radiotherapy can manipulate these and speculate on the application of radio-immunotherapy in the control of cancer.

**OC-0500**
**Using radiotherapy to improve immunotherapy**
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Abstract not received.

**OC-0501**
The role of radiotherapy on macrophages and on macrophage-cancer cell communication
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Purpose/Objective: Despite therapeutic advances in radiotherapy, the control of metastasis, is still a major challenge in cancer management. In order to develop more efficient therapies to counteract cancer cell invasion and metastasis, we need to understand the contribution of the tumour microenvironment. We are particularly interested on the effect of radiotherapy on macrophage behavior and how irradiated macrophages may modulate cancer cell activities and their response to radiotherapy.

Materials and Methods: In order to address this question, we subjected primary human monocyte-derived macrophages to conventional doses of ionizing radiation, as used for cancer patient’s treatment, and characterized macrophage functionality. The impact of irradiated macrophages on cancer cell activities, namely invasion and motility was also investigated, through Matrigel-invasion assay and time-lapse microscopy, respectively.

Results: Our results evidence that radiation induces macrophage DNA damage, through H2AX-phosphorylation, without causing apoptosis. Instead, the increased expression of the anti-apoptotic protein Bcl-xl may contribute to irradiated macrophage pro-survival activity. Together, macrophage MMP-2 and 9 activities are not affected by ionizing radiation. Finally, we are also focused on the effect of ionizing radiation on macrophage proteome. Different proteomic approaches revealed that irradiated macrophages present altered expression levels of some metabolism-related proteins, which are currently under investigation. Nevertheless, irradiated macrophages are still able to promote cancer cell invasion and its conditioned medium increases motility of cancer cells.

Conclusions: In summary, our results demonstrate that although the ionizing radiation doses used in the present work induce DNA damage, macrophages are still functional. In fact, irradiated macrophages are still able to promote cancer cell activities, namely invasion and motility. Current research on identification of cytokines and chemokines differentially expressed in macrophages upon ionizing radiation will complement these findings. Furthermore, this work will allow a better understanding on how ionizing radiation affects macrophage-cancer cell communication, opening perspectives for new therapeutic strategies that could be coupled with radiotherapy.

**OC-0502**
Gastrin-releasing peptide receptor-targeted radiotherapy using 177Lu-labeled bombesin analogue
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Purpose/Objective: The gastrin-releasing peptide receptors (GRPR) are up-regulated in many cancers, including prostate, colon, gastric, breast, pancreatic, and small cell lung cancers. Because bombesin binds to GRPR with high affinity, bombesin analogues have been labeled with various radionuclides for a targeted radiotherapy. The present study describes a new radiolabeled bombesin analogue for treatment of GRPR-overexpressing prostate tumors.

Materials and Methods: A novel peptide was synthesized using a solid-phase synthetic method, and radiolabeled with 177Lu, which was produced by the HANARO research reactor (thermal neutron flux of 1.8 × 10¹⁴ n·cm⁻²·s⁻¹). The pharmacokinetic characteristics and therapeutic efficacy of the radiolabeled peptide were evaluated using PC-3 human prostate carcinoma cells-xenografted mice.

Results: The purity of the synthesized peptide was exceeded 98%, and it was radiolabeled with 177Lu at a high radiochemical purity (> 98%). The radiolabeled peptide showed in vitro nanomolar binding affinity on GRPR. It was highly accumulated in PC-3 tumors in vivo, and rapidly excreted from the blood pool. As a result, PC-3 tumor was specifically visualized by SPECT/CT imaging at 1 hr p.i. (Fig. 1.). In addition, the radiolabeled peptide significantly inhibited the PC-3 tumor growth (P < 0.05) without treatment-related toxicities, except for slight glomerulopathy.

Conclusions: The pharmacokinetic, imaging, and therapy studies suggest that a novel 177Lu-labeled peptide has a promising characteristics for the targeted radiotherapy of GRPR-overexpressing prostate tumors.

Fig. 1. SPECT/CT images of PC-3-bearing mice using 177Lu-labeled bombesin analogue.