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Abstract

Analytical chemisytry, analytical method development

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Abstract:

Achieving radical tumor resection while preserving disease-free tissue during breast-conserving surgery (BCS) remains a challenge. Here, mass spectrometry technologies were used to discriminate stromal tissues reported to be altered surrounding breast tumors, and build tissue classifiers ex vivo. Additionally, we employed the approach for in vivo and real-time classification of breast pathology based on electrosurgical vapors. Breast-resected samples were obtained from patients undergoing surgery at MUMC+. The specimens were subsequently sampled ex vivo to generate electrosurgical vapors analyzed by rapid evaporative ionization mass spectrometry (REIMS). Tissues were processed for histopathology to assign tissue components to the mass spectral profiles. We collected a total of 689 ex vivo REIMS profiles from 72 patients which were analyzed using multivariate statistical analysis (principal component analysis-linear discriminant analysis). These profiles were classified as adipose, stromal and tumor tissues with 92.3% accuracy with a leave-one patient-out cross-validation. Tissue recognition using this ex vivo-built REIMS classification model was subsequently tested in vivo on electrosurgical vapors. Stromal and adipose tissues were classified during one BCS. Complementary ex vivo analyses were performed by REIMS and by desorption electrospray ionization mass spectrometry (DESI-MS) to study the potential of breast stroma to guide BCS. Tumor border stroma (TBS) and remote tumor stroma (RTS) were classified by REIMS and DESI-MS with 86.4% and 87.8% accuracy,

respectively. We demonstrate the potential of stromal molecular alterations surrounding breast tumors to guide BCS in real-time using REIMS analysis of electrosurgical vapors.

Biography:

PhD in Biophysics; Analytical Development of Pharmaceutical Biotechnology, Quality control of pharmaceutical products. MedvacInstitute of Iran • Supervisor of quality control • Medvac.

Recent Publications:

1. 1.Finding the best angle, between the carbon nanotubes and Four groups of antibiotics, using methods computational using.

Webinar on Pharmaceutical Sciences, November 30,2020 | Rome, Itly

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