



ElectronFlash

The First Dedicated Research
Accelerator for FLASH RT



What's new in radiation therapy

FLASH RT has deep roots and it is undeniable that its scientific background becomes nowadays stronger and stronger.

Conventional RT has made great steps forward and is the expression of a mature and advanced technology. It is clear so far to the world of scientific research and clinical experimentation that the damage caused to healthy tissues during radiation therapy treatment is still an important challenge for conventional RT.

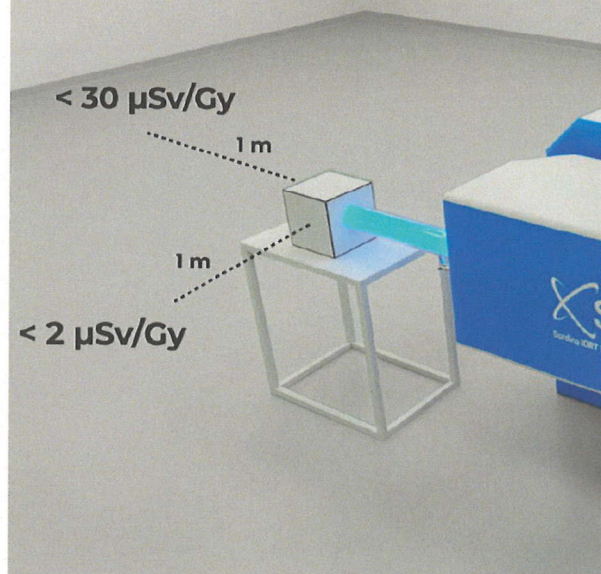
FLASH RT represents a complete paradigm shift rather than a development of an existing technology. The number of studies is constantly increasing leading to an accumulation of promising results.

To perform their studies, researchers were forced to modify existing equipment designed for a different use. Finally, a ready-to-use FLASH RT solution has been recently developed, improving and expanding dramatically the technological activity and investigation in this field.

A new horizon

The possibility of relying on equipments able to operate in a controlled setup and based on accurate dosimetry calibrated according to clinical standards: this idea foreseen as a possibility before, is now a concrete solution thanks to the technology introduced by ElectronFlash.

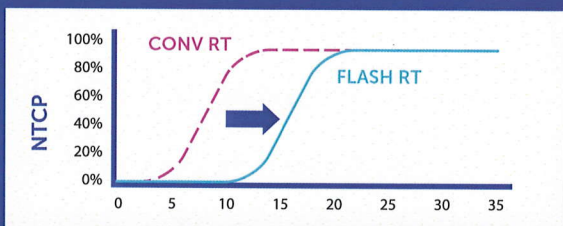
ElectronFlash is more than just a device: it is a solid technological platform to be operated similar to clinical standard settings specifically designed for FLASH radiation therapy research.



Advantages of FLASH radiation therapy compared to conventional radiation therapy

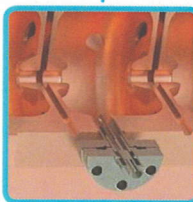
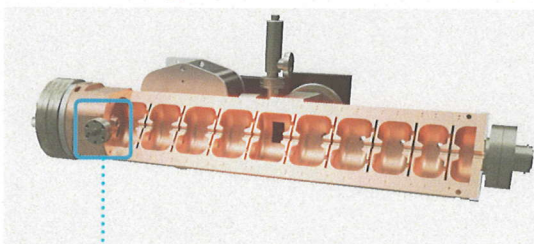
- FLASH RT enhances the differential effect between tumors and normal tissues.
- FLASH RT delivers doses within an extremely short irradiation time.
- FLASH RT is iso-effective compared to conventional dose rate RT, reducing normal tissue toxicity and side effects.

J. Bourhis et al. Clinical translation of FLASH radiotherapy: Why and how?, Radiother Oncol; 2019



CONV RT = Conventional radiation therapy FLASH RT = FLASH radiation therapy
NTCP = Normal Tissue Control Probability

Real-time energy control



3 versions available:

- 5 MeV - 7 MeV
- 7 MeV - 9 MeV
- 10 MeV - 12 MeV

Italian Patent IT
10201500009805

A brief history of FLASH RT

FLASH radiation therapy dates back to the seventies with the first in-vitro experiment investigating oxygen depletion in cells irradiated at very high dose rates. Forty years on, in 2014, a report revealed the differential response to high dose rates between normal and tumor tissue in mice^[1]. Thanks to this study, a new wave of scientific interest for a topic called FLASH radiation therapy started, increasing the data that became available in the scientific literature, with a growing number of studies demonstrating the advantages of FLASH over conventional radiation therapy^[2-3-4-5].

1. Ultrahigh dose-rate FLASH irradiation increases the differential response between normal and tumor tissue in mice

V. Favaudon et al., Sci Transl Med; 6(245):245ra93, 2014.

2. Irradiation in a flash: Unique sparing of memory in mice after whole brain irradiation with dose rates above 100 Gy/s

P. Montay-Gruel et al., Radiother Oncol;124(3):365-369, 2017.

3. The Advantage of FLASH Radiotherapy Confirmed in Mini-pig and Cat-cancer Patients

Vozenin MC et al., Clin Cancer Res;25(1):35-42, 2019.

4. Clinical translation of FLASH radiotherapy: Why and how?

J. Bourhis et al., Radiother Oncol;139:11-17, 2019.

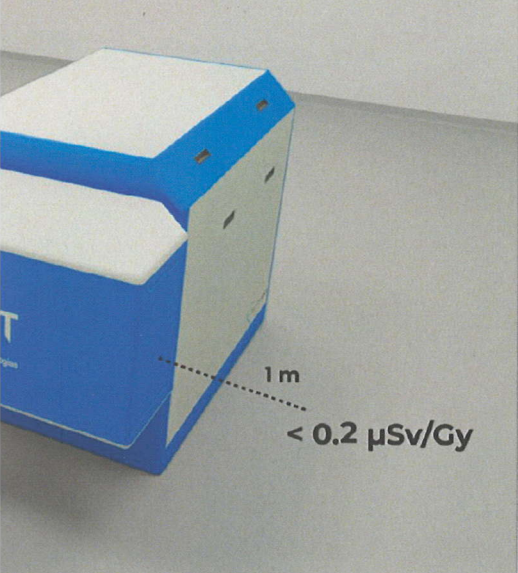
5. Treatment of a first patient with FLASH-radiotherapy

J. Bourhis et al., Radiother Oncol;139:18-22, 2019.

Extraordinary radiation protection performances: data measured at 1 m from the source

ElectronFlash main technical features

- Real-time output monitoring.
- Available fields from 1 up to 12 cm round and square fields.
- Dose rate available range between 0,005 Gy/s up to 10.000 Gy/s.



1 m
< 0.2 μSv/Gy

ElectronFlash: the research accelerator

FLASH radiation therapy, one of the most promising technologies for tumor treatment, offers important perspectives for preclinical research.

Meeting this challenge means being at the forefront of the contribution to the fight against cancer. ElectronFlash is the first experimental platform dedicated to electron FLASH RT designed to speed up the research and the development of tools and protocols able to improve the adoption and diffusion of clinical applications.

From the world leader in IOeRT

ElectronFlash is a technology patented by SIT - Sordina IORT Technologies S.p.A.

SIT is the world leader and pioneer in IOeRT (Intra Operative electron Radiation Therapy).

SIT is the only Italian company, and one of the few in the world, capable of designing, manufacturing, distributing and performing after sales service of miniaturized mobile electron linear accelerators. SIT operates installations, business units and field engineers worldwide.

Designing and manufacturing electron accelerators requires a combination of high-level of expertise in different fields, ranging from ultra-high vacuum technology to microwaves, radio-frequency emissions and high voltages.

SIT can successfully carry out its activities thanks to its well-equipped laboratories, specialized manufacturing departments and 2 bunkers, where any R&D or testing activity can be performed.

SIT is the patent-holder and provider of innovative high-performance technological solutions. Today, thanks to ElectronFlash, SIT confirms its commitment to contribute and invest at full speed in scientific research and, specifically, in the field of radiation therapy.

EF4000000-BR_CE Rev.B_EN



Sordina IORT Technologies



www.soiort.com