

Investigations on the potential radio-protective properties of edible cyanobacterium during pelvic irradiation in a mouse model.

Wannes Van Beeck^{1, 2, 3}, Mieke Verslegers², Sarah Baatout², Mohamed Mysara¹, Pieter Monsieurs¹, Natalie Leys¹, Sarah Lebeer³, Felice Mastroleo¹

¹ SCK•CEN, Mol, Belgium, research unit for Microbiology

² SCK•CEN, Mol, Belgium, research unit for Radiobiology

³ University of Antwerp, Antwerp, Belgium, ENdEMIC research group

Exposure to pelvic irradiation result in several side effects including an increased oxidative stress^[1], increased inflammation and, dysbiosis of the gut microbiota resulting in diarrhea. Due to the ability to resist high doses of radiation (up to 6400Gy^[2]) and its anti-oxidative capacity, the cyanobacterium *Arthrospira* sp. seems promising to treat these side effects. As such, we aimed to investigate the possible radio-protective properties of *Arthrospira* sp. by assessing its effects on: (i) ileum morphology, (ii) inflammation and (iii) gut microbiome composition. Here for, male mice received *Arthrospira* sp. supplemented chow prior to local 8Gy X-ray pelvic irradiation. These mice showed a significant decrease in villi length, but no change inflammatory response. In this pilot study, different high end points were used to evaluate the potential radio-protective properties of the cyanobacterium but to really understand the mechanism, more in depth techniques have to be used e.g. immunological staining for apoptosis.

1. Riley P. Free radicals in biology: oxidative stress and the effects of ionizing radiation. *International journal of radiation biology*. 1994;65(1):27-33.
2. Badri H, Monsieurs P, Coninx I, Wattiez R, Leys N. Molecular investigation of the radiation resistance of edible cyanobacterium *Arthrospira* sp. PCC 8005. *MicrobiologyOpen*. 2015.