

## Image in cardiology

## Proepicardial Origin of Developing Coronary Vessels

## Formación de vasos coronarios a partir del proepicardio

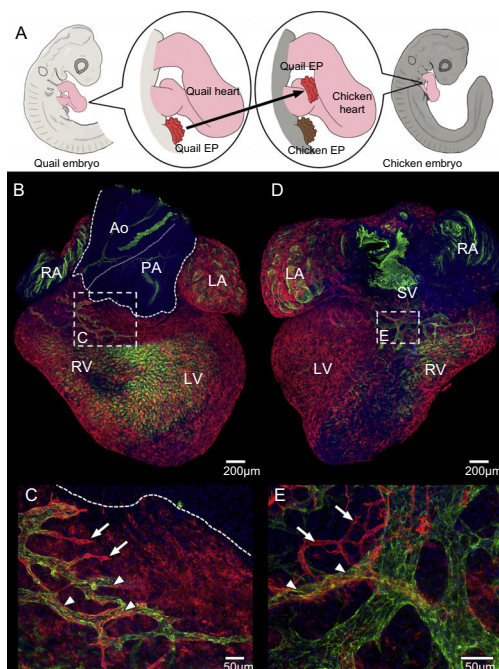
Paul Palmquist-Gomes,<sup>a,b</sup> José María Pérez-Pomares,<sup>a,b</sup> and Juan Antonio Guadix<sup>a,b,\*</sup><sup>a</sup> Departamento de Biología Animal, Facultad de Ciencias, Universidad de Málaga, Instituto Malagueño de Biomedicina (IBIMA), Málaga, Spain<sup>b</sup> Bionand, Centro Andaluz de Nanomedicina y Biotecnología, Junta de Andalucía, Universidad de Málaga, Campanillas, Málaga, Spain

Figure.

Coronary irrigation of the myocardium is essential for homeostasis in the adult heart, and embryonic developmental abnormalities in these blood vessels may result in congenital heart defects. Despite the clinical relevance of coronary arteries, the embryonic mechanisms regulating their formation are not known in detail. Recent studies suggest that the epicardial progenitors (proepicardial cells [EP]) make a critical contribution to coronary artery morphogenesis. Transplantation of proepicardial quail cells to chicken hearts (Figure A) can be used to trace the destination of the donor cells in chimeric embryos, as endothelial quail cells—but not chicken cells—are labeled with QH1 antibody (Figure B-E, red signal; Ao, aorta; LA, left atrium; LV, left ventricle; PA, pulmonary artery; RA, right atrium; RV, right ventricle). Intravascular injection of fluorescein-conjugated *Lens culinaris* lectin (FITC-LC) labels all blood vessels connected with systemic circulation (Figure B-E, green signal). The ventral views (Figure B) and dorsal views (Figure D; VS, venous sinus) of a chimeric heart (7 days of incubation) show how donor EP-derived endothelial cells (QH1<sup>+</sup>) form coronary vessels in heart chambers but not at the arterial pole of the heart (Figure B and C, discontinuous line), and become incorporated into the endothelium of coronary vessels whether connected (FITC-LC<sup>+</sup>, arrowheads of Figure C and E) or not connected with systemic circulation (FITC-LC<sup>-</sup>) (Figure C and E, arrows). The FITC-LC<sup>+</sup>/QH1<sup>-</sup> vessels are not derived from the quail EP.

## FUNDING

Spanish Ministry of Economy (MINECO), BFU2015-65783-R and SAF2015-71863 (J.M. Pérez-Pomares; Instituto de Salud Carlos III [MINECO-ISCI]), RD16/0011/0030-TERCEL (J.M. Pérez-Pomares); I Plan Propio-Málaga University (J.A. Guadix).

\* Corresponding author:

E-mail address: [jaguadix@uma.es](mailto:jaguadix@uma.es) (J.A. Guadix).

Available online 4 May 2018

<https://doi.org/10.1016/j.rec.2018.01.028>

1885-5857/© 2018 Sociedad Española de Cardiología. Published by Elsevier España, S.L.U. All rights reserved.