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Data Article

Lipid and protein maps defining arterial layers in atherosclerotic aorta

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ABSTRACT

Subclinical atherosclerosis cannot be predicted and novel therapeutic targets are needed. The molecular anatomy of healthy and atherosclerotic tissue is pursued to identify ongoing molecular changes in atherosclerosis development. Mass Spectrometry Imaging (MSI) accounts with the unique advantage of analyzing proteins and metabolites (lipids) while preserving their original localization; thus two dimensional maps can be obtained. Main molecular alterations were investigated in a rabbit model in response to early development of atherosclerosis. Aortic arterial layers (intima and media) and calcified regions were investigated in detail by MALDI-MSI and proteins and lipids specifically defining those areas of interest were identified. These data further complement main findings previously published in

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J Proteomics (M. Martin-Lorenzo et al., J. Proteomics. (In press); M. Martin-Lorenzo et al., J. Proteomics 108 (2014) 465–468.) [1,2].

Specifications table

Subject area	Biology
More specific subject area	Cardiovascular disease, MSI development and application to arterial tissue
Type of data	Table and figure
How data was acquired	MALDI-MSI, FTICR
Data format	Analyzed
Experimental factors	Specific and careful tissue treatment was applied as previously published [1]
Experimental features	
Data source location	LUMC (Leiden, The Netherlands), IIS-Fundación Jiménez Díaz (Madrid, Spain)
Data accessibility	

Value of the data

- A novel unexplored ex vivo imaging approach in cardiovascular disease;
- 30 μm high spatial resolution is applied to investigate atherosclerosis tissue layers;
- This is the first time specific protein localization and alteration in response to atherosclerosis is shown by MALDI-MSI;
- TMSB4X up-regulation in atherosclerosis is firstly identified at its original location.

1. Data, experimental design, materials and methods

1.1. Data

Specific molecular features (*m*/*z* values) were identified by MALDI-MSI, corresponding to proteins and lipids specifically defining intima, media or calcified regions in atherosclerotic rabbit aorta (Fig. 1).

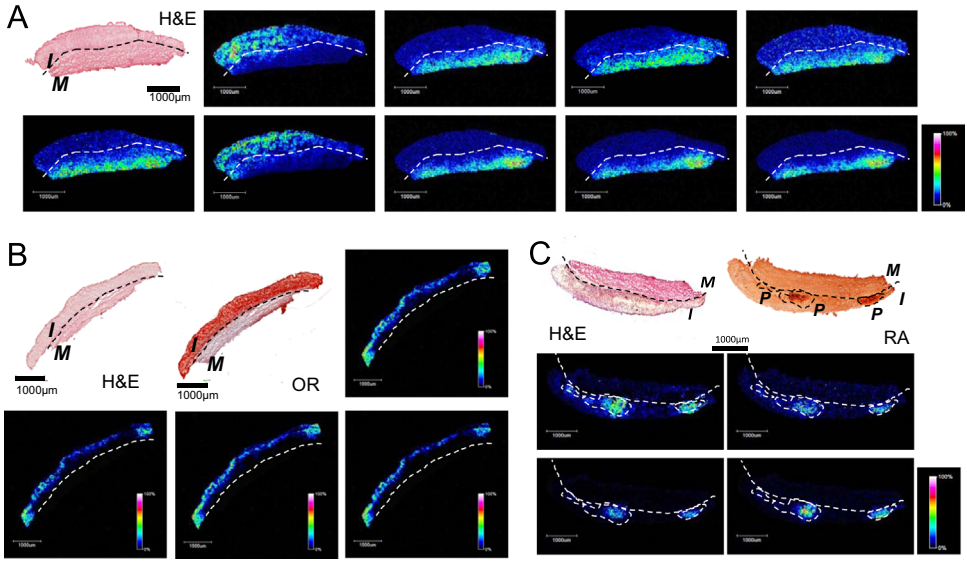

Fig. 1. Representative MALDI-MSI images for proteins (A) and lipids (B, C) in rabbit aorta. Intima (I) and media (M) layers and calcified regions (*P*) in the intima are defined by specific *m*/*z* values. Characterization of samples is made according to histology: H&E, Oil-Red (OR) and Red Alizarin (RA).