

3 - 88 Effect of N-Acetylcysteine on ¹²C⁶⁺ Ion Irradiation-induced Immune System Changes in Mice

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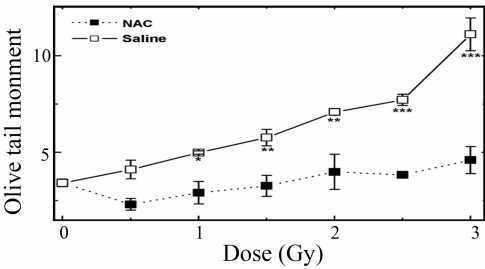


Fig.1 The damage of DNA assessed of splenic lymphocytes in mice administration of NAC and saline at 0, 0.5, 1, 1.5, 2, 2.5, 3 Gy of carbon-ion irradiation (* $p<0.05$, * * $p<0.01$, * * * $p<0.001$ vs controls).

Thiols are a kind of important molecules to control apoptosis^[1,2]. Here we evaluate the effects of different doses of ¹²C⁶⁺ ion irradiation and administration modes of N-acetylcysteine (NAC) against carbon ion irradiation in mice^[3]. In our study, the results showed lymphocyte DNA damage increased with doses (Fig. 1), which caused IFN- γ level (≥ 3 Gy), number of thymocyte G₀/G₁ and immunocyte apoptosis increases and the alteration of SOD activity level. However, no significant changes are showed in NAC-treated group. These indicated whole-body ¹²C⁶⁺ ion irradiation could induce lymphocyte DNA double-strand breaks (DSBs); Pre-treatment with NAC could significantly reduce the acute immunity radiation damages; and the increase of IFN- γ (≥ 3 Gy) in serum were concomitant of DSBs enhancement in vivo.

References

[1] G. Poli, M. Parola, Free Radical Biology and Medicine, 22(1996)287.
[2] R. E. Rugo, M. B. Secretan, R. H. Schiestl, Radiation Research, 158(2002)210.
[3] H. Tominaga, et al., Radiation Research, 45(2004)181.

3 - 89 Curcumin Treatment Alleviates Irradiation Damage in Mouse Testis Induced by ¹²C⁶⁺ Ions

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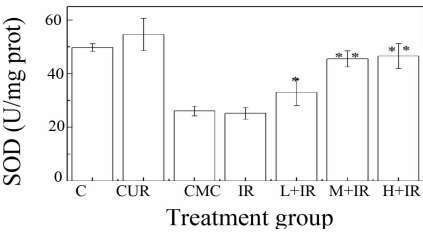


Fig.1 Effect of CUR on the superoxide dismutase level in mouse testis. * $P<0.05$ and * * $P<0.01$ vs IR group.

Curcumin (5-hydroxy-1,7-bis(4-hydroxy-3-methoxyphenyl)-1,4,6-heptatrien-3-one, CUR), the major component extracts from the rhizomes of turmeric^[1]. This compound has been reported to possess antioxidant, anti-inflammatory, antimicrobial and anticancer properties, and thus has a potential protective effect against various malignant disease^[2]. Ionizing radiation instantaneously causes the formation of water radiolysis products that contain some reactive oxygen species (ROS)^[3]. And the level of ROS is very important to organism. In this paper, 42 male Kun-Ming mice were divided into 7 groups: Control group, CUR group, carboxymethylcellulose sodium+irradiated group, irradiated group, CUR+irradiated group. Mice were irradiated by ¹²C⁶⁺ ions with dose of

4 Gy, respectively. Superoxide dismutase (SOD) was measured. The result indicated that CUR could protect normal tissues from heavy ion radiotherapy in some extent via activation of the antioxidant enzymes.

Note: Control group: C, CUR group: CUR, Carboxymethylcellulose sodium+irradiated group: CMC, Irradiated group: IR, Low CUR+irradiated group: L+IR, Middle CUR+irradiated group: M+IR, High CUR+irradiated group: H+IR.