

CONTENTS

| | |
|---|----|
| 1 Introduction | 1 |
| 2 Materials and Methods | 3 |
| 3 General Morphology of the Fish Heart | 5 |
| 4 Development of the Fish Heart | 9 |
| 5 Fish Heart Morphology | 14 |
| 5.1 Cyclostomes | 14 |
| 5.2 Elasmobranchs | 15 |
| 5.3 Teleosts | 21 |
| 5.3.1 Heart Weight: Body Weight Relationships | 21 |
| 5.3.2 Sinus Venosus, Sino-atrial Junction and Valves | 22 |
| 5.3.3 Atrium | 24 |
| 5.3.4 Ventricle | 29 |
| 5.3.5 Bulbus Arteriosus | 41 |
| 5.4 Coronary Arterial Structure and Pathology | 45 |
| 5.5 Dipnoans | 48 |
| 6 Electron Microscopy of the Fish Heart | 51 |
| 6.1 Sinus Venosus | 51 |
| 6.2 Atrium and Ventricle | 53 |
| 6.2.1 Epicardium | 53 |
| 6.2.2 Myocardial Cells – Size and Complement of Contractile Elements | 53 |
| 6.2.3 Myocardial Cells – Sarcolemma and Sarcoplasmic Reticulum | 58 |
| 6.2.4 Myocardial Cells – Intercellular Relationships | 61 |
| 6.2.5 Myocardial Cells – Specific Granules | 65 |
| 6.2.6 Myocardial Cells – Other Cytoplasmic Organelles | 66 |
| 6.3 Endothelial Cells | 67 |
| 6.4 Granule-Containing Cells | 69 |
| 6.5 Bulbus Arteriosus | 71 |
| 7 Innervation of the Fish Heart | 73 |
| 7.1 Cyclostomes | 73 |
| 7.2 Elasmobranchs | 74 |

| | |
|--|------------|
| 7.3 Teleosts | 75 |
| 7.3.1 Light Microscopy | 75 |
| 7.3.2 Electron Microscopy | 78 |
| 7.4 Dipnoans | 83 |
| 8 Summary and Conclusions | 84 |
| Acknowledgements | 86 |
| 9 References | 87 |
| Subject Index | 100 |