## Structural Studies of Water-soluble Chlorophyll Protein from Chenopodium Album

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Generally, chlorophyll (Chl) molecules functioning in photosynthesis are associated with hydrophobic integral membrane proteins. Water-soluble Chl protein (WSCP) was first found in Chenopodium album in 1963. WSCPs have then been detected in several species classified in the Polygonaceae, Chenopodiaceae, Amaranthaceae and Brassicaceae families. Although the physiological function of WSCPs has not yet been cleared, these WSCPs can be categorized into two classes according to their photoconvertibility: Chenopodium-type (Class I) and Brassica-type (Class II). The absorption spectrum of a Class I WSCP changes drastically on exposure to visible light, while a Class II WSCP does not. And there is no significant sequence homology between Classes I and II WSCPs. The X-ray structure analysis of Class II WSCPs containing Lepidium-, Raphanus- and Kale-WSCPs reveals that these WSCPs consist of 4 subunits and a Chl is contained in each subunit. In order to determine the crystal structure of a Class II WSCP and elucidate the photoconversion mechanism, Chenopodium-WSCP was extracted from leaves, purified, and crystallized in a dark room. Green rod crystals appeared in a week. A native data set was collected to 3.0 Å resolution at 100 K with synchrotron radiation at PF. The space group of the crystal was determined to be orthorhombic I222 with unit-cell parameters a = 47.08, b= 61.42, and c = 107.0 Å. Heavy atom derivative screening for structure determination is in progress. The photoconversion mechanism and the interaction between Chl and the protein are being studied.

Keywords: water-soluble chlorophyll protein, photoconvertibility, pigment protein