

ABSTRACT

The effects of radiation on the intestine have been extensively studied for long time. However, it is still unclear whether or not this organ has specific cellular defense mechanisms against ionizing radiation (IR). Here, by using *Caenorhabditis elegans*, we show that the silencing of an intestinal expressed mucin-like genes, *F49F1.6* (termed *Ce-mul-1*), results in growth retardation after IR irradiation in *Caenorhabditis elegans*. Expression of the *mul-1* genes was induced by ionizing radiation and was highly dependent on the expression of the ELT-2 transcription factor and p38 MAPK. Its expression was also enhanced by the insulin/IGF-1 signaling pathways. Moreover, by the insulin/IGF-1 signaling pathways works as an enhancer of this gene induction. The *mul-1* gene induced a different pattern from that of the DNA damage response gene, *ced-13*, which implies that the expression of this gene might be indirectly triggered by effect of radiation. We also focused on the radiation-induced genes *clec-4*, *clec-67*, *lys-1* and *lys-2*, which are innate immune response genes. Finally, we describe the cross-talk response that occur to radiation and in the innate immune response at the gene expression level following IR.

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