



Supplementary Figure 1. Structure and pigment organisation in the photosynthetic reaction center of purple bacteria. (a) Overall structure. The protein surface shown as a semi-transparent object with the backbone fold of the H-, L- and M-polypeptides shown as white, green and yellow tubes, respectively. The approximate position of the membrane is shown as a grey box, with the primary donor side (P-side) and quinone side (Q-side) of the reaction centre labelled. The embedded cofactors are shown as sticks, with the carotenoid (bottom left) shown with teal carbons. (b) Enlarged view of the BChl, BPhe and quinone cofactors, color coded as in (a) with oxygens in red, nitrogens in blue and Fe and Mg atoms shown as brown or magenta spheres, respectively. Membrane-spanning electron transfer starts from the primary donor pair of BChls (P_A/P_B – pink carbons) and proceeds via the B_A BChl (green carbons), H_A BPhe (yellow carbons) and Q_A ubiquinone (cyan carbons). Electrons are passed on to the dissociable Q_B ubiquinone (cyan carbons), which can exchange with exogenous ubiquinone. The B_B BChl and H_B BPhe do not participate in electron transfer. For clarity the large hydrocarbon side-chains of the BChl, BPhe and quinone cofactors are not shown. (c) Diagram of the redox potentials of the components relevant to the present study. Components are labelled with the convention reactant-redox-state/product-redox-state. Light absorption converts P into P^* , triggering subsequent electron transfer to Q_B through a large change in redox potential. P^+ is reduced by cyt-*c*. (d) Absorbance spectra of the *Rba. sphaeroides* RC and the *Rps. acidophila* RC-LH1, showing band attributions. (e) Structure of the RC-LH1 complex from *Rps. palustris* (Roszak *et al.*, 2003; PDB entry 1PYH – resolution 4.8 Å) The central RC, colored as for (a) and viewed from the same direction, is surrounded by concentric cylinders of multiple copies of alpha (cyan ribbons) and beta (magenta ribbons) polypeptides, sandwiching a ring of BChls (colored alternately red and orange).

Roszak, A. W.; Howard, T. D.; Southall, J.; Gardiner, A. T.; Law, C. J.; Isaacs, N. W.; Cogdell, R. J. Crystal structure of the RC-LH1 core complex from *Rhodopseudomonas palustris*. *Science* **2003**, 302, 1969-1972.