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A Mathematical Model for Estimating Biological Damage Caused by Radiation

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(Submitted on 11 Apr 2012 (v1), last revised 16 Aug 2012 (this version, v2))

We propose a mathematical model for estimating biological damage caused by low-dose irradiation. We understand that the Linear Non Threshold (LNT) hypothesis is realized only in the case of no recovery effects. In order to treat the realistic living objects, our model takes into account various types of recovery as well as proliferation mechanism, which may change the resultant damage, especially for the case of lower dose rate irradiation. It turns out that the lower the radiation dose rate, the safer the irradiated system of living object (which is called symbolically "tissue" hereafter) can have chances to survive, which can reproduce the so-called dose and dose-rate effectiveness factor (DDREF).

Submission history

From: Kento Ichikawa [view email]

[v1] Wed, 11 Apr 2012 03:10:46 GMT (350kb)

[v2] Thu, 16 Aug 2012 08:34:53 GMT (493kb)

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