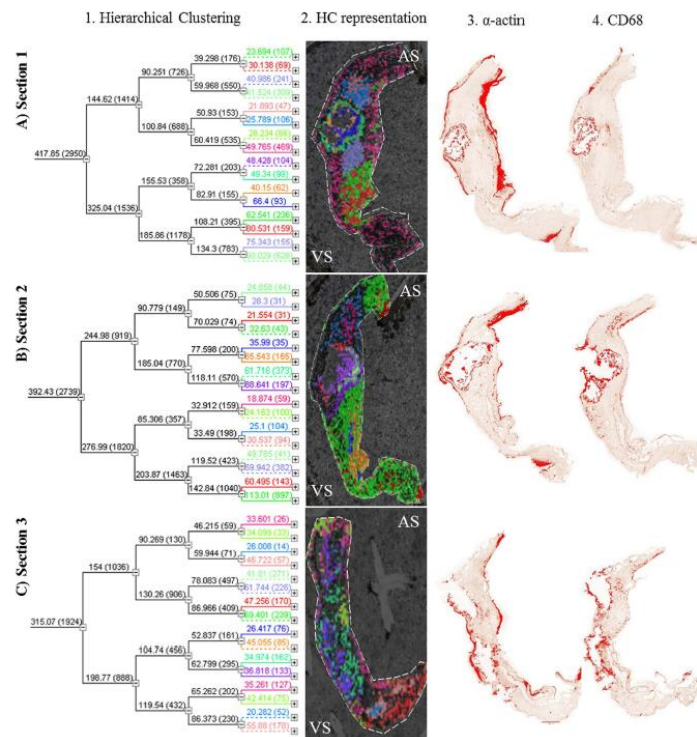


MALDI-Imaging Mass Spectrometry: a step forward in the anatomopathological characterization of stenotic aortic valve tissue.

Aortic stenosis (AS) is the most common form of human heart valve diseases. Once symptoms develop, there is an inexorable deterioration with a poor prognosis. When the aortic valve is obstructed, the heart needs to work harder to pump blood to the body. Eventually, this extra work limits the amount of blood it can pump and may weaken the heart muscle. Currently there are no therapies capable of modifying disease progression and aortic valve replacement is the only available treatment. The aim of the work was to study the progression of calcification of stenotic aortic valves by matrix-assisted laser desorption ionization imaging mass spectrometry (MALDI-IMS) and get new insights at molecular level that could help in the understanding of the disease.

In this study the scientist of the Proteomics Platform at CIC bioGUNE analyzed consecutive slices from aortic valve tissue, with increasing degree of lesion, by MALDI-IMS. MALDI-IMS is a methodology never used before in this pathology. By applying advanced statistical methods, this novel approach allowed establishing the spatial distribution of proteins and peptides directly from the surface of the analyzed histological sections in an unbiased manner.



Based on these images, the multidisciplinary group of scientist composed by researchers from SESCAM (Hospital Nacional de Paraplégicos & Hospital Virgen de la Salud), Hospital General Universitario Gregorio Marañón, Hospital Universitario de Salamanca-IBSAL, IDEKO-IK4 and CIC bioGUNE performed a study that helped shedding light into the molecular mechanisms implied in the progression of aortic stenosis. A major outcome is that specific regions corresponding to given protein/peptide signals could be defined by this molecular histology technique, proving to be complementary to other well established methodologies such as immunohistochemistry.