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PRESENTATION TITLE: Comprehensive Targeted and Non-Targeted Lipidomics Analyses in Failing and Non-Failing heart Comprehensive Targeted and Non- Targeted Lipidomics Analyses in Failing and Non-Failing heart

ABSTRACT: Myocardial infarction (MI) and subsequent progressive heart failure pathology is the major cause of death worldwide; however, the mechanism of this pathology remains unclear. The present work aimed at testing the hypothesis whether the inflammatory response is superimposed with the formation of bioactive lipid resolving molecules at the site of the injured myocardium in acute heart failure pathology post-MI. In this view, we used a robust permanent coronary ligation model to induce MI, leading to decreased contractility index with marked wall thinning and necrosis of the infarcted left ventricle. Then, we applied mass spectrometry imaging (MSI) in positive and negative ionization modes to characterize the spatial distribution of left ventricle lipids in the infarcted myocardium post-MI. After micro-extraction, liquid chromatography coupled to tandem mass spectrometry was used to confirm the structures of the imaged lipids. Statistical tools such as principal component analysis were used to establish a comprehensive visualization of lipid profile changes in MI and no-MI hearts. Resolving ioactive molecules such as resolvin (Rv) D1, RvD5, RvE3, 17-HDHA, LXA4, and 18-HEPE were detected in negative ion modeMSI, whereas phosphatidyl cholines (PC) and oxidized derivatives thereof were detected in positive ion mode. MSI-based analysis demonstrated a significant increase in resolvin bioactive lipids with comprehensive lipid remodeling at the site of infarction. These results clearly indicate that infarcted myocardium is the primary location of inflammation-resolution pathomechanics which is critical for resolution of inflammation and heart failure pathophysiology.

BIOGRAPHY: A compter du mois de septembre 2021, Dr Boutayna Rhourri Frih, Maitre de conférences à l'UFR des sciences pharmaceutiques de l'Université de Bordeaux et chercheure dans l'équipe de spectrométrie de masse dirigée par Caroline Tokarski au CBMN, va rejoindre le **laboratoire d'imagerie moléculaire** du Professeur Pierre Chaurand en tant que professeure invitée pour une durée de trois ans. Boutayna compte continuer le développement de méthodologies d'imagerie moléculaire par spectrométrie de masse en lien avec des problématiques de santé publique notamment l'étude de la comorbidité insuffisance cardiaque et infection virale (COVID-19), l'étude du cancer du sein triple négatif et l'analyse du lipidome cérébral dans le cas de la maladie de Parkinson. Cette délégation à l'université de Montréal va permettre de mettre en place de nouvelles collaborations et des opportunités d'échange à la fois sur le plan de recherche que de l'enseignement. Areas of Expertise: Mass spectrometry, Ionic liquids, Analytical chemistry, Molecular imaging, Covid-19 Imagerie MALDI pour le diagnostic pronostic de pathologiesProjet de recherche au Canada / 2021 – 2024. Lead researcher - Funding sources: CNRS/Centre national de la recherche scientifique.