imaging for assessing its relationship with cancer metabolism and metastatic potential as well as for assessing treatment response to novel anticancer therapies.
We will discuss different MRI-based approaches developed for imaging tumor acidosis, using examples from our own research and from recent literature. Based on these data, tumor pH imaging may be a potential innovative diagnostic tool for characterizing tumor metabolism and to evaluate treatment response.

SP-0556 Tracing Tumor Hypoxia
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Abstract text
Hypoxia is known to play a role in many types of cancer and is linked to metastasis, genetic instability, resistance to therapy and poor prognosis. Despite the overwhelming prognostic and predictive significance of tumor hypoxia, hypoxia modification strategies have been mostly unsuccessful in patients. There is a knowledge gap in the characterization and behavior of hypoxic tumor cells during tumorigenesis and treatment. We have optimized a system that allows hypoxic cells to be lineage traced using genetically encoded fluorescent sensors and cytotoxins to investigate their dissemination within the primary tumor and in distant metastasis. I will present data showing the application of these systems to the intravital imaging of hypoxic tumor cells.

Symposium: New developments for breast cancer irradiation

SP-0557 Neoadjuvant radiotherapy in breast cancer
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Abstract text
Previous experience with preoperative RT with or without systemic treatment was reported with long term results. The studies have shown the excellent response rate, increasing the breast conserving surgery. These studies helped to numerous patients to preserve their breasts. Conventional scheduling in breast cancer treatment has been challenged in recent years with primary systemic therapy now widely used. The potential advantages of delivering RT before surgery are now under investigation, with current and upcoming trials. These new studies are asking new questions: how to optimize timing with mastectomy and reconstruction when the breast conserving surgery is not feasible, as well as the interest of combination with novel drugs to improve the response rates in chemo resistant tumours. The associations between radiotherapy and systemic treatments are also useful in patients who did not responded to primary systemic therapy as salvage treatment. Technically the neoadjuvant radiotherapy is interesting option because the radiation oncologist can visualize and directly delineate the tumour. Other advantage of the preoperative radiotherapy is that it can avoid the challenging techniques after oncoplastic and reconstruction surgical techniques in terms of volumes definition, as well as the sparing of organs at risk (OAR). With the hypofractionation regiments, the toxicity is lower and the postoperative complications can be decreased. There is also currently increased interest of association between neoadjuvant irradiation and new targeted molecules as PARP inhibitors, immunotherapy agents with the aim to improve the treatment results. These associations realized in clinical trials open the door for the translational research with understanding the mechanisms of tumour resistance, as well as the discovery of new biomarkers to permit individualized optimal treatment.

SP-0558 Response to preoperative therapy - prediction, assessment and indications for adjuvant radiotherapy
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Abstract not received

SP-0559 Nodal irradiation with or instead axillary lymph node dissection
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Abstract text
The management of the node positive axilla in breast cancer remains a controversial topic.
A negative finding on examination of the axilla identifies patients who are candidates for axillary staging with SLNB. The absence of cancer cells in the SLNB confirms that no further surgical management of the axilla or nodal RT is warranted.
Clinical trials (EBCTCG metaanalysis /EORTC 22922/10925 and NCIC MA209) support the use of regional nodal irradiation (RNI) in breast cancer patients with 1-3 axillary nodal metastases following ALND. However, the controversy lies in regarding the need for ALND and/ or RNI in T1-2 clinically node negative breast cancer undergoing conservative breast surgery and systemic therapy and have metastases in 1 or 2 sentinel nodes. Ten year results of ACOSOG Z0011 (ALND or no further axillary treatment) and 5 year results of AMAROS (ALND or axillary radiotherapy) confirm no differences in nodal recurrence, disease-free survival or overall survival. The presence of risk factors such as: younger patient age, large tumor size, extent of nodal involved, lymphovascular invasion, and high tumor grade strongly support the use of RNI in this group of patients. Future work is ongoing to examine whether genes that are frequently associated with risk of recurrence can be used to assign patients to the most appropriate loco-regional treatment.
In those patients with T1-2 and sentinel node metastases undergoing mastectomy, there is little evidence to support omitting ALND and/or RNI. There are some scenarios in which axillary treatment could be omitted, such as: sentinel node micrometastases (AATRM 048/13/2000 and IBCSG 23-01) and the use of neoadjuvant chemotherapy (NAC).
The increasing use of NAC has significantly affected local-regional decision-making. Higher rates or loco-regional recurrence was seen in patients with extensive disease at presentation or nodal positive after NAC, which could decreased with RNI. However, there are some clinical data suggesting that in women who experience a complete response with NAC, ALND and/ or RNI could be omitted. Achieving a pathological response following NAC has been associated with improved survival. The NSABP B-18 and B-27 trials and data from retrospective studies found that the incidence of locoregional recurrence failure is less than 10% in patients with stage II and non residual lymph node disease. However, there are other factors that have to be taken into consideration, such as: presence of residual disease in the breast, young age and