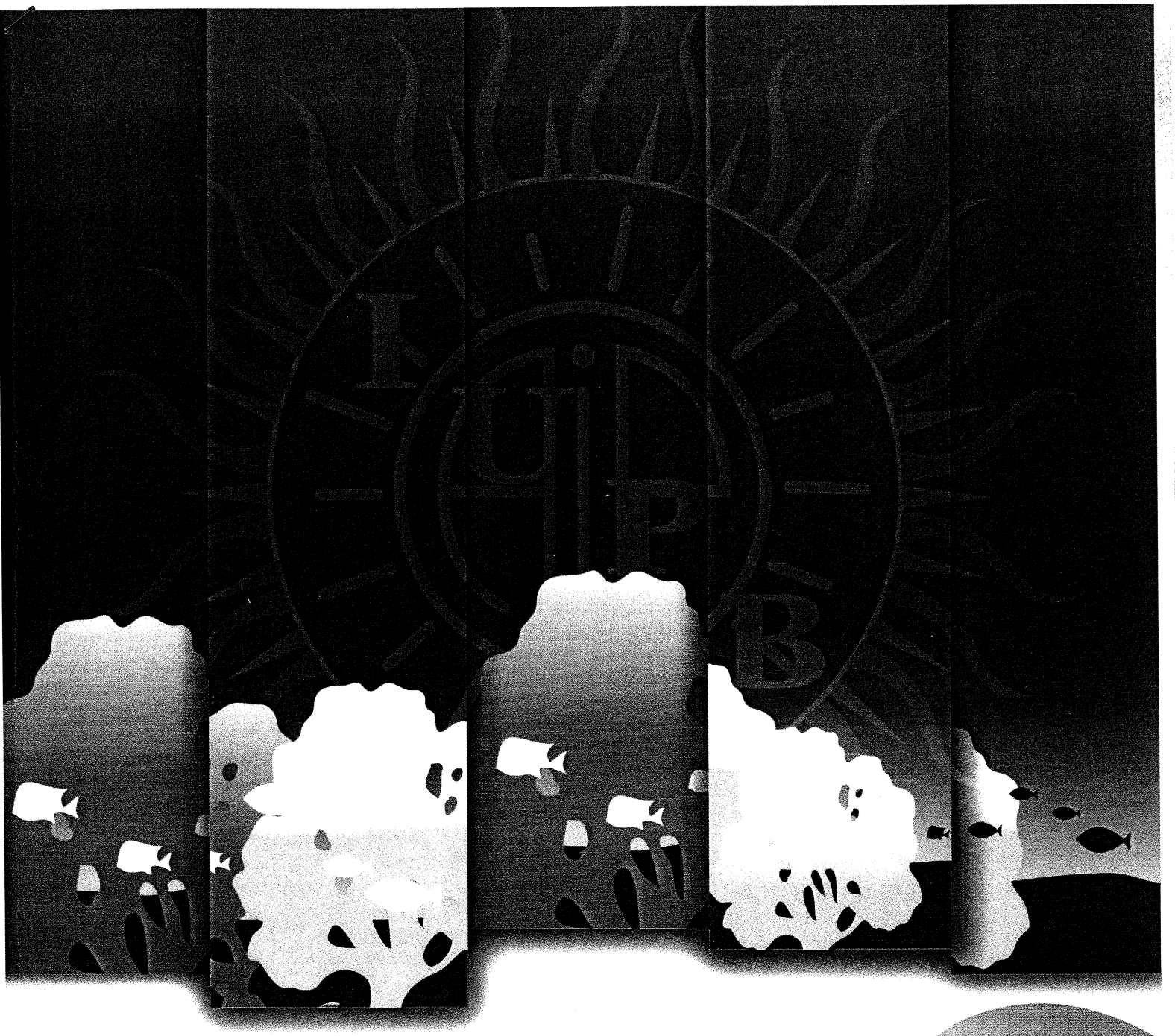

14th INTERNATIONAL CONGRESS ON PHOTOBIOLOGY

June 10 - 15, 2004

International Convention Center (ICC), Jeju, Korea

Program & Abstracts

Hosted by: Korean Society of Photoscience

Co-Hosted by: The Photobiology Association of Japan
The Asia and Oceania Society for Photobiology
The Association for Photosciences in the Tropics

Sponsored by: International Union of Photobiology

S28-05

PHOTORECEPTION AND SENSORY TRANSDUCTION IN THE CILIATE *BLEPHARISMA JAPONICUM*

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The primary molecular events that are at the basis of photomotile response of the protozoan *Blepharisma japonicum* have been studied by steady-state and time-resolved fluorescence polarization and by subpicosecond transient absorption spectroscopy. The photosensing pigment of the light-adapted cell, oxyblepharismin, has been studied as free chromophore in solution and when associated to its apoprotein. Fluorescence polarization results suggest that oxyblepharismin is non-covalently bound to the apoprotein and that in NaCH it is inserted in a micelle which mimics a "hindered" molecular environment, not very different from the apoprotein pocket. Fluorescence polarization data also confirm that the molecular weight of the protein is of the order of 200 kDa. Although showing similar steady-state and transient spectra, oxyblepharismin and its protein complex reveal considerably different excited-state dynamics. In the chromoprotein, in fact, a pronounced fast biexponential decay (5 ps and 60 ps) is observed, which is not found in the corresponding kinetics of the isolated chromophore. This early behavior could be the signature of a specific primary phototransduction process, in particular of a photoinduced electron transfer from the first excited singlet state of oxyblepharismin to an amino-acid residue of its apoprotein.

Acknowledgments: This work was performed in the framework of a CNR-CNRS Cooperation Agreement.

S28-06

PHYTOCHROME-LIKE PIXJ1, A NOVEL PHOTORECEPTOR FOR POSITIVE PHOTOTAXIS IN THE CYANOBACTERIUM SYNECHOCYSTIS SP. PCC 6803

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The unicellular cyanobacterium *Synechocystis* sp. PCC 6803 is known to show phototactic motility on solid surfaces by type IV-like pilus structures. Previously, we showed that a gene cluster of *pixG (sll0038), pixH (sll0039), pixI (sll0040), pixJ1 (sll0041), pixJ2 (sll0042)* and *pixL (sll0043)* is involved in the positive phototaxis in *Synechocystis* (formerly designated *pisG/H/I/J1/J2/L*). These genes show significant homologies to PatA, CheY, CheW, MCP (methyl-accepting chemotaxis protein), MCP and CheA, respectively, which take part in a signal transduction system to switch flagellar rotation in bacterial chemotaxis. The gene, *pixJ1*, is predicted to encode a MCP harboring a phytochrome-like chromophore-binding region. It was strongly suggested that PixJ1 protein functions as a photoreceptor for the positive phototaxis in *Synechocystis.*

PixJ1 protein, which was overexpressed as a fusion with His-tag and isolated from