ELECTRONIC SUPPLEMENTARY INFORMATION

ESI 1

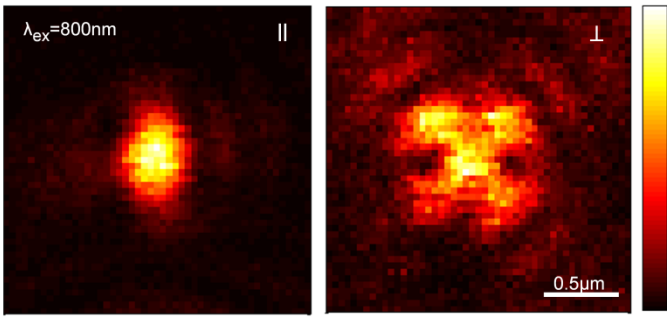

Fig. 1 High resolution confocal scan of L=150 nm NR-LH2 hybrid oriented parallel (//) or perpendicular ($\perp$) with respect to the excitation light, λ=800 nm. Focusing a x-polarized excitation beam with a high NA objective results mostly in x-polarisation in the central spot, but a fraction of the light is distributed in four lobes and polarized in the orthogonal y-direction.[1] These four lobes are clearly visible for the $\perp$-NR as the depolarized light is resonant with the longitudinal antenna-mode leading to enhanced excitation.

ESI 2

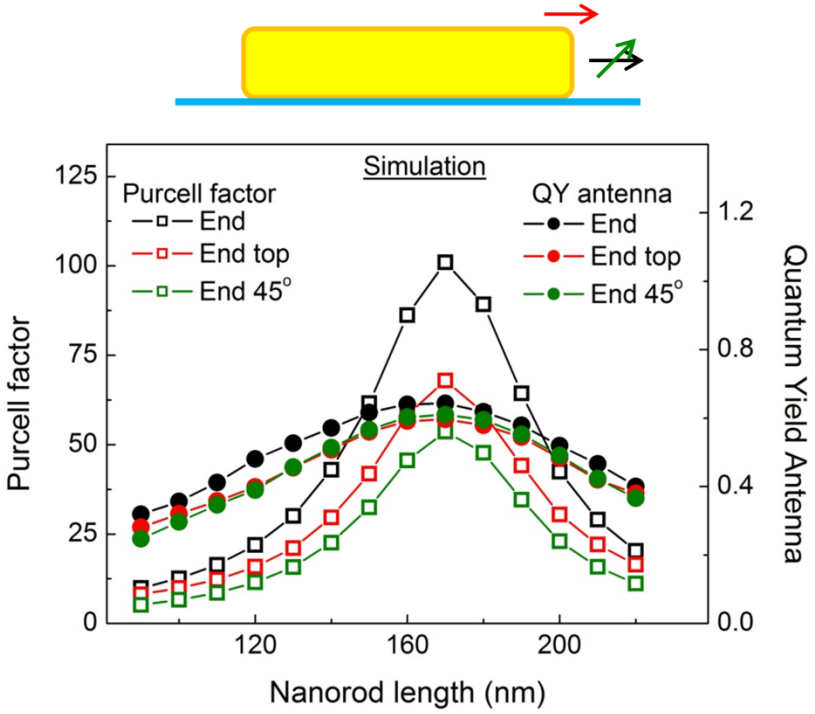

Fig. 2 The antenna efficiency as function of dipole position. The dipole source was positioned at three locations: (1) in front and in line with the antenna long-axis, (2) on top of the antenna and in line, and (3) in front tilted 45° with respect to the antenna long-axis, as indicated in the figure. The largest Purcell factor is found for the dipole in line and parallel with respect to the antenna long-axis, however the antenna efficiency is comparable for the different orientations.

Reference

1. L. Novotny and B. Hecht, *Principles of Nano-Optics*, Cambridge University Press, Cambridge, 2012.