

An analytical method for quantifying the yields of DNA double-strand breaks coupled with strand breaks by γ -H2AX focus formation assay based on track-structure simulation

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This supplementary data includes two figures and one table: Figure S1. Probability density of γ -H2AX foci area for various X-ray spectra used in this study; Figure S2. Energy spectra of photon and secondary electron for X-rays used in this study; Table S1. Average energy of photon and secondary electron generated by each X-ray spectra used in this study.

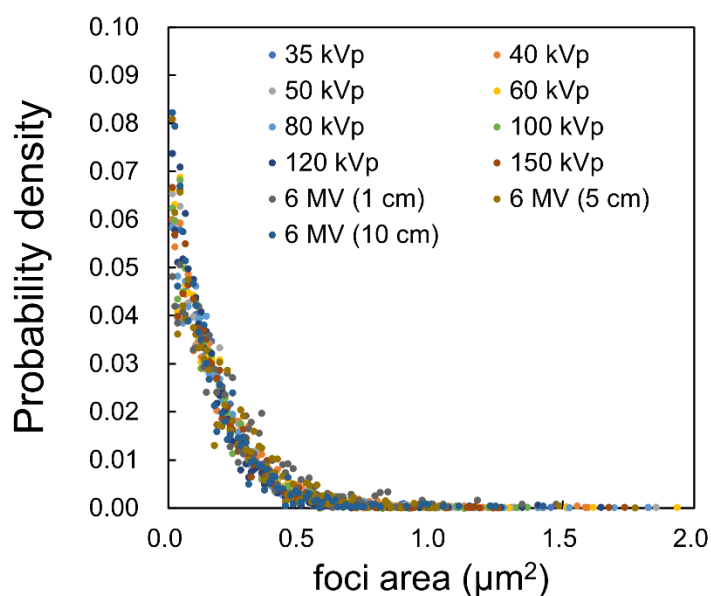
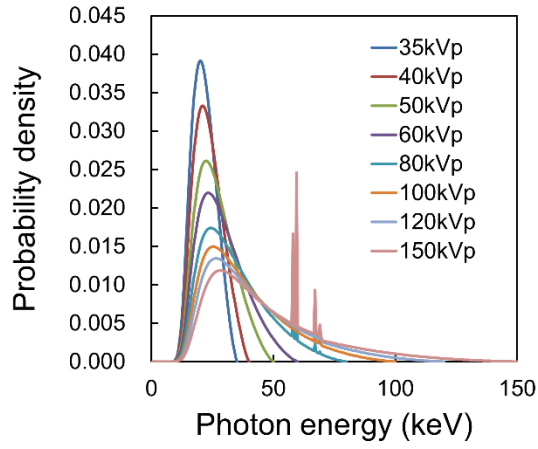
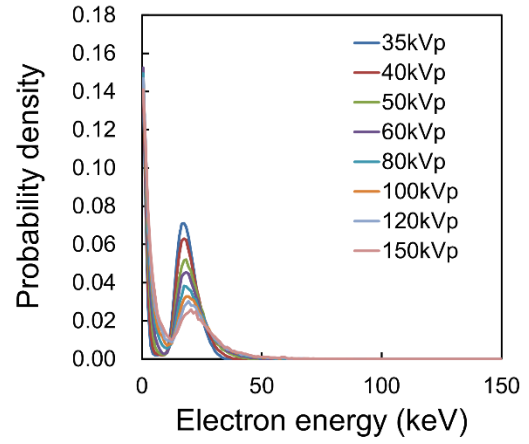


Figure S1. Probability density of γ -H2AX foci area for various X-ray spectra used in this study. In these energy spectra, the distributions show the same tendency. From these results, we presented the mean value for each irradiation condition as shown in Fig. 3 (see main paper).

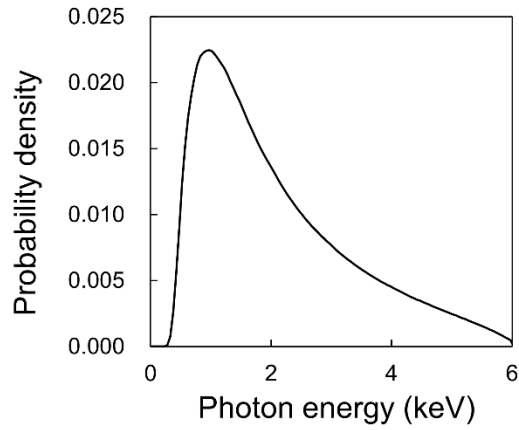
(A) Photon spectra of 35-150 kVp X-rays



(B) Secondary electron spectra of 35-150 kVp X-rays



(C) Photon spectrum of 6MV-linac X-ray



(D) Secondary electron spectra of 6MV-linac X-ray

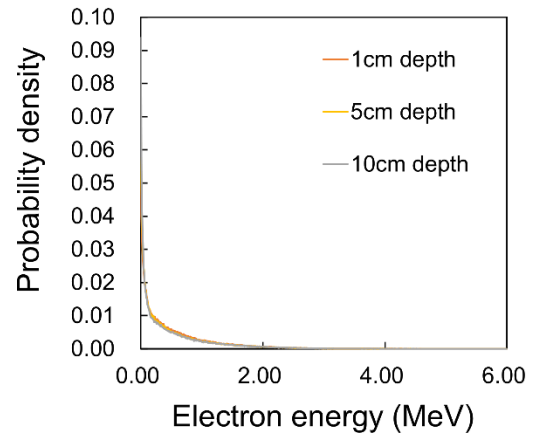


Figure S2. Energy spectra of photon and secondary electron for X-rays used in this study. These photon spectra were calculated using the present formula [1], and secondary electron spectra were calculated by the EGS mode [2] and *etsmode* [3,4] in PHITS [5].

Table S1. Average energy of photon and secondary electron generated by each X-ray spectra used in this study. These energies were calculated by the probability density distributions as shown in Figure S2.

Type of X-ray	Average energy of photon (keV)	Average energy of electron (keV)
35 kVp X-ray (1 mm depth)	21.54	14.38
40 kVp X-ray (1 mm depth)	23.25	14.32
50 kVp X-ray (1 mm depth)	26.28	14.07
60 kVp X-ray (1 mm depth)	28.96	13.85
80 kVp X-ray (1 mm depth)	33.82	13.57
100 kVp X-ray (1 mm depth)	38.12	13.35
120 kVp X-ray (1 mm depth)	41.85	13.06
150 kVp X-ray (1 mm depth)	46.85	12.99
6 MV (1 cm depth at isocenter)	2070.09	530.04
6 MV (5 cm depth at isocenter)	2070.09	489.40
6 MV (10 cm depth at isocenter)	2070.09	476.69

References

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