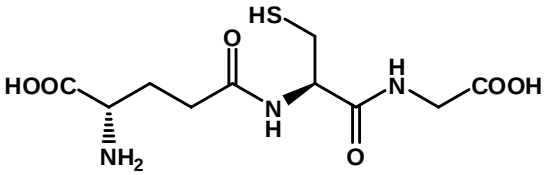
Supporting Information:

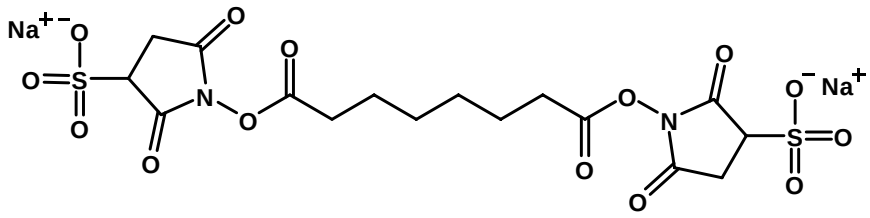
Materials: Ultrapure water from NANOpure Diamond (Barnstead Int., Dubuque, IA) source was used throughout the experiments. Hops Yellow Core Shell EviDots, CdSe/ZnS Quantum dots in toluene were purchased from Evident Technologies. Bis(Sulfosuccinimidyl) suberate (BS^3) was purchased from Pierce Biotechnologies. All others chemicals and enzymes were purchased from Sigma.

The structures of the chemical compounds used in the study are:

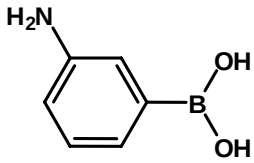
Glutathione



BS^3



3-Aminophenyl boronic acid



Preparation of GSH capped QDs: QDs were precipitated from the toluene solution by addition of 2 ml methanol to 0.5 ml of the QDs in toluene, followed by centrifugation for 5 minutes at 3000 rpm. The resulting precipitate was dissolved in 1 ml chloroform, to which was added a 200 μl of a glutathione, GSH, solution (containing 0.142 gr GSH and 40 mg KOH in 2 ml methanol) and the resulting mixture was shaken. After the addition of 1.5 ml of 1 mM NaOH solution in water, all particles were transferred to the water phase. The QDs solution was separated from the chloroform by centrifugation for 1 min. The excess of GSH was removed by two successive

precipitation steps of QDs, using NaCl and methanol followed by centrifugation. The resulting QDs were dissolved in 200 μl of a 10 mM HEPES buffer, pH=7.4.

Preparation of 3-Aminophenylboronic acid capped QDs: To the 1 nmol of the GSH-capped QDs in HEPES buffer, were added 100 μl of a bis(Sulfosuccinimidyl) suberate, BS^3, stock solution (1 mg/ml) and the mixture was shaken for 15 min. The QDs were purified by precipitation, dissolved in 10 mM HEPES buffer (pH=7.4) to which was added 100 μl of a 3-aminophenylboronic acid stock solution (1 mg/ml), and the resulting solution was shaken for 1.5 hours. Finally, the excess of 3-aminophenylboronic acid was removed by two successive precipitation steps, and the purified particles were dissolved in 200 μl of phosphate buffer, 0.1M, pH 10.3.

Preparation of β-CD-capped QDs: To 1 nmol of 3-aminophenylboronic acid-functionalized QDs was added 1 μmol of β-cyclodextrin, dissolved in 100 μl phosphate buffer, and the mixture was shaken for 12 hours. The excess of β-cyclodextrin was removed by two successive precipitation steps. The resulting QDs were, then, dissolved in a 0.1M phosphate buffer, pH 10.3.

Optical Instrumentation: Real-time fluorescence measurements were carried out using a photon-counting spectrometer (Edinburgh Instruments, FLS 920) equipped with a cooled photomultiplier detection system, connected to a computer (F900 v.6.3 software, Edinburgh Instruments).