Supporting Information

Construction and Structural Analysis of Tethered Lipid Bilayer Containing Photosynthetic Antenna Proteins for Functional Analysis

Ayumi Sumino, [†] *Takehisa Dewa,* [†, §, *] *Toshikazu Takeuchi,* [†] *Ryuta Sugiura,* [†] *Nobuaki Sasaki,* [†] *Nobuo Misawa,* [‖] *Ryugo Tero,* [‖] *Tsuneo Urisu,* [‖] *Alastair T. Gardiner,* [^] *Richard J. Cogdell,* [^] *Hideki Hashimoto,* [‡, ⊥] *and Mamoru Nango,* [†, ‡, ⊥, *]

[†]Department of Frontier Materials, Graduate School of Engineering, Nagoya Institute of Technology, Gokiso-cho, Showa-ku, Nagoya 466-8555, Japan, [§]PRESTO/JST, [‖]Division of Biomolecular Sensing, Institute for Molecular Science, Myodaizi, Okazaki 444-8585, Japan, [^]Institute of Molecular, Cell and Systems Biology, College of Medical, Veterinary and Life Sciences, University of Glasgow, University Avenue, G12 8QQ. U.K. [‡]The OCU Advanced Research Institute for Natural Science and Technology (OCARINA), Osaka City University, 3-3-138 Sugimoto, Sumiyoshi-ku, Osaka 558-8585, Japan, [⊥]CREST/JST

takedewa@nitech.ac.jp, nango@sci.osaka-cu.ac.jp

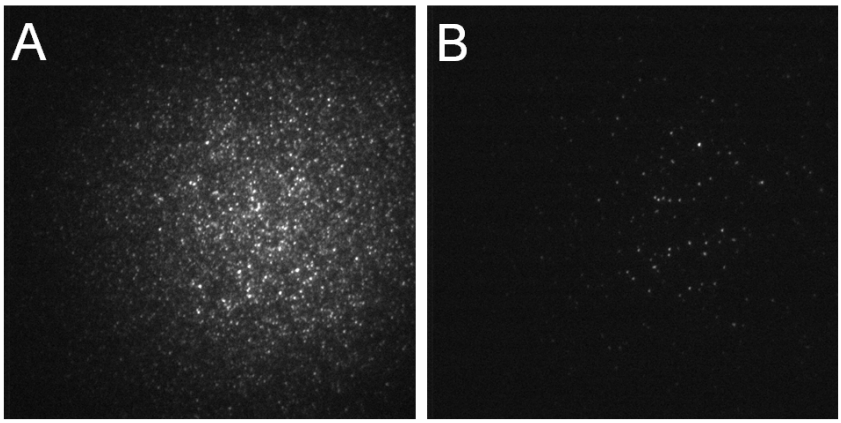

Figure S1. TIRF microscopic images of immobilized liposomes with (A) and without (B) 1 mol% biotinylated lipid on avidin-immobilized coverglass. LUV suspensions were applied onto avidin-immobilized coverglass and incubated for 5 min, followed by rinsing with 1M NaCl/HEPES buffer (pH 7.4) to remove unabsorbed vesicles. Scale: 65 × 65 μm.

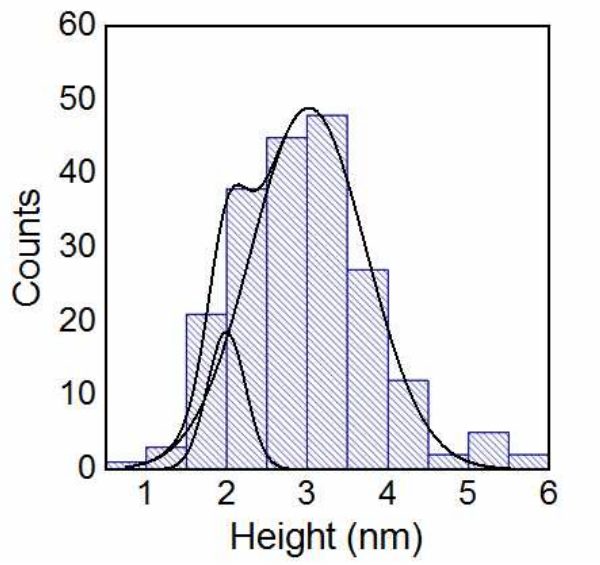

Figure S2. Height distribution of protuberant domain of LH1-RC from the membrane surface estimated by AFM measurement. Gaussian fitting analysis (solid lines) provided two components, 2 nm and ~3 nm of maxima, corresponding to periplasmic and cytoplasmic (H-subunit side) domains of LH1-RC, respectively. The ratio of peak areas, periplasmic/cytoplasmic domains, is 11/89.

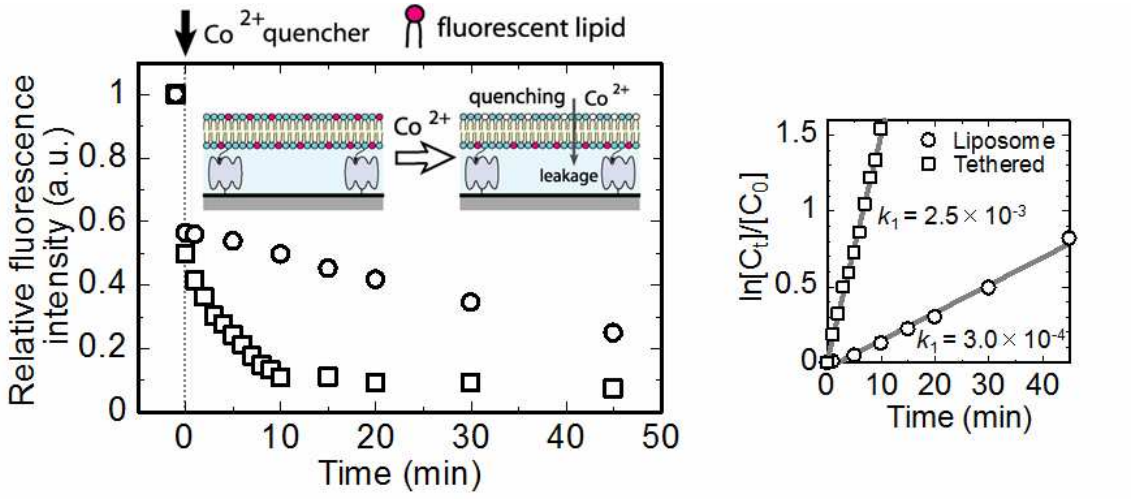

Figure S3. Left pannel: timecourses of fluorescence intensity of *N*-Rh-DOPE incorporated into the tethered (□) and liposomal membranes (○). Addition of $CoCl_2$ solution (indicated by the black arrow) onto the upper aqueous solution of the planar membrane (or into the liposomal solution) causes fluorescence quenching of *N*-Rh-DOPE in the upper (or the outer) leaflet immediately. Following the quick quenching (by ~50% of the intensity), the fluorescence gradually decreases due to the Co^{2+} ion leakage across the membranes. Right panel: first order kinetics of the slow process of the fluorescence quenching for the tethered and liposomal membranes.