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Supporting Material

Single-molecule spectroscopy reveals that individual low-light LH2 complexes from Rhodopseudomonas palustris 2.1.6. have a heterogeneous polypeptide composition

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Supplementary Material

	LH2*	**LH3§**	**Mixed LH2-LH3†**
R_α (Å)	26.09	26.02	26.02
R_β (Å)	26.92	26.95	26.92
A_α (rad)	-0.2043	-0.2015	-0.2015
A_β (rad)	0.1566	0.1592	0.1566
Π_α (rad)	-3.4957	-3.4598	-3.4598
Π_β (rad)	-0.5058	-0.5620	-0.5058
Φ_α (rad)	-0.1361	-0.0801	-0.0801
Φ_β (rad)	-0.1284	-0.1288	-0.1284
dH (Å)	0.00725	-0.0785	0.00725
$V_{n,i}$; $V_{n,e}$ (cm^{-1})	254[a];226[a]	256[b];210[b]	270[c];230[c]
W_α; W_β (cm^{-1})	-35[a];-26[a]	-38[b];22[b]	-38[c];-25[c]

Note: R_α and R_β, radius of α- and β-bound Bchl *a* circle in xy-plane; A_α and A_β, geometrical angle of the pigment of α- and β- bound Bchl *a* in xy-plane; Π_α and Π_β, in-plane dipole tilt from circular tangent of the α- and β- bound Bchl *a* in xy-plane; Φ_α and Φ_β, out-of-plane dipole tilt of the α- and β-bound Bchl *a* in z-plane; dH, height differences between centres α- and β-unit in z-plane. $V_{n,i}$ and $V_{n,e}$, the nearest-neighbour intra- and inter-dimer interaction; W_α; W_β, the α-next-nearest-neighbour interaction and the β-next-nearest-neighbour interaction

***** McDermott, S.M., et al., 1995, *Nature* 375, 517-521 and Papiz, M.Z., et al., 2003, *J Mol Biol* 326, 1523-1538.§ McLuskey, K., et al., 2001, Biochemistry 40(30), 8783-8789.

[a]Hofmann, C., et al., 2004, *Chem Phys Lett* 395, 373-378. [b]de Ruijter, W.P.F., et al.,2007, *Chem Phys* 341, 320-325.

†[c] This work

Table S1. The coordinate of the arrangement of Bchl *a* molecules in an LH2 complex according to the x-ray structural data.

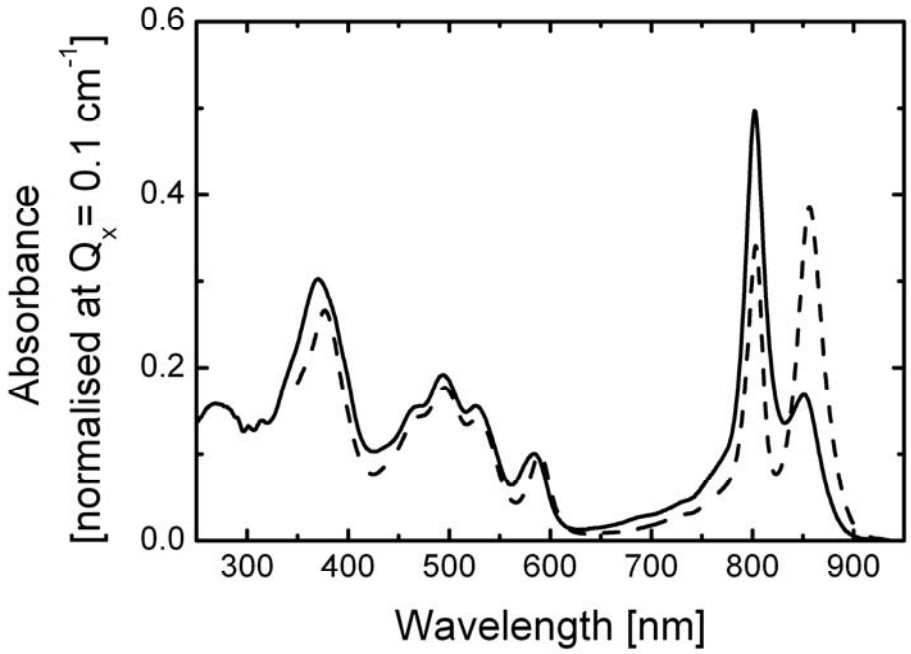

Figure S1. Room-temperature absorption spectra of *Rps. palustris* 2.1.6 grown at high-light (dashed line) and at low-light intensity (solid line). The absorption spectra are normalised at the Q_x-band around 590 nm.

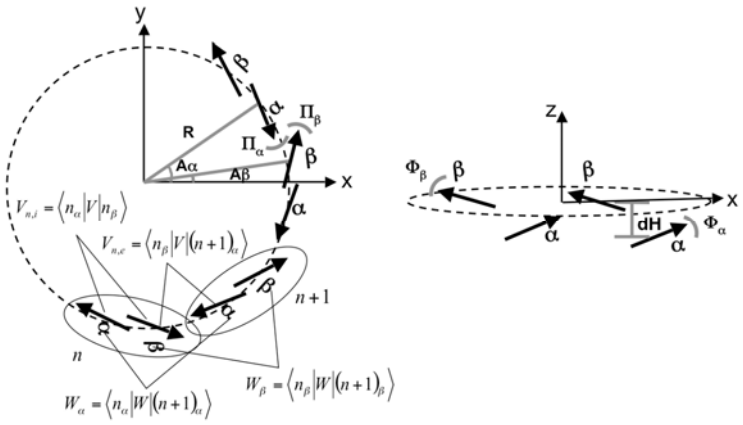

Figure S2. A schematic representation of the transition-dipole moments and the coordinate arrangement of the α- and β-bound Bchl a molecules in the xy-plane (left) and zy-plane (right). The $|n_\alpha\rangle$ etc. correspond to the wavefunctions of the electronically excited state localised on the α-bound Bchl *a* molecule in dimer n, respectively. The strongest contributions to the interaction result from the matrix elements for the intradimer nearest-neighbour interaction $V_{n,i}$, the interdimer nearest neighbour interaction $V_{n,e}$, the α-next-nearest-neighbour interaction W_α, and the β-next-nearest-neighbour interaction W_β, respectively. The geometrical arrangement of the α- and β-bound Bchl *a* molecules are defined by the radius of α- and β-unit circle in xy-plane R_u (u = α, β), the geometrical angle of the pigment of α- and β-unit in xy-plane A_u , the in-plane tilt of the transition-dipole moment of the α- and β-Bchl *a* from the circular tangent in xy-plane Π_u, the height differences between the centres of the α- and β-Bchl *a* in the z-plane dH_u, and the out-of-plane tilt of the transition-dipole moment of the α- and β-Bchl a in the z-plane Φ. The actual values of these parameters are summarised in table 1 together with the respective data for LH2 and LH3 from *Rhodopseudomonas acidophila*. The circles with the dashed line help to orient our eyes.