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Immunophenotyping of radiotherapy-related systemic effects, Development of an optimized cancer therapy?

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Recent data from our groups and others support two main notions, that these ionizing radiation-induced DNA damaged clusters are: (1) repair resistant, increasing genomic instability (GI) and malignant transformation and (2) can be considered as persistent "danger" signals promoting chronic inflammation and immune response with detrimental effects for the organism (like radiation toxicity). Last but not least, the paradigm shift for the role of radiation-induced systemic effects is also incorporated in this picture of IR-effects and consequences of complex DNA damage induction and erroneous repair. An introduction to this idea as explained in our recent paper (1) and image given below. During this presentation and open call for collaboration, I will explain: 1. How the study of crosstalk between ionizing radiation effects and the immune system can be a tool for the immunomodulation of radiation-therapy systemic effects in order to: a. Increase tumor cell death and control and b. Decrease radiation-toxicity and secondary malignancies (2-4). c. How innovative natural product-based strategies for modulation radiation-induced systemic effects can be developed. We suggest a collaborative project with the following aims: I. Immunophenotyping libraries of radiotherapy patients (for different types of tumors and radiation treatment) II. Antigen discovery and creation of libraries relating to specific cancer treatment, outcome (tumor control and toxicity) and association with type of DNA damage in the tumor and organism.

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