



Immunohistochemistry in Irradiated Skin Tissue

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## Immunohistochemistry in Irradiated Skin Tissue

### Abstract

Currently there is no effective treatment for radiation dermatitis that results from clinical or accidental radiation exposures. Radiation exposure can cause severe burns and sloughing of the skin and damage muscle and bone layers underneath the skin. Radiation exposure in cells results in several types of cell death, such as necrosis, apoptosis, or autophagy, or accelerated senescence. Preliminary experiments demonstrated that accelerated senescence is a primary response to radiation in normal skin cells in culture and skin tissue *in vivo* in mice. We wanted to use immunohistochemistry to identify the skin cells that undergo senescence in tissues obtained from 4 mice over a time course from 1-30 days following exposure to 17.9 Gy (0.6 Gy/min) irradiation. The different stains that are going to be used are hematoxylin and eosin stain which shows the morphology of the whole tissue, K15 which marks adult skin epidermal stem cells, p21/waf1 which is a marker for senescence, DCT which marks melanocyte stem cells, and c-kit which marks melanocytes and basal epithelial cells. The results from these experiments will help us to determine which cells to protect in order to treat severe radiation exposure.

### Keywords

Radiation; senescence; stem cells; skin



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### **ABSTRACT**

Currently there is no effective treatment for radiation dermatitis that results from clinical or accidental radiation exposures. Radiation exposure can cause severe burns and sloughing of the skin and damage muscle and bone layers underneath the skin. Radiation exposure in cells results in several types of cell death, such as necrosis, apoptosis, or autophagy, or accelerated senescence. Preliminary experiments demonstrated that accelerated senescence is a primary response to radiation in normal skin cells in culture and skin tissue *in vivo* in mice. We wanted to use immunohistochemistry to identify the skin cells that undergo senescence in tissues obtained from 4 mice over a time course from 1-30 days following exposure to 17.9 Gy (0.6 Gy/min) irradiation. The different stains that are going to be used are hematoxylin and eosin stain which shows the morphology of the whole tissue, K15 which marks adult skin epidermal stem cells, p21/waf1 which is a marker for senescence, DCT which marks melanocyte stem cells, and c-kit which marks melanocytes and basal epithelial cells. The results from these experiments will help us to determine which cells to protect in order to treat severe radiation exposure.

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