

## Low dose irradiation of three-dimensional cell cultures has an acute effect on proliferation rate

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Low doses of ionizing radiation are not yet consistently studied and documented. In such context, more advanced and complex biological models should be applied to obtain relevant data.

Recognizing several known limitations and difficulties of the current monolayer cellular models, as well as the increasing difficulties to use advanced biological models, our group has been developing advanced biological alternative models, namely three-dimensional cell cultures.

These cellular models (monolayer cellular culture and three-dimensional cell cultures - cultured with encapsulation in 1% alginate and 1,5% agarose coating) were externally irradiated with 100mGy and 1Gy. The consequences of that irradiation were studied in terms of proliferation rate (using MTT assay) and DNA damage (using comet assay), 24h and 72h post-irradiation.

Our results show an acute statistically significant tendency of decrease in the proliferation rate of three-dimensional cell cultures irradiated with both doses, 24h post-irradiation, with normalization of the values at 72h post-irradiation. Interestingly, monolayer cell cultures displayed a distinct proliferative behavior when compared with three-dimensional cultures.

On the other hand, there seems to be no evidence of any relation between doses of irradiation and DNA damage, while culture method has a considerable impact (higher manipulation in three-dimensional cultures increases genetic damage).

In conclusion, the acute response to low dose irradiation is related with the decrease of proliferation rate that is recovered 72h post-irradiation and seems to have no significant genetic impact.



*Foi decidido que não será apresentada a versão integral deste documento.*

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