a methylene carbon; (3) in thiol and —SeH compounds the proton on sulphur or selenium is labile; (4) in di-aliphatic sulphides and selenides the C—S or C—Se bond usually ruptures; (5) in dibenzyl sulphide and selenide compounds the C—S or C—Se bonds do not rupture; instead, a proton is removed from the methylene group.

J. J. WINDLE
A. K. WIERSEMA
Western Regional Research Laboratory,
Agricultural Research Service,
U.S. Department of Agriculture,
Albany, California.

A. L. TAPPEL
University of California,
Davis, California.

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BIOPHYSICS

Light-induced Absorption-change Transients in Some Blue-green Algae

As reported recently[1,2], in aged chloroplasts of spinach the decay of the light-induced absorption decrease at 430 mμ becomes biphasic when the system is coupled with ascorbic acid and an appropriate amount of the redox dye phenazine methosulphate. It was further found that the slowly decaying portion becomes saturated at a lower actinic intensity and the rapidly decaying portion starts to appear only when the actinic intensity exceeds the threshold-level. The biphasic decay was attributed to the re-reduction of two separate photo-oxidized species, possibly the chlorophyll complex *P*700 and cytochrome *f*.

In this communication is reported the finding of a decrease in light absorption at 430 mμ with a similar complex decay kinetics in whole cells of several blue-green algae. *Plectonema boryanum*, *Phormidium luridum*, *Gloeocapsa alpicola*, and *Anacystis nidulans* have been examined, and all show more or less the same characteristics. Fig. 1 shows a typical transient absorption change at 430 mμ obtained from *Plectonema*, which gave the largest signal among the species studied. The total optical density change shown in Fig. 1 was about 0·006. Broad-band red (645–745 mμ) flashes of 20-μsec duration spaced at 2-sec intervals were used for excitation. The signal shown in Fig. 1 was obtained by integration of 30 flashing cycles through the *CAT*-computer. Detailed experimental procedures have been described previously[3].

On the average, the decay constants of the rapid and slow portions are 10 and 300 ± 50 msec, respectively. In most fresh blue-green algal cells, the ratio of the two signal heights is nearly unity. The extent of the rapidly decaying portion usually decreases on storage. *Plectonema* stored in the dark at 0° C for one month still retained 50 per cent of the activity without change in the signal ration. Preliminary examination indicates that the light-minus-dark difference spectrum of the rapidly decaying portion resembles that of an oxidized cytochrome while the difference spectrum of the slowly decaying portion agrees closely with that of the oxidized *P*700[4–6].

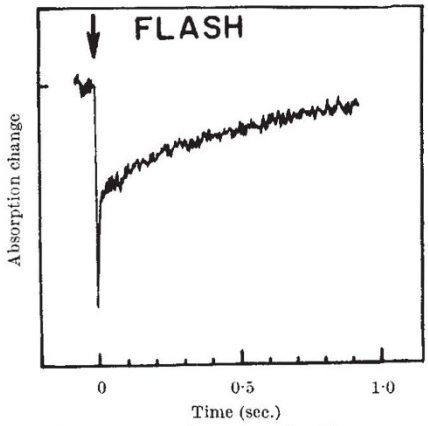

Fig. 1. Light-induced absorption change in *Plectonema boryanum* at 430 mμ

Since blue-green algae are relatively heat-resistant, the transient absorption changes are little affected when the cells are heated for 5 min at temperatures up to 50° C. When heated to higher temperatures, the rapidly decaying portion is affected and begins to disappear, while the slowly decaying portion remains intact. When heated above 60° C, both signals are eliminated.

The actinic-intensity dependence of the composite signal in blue-green algae is similar to that of aged chloroplasts[1,2]. At the threshold intensity of approximately 2×10^{14} quanta cm^{-2} per flash, the rapidly decaying signal starts to appear. At lower actinic intensity, only the slowly decaying portion can be observed.

Cells incubated with 3×10^{-5} M 3(3,4-dichlorophenyl)-1,1-dimethyl urea yielded practically the same composite signal. Sonicated cells, from which phycocyanin was liberated, yielded transients of smaller signal height, but with similar complex decay kinetics. The 430 mμ transient presented here is associated with the long-wave-length reaction centre. This is shown by the fact that 10 mμ-wide flashes at 680 or 690 mμ can also induce the complex transient signal but it has smaller overall height. Preliminary examination with actinic flashes at 620 or 590 mμ, at which phycocyanin absorbs, showed that the accessory pigment has a quite different behaviour of sensitization. Detailed investigations of the action spectrum are in progress and will be reported elsewhere.

BACON KE
Charles F. Kettering Research Laboratory,
Yellow Springs, Ohio.

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BIOCHEMISTRY

Direct Extraction of Actin in the Fibrous Form from Fish Muscle

WATER extraction of an acetone-dried muscle powder preparation of rabbit[1] is one of the standard methods of producing a solution of globular or *G*-actin. Such a solution possesses no birefringence of flow and has a low specific viscosity[2]. On making this solution 0·1 M with respect to potassium chloride, 0·001 M with respect to Mg^{++} and allowing to stand, a marked birefringence of flow develops and the solution has a considerably increased specific viscosity. These changes have been classically considered to be a result of the polymerization of the *G*-actin, as extracted, to the fibrous or *F*-form.

During the course of investigations of the muscle proteins of various animals it was observed that actin can apparently be extracted directly from fish acetone-dried muscle powders in the *F*-form. Acetone-dried muscle powders were prepared from salt- and fresh-water fish of various species by the method of Barany, Barany and Guba[1]. The fish were killed by decapitation or a blow on the head, the dorsal muscle dissected out as quickly as possible and minced twice through an ordinary kitchen mincer. The muscle was then treated twice with 10 vol. 0·4 per cent sodium bicarbonate, washed with 15 vol. of