
Contents

<i>Preface</i>	<i>v</i>
<i>Contributors</i>	<i>xi</i>
PART I MODEL ORGANISMS	
1 Use of Whole Embryo Culture for Studying Heart Development	3
<i>Calvin T. Hang and Ching-Pin Chang</i>	
2 Quantifying Cardiac Functions in Embryonic and Adult Zebrafish	11
<i>Tiffany Hoage, Yonghe Ding, and Xiaolei Xu</i>	
3 Analysis of the Patterning of Cardiac Outflow Tract and Great Arteries with Angiography and Vascular Casting	21
<i>Ching-Pin Chang</i>	
4 Morpholino Injection in <i>Xenopus</i>	29
<i>Panna Tandon, Chris Showell, Kathleen Christine, and Frank L. Conlon</i>	
5 Chicken Chorioallantoic Membrane Angiogenesis Model	47
<i>Domenico Ribatti</i>	
6 Visualizing Vascular Networks in Zebrafish: An Introduction to Microangiography	59
<i>Christopher E. Schmitt, Melinda B. Holland, and Suk-Won Jin</i>	
7 Whole-Mount Confocal Microscopy for Vascular Branching Morphogenesis.	69
<i>Yoh-suke Mukoyama, Jennifer James, Joseph Nam, and Yutaka Uchida</i>	
8 Visualization of Mouse Embryo Angiogenesis by Fluorescence-Based Staining.	79
<i>Yang Liu, Marc Antonyak, and Xu Peng</i>	
9 Miniaturized Assays of Angiogenesis In Vitro	87
<i>May J. Reed and Robert B. Vernon</i>	
PART II CELL AND MOLECULAR BIOLOGY METHODS	
10 Analysis of the Endocardial-to-Mesenchymal Transformation of Heart Valve Development by Collagen Gel Culture Assay	101
<i>Yiqin Xiong, Bin Zhou, and Ching-Pin Chang</i>	
11 Quantification of Myocyte Chemotaxis: A Role for FAK in Regulating Directional Motility.	111
<i>Britni Zajac, Zeenat S. Hakim, Morgan V. Cameron, Oliver Smithies, and Joan M. Taylor</i>	

12	Analysis of Neural Crest Cell Fate During Cardiovascular Development Using Cre-Activated <i>lacZ</i> / β -Galactosidase Staining	125
	<i>Yanping Zhang and L. Bruno Ruest</i>	
13	Indirect Immunostaining on Mouse Embryonic Heart for the Detection of Proliferated Cardiomyocyte	139
	<i>Jieli Li, Marc Antonyak, and Xu Peng</i>	
14	Isolation and Characterization of Vascular Endothelial Cells from Murine Heart and Lung	147
	<i>Yixin Jin, Yang Liu, Marc Antonyak, and Xu Peng</i>	
15	Isolation and Characterization of Embryonic and Adult Epicardium and Epicardium-Derived Cells	155
	<i>Bin Zhou and William T. Pu</i>	
16	Vascular Smooth Muscle Cells: Isolation, Culture, and Characterization	169
	<i>Richard P. Metz, Jan L. Patterson, and Emily Wilson</i>	
17	C-kit Expression Identifies Cardiac Precursor Cells in Neonatal Mice	177
	<i>Michael Craven, Michael I. Kotlikoff, and Alyson S. Nadworny</i>	
18	Cardiomyocyte Apoptosis in Heart Development: Methods and Protocols	191
	<i>Dongfei Qi and Mingui Fu</i>	
19	Adenovirus-Mediated Gene Transfection in the Isolated Lymphatic Vessels	199
	<i>Anatoliy A. Gashev, Jieli Li, Mariappan Muthuchamy, and David C. Zawieja</i>	
20	Isolation of Cardiac Myocytes and Fibroblasts from Neonatal Rat Pups	205
	<i>Honey B. Golden, Deepika Gollapudi, Fnu Gerilechaogetu, Jieli Li, Ricardo J. Cristales, Xu Peng, and David E. Dostal</i>	

PART III NEW TECHNIQUES

21	The Application of Genome-Wide RNAi Screens in Exploring Varieties of Signaling Transduction Pathways.	217
	<i>Shenyuan Zhang and Hongying Zheng</i>	
22	Application of Atomic Force Microscopy Measurements on Cardiovascular Cells	229
	<i>Xin Wu, Zhe Sun, Gerald A. Meininger, and Mariappan Muthuchamy</i>	
23	In Utero Assessment of Cardiovascular Function in the Embryonic Mouse Heart Using High-Resolution Ultrasound Biomicroscopy	245
	<i>Honey B. Golden, Suraj Sunder, Yang Liu, Xu Peng, and David E. Dostal</i>	
24	Isolation and Preparation of RNA from Rat Blood and Lymphatic Microvessels for Use in Microarray Analysis.	265
	<i>Eric A. Bridenbaugh</i>	

25	Visual Data Mining of Coexpression Data to Set Research Priorities in Cardiac Development Research.	291
	<i>Vincent VanBuren</i>	
26	High-Speed Confocal Imaging of Zebrafish Heart Development.	309
	<i>Jay R. Hove and Michael P. Craig</i>	
27	Measurement of Electrical Conduction Properties of Intact Embryonic Murine Hearts by Extracellular Microelectrode Arrays.	329
	<i>David G. Taylor and Anupama Natarajan</i>	
	<i>Index.</i>	339



<http://www.springer.com/978-1-61779-522-0>

Cardiovascular Development
Methods and Protocols

Peng, X.; Antonyak, M. (Eds.)

2012, XIV, 341 p., Hardcover

ISBN: 978-1-61779-522-0

A product of Humana Press