Contents

List of abbreviations 8

Chapter 1 11
General introduction

Chapter 2 25
Changes in microcirculatory perfusion and oxygenation during on-pump and off-pump cardiac surgery

Chapter 3 51
Microcirculatory perfusion is preserved during off-pump but not on-pump cardiac surgery

Chapter 4 67
Pulsatile flow during cardiopulmonary bypass preserves postoperative microcirculatory perfusion irrespective of systemic hemodynamics

Chapter 5 87
Systemic microvascular shunting through hyperdynamic capillaries after acute physiological disturbances following cardiopulmonary bypass

Chapter 6 109
Endothelial hyperpermeability after cardiac surgery with cardiopulmonary bypass as assessed using an in vitro bioassay for endothelial function

Chapter 7 131
Side-by-side alterations in glycocalyx thickness and perfused microvascular density during acute microcirculatory alterations in cardiac surgery

Chapter 8 145
Impaired microcirculatory perfusion in a rat model of cardiopulmonary bypass: the role of hemodilution

Chapter 9 167
Reduction of vascular leakage by imatinib is associated with preserved microcirculatory perfusion and reduced renal injury in a rat model of cardiopulmonary bypass

Chapter 10 191
General conclusions and discussion

English summary 209
Nederlandse samenvatting 213
Résumé français 219
Acknowledgements 223
List of publications 229
Biography 231