

# Proteomic analysis of the Radiation-Induced Bystander Effects

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Experimental evidence shows that, in addition to this direct and targeted effect of radiation, a side or secondary effect is observed within the un-irradiated area. Irradiated cells relay a stress signal in the close proximity. Neighboring un-irradiated cells react to this signal, i.e., BE with a specific “bystander response” (BR), characteristic of a biological context, but with a close relationship to the biological response typically associated with direct radiation exposure. Bystander responses and bystander factors (BF) secreted by irradiated cells were observed and studied in many physical and biological conditions, in vitro and in vivo.

In the present study, we investigated the capacity of chondrocytes in responding to bystander factors released by irradiated chondrosarcoma cells using a medium transfer protocol. The cells were irradiated with X-rays / Carbon ions and the Bystander supernatant was transferred on non-irradiated cells. To study the effects of these treatments on the survival of cell lines, we carried out clonogenic assays and in order to study the impact of these treatments on the cellular proteome, we carried out proteomic analysis by two-dimensional electrophoresis (2DE), starting from the cellular protein lysates.

The 2DE analysis showed the effect of irradiation on the proteome of irradiated chondrosarcoma cells as well as the Bystander effect on the proteome of bystander chondrocytes. We then selected variant spots that were analyzed by mass spectrometry.

An in-depth analysis of the identified proteins will provide a better understanding of the mechanisms involved in cell irradiation as well as the radio-induced Bystander effect.