Supplementary Information:

Visible-light excited polar Dion-Jacobson $Rb(Bi_{1-x}Eu_x)_2Ti_2NbO_{10}$ perovskite: Photoluminescence properties and in-vitro bioimaging

Debendra Prasad Panda,[a] Akash Kumar Singh, [b] Tapas K. Kundu [b] and A. Sundaresan [a]

[a] School of Advanced Materials and Chemistry and Physics of Materials Unit, Jawaharlal Nehru Centre for Advanced Scientific Research, Jakkur, Bangalore 560064, India.

[b] Transcription and Disease Laboratory, Molecular Biology and Genetics Unit, Jawaharlal Nehru Centre for Advanced Scientific Research, Jakkur, Bangalore 560064, India.

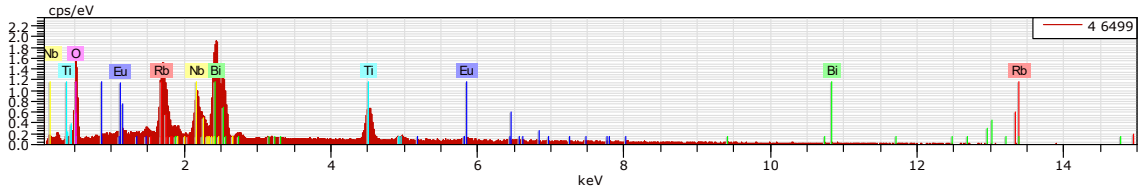

Fig. S1. The EDX spectrum of $Rb(Bi_{0.875}Eu_{0.125})_2Ti_2NbO_{10}$ measured in a Bruker instrument confirms the successful substitution of Eu^{3+} ions.

Table S1 Elemental composition of $Rb(Bi_{0.875}Eu_{0.125})_2Ti_2NbO_{10}$

Elements	Atomic Percentage (%)
Rb	9.02
Bi	9.21
Eu	1.59
Ti	13.06
Nb	5.46
O	61.67

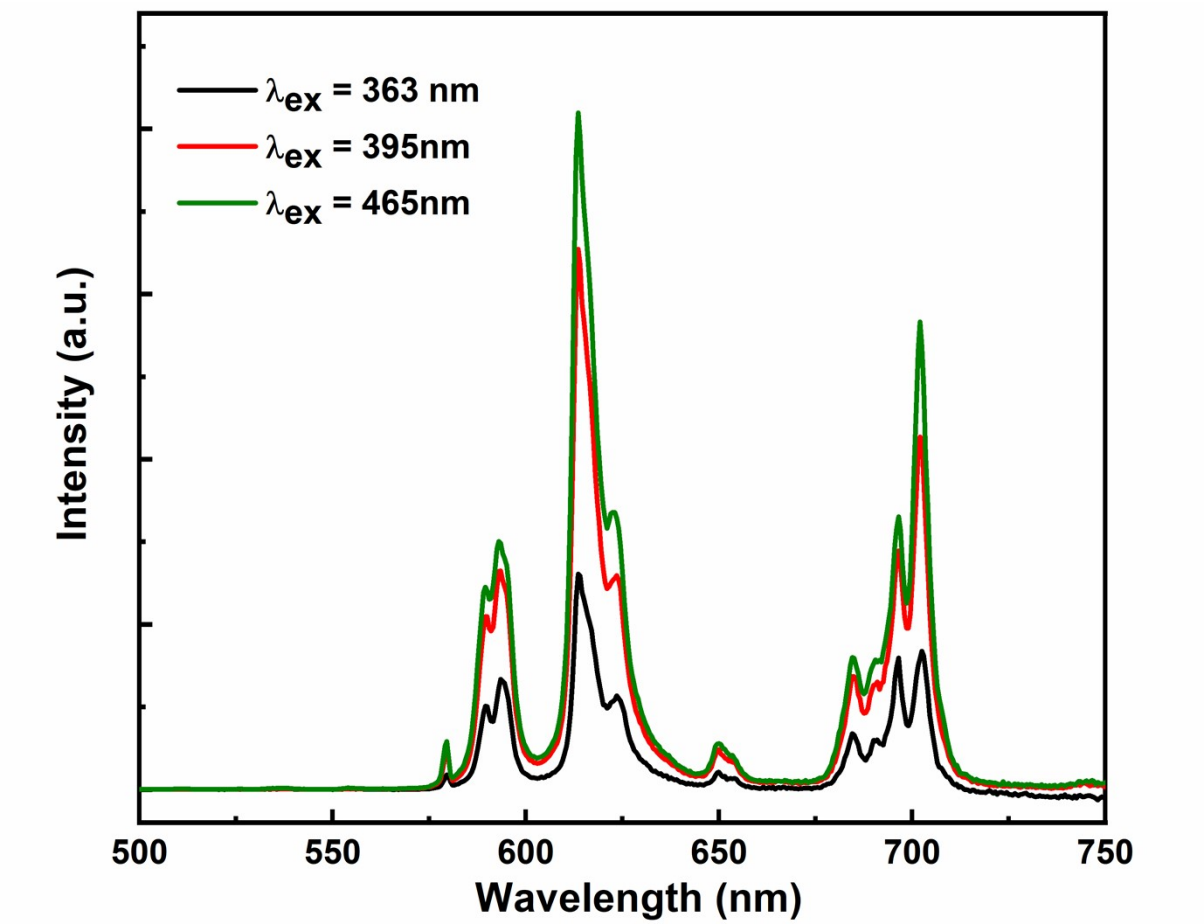

Fig. S2. Room temperature emission spectra of $Rb(Bi_{0.875}Eu_{0.125})_2Ti_2NbO_{10}$ excited at different wavelengths of excitation.

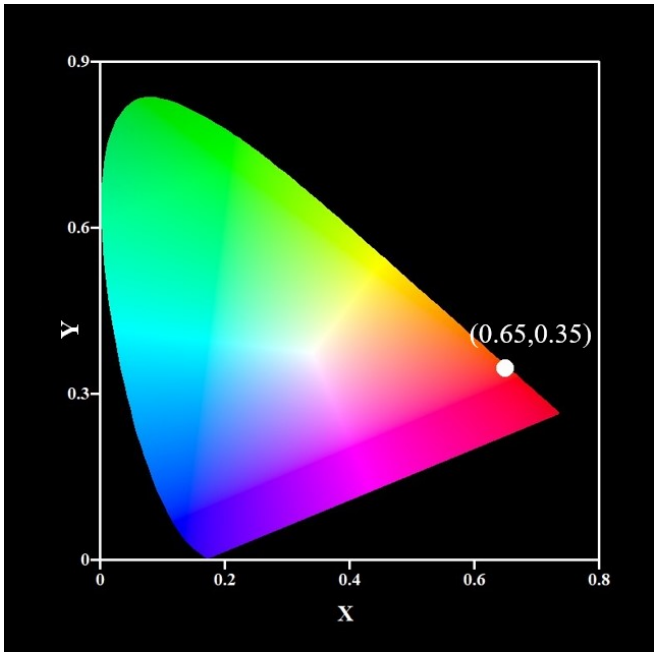

Fig. S3. CIE chromaticity coordinates of $Rb(Bi_{0.875}Eu_{0.125})_2Ti_2NbO_{10}$ under excitation of 465 nm light.

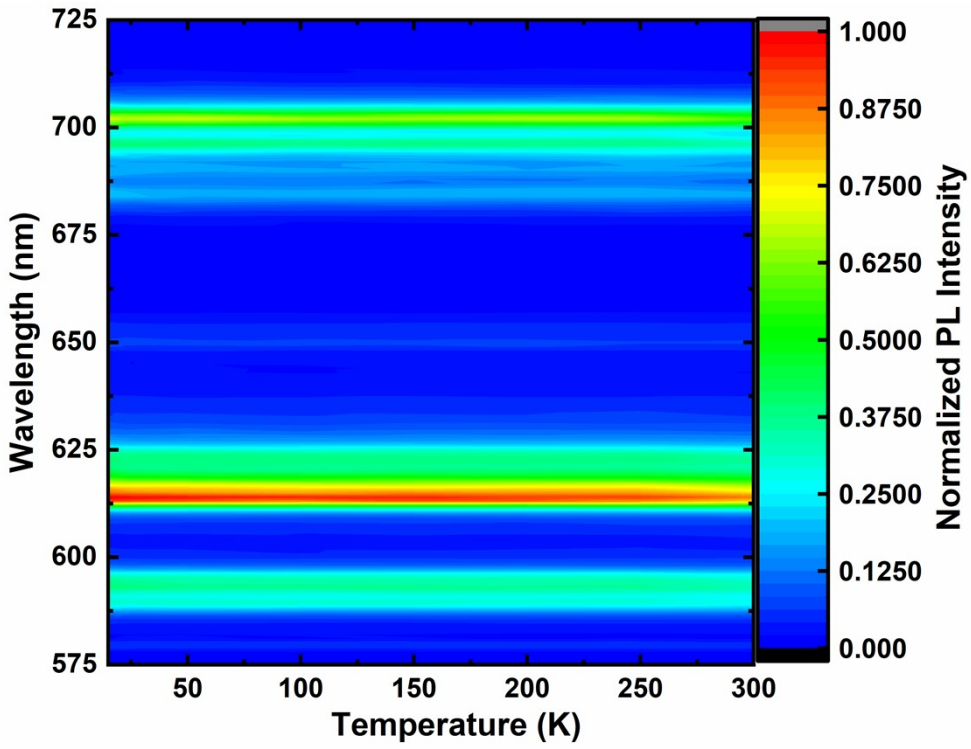

Fig. S4. Low-temperature emission spectra of $Rb(Bi_{0.875}Eu_{0.125})_2Ti_2NbO_{10}$ in the range of 15-300 K upon λ_{ex} = 465 nm wavelength light.

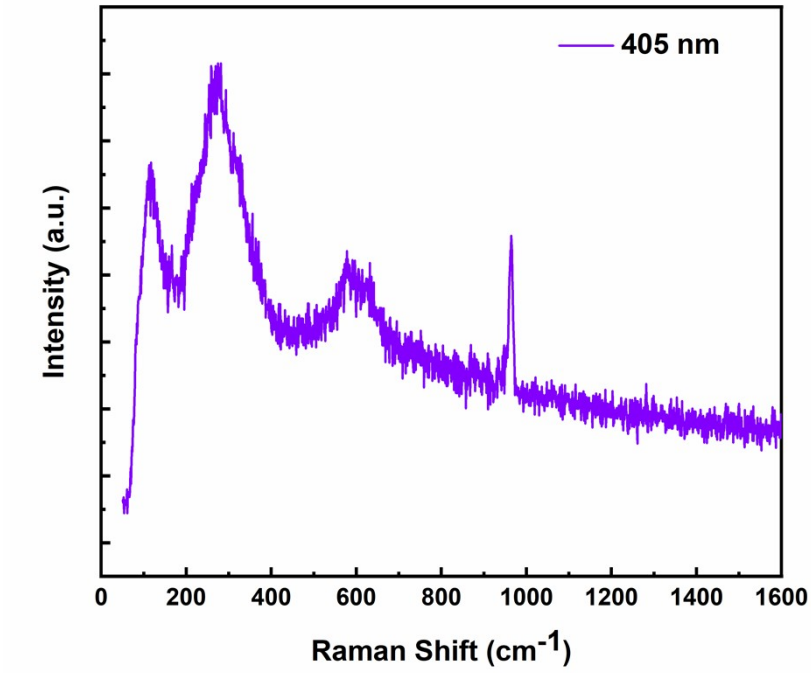

Fig. S5. Raman spectrum of $Rb(Bi_{0.875}Eu_{0.125})_2Ti_2NbO_{10}$ excited at 405 nm shows maximum vibration below 1000 cm^{-1}.

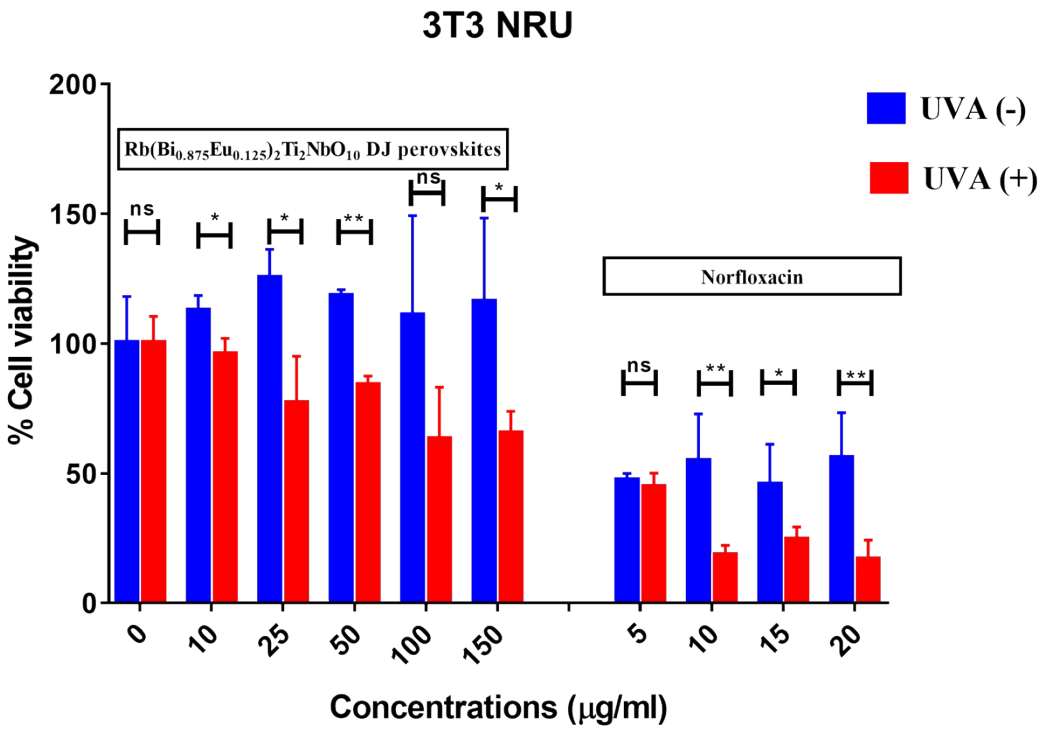

Fig. S6. Mouse fibroblast NIH-3T3 cells were treated with different concentrations of $Rb(Bi_{0.875}Eu_{0.125})_2Ti_2NbO_{10}$ DJ perovskites and irradiated with UVA light UVA(+) for 50 mins. Non-irradiated {UVA(-)} samples were used as control and a known phototoxic chemical norfloxacin was used as a positive control. Neutral red uptake assay was performed after 24 hours of irradiation and absorbance was measured at 540nm. Unpaired *t-test* were performed for statistical analysis and Error bars represent the standard error of the mean.

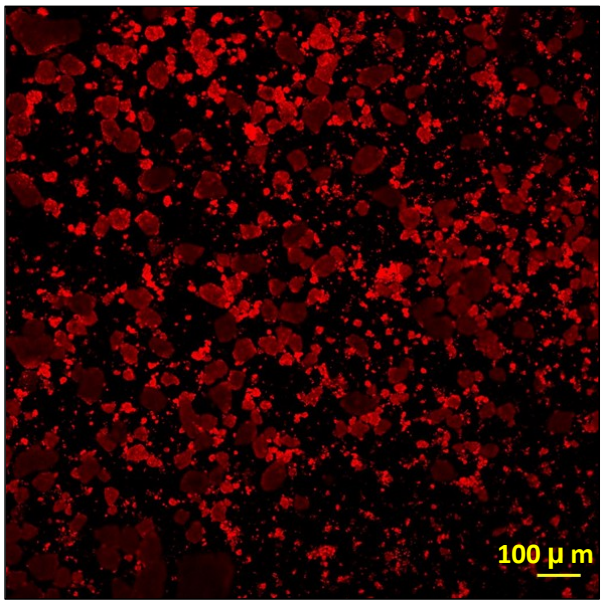

Fig. S7. Two-photon microscopy image of $Rb(Bi_{0.875}Eu_{0.125})_2Ti_2NbO_{10}$ DJ perovskite dispersed in water. (excitation wavelength: 930 nm and laser power: 40 % intensity).

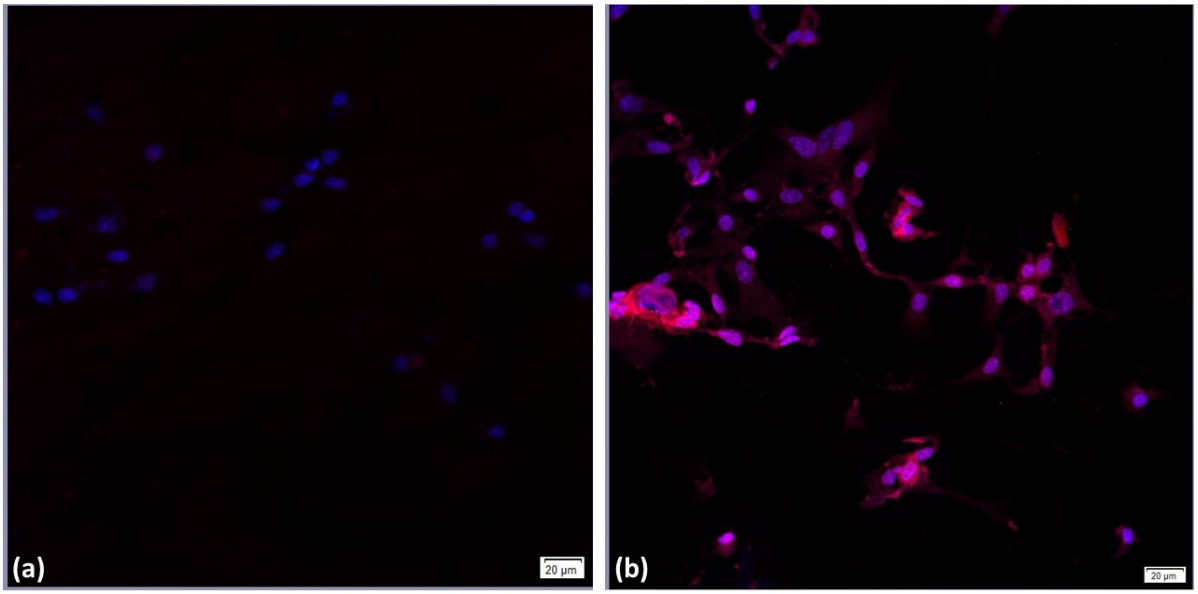

Fig. S8. Two-photon microscopy images of $Rb(Bi_{0.875}Eu_{0.125})_2Ti_2NbO_{10}$ DJ perovskite incubated with SHSY-5Y neuroblastoma cells. (a) SHSY-5Y cells, stained with Hoechst nuclear stain (blue) dye. (b) Cells were incubated with 200 µg/ml of the perovskite compound for 24 hours. Identical settings and gains were used across all the samples during the imaging.

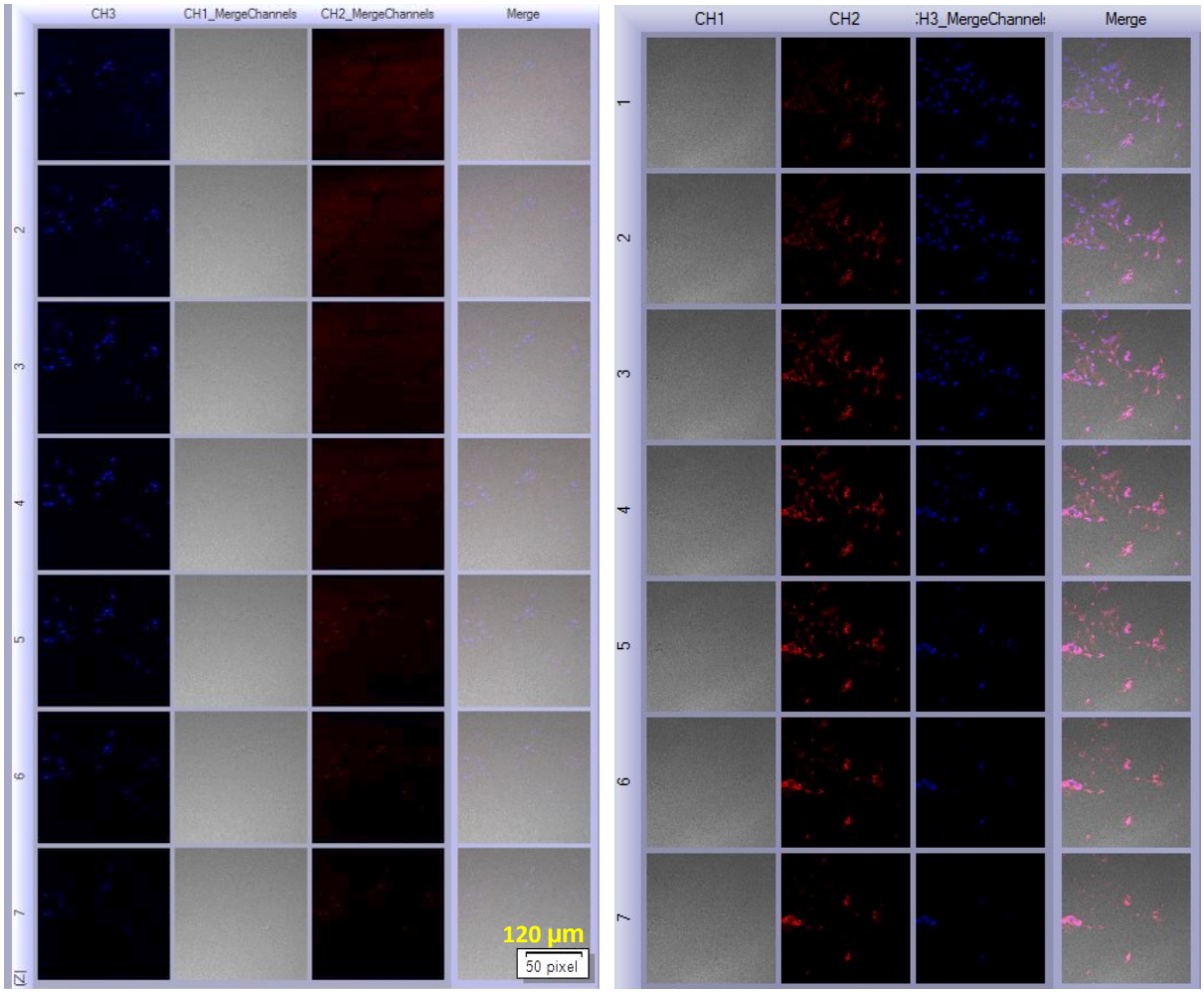

Fig. S9. Z-scan images of (a) untreated and (b) $Rb(Bi_{0.875}Eu_{0.125})_2Ti_2NbO_{10}$ treated SH-SY5Y cells confirming the compound is successfully diffused inside the cells.