Electronic Supplementary Material (ESI) for Dalton Transactions.

Highly stable spherical-shaped and blue photoluminescent cyclodextrin coated Tellurium nanocomposites prepared by in situ generated solvated electrons: a rapid green method, mechanistic and anticancer studies

Apurav Guleria[a,b*], Vishwa V. Gandhi[a,b], Amit Kunwar[a,b], Anil K. Debnath[c], and Soumyakanti Adhikari[a,b*]

[a]*Radiation & Photochemistry Division, Bhabha Atomic Research Centre, Mumbai 400085, India*
[b]*Homi Bhabha National Institute, Trombay, Mumbai 400094, India*
[c]*Technical Physics Division, Bhabha Atomic Research Centre, Mumbai 400085, India*

***Corresponding author email:** aguleria@barc.gov.in & asoumya@barc.gov.in,
Tel: (+91)-22-25590919, (+91)-22-25590301

Supporting information

NS1: Photoluminescence (PL) quantum efficiency (QE)

The PL QE of the nanocomposites was evaluated by comparison method using equation (1). The standard reference employed was quinine sulfate (Φ = 0.55) dissolved in 0.5 M sulfuric acid.

$$\Phi_S = \Phi_R \frac{A_S}{A_R} * \frac{OD_R}{OD_S} * \left(\frac{n_s}{n_R}\right)^2 \quad (1)$$

Where 'Φ' is the quantum yield, 'A' is the integrated PL intensity, 'OD' is the optical density, and 'n' is the refractive index. The subscript 'S' and subscript 'R' denotes the sample and reference, respectively.

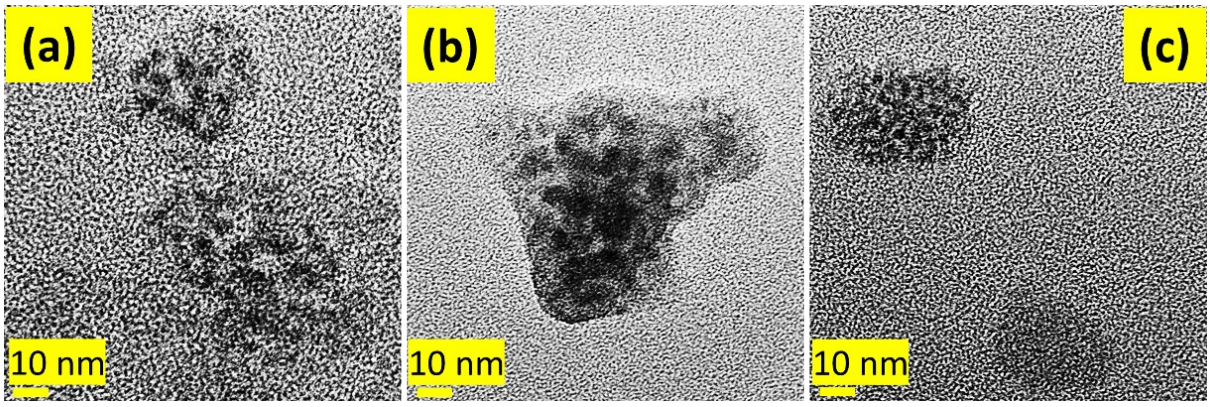

Fig.S1. HRTEM images (a), (b), (c) of α-CD@Te NCs prepared with an absorbed dose of 25, 40 and 60 kGy, respectively.

Table S1. CHNS elemental analysis of α-CD@Te NCs

Sample	Organic Carbon (%)	Hydrogen (%)	Nitrogen (%)	Sulphur (%)
α-CD@Te NCs	35.671	5.88	0.12	0.119

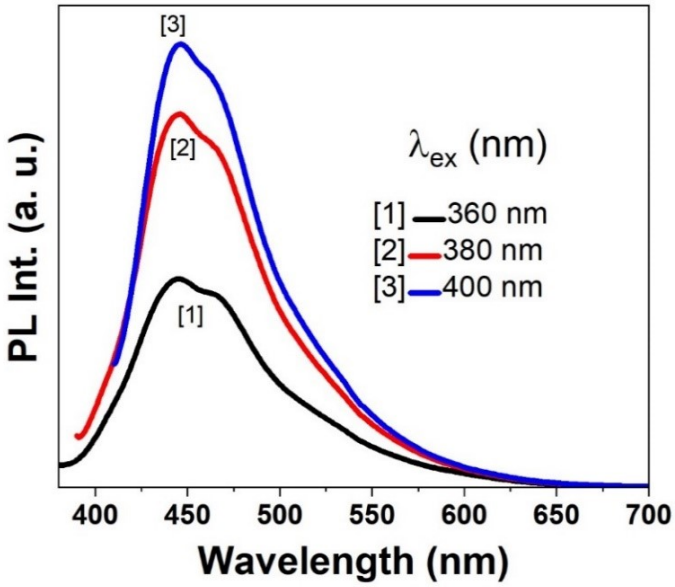

Fig.S2. PL spectra of α-CD@Te NCs (prepared with an absorbed dose of 25 kGy) at various excitation wavelengths.

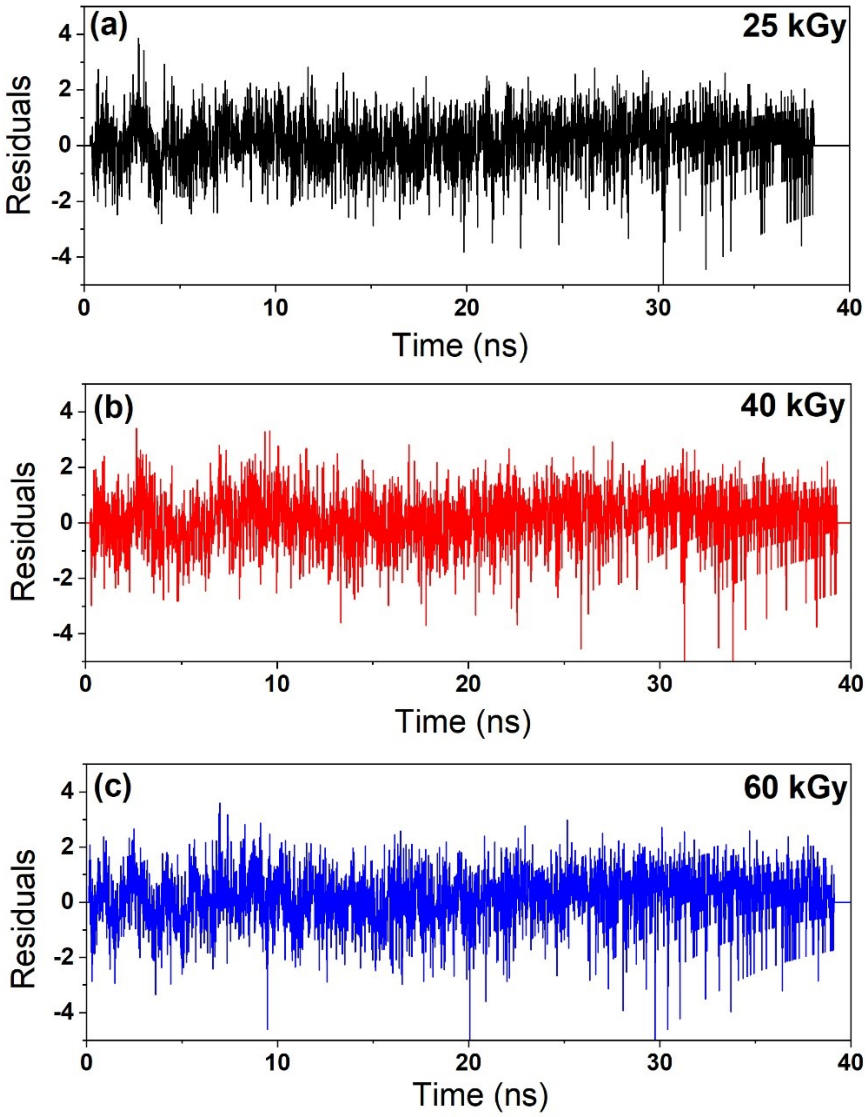

Fig.S3. Residuals of the best fits of PL lifetime decay curves corresponding to α-CD@Te NCs synthesized with various absorbed doses (λ_{ex} = 339 nm & λ_{em} = 445 nm).

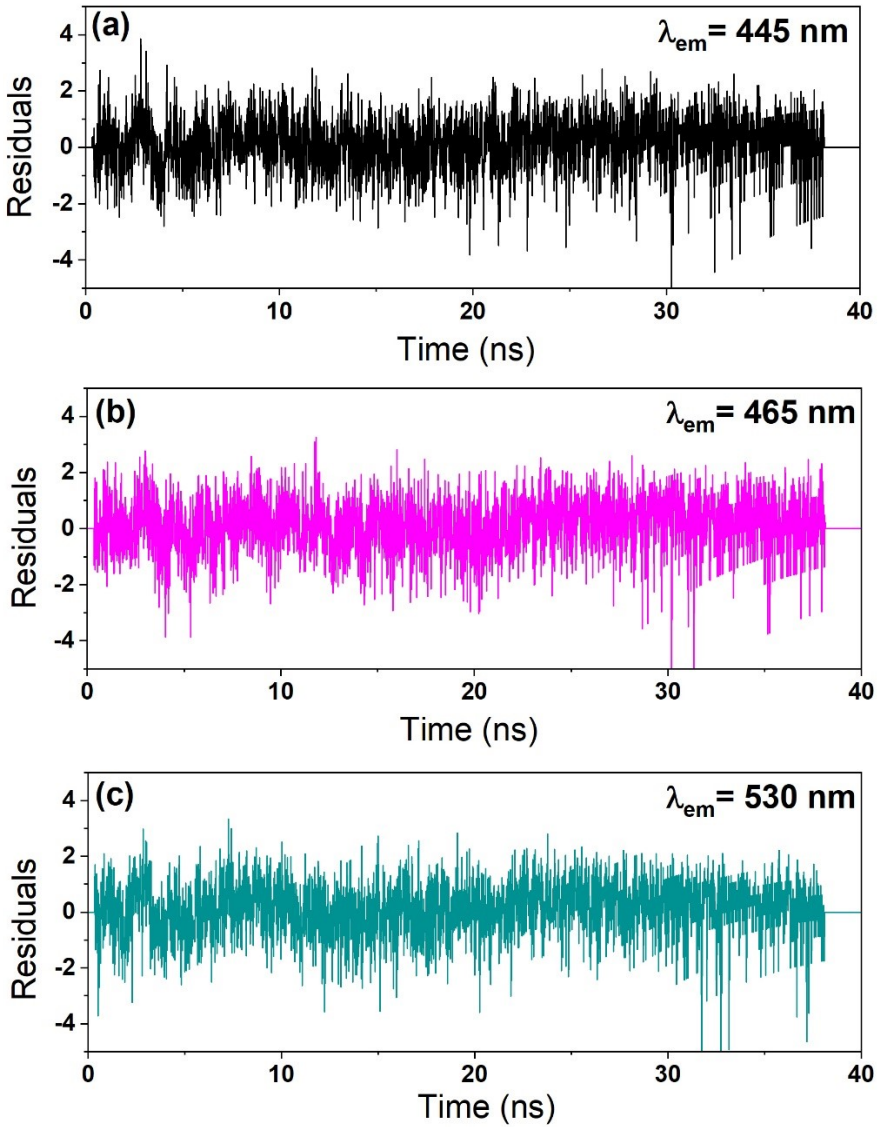

Fig.S4. Residuals of the best fits of PL lifetime decay curves corresponding to α-CD@Te NCs synthesized with an absorbed dose of 25 kGy at different emission wavelengths (λ_{ex} = 339 nm).

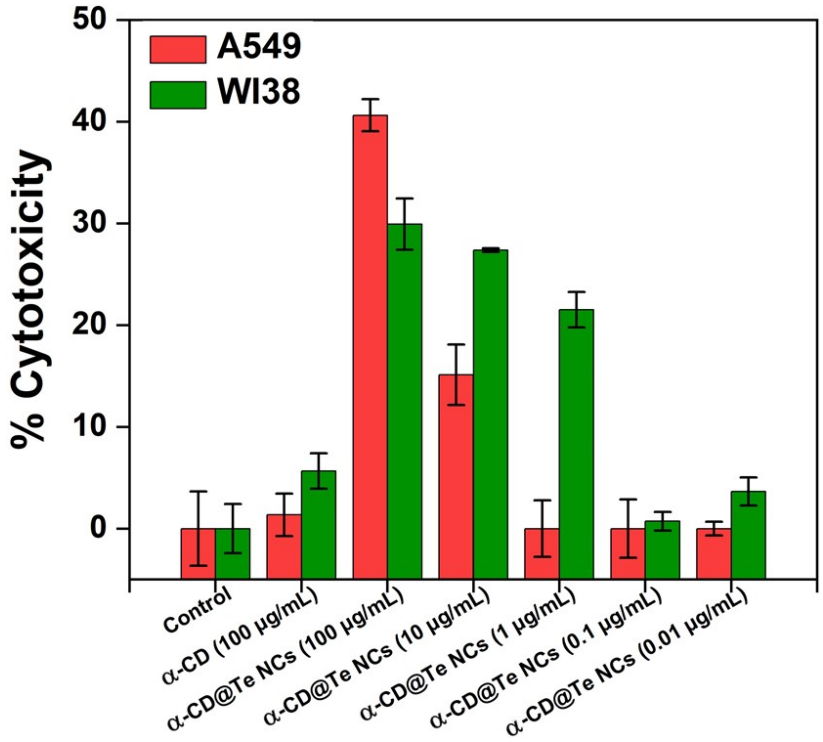

Fig.S5. The cytotoxic effect of α-CD@Te NCs in A549 and WI38 cells by MTT assay is presented. The cells were treated with increasing concentrations (0.01-100 μg/ml) of NCs for 48 h before the MTT assay. The results are presented as mean ± SD (n = 4).

NS2: It can be seen from Fig.S5 that the treatment of α-CD@Te NCs in the concentration range of 0.1 to 0.01 μg/mL did not cause any significant cytotoxicity in either the normal or cancerous cells. Further, an increase in the treatment concentration of α-CD@Te NCs in the concentration range of 1 to 100 μg/mL although showed significant cytotoxicity in normal cells, the effect appeared to be saturated. In order words, the cytotoxic effect of α-CD@Te NCs in normal cells did not show concentration dependency. On the other hand, treatment of α-CD@Te NCs in a similar concentration range exhibited a concentration-dependent cytotoxic effect

in tumor cells. Similar observations have been reported by Medina Cruz et al. [1] in their recent study, wherein Te nanoparticles caused a decrease in the proliferation of cells for both healthy and cancer cell lines. However, the decay was found to be more pronounced for cancer cells, showing higher cytotoxicity.

Reference:

(1) D. Medina Cruz, W. Tien-Street, B. Zhang, X. Huang, A. Vernet Crua, A. Nieto-Argüello, J. L. Cholula-Díaz, L. Martínez, Y. Huttel, M. U. González, J. M. García-Martín and T. J. Webster, *Green Chem.*, 2019, **21**, 1982–1998.