

## Glutaraldehyde Free Processing of Patch for Cardiovascular Repair Is Associated with Improved Outcomes on Rvot Repair, Rat Model

**Authors :** Parnaz Boodagh, Danila Vella, Antonio Damore, Laura Modica De Mohac, Sang-Ho Ye, Garret Cohan, Gaetano Burriesci, William Wagner, Federica Cosentino

**Abstract :** The use of cardiac patches is among the main therapeutic solution for cardiovascular diseases, a leading mortality cause in the world with an increasing trend, responsible of 19 millions deaths in 2020. Several classes of biomaterials serve that purpose, both of synthetic origin and biological derivation, and many bioengineered treatment alternatives were proposed to satisfy two main requirements, providing structural support and promoting tissue remodeling. The objective of this paper is to compare the mechanical properties and the characterization of four cardiac patches: the Adeka, PhotoFix, CorPatch, and CardioCel patches. In vitro and in vivo tests included: biaxial, uniaxial, ball burst, suture retention for mechanical characterization; 2D surface topography, 3D volume and microstructure, and histology assessments for structure characterization; in vitro test to evaluate platelet deposition, calcium deposition, and macrophage polarization; rat right ventricular outflow tract (RVOT) models at 8- and 16-week time points to characterize the patch-host interaction. Lastly, the four patches were used to produce four stented aortic valve prosthesis, subjected to hydrodynamic assessment as well as durability testing to verify compliance with the standard ISO.

**Keywords :** cardiac patch, cardiovascular disease, cardiac repair, blood contact biomaterial

**Conference Title :** ICABM 2022 : International Conference on Advances in Biocompatible Materials

**Conference Location :** Dubai, United Arab Emirates

**Conference Dates :** September 27-28, 2022