

SUPPLEMENTAL MATERIAL

Supplemental Video Legends:

Supplemental Video S1. Three-dimensional (3D) reconstruction of normal morphology of aortic arch and pulmonary artery in an E15.5 *Rac1^{ff}* heart. In *Rac1^{ff}* hearts, the aortic arch (pink) is located on the left side. Ascending and descending aorta are in red. The descending aorta runs parallel to the esophagus (green) and trachea (yellow). Pulmonary artery is in blue.

Supplemental Video S2. 3D reconstruction of vascular ring in an E15.5 *Rac1^{SHF}* heart. In *Rac1^{SHF}* hearts, the aortic arch (pink) is located incorrectly on the right side. The ascending and descending aorta are in red. The descending aorta wraps around the esophagus (green) and trachea (yellow), forming a vascular ring. Pulmonary artery is in blue.