Electronic Supplementary Material (ESI) for Physical Chemistry Chemical Physics

Supplementary data

n-phenyl-porphyrin nanorod and nanosphere structures

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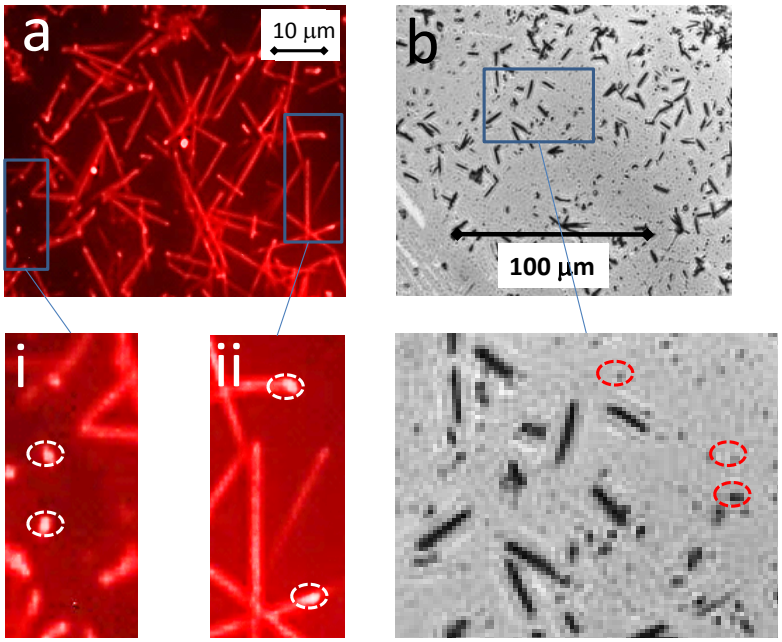

Fig S1. Microscopy images of H_2TPP. a) Fluorescence microscopy image, showing dispersed nanorods, i) zoomed in area showing the presence of nanospheres (circled examples), ii) zoomed in area showing bring regions occurring at the ends of the nanorods. b) optical transmission image showing dispersed nanorods, underneath zoomed in region for clarity a region of the image showing the presence of nanorods and nanospheres (some circled in red). It is noted that the length and thickness of the nanorods show a large degree of similarity withstanding the image resolution of the optical microscope.

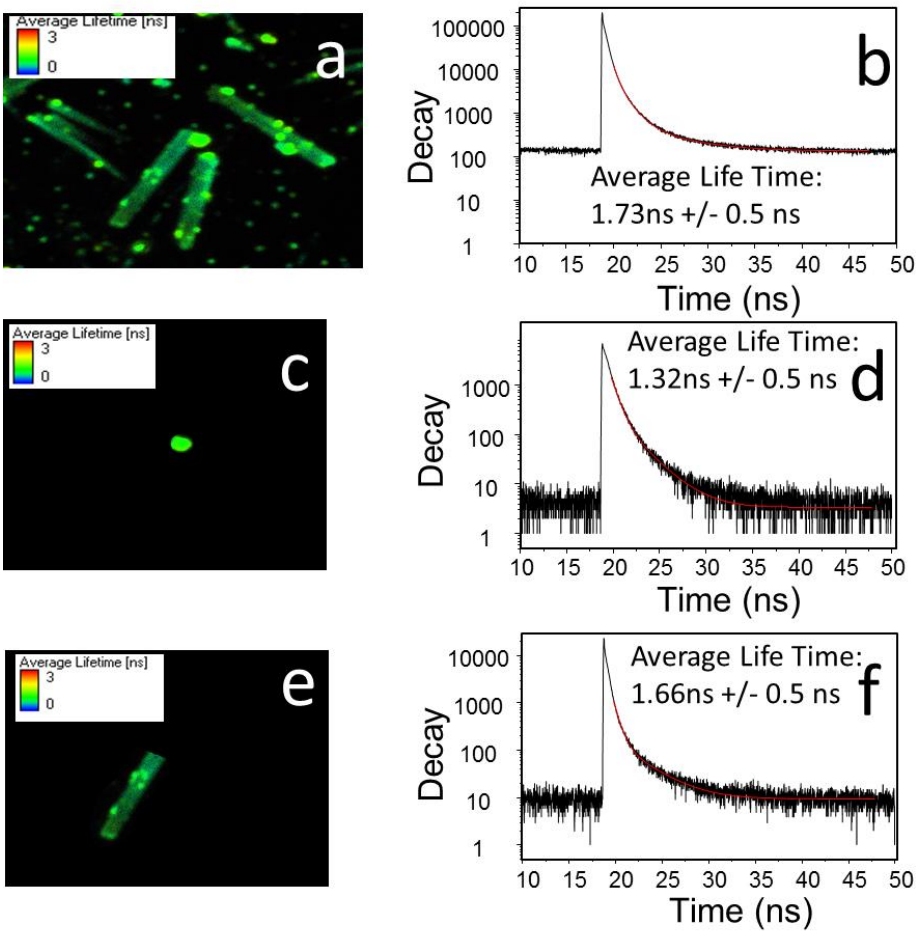

Fig S2. FLIM images of H_2TPP. a) nanorod and nanospheres, b) shows the average decay value from the image a). c) single nanosphere, d) decay curve from image c), e) single nanorod, f) decay trace from image e). Analysis of the FLIM image via assigning a exciton recombination lifetime to a single nanosphere (image s2-c) and a single nanorods (image s2-f) and comparing this to the average value for a image with both nanorods and nanospheres (image s2-a). The fitting error was 0.5 ns. The lifetimes obtained for the single nanorod and nanosphere were within a 0.5 ns difference as was the average lifetime for a collection of nanorods and nanospheres.

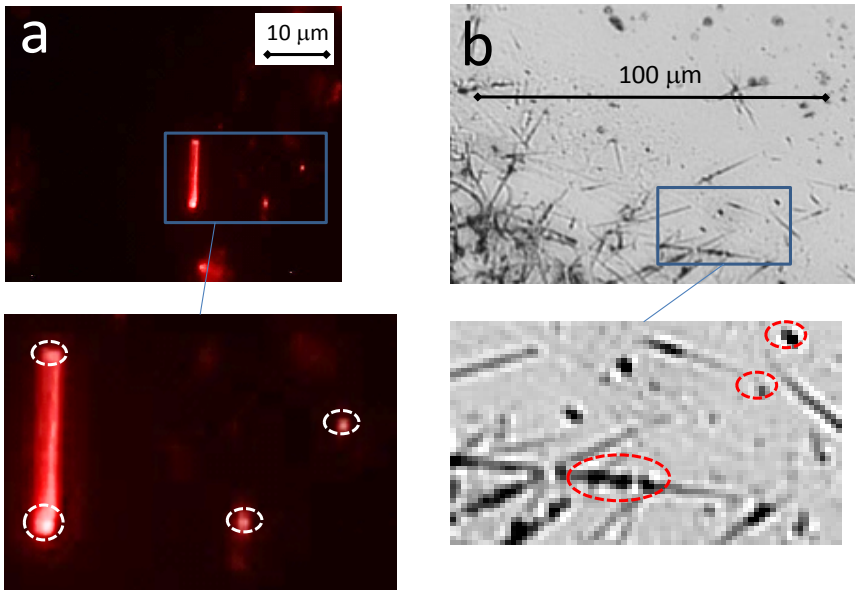

Fig S3. Microscopy images of H_2-Tri-PP. a) Fluorescence microscopy image, showing a single nanorod, i) zoomed in area showing the presence of nanospheres, circled, circled also are bring regions occurring at the ends of the nanorods. b) optical transmission image showing dispersed nanorods, underneath zoomed in region for clarity a region of the image showing the presence of nanorods and nanospheres (some circled in red) it is noted that the nanospheres occur of and on the nanorods.

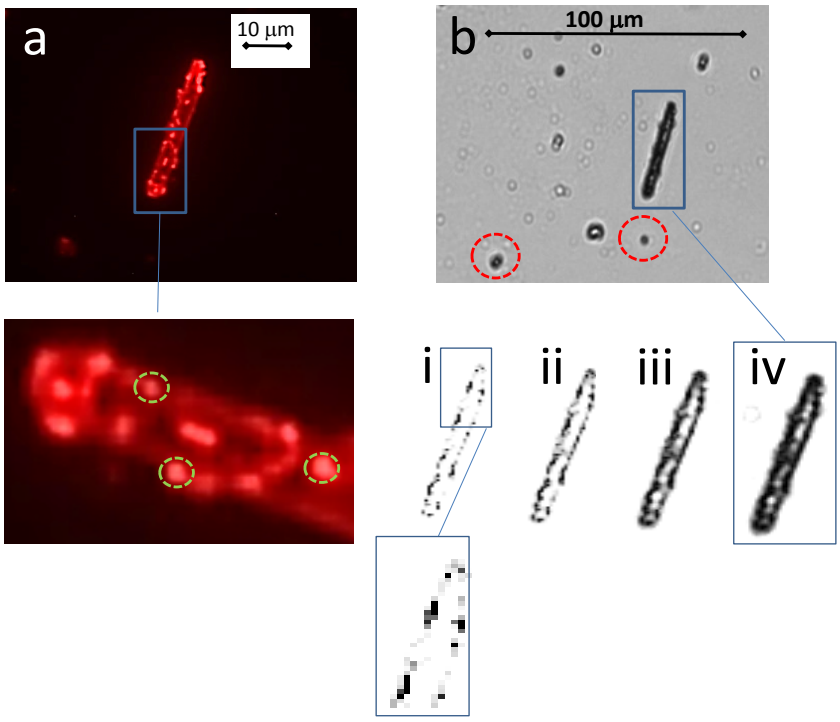

Fig S4. Microscopy images of $H_2$5,15 Di-PP. a) Fluorescence microscopy image, showing a single nanorod, i) zoomed in area of the nanorod showing the presence of nanospheres, circled, circled occurring over the nanorod. b) optical transmission image showing dispersed nanorods and nanospheres (circled) underneath zoomed in region for clarity a region of the image showing a nanorod with increasing constrast from i to iv. As the contrast is increased from iv to i the parts of the nanorod visable occurs increasingly at the edge. Inspection of the features at the edge is seen by zooming into a region of i), it can be seen in the resulting image that nanosphere like shapes occur randomly at c.a. the nanorods edge.

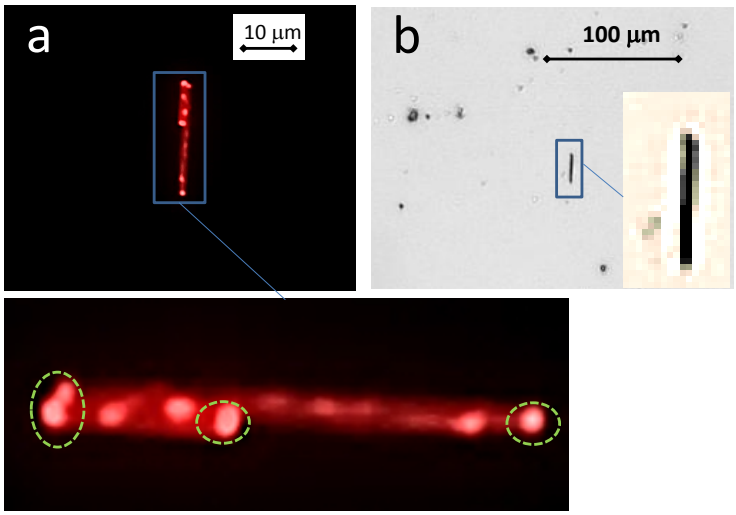

Fig S5. Microscopy images of $H_2$5,10 Di-PP. a) Fluorescence microscopy image, showing a nanorod, zoomed in area of the nanorod showing the presence of nanospheres, circled, circled also are the bright regions occurring at the ends of the nanods. The presence of two nanorods can be inferred to be present, one shorter than the other one on-top of the other. A number of nanospheres can be seen to be present on the nanorod. b) optical transmission image showing dispersed nanorods and nanospheres.

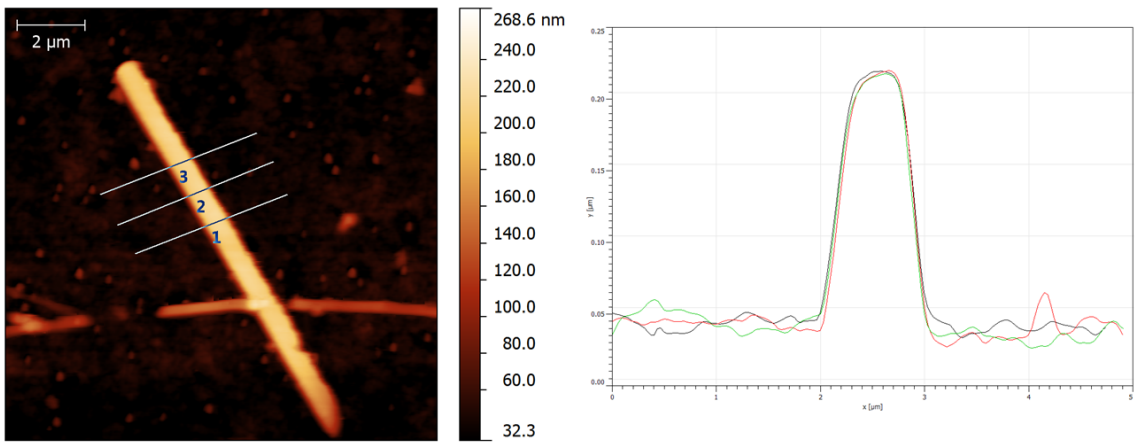

Fig S6. AFM image of a J-H_2TPP porphyrin nanorod (left). The image shows a single rod with three lines. The lines recording the height and cross section of the rod as shown in the plot (right). This enabling length, height and width to be estimated for each rod or sphere.

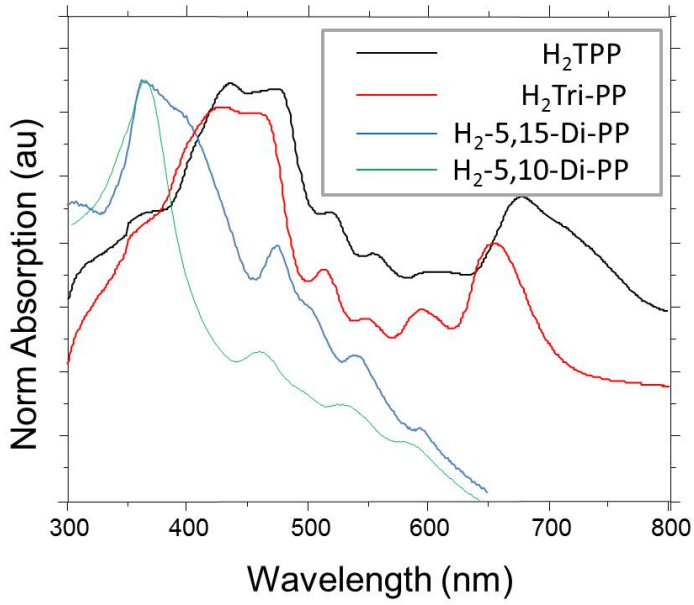

Fig S7. Normalised UV-vis spectra for all four porphyrins.