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## **CYTOLOGICAL DAMAGE PRODUCED IN THE MOUSE TESTES BY TRITIATED THYMIDINE, TRITIATED WATER AND X-RAYS**

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**Abstract** -- Irradiation of the mouse testes was carried out using internally distributed tritium from injected tritiated thymidine and tritiated water and also using external whole body irradiation with 200 kVp X-rays.

The inability of intermediate spermatogonia to divide twice and produce resting primary spermatocytes was used as a criterion of biological damage and the following conclusions were reached:-

(i) Injected amounts of both tritiated thymidine and tritiated water equivalent to less than 2  $\mu\text{Ci/g}$  body mass produced cell death in the testes;

(ii) Tritiated thymidine was four times more effective in killing spermatogonia than equivalent injected amounts of tritiated water;

(iii) For the same total dose to the whole body of 200 kVp X-rays, acute irradiation (dose rate 1.6 rads/min) delivered in less than 30 min, was more effective for cell lethality than irradiation at low dose rates ( $<0.7$  rad/hr) spread over 72 hr.

(iv) 5  $\mu\text{Ci}$   $^3\text{HTdR}$  injected/g body mass, 20  $\mu\text{Ci}$  tritiated water injected/g body mass and 30 rads to the whole animal from 200 kVp X-rays delivered at an exponentially decreasing dose rate similar to that obtained from the two tritiated compounds, produced equivalent cell death within the testes over 72 hr.

(v) The RBE of tritium as tritiated thymidine or tritiated water relative to 200 kVp X-rays was found to be in the range 1.3-2.4.