

Singol voxel-MR spectroscopy choline peak and calcium sensing receptor expression for breast cancer diagnosis by a 3T MR scanner

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Ca²⁺ as a primary extracellular signalling molecule, acts through the calcium sensing receptor (CaSR) and plays an important role in cell signal transduction. Data from Northern blot analysis and immunohistochemical staining have shown that the CaSR is expressed in normal human breast and breast ductal carcinoma. Alteration in choline phospholipid metabolism as detected by MRI, is a common feature of breast and many other cancers. However understanding of the molecular mechanisms that regulates ChoK is very limited. On the basis that CaSR-ChoK signalling plays an important role in breast cancer biology, we correlated the MR spectroscopy (MRS) choline peak between CaSR-positive and negative breast cancer. Single-voxel MRS of breast lesions (n=16) with a BI-RADS-5 at mammography or ultrasound were performed by a 3T MR scanner. Tumor morphology and DCE-kinetics were evaluated on ACR BI-RADS lexicon. MRS findings were defined as positive by the visual inspection for the presence or absence of choline peak and then compared with the pattern of CaSR by immunohistochemistry. We observed in 67% of the breast lesions, the presence of choline peak and an high level expression of CaSR. In 27% of the lesions the choline peak was absent with a low CaSR expression. These results support the hypothesis that CaSR represents an important role in the production of choline in breast cancer, determinating an increase of his production when CaSR is expressed at high level and implicating a no detectable choline peak when CaSR is not expressed, suggesting the possibility that CaSR-Cho signalling may represent a potential biomarker for tumor targeting and therapeutic strategies.

Biography

Gabriella Baio received medical education at University of Pisa, completed medical radiology fellowship at University of Genoa. She received a Research Grant in the Department of Radiology, National Cancer Institute-IST, in order to develop immunotargeting strategies for Lymphoma tumor imaging by MR. She actually works at IRCCS-San Martino University Hospital-IST-National Cancer Institute, as a radiologist. She is involved in more than 30 clinical cancer research projects in phase III and as a researcher in molecular imaging field, on many projects approved from the Ministry of Health about breast, prostate and glioblastoma tumours by MR and Optical Imaging. She developed a prototype coil for in vivo imaging in small animal model for a clinical 3T scanner, with GE Healthcare industry. Reviewer for Molecular Imaging and Biology Journal and Abstract Reviewer for WMIC 2011 and 2012.

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