

Nuclear hormone receptor and cytokines as radio modifying agents to combat with radiation induced immunosuppression and inflammation

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Abstract

Radiation induced oxidative stress is the sole determinant of damage to the hematopoietic, gastrointestinal system and immune system suppression causing immunodeficiency. Radiation induced apoptosis in normal cells is one of the limiting factors in radiation therapy. Therefore, the development of drugs that can serve to protect normal tissue from radiation during radiation therapy is the need of the hour. The nuclear receptors known as peroxisome proliferator activated receptor gamma (PPARG) are lipid-activated transcription factors that have emerged as key regulators of inflammation. PPARG is involvement in the reduction of oxidative stress, inflammation and associated immune response. In the present study, the role of PPARG agonist has been evaluated in vitro and in vivo in the normal system during radiation exposed conditions. A dose of 10mg/kg PPAR agonist was administered prior to radiation and has shown protection of C57BL/6 mice from a lethal dose of irradiation. The protective role of PPARG was also assessed in vitro in RAW264.7 where the PPARG agonist has shown radio protective effect at LD50 dose of radiation. The acute radiation syndrome which includes Gastrointestinal (GI) as well as hematopoietic damage was also attenuated with the administration of the PPAR agonist. Therefore, we propose that PPAR gamma agonist have great potential as radio protective agents through combating with immunodeficiency caused by radiation. Cytokines serve as an immunomodulatory agent that regulates innate and adaptive inflammatory responses. The development of recombinant cytokines has made it possible to investigate their role in radiation exposed conditions and for other therapeutic purposes. In the present study, we have assessed the role of IL-2 during radiation exposed conditions in vitro and in vivo. IL-2 has shown to protect mice from a lethal dose of irradiation through immunomodulation.

Biography:

Simran Kaur has done her Bachelor's as well as Master's in Biochemistry from Delhi University. She has submitted her Ph.D Thesis. The topic of her Ph.D is to evaluate 'The effect of immunomodulation on radiation induced damage and inflammation'. She has done her Ph.D from Delhi University in Biochemistry in collaboration with Institute of Nuclear Medicine and Allied Sciences.



[European Congress on Immunology](#) | Edinburgh, Scotland | March 04-05, 2020

Citation: Simran Kaur, *Nuclear hormone receptor and cytokines as radio modifying agents to combat with radiation induced immunosuppression and inflammation*, Euro Immunology 2020, European Congress on Immunology, Edinburgh, Scotland, March 4 -5, 2020, 13