## Therapeutic strategies to prevent, improve or reduce diseases induced by ionizing radiation

### DESCRIPTION OF THE TECHNOLOGY

New radioprotective and radiomitigating formula that effectively protects organs and tissues against the deleterious effects of ionizing radiation. It combines two polyphenols with radioprotective effects (Pterostilbene and Silibinin) with two potentially radiomitigating molecules, nicotinamide riboside (a precursor of NAD+) and ther fibroblast-stimulating lipopeptide (FSL-1, which promotes hematopoitic recovery). The combined treatment protects organs and tissues, helps to repairing radiation damage, mitigates side effects, and significantly increases survival mice subjected to lethal doses of ionizing radiation.

Ionizing radiation causes direct and indirect damage to DNA and other molecules, inducing the formation of free radicals, reactive oxygen and nitrogen species. The response in our body depends on physical, chemical and biological factors, i.e. the type and dose of radiation received, the exposure time, the partial pressure of oxygen, the phase of the cell cycle, the cellular antioxidant defenses, or the regeneration capacity of each particular organ/tissue.

The consequences of these damages imply two types of biological effects: deterministic tissues (short-term, high doses, cell death) or stochastic (low doses, long-term, mutations; where cancer development is the most relevant). Our formula would prevents deterministic effects and reduce the probability of stochastic effects, a fundamental principle of radiological protection.

At this point it is important to highlight that the formula we propose, although it is aimed at preventing radiation-induced diseases, could be adapted to different routes of administration. For example topical use, which facilitates the protection of skin and mucous membranes, highly exposed to the effects of radiotherapy. Furthermore, since some radiation-induced diseases are frequently associated with pain, it should be noted that the present technology is compatible with local or general antialgic therapy.

### MARKET APPLICATION SECTORS

The present invention is of interest to:

- Medical Institutions focused on radioimaging and radiotherapy.
- Regulatory Institutions (such as FAO, IAEA, CSN, etc.).
- Military sector and related institutions.
- Companies and institutions of the aeronautical space sector.
- Companies related to the use of ionizing radiation.
- Companies linked to the exploitation of nuclear energy.

### TECHNICAL ADVANTAGES AND BUSINESS BENEFITS

- Effective radioprotection. Therapeutically protects and mitigates the acute effects of ionizing radiation, and reduces secondary pathologies associated to chronic exposure.

- Prevention of damage associated with exposure to ionizing radiation, in workers of nuclear power plants, radioimaging and radiodiagnosis services, or in companies in the aeronautical and electrical sectors, in the general population in the event of terrorist attacks, etc.

- Does not interfere in treatment of patients undergoing radiotherapy. Thus, contributes to a longer survival, improvement of the quality of life, and the associated hospital costs.

- The commercialization of the formula by pharmaceutical companies.

### CURRENT STATE OF DEVELOPMENT

Currently, the experimental phase has ended and the prototype formula has been developed.

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### INTELLECTUAL PROPERTY RIGHTS

European Patent, EP21382036.8, dated January 18, 2021, jointly owned with the University of Valencia.

Title: *Compositions and method for preventing, improving or reducing radiation-induced diseases.*

### COLABORATION SOUGHT

The inventors are looking for investors and companies interested in licensing the technology, as well as strategic partners and new sources of funding to advance the development of the prototype.

### RELATED IMAGES

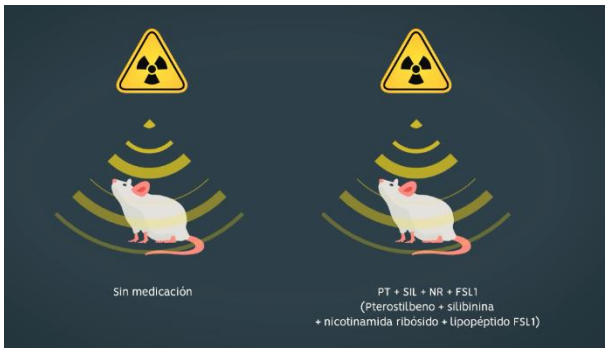


*Image 1. Exposure to whole body ionizing radiation. In vivo studies with and without the radioprotective and radiomitigating formula.*


*Image 2. In vivo administration of the radioprotective and radiomitigating formula*

### CONTACT

**TTO IIS La Fe**
otri@iislafe.es
+0034 618 73 00 95
Health Research Institute Hospital La Fe
Avinguda de Fernando Abril Martorell, nª 106
46026 Valencia- SPAIN

**TTO VU**
**Contacto:** otri@uv.es; +34 96 386 40 44