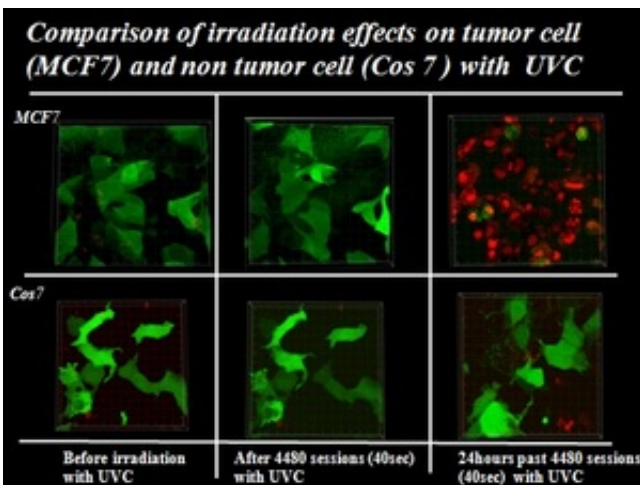


# New cancer therapy using ultra-violet C (UVC) pulse flash irradiation

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MCF7: neoplastic cell, COS7:non-neoplastic cell. The Ultra Violet C (UVC) pulse flash irradiation only selectivity caused death of neoplastic cells, and not non-neoplastic cells. © Tokai University

Johbu Itoh at the Tokai University School of Medicine in Japan has developed a new and highly effective cancer therapy method where cancer cells are irradiated with ultraviolet C (UVC) light. The new method employs high intensity-UVC pulse flash rays (UVC-PFR) of a broad UVC spectrum (230 to 280 nm) produced by a modified UV-flash sterilization system (BHX200). The experiments showed the pulsed nature of the spectrum to enhance the efficiency of destruction of neoplastic cells.

Importantly, the research demonstrates that under the appropriate UVC irradiation conditions, only neoplastic cells were destroyed, while non-neoplastic cells did not.

The well-known "germicidal light" of low pressure mercury lamps ([UV lamp](#)) is widely used for sterilizing medical instruments. However, it takes several hours for the weak light from UV lamps to have their germicidal effects.

In contrast, the sterilization effects of UV pulsed flash rays (wavelengths of 230-280nm and peak wavelength of 248 nm) show promise as a more efficient and rapid means of destroying a wider range of bacteria because this type of irradiation produces light whose energy is tens of thousands of times greater for a given area of irradiation, compared with conventional UV lamps (65W equivalency).

UVC pulse flash rays (UVC-PFR), with 1-10 continuous flashes per second, can be produced by a powerful discharge of [xenon gas](#). Johbu Itoh and colleagues at the [Tokai University](#) School of Medicine has developed and established UVC-PFR therapy system for [cancer therapy](#).

The researchers irradiated cells with pulsed light UVC-PFR and caused functional disorder to produce cell injury and/or a functional obstruction only to neoplastic cells. Higher ultraviolet radiation sensitivity in the UVC range was observed in neoplastic cells compared to non-neoplastic cells. That is, a short burst of ultraviolet radiation was sufficient to selectively induce injury and death to neoplastic cells.

Furthermore, experiments showed UVC-PFR to cause cell death within a few seconds. One of the major features of this method is that below a certain range of irradiation conditions, damage to intact or non-neoplastic cells can be largely ignored, and only neoplastic cells die. This method offers a simple means of reducing the burden on patients

undergoing cancer therapy. Itoh and colleagues plan to adapt this system for cancer treatment using endoscopy, laser microscopy, and other such light irradiation equipment.

**More information:** [www.acplan.jp/ichc2012/](http://www.acplan.jp/ichc2012/)

Provided by Tokai University School of Medicine

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