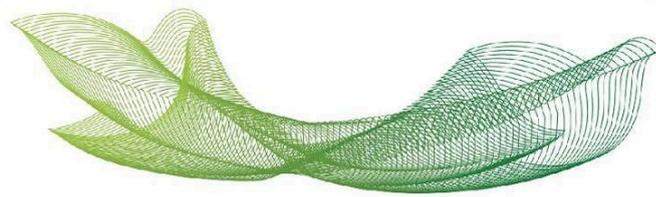




Tipo	Periódico
Título	Data Acquisition and Intraoperative Tissue Analysis on a Mobile, Battery-Operated, Orbitrap Mass Spectrometer
Autores	Michael F. Keating; Charles A. WolfeKeziah Liebenberg; Ashley Montgomery; Andreia M. Porcari; Nicole D. Fleming; Alexander Makarov; Livia S. Eberlin
Autor (es) USF	Andreia M. Porcari
Autores Internacionais	Michael F. Keating; Charles A. WolfeKeziah Liebenberg; Ashley Montgomery; Nicole D. Fleming; Alexander Makarov; Livia S. Eberlin
Programa/Curso (s)	Programa de Pós-Graduação Stricto Sensu em Ciências da Saúde
DOI	https://doi.org/10.1021/acs.analchem.4c00722
Assunto (palavras chaves)	Batteries; Ions; Mass spectrometers; Mass spectrometry; Power
Idioma	Inglês
Fonte	Título do periódico: Analytical Chemistry ISSN: 1520-6882 Volume/Número/Paginação/Ano: Anal. Chem. 2024, 96, 21, 8234–8242
Data da publicação	28 de Maio de 2024
Formato da produção	digital
Resumo	<p>Mass spectrometry has been increasingly explored in intraoperative studies as a potential technology to help guide surgical decision making. Yet, intraoperative experiments using high-performance mass spectrometry instrumentation present a unique set of operational challenges. For example, standard operating rooms are often not equipped with the electrical requirements to power a commercial mass spectrometer and are not designed to accommodate their permanent installation. These obstacles can impact progress and patient enrollment in intraoperative clinical studies because implementation of MS instrumentation becomes limited to specific operating rooms that have the required electrical connections and space. To expand our intraoperative clinical studies using the MasSpec Pen technology, we explored the feasibility of transporting and acquiring data on Orbitrap mass spectrometers operating on battery power in hospital buildings. We evaluated the effect of instrument movement including acceleration and rotational speeds on signal stability and mass accuracy by acquiring data using direct infusion electrospray ionization. Data were acquired while rolling the systems in/out of operating rooms and while descending/ascending a freight elevator. Despite these movements and operating the instrument on battery power, the relative standard deviation of the total ion current was <5% and the magnitude of the mass error relative to the internal calibrant never exceeded 5.06 ppm. We further evaluated the feasibility of performing intraoperative MasSpec Pen analysis while operating the Orbitrap mass spectrometer on battery power during an ovarian cancer surgery. We observed that the rich and tissue-specific molecular profile commonly detected from ovarian tissues was conserved when running on battery power. Together, these results demonstrate that Orbitrap mass spectrometers can be operated and acquire data on battery power while in motion and in rotation without losses in signal stability or mass accuracy. Furthermore, Orbitrap</p>



	mass spectrometers can be used in conjunction to the MasSpec Pen while on battery power for intraoperative tissue analysis.
Fomento	This work was supported by the Betty Moore Foundation through Grant GBMF8049, by the National Cancer Institute of the National Institutes of Health under Award Numbers R33CA229068 and R01CA284742, and by the Welch Foundation under Award Number Q-1895-20220331.