Reviewer’s report

Title: Global gene expression analyses of bystander and alpha particle irradiated normal human lung fibroblasts: Synchronous and disparate responses

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Reviewer: Geza Safrany

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Gandhi et al investigated gene expression alterations in directly irradiated and bystander fibroblast cells after exposure to 4He ions. Their major finding was that after direct irradiation both the p53 and the NF#B pathways were induced. In bystander cells the activation of the p53 pathway was much less prominent. The paper is very well written and the experiments are well designed. First, they analyzed the existence of the bystander effect by micronuclei assay and then performed the gene expression study by one color microarray. The microarray data were very carefully analyzed and confirmed by qRT-PCR. The gene ontology patterns and pathway analyses was performed by up to date assays.

Minor concerns

The authors found that 165 genes responded to radiation both in directly hit and bystander cells. What percentage of these genes had a FDR<10%?

In directly irradiated cells significant portion of the activated genes were pro-apoptotic, however in primary fibroblast cells radiation induced apoptosis is not a frequent event. I wonder if the authors could comment on that.

Level of interest: An article of importance in its field

Quality of written English: Acceptable

Statistical review: No, the manuscript does not need to be seen by a statistician.

Declaration of competing interests:

I have no competing interests.