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MEMBRANE PROTEINS OF *RHODOPSEUDOMONAS SPHEROIDES*

V. ADDITIONAL CHEMICAL CHARACTERIZATION OF A PIGMENT–LIPID-ASSOCIATED PROTEIN ISOLATED FROM CHROMATOPHORES

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SUMMARY

The major protein component, Band 15, of the chromatophores of *Rhodopseudomonas spheroides* is associated with most of the pigments and phospholipids. The primary structure of Band 15 has been further characterized. Cyanogen bromide cleavage produced 3 oligopeptides which were present in equimolar amounts. The sum of the molecular weights of the oligopeptides derived from cyanogen bromide cleavage of Band 15 was 8600. This value compares favorably with the value of 11 000 calculated from the methionine content of the protein. A C-terminal sequence, NH_2...Tyr–Ser–Glu–Glu–(Leu, Ala, Ala, Val, Val, Ala, Ala)–GlyCOOH, is proposed. A tryptic map of the protein has been obtained and the amino acid composition of each tryptic peptide determined.

INTRODUCTION

A major protein component of the chromatophore, isolated from the photosynthetic bacterium, *Rhodopseudomonas spheroides*, is designated Band 15 (Fraker and Kaplan[1]). Band 15 when isolated is associated with most of the pigment and phospholipid found in the chromatophore and therefore must play an important functional and structural role in the chromatophore. The gross chemical composition of Band 15 contained 59% protein, 35% phospholipid, and 6% bacteriochlorophyll[1]. The molecular weight of Band 15 was determined as 9700 by dodecyl sulphate–polyacrylamide gel electrophoresis and 14000 by sedimentation equilibrium; the N-terminus was methionine and the C-terminus was inconclusive but may be glycine[1]. Tryptic digestion gave 10–14 peptides and chymotryptic digestion gave 17 peptides (see Paper IV of this series, Huang and Kaplan[2]).

Because Band 15 represents greater than 50% of the total chromatophore protein and has been shown to be unique to the chromatophore, its ultimate physical and chemical description is essential to a thorough understanding of the structure–function interrelationship of the chromatophore. Further characterization should also add to the knowledge of the structural and functional interrelationship between lipids,