

Novel Approaches to Radiation Mitigation and Biodosimetry

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Following a radiological attack, rapid triage of a large number of potentially exposed individuals is essential to remove non-exposed individuals from the treatment system and ensure rapid treatment of the irradiated. These non-exposed, or potentially irradiated, out-number exposed individuals by an estimated factor of at least 100:1 in most scenarios and simulations. Current technology for determining radiation exposure level takes more than twenty four hours and requires highly trained personnel with specialized facilities. This program will develop biodosimetry and novel mitigation technologies to address these current shortfalls. Performers will develop cost-effective, non- or minimally-invasive, portable biodosimeters that can be used by relatively untrained individuals to rapidly triage patients. Use of these minimally-invasive techniques will enable rapid screening of large numbers of individuals in the event of a radiological attack. This program also seeks to develop novel treatments for radiation-related symptoms that are effective when administered after radiation exposure that increase survival to greater than 90% in animal models receiving radiation doses larger than 200 cGy. Program researchers will use novel methods involving probiotic bacteria, recombinant protein administration to prevent sepsis, and targeted delivery of therapeutics using nanovectors to treat the effects of radiation. Development of these treatment protocols will increase the effective treatment time window, thereby improving survivability following a radiation attack.

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