Lasing behavior of surface functionalized carbon quantum dots/RhB composite

(Supporting Information)

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**Fig. S1** Sketch of the experimental set-up used in laser emission studies. HW is a half wave plate, P a Glan-Taylor polarizer, M a mirror, SH a frequency doubling crystal, DM a dichroic mirror, N a 532 nm-notch filter connected, by means of a lens-coupled optical fiber-bundle, to the spectrometer for the luminescence detection.

**Fig. S2** TEM images of a) OH-CQDs and b) NH$_2$-CQDs.

**Fig. S3.** Particle-size histogram of a) OH-CQDs, b) NH$_2$-CQDs, c) PO$_4$-CQDs.
**Fig. S4** The Energy Dispersive X-ray Spectroscopy (EDS) analysis of NH$_2$-CQDs, PO$_4$-CQDs and OH-CQDs.

**Fig. S4.** Particle-size histogram of a) OH-CQDs, b) NH$_2$-CQDs, c) PO$_4$-CQDs. Fluorescence spectra of different amount of 0.5 mg/mL RhB solution in OH-CQDs solution and b) in NH$_2$-CQDs solution with the excitation wavelength of 365 nm.

**Fig. S5.** The relationship of fluorescence intensity and linewidth of b) PO$_4$-CQDs/RhB composite with the input energy of 1.42, 1.52 and 1.68 mJ.
Fig. S6. Scheme of interaction between RhB dye molecules and CQDs.