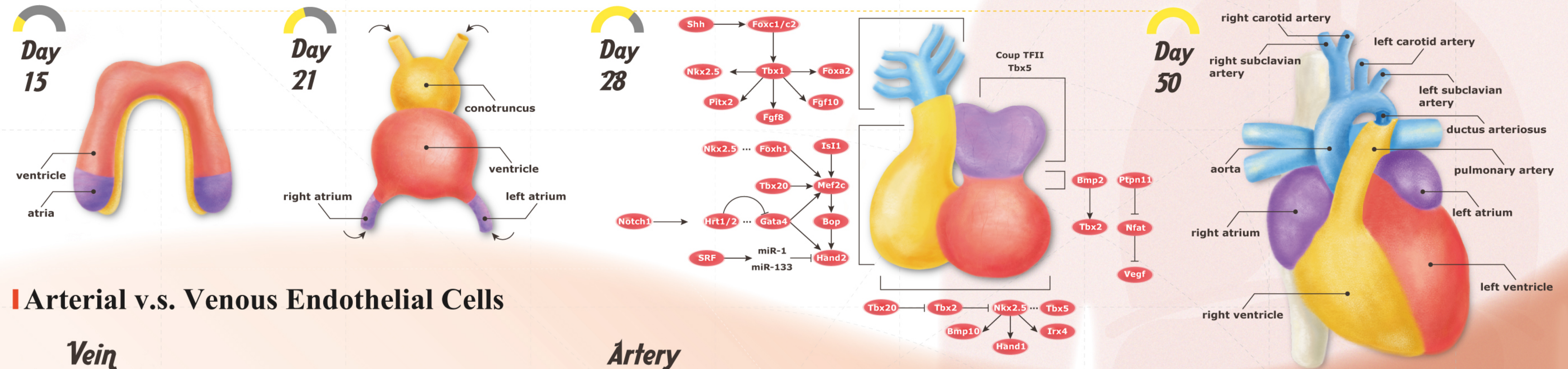
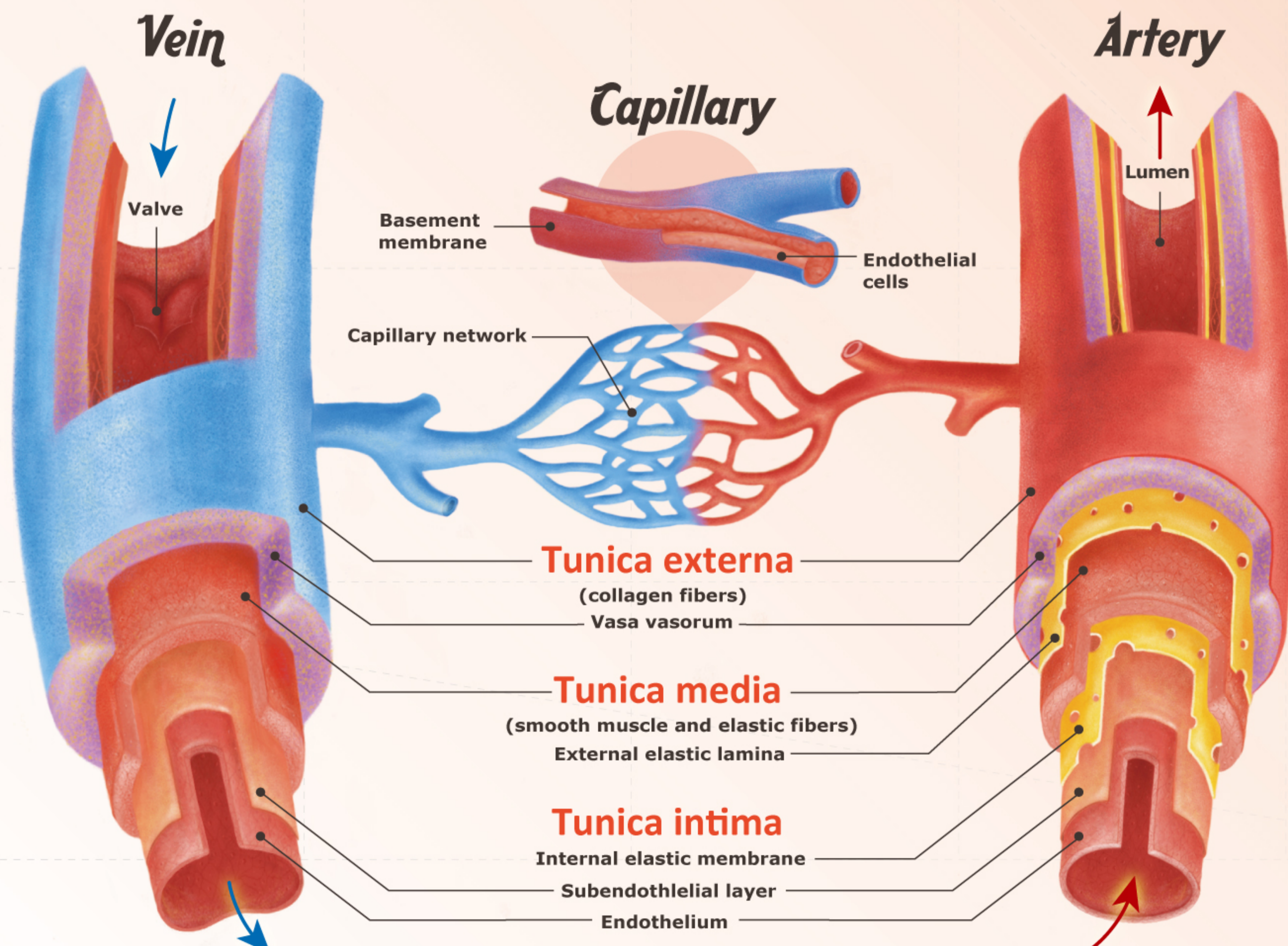


# Cardiovascular Research

## Human Cardiac Development



## Arterial v.s. Venous Endothelial Cells



## Human Cardiac Lineage Markers

Developmental stage	Cell phenotype	Cell-surface marker profile	Key genetic markers
Pluripotency	hPSC	SSEA3+, SSEA4+, CD9+, CD90+, CD17+, CD133+, CD117+, EPCAM+, TRA-1-60+, TRA-1-81+	OCT4+, NANOG+, SOX2+
EMT	Mesoderm progenitor	SSEA-1+, NCAM+, EPCAM-	OCT4+
Mesoderm induction	Pre-cardiac mesoderm	ROR2+, CD13+, PDGFRa+, KDR+	MESP1+, MIXL1+, GATA4+
Cardiac mesoderm induction	Tri-potent cardiac progenitor	SIRPA+, PDGFRa+	TBX5+, GATA4+, NKX2-5+, ISL1+, MEF2C+
	Epicardial cell	SIRPA+, CD90+, PDNP+, PDGFRb+	TBX5+, GATA4+, NKX2-5+, ISL1+, MEF2C+, WT1+
	Pericyte Progenitor	CD105+, CD146+, CD73+, CD133+, CD31-	aSMA+
Cardiac induction	Fibroblast	PDGFR a+, Thy1+, PDGFRb+, KIT-, vimentin+, CD34-, CD45-, CD31-, CD11b-, Ter119-	aSMA+, COL1A+
	Smooth muscle cell	SIRPA+, VCAM1+, CD34-	aSMA+, SM22+, CNN1+, MYH11+
	Atrial cardiomyocyte	SIRPA+, VCAM1+, CD34-, Kv1.5+, Kir3.1+	NKX2-5+, CTNT+, MYH6+, MYH7+, MLC2a+
	Ventricular cardiomyocyte	SIRPA+, VCAM1+, CD34-, Kv1.5-, Kir3.1-	NKX2-5+, CTNT+, MYH6+, MYH7+, MLC2v+, IRX4+
	Pacemaker cell	SIRPA+, HCN4+, CD166+, PDNP+, CD90-	NKX2-5, TBX18+, TBX3+, SHOX2+
	Endothelium	SIRPA+, VCAM1+, CD34+, CD31+, TIE2+, VE-cadherin+, VWF+	SCL1+
	Pericyte	NG2+/-, PDGFR b +/-, CD105+, CD146+, CD73+, CD133-, CD31-, CD34-	COL1+, aSMA+, COL4+, FN1+, SM22+, CALD1+

Trends Mol Med. 2017 Jul;23(7):651-668. Cell. 2006 Sep 22;126(6):1037-48. Cell Tissue Res. 2009 Jan;335(1):5-16.

