

CONTENTS

I. INTRODUCTION.....	1
I.1. Zebrafish as experimental model	2
I.1.1. In biomedicine.....	2
I.1.2. In toxicogenomics/environmental risk assessment	4
I.1.3. In aquaculture.....	5
I.2. Pacific oyster as experimental model	7
I.2.1. In biomedicine.....	7
I.2.2. In environmental risk assessment	8
I.2.3. In aquaculture.....	9
References	11
II. OBJECTIVES	21
III. EXPERIMENTS	22
III.1. Cell Cryopreservation in zebrafish	23
Study 1. Vitrification of caudal fin explants from zebrafish adult specimens	27
Study 2. Vitrification of zebrafish embryo blastomeres in microvolumes	33
Study 3. Can vitrified zebrafish blastomeres be used to obtain germ-line chimaeras?	44
Study 4. Effects on cell viability of three zebrafish testicular cell or tissue cryopreservation methods.....	54
Study 5. Testicular cell transplantation into newly hatched larvae in zebrafish	60
III.2. Chimaerism in zebrafish	68
Study 6. Ultraviolet radiation dose to be applied in recipient zebrafish embryos for germ-line chimaerism is strain dependent	70
Study 7. Micromanipulation medium osmolarity compromises zebrafish embryo and cell survival in chimaerism	84
Study 8. UV radiation and osmolarity media affects germ-line chimaerism success in zebrafish	92

III.3. Nuclear Transplant in zebrafish	99
Study 9. Effect of gametes aging on their activation and fertilizability in zebrafish (<i>Danio rerio</i>)	104
Study10. Definition of three somatic cell nuclear transplant methods in zebrafish (<i>Danio rerio</i>): before, during and after egg activation by sperm fertilization	111
Study11. Transplant of adult fibroblast nuclei into the central region of metaphase II eggs resulted in mid blastula transition (MBT) embryos	124
Study12. Electroactivation of zebrafish (<i>Danio rerio</i>) eggs	133
Study13. Comparison of different activating stimuli efficiency in zebrafish nuclear transplant	144
Study14. Reconstruction of heteroparental gynogenetic diploid condition by nuclear transplant in zebrafish: preliminary results	153
III.4. Zygotic Electrofusion in P. Oyster	160
Study15. Seasonal evolution of gonadal maturation, gametes quality and fertilizability of Pacific oyster (<i>Crassostrea gigas</i>) in the west coast of Mediterranean Sea	162
Study16. Definition of fusion medium and electric parameters for efficient zygote electrofusion in the Pacific oyster (<i>Crassostrea gigas</i>)	172
References	185
CONCLUSIONS	206