

**PROOF OF CONCEPT OF AN IN VITRO TRANSCRIBED VACCINE AGAINST
CARP EDEMA VIRUS DISEASE WITH LOW-COST EXPERIMENTAL DESIGN**

by

YOUR NAME

A thesis submitted in partial fulfillment of the requirements for the degree of Master of
Science in
in Aquaculture and Aquatic Resources Management

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April 2022

AUTHOR'S DECLARATION

I, Quentin ANDRES, declare that the research work carried out for this thesis was in accordance with the regulations of the Asian Institute of Technology. The work presented in it are my own and has been generated by me as the result of my own original research, and if external sources were used, such sources have been cited. It is original and has not been submitted to any other institution to obtain another degree or qualification. This is a true copy of the thesis, including final revisions.

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ACKNOWLEDGMENTS

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[one page, maximum]

ABSTRACT

Fighting viral infection inducing mass mortality in fish is a hot-topic research in the aquaculture field in order to be able to sustain its intensification. This research project is about developing a vaccine against Carp Edema Virus for which there is currently no existing vaccine. I intend to develop a proof of concept for the production of a mRNA vaccine candidate using low-cost experimental design. This is a high-complexity and challenging research project I want to work on because I am passionate about biotechnology and cutting-edge technologies. To do so I will start with a bibliographic research on the methods and protocols that I will use during the experimentation. The first step in the realization of the vaccine consists in harvesting the virus and being able to recover the viral elements that will be the target of the vaccine. The mRNA vaccine in my project will be a messenger mimicking the infection from CEV in the Carps and will be synthesized by the means of common but also more advanced molecular biology techniques inside of bio-engineered bacteria as the transcription vector. The former step in the assessment of the transfection and translational efficiency of the candidate will be to quantify the activity of the messenger, *in vitro*, inside the Carp cells or inside of a related fish cell line via a reporter and by gene expression assay. During the latter stage of the experimentation, I will perform a challenge test *in vivo* on the carp fish, either in Koi (*Cyprinus rubrofuscus*) or in the common carp (*Cyprinus carpio*). The ultimate part of the project will be to monitor the results and communicate them to the community.

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Acronyms

EU European Union

USA United States of America

USSR Union of Soviet Socialist Republics

Chapter 1

INTRODUCTION

Some text.

1.1 Background of the Study

Human monitoring is therefore becoming increasingly expensive and ineffective as the torrent of video data increases. For instance, in a CCTV monitoring room (see Figure ??), security operators are required to monitor 24 hours a day and be ready to take action when an alarm occurs.

United States of America (USA), USA,

European Union (EU), EU

Union of Soviet Socialist Republics (USSR), USSR

1.2 Statement of the Problem

Some text ...

1.3 Research questions-Discuss with your adviser

Some text ...

1.4 Objectives of the Study

Some text ...

1.5 Write the next section here

Some text ...

1.6 Organization of the Study

I organize the rest of this dissertation as follows.

In Chapter 2, I describe the literature review.

In Chapter 3, I propose my methodology.

In Chapter 4, I present the experimental results.

Finally, in Chapter 5, I conclude my thesis.

Chapter 2

TITLE

Some intro..

2.1 Section Name in Literature Review

Example text below ..

apply the background subtraction technique to extract blobs or human from a scene by the following conditions:

$$\begin{array}{ll} \text{if} & |I_a(x, y) - I_b(x, y)| < T, \quad I_e(x, y) = 0 \\ \text{else} & I_e(x, y) = I_a(x, y), \end{array}$$

where $I_e(x, y)$ is a human extracted image, $I_a(x, y)$ is an original image, $I_b(x, y)$ is a background image, and T is a threshold. shows something. Some work also uses mesh features.

2.1.1 heading Level 3

Chapter 3

Methodology

Some intro..

3.1 System Overview

Some text .. Algorithm ?? is just a pseudocode.

3.2 System Design

3.2.1 Design A

Some text ..

Chapter 4

Experimental Results

Some intro..

4.1 Section Name in Experimental Results

Chapter 5

Conclusion and Recommendations

Some text..

5.1 Conclusion

Text..

5.2 Recommendations

Text..

Bibliography

yamato92hmmYamato, J., Ohya, J. Ishii, K. 1992. Recognizing human action in time-sequential images using hidden Markov model. International Conference on Computer Vision and Pattern Recognition (CVPR) (379–385). [p]

APPENDIX A

Section Name

Some text ..

APPENDIX B

Section Name

Some text ..

VITA

Section Name

Some text ..