Hyperthermia-Induced DNA Repair Deficiency Suggests Novel Therapeutic Anti-Cancer Strategies.


Abstract:

Local hyperthermia is an effective treatment modality to augment radio- and chemotherapy-based anti-cancer treatments. Although the effect of hyperthermia is pleotropic, recent experiments revealed that homologous recombination, a pathway of DNA repair, is directly inhibited by hyperthermia. The hyperthermia-induced DNA repair deficiency is enhanced by inhibitors of the cellular heat-shock response. Taken together, these results provide the rationale for the development of novel anti-cancer therapies that combine hyperthermia-induced homologous recombination deficiency with the systemic administration of drugs that specifically affect the viability of homologous recombination deficient cells and/or inhibit the heat-shock response, to locally sensitise cancer cells to DNA damaging agents.