

## *P25 - Proteomic analysis of bystander effects in chondrosarcoma cells*

### Molecular and cellular effects

Gilbert Antoine<sup>1, 2</sup>

Tudor Mihaela<sup>3, 4</sup>, Lepleux Charlotte<sup>1, 2</sup>, Rofidal Valérie<sup>5</sup>, Hem Sonia<sup>5</sup>, Almunia Christine<sup>6</sup>, Armengaud Jean<sup>6</sup>, Brotin Emilie<sup>7</sup>, Haghdoost Siamak<sup>1, 2</sup>, Savu Diana<sup>3</sup>, **Francois Chevalier**<sup>1, 2</sup>

<sup>1</sup> LARIA, CEA-DRF-iRCM, François JACOB Institute, Caen, France

<sup>2</sup> CIMAP UMR6252, Normandie Univ, ENSICAEN, UNICAEN, CEA, CNRS, Caen, France

<sup>3</sup> Department of Life and Environmental Physics, Horia Hulubei National Institute of Physics and Nuclear Engineering, Magurele, Romania

<sup>4</sup> University of Bucharest, Faculty of Biology, Splaiul Independentei 91-95, Bucharest R-050095, Romania

<sup>5</sup> BPMP, Mass Spectrometry Proteomics Platform, Montpellier, France

<sup>6</sup> Innovative technologies for Detection and Diagnostics, CEA-DRF-Li2D, Marcoule, France

<sup>7</sup> ImpedanCELL Platform, Federative Structure 4206 ICORE, Normandie Univ, UNICAEN, Inserm U1086 ANTICIPE, Biology and Innovative Therapeutics for Ovarian Cancers group (BioTICLA), Comprehensive Cancer Center F. Baclesse, 14000, Caen, France.

**Introduction:** Experimental evidences show that, in addition to direct and targeted effects of ionizing radiations, another effect is observed within the surrounding un-irradiated area; irradiated cells relay a stress signal in this close proximity, the bystander effect. Neighbouring un-irradiated cells react to this bystander signals with a specific response, 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 secreted by irradiated cells were observed and studied in many physical and biological conditions, in vitro and in vivo [1].

**Methods:** 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 low doses X-rays and the bystander supernatant was transferred on non-irradiated cells. Survival and proliferation assays were performed to study the effects of this treatment on the bystander cells [2]. In order to study the impact of these treatments on the cellular proteome, we carried out proteomic analysis starting from the cellular protein lysates and the conditioned medium.

**Results:** The proteomic analysis showed the effect of irradiation on the secretome of chondrosarcoma cells as well as the bystander effect on the proteome of bystander chondrocytes. We then selected variant spots that were analysed by mass spectrometry.

**Conclusion:** An in-depth analysis of the identified proteins provides a better understanding of the mechanisms involved in cell irradiation as well as the radio-induced Bystander effect.

### **Selected references**

1. Chevalier F, et al. Proteomic overview and perspectives of the radiation-induced bystander effects. *Mutation Research/Reviews in Mutation Research*. 2014;763:280–93.
2. Lepleux C, et al. Bystander effectors of chondrosarcoma cells irradiated at different LET impair proliferation of chondrocytes. *J Cell Commun Signal*. 2019.