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Data Article

Data in support of intermolecular interactions at early stage of protein/detergent particle association induced by salt/polyethylene glycol mixtures

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ABSTRACT

The data provide information in support of the research article, "Intermolecular interactions at early stage of protein/detergent particle association induced by salt/polyethylene glycol mixtures" [1]. The data regarding variation of absorption spectra is used as an indicator of the duration of *Rp. viridis* PRU and RC, *Rb. sphaeroides* RC and LH2, and *Rb. capsulatus* LH2 in the native state in the presence of NaCl/polyethylene glycol (PEG) mixture. The data about minimum concentrations of salt and PEG whose aqueous phases are mutually separated presents information on additional influence of Tris buffer and N-octyl-β-D-glucoside on the salt–PEG phase separation.
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Specifications table

Subject area	*Biophysics*
More specific subject area	*Association of protein/detergent particles by salt/PEG mixtures*

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Type of data	*Figure*
How data was acquired	*Absorption spectroscopy for protein stability, and observation with eyes for salt/PEG phase separation*
Data format	*Scaled intensity data for absorption spectra, and raw data for salt/PEG phase separation*
Experimental factors	*Wild-type photosynthetic bacteria were obtained from ATCC. Chemicals employed were high-grade ones; polyethylene glycol 4000 for gas chromatography was purchased from MERCK, NaCl and Tris(hydroxymethyl)aminomethane for biochemical assay from Wako, N-octyl-β-D-glucoside and N-dodecyl-β-D-maltoside from DOJINDO, and N,N-dimethyldodecylamine N-oxide from SIGMA*
Experimental features	*Absorption spectra were measured at various time points after NaCl/PEG mixture addition. Minimum concentrations for immiscible aqueous phases of salt and PEG were determined in the presence of 25 mM Tris buffer and 8 mg/mL OG.*
Data source location	*Tsukuba, Japan*
Data accessibility	*Data are available in this article.*

Value of the data

- Protein stability is a significant factor for determination of measurement time points after precipitant addition in the study of association of proteins in the native states.
- Protein stability will also provide basic information for the study of denaturation process of proteins caused by salt/PEG mixtures.
- Influence of buffer and detergent on salt–PEG phase separation is basic information to avoid the undesired influence on the association of integral membrane proteins.

1. Data

In this data article, data are shared regarding protein stability and salt–polyethylene glycol (PEG) phase separation. The former is absorption spectra of *Rp. viridis* PRU [2,3] and RC, *Rb. sphaeroides* RC [4,5] and LH2, and *Rb. capsulatus* LH2 measured at different time points after addition of NaCl/PEG mixture. The latter is shown as minimum concentrations of salts and PEG that form immiscible aqueous phases [6] in the presence of 25 mM Tris buffer and 8 mg/mL N-octyl-β-D-glucoside.

2. Experimental design, materials and methods

2.1. Stability of integral membrane proteins in the presence of NaCl/polyethylene glycol mixture

Fig. 1 shows representatives of the spectra measured at various time points after the addition of NaCl/PEG mixture. At one hour or shorter time points after the mixture addition, no variations in the spectra were observed for all the proteins. After several to 30 days, however, four proteins excluding *Rb. sphaeroides* RC exhibited variation in their absorption spectra that reflected variation of the intramolecular cofactors and the peptides supporting them. With *Rp. viridis* PRU, the absorption band with a maximum at 1006 nm, arising from bacteriochlorophyll in the LH1 subunits, decreased and a new peak appeared at 687 nm. In the spectra of *Rp. viridis* RC, the absorption band with a maximum at 830 nm, arising from special pair of bacteriochlorophyll, disappeared. With *Rb. sphaeroides* LH2 and *Rb. capsulatus* LH2, the two absorption peaks at 800 nm and 850 nm decreased and a small peak appeared at 690 nm.

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