

## BITS :: Call for Abstracts 2019 - Oral communication

<i>Type</i>	Oral communication
<i>Session</i>	Bioinformatics challenge in precision medicine
<i>Title</i>	A radiogenomic approach to improve personalized radiation treatments.
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<i>Motivation</i>	<p>Cancers are highly heterogeneous diseases, at both clinical and molecular levels, associated with different clinical outcomes. Understanding this heterogeneity represents a key factor for the development of targeted preventive and therapeutic interventions. There is extensive scientific evidence that radiation therapy (RT) is a crucial treatment, either alone or in combination with other treatment modalities, for many types of cancer, including breast cancer (BC). BC is featured by distinct subtypes, linked also to the hormone receptor (HR) status and associated with different clinical behaviors.</p> <p>Currently, RT treatment planning take in account physic metrics, nonetheless it emerges the necessity to include biological biomarkers of normal tissues toxicity and tumor radiosensitivity, to optimize therapeutic efficacy.</p> <p>The main aim of our researches is to investigate potential genes and signal pathways associated with specific RT schedules and to BC subtypes, by using a radiogenomic approach.</p>
<i>Methods</i>	<p>We study gene expression profiles by cDNA microarray induced by different irradiation modalities in term of linear energy transfer values (LET), doses, particles etc., in cancer diseases using an in-vitro, ex-vivo and in-vivo approaches. Moreover, using multiple bioinformatic analyses, we analyze specific pathways and cellular processes that overall appear cell-line and radiation type-dependent.</p>
<i>Results</i>	<p>We describe in a detailed way the gene expression profiles induced by different irradiation conditions, also in combination with radiosensitizing agents, highlighting specific gene signatures able to modify radioresistance/radiosensitivity balance.</p> <p>These information will eventually allow clinicians to prescribe more personalized total doses or associated targeted therapies for specific tumor subtypes, thus enhancing cancer radio-sensitivity.</p> <p>In the era of personalized medicine and cancer target-directed intervention, we trust that these kind of studies could drive RT towards personalized treatments.</p>
<i>Info</i>	<p>Acknowledgments. We thank: i)Oncology Unit, Fondazione-Istituto G.Giglio, for the support insamples collection and clinical data availability; ii)National Institute for Nuclear Physics, Laboratori Nazionali del Sud (INFN-LNS), iii) Medical Physics Department and iv) Radiation Oncology of ARNAS-Civico Hospital (Palermo), for their support in performing irradiation setups and schedules and v) Center for Advanced Preclinical in vivo Research (CAPIR)- University of Catania for their expertise in preclinical experimental approaches.</p>
<i>Figure</i>	-
<i>Availability</i>	-
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