RAMAIAH
Institute of Technology

DEPARTMENT OF BIOTECHNOLOGY

CERTIFICATE

Certified that the project entitled **"ROLE OF NON-CODING RNAs IN CARDIOVASCULAR DISEASES"** carried out by **Ms. Megha RD, Ms. Mounika Rao, Ms. Nidhi Hookeri and Ms. Shruthi Selvaraj** bearing University Seat Number **1MS15BT021, 1MS15BT024, 1MS15BT028 and 1MS15BT048** respectively, bonafide students of **Department of Biotechnology, Ramaiah Institute of Technology, Bengaluru** in fulfillment of the **Mini Project** under the affiliation of **Visvesvaraya Technological University, Belgaum** during the year 2015-2019. It is certified that all corrections/ suggestions indicated for the internal assessment have been incorporated in the report. The project report has been approved as it satisfies the academic requirements in respect of Project Work prescribed for the said degree.

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Shodhaka *The discoverer at your service!*

Date: 02-May-2018

To Whom It May Concern

Certified that the project work entitled **"Role of non-coding RNA in Cardiovascular diseases"** was carried out at Shodhaka Life Sciences Pvt. Ltd. by **Ms. Megha R D** [USN No.:1MS15BT021], **Ms. Mounika Rao** [USN No.: 1MS15BT024], **Ms. Nidhi Hookeri** [USN No.:1MS15BT028] and **Ms. Shruthi Selvaraj** [USN No.:1MS15BT048], students of Ramaiah Institute of Technology, Bengaluru, an autonomous college affiliated to Visvesvaraya Technological University in partial fulfillment for the award of B.E Biotechnology, from 1st February 2018 to 02nd May 2018. It is certified that they have completed the project satisfactorily.

For Shodhaka Life Sciences Pvt. Ltd.

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DECLARATION

I hereby declare that this project report is based on my original work except for citations and quotations which have been duly acknowledged. I also declare that it has not been previously and concurrently submitted by any other student/person or at any other institutions or for any other purpose.

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APPROVAL FOR SUBMISSION

I certify that this project report entitled "**ROLE OF NON-CODING RNAs IN CARDIOVASCULAR DISEASES**" was prepared by Megha RD, Mounika Rao, Nidhi Hookeri, Shruthi Selvaraj, bonafide students of Department of Biotechnology, Ramaiah Institute of Technology, Bengaluru in partial fulfillment of the requirements for the award of Bachelor of Engineering in Biotechnology under the affiliation of Visvesvaraya Technological University, Belgaum during the year 2015-2019. It is certified that all corrections/suggestions indicated for internal assessment have been incorporated in the report deposited in the departmental library. The project report has been approved as it satisfies the academic requirements in respect of Mini Project Work prescribed for the degree.

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TABLE OF CONTENTS

Page Number

CERTIFICATE i

DECLARATION iii

APPROVAL OF SUBMISSION iv

ACKNOWLEDGEMENTS v

LIST OF TABLES viii

LIST OF FIGURES xi

ABSTRACT x

CHAPTER

1. INTRODUCTION....1

1.1 Cardiovascular disease....1

1.1.1 Myocardial Infarction....1

1.1.2 Biomarkers as diagnostic tools for Myocardial Infarction....1

1.2 Non-coding molecules....2

1.2.1 Importance of non-coding RNA in Myocardial Infarction....2

1.3 PubMed....3

1.3.1 History of PubMed....3

1.3.2 Utilization of PubMed....3

1.4 Biocuration....5

1.4.1 Role of biocurators in biological and biomedical research....5

2. REVIEW OF LITERATURE....6

2.1 Historical papers on MI....6

2.2 ncRNA in other diseases....6

2.3 Biomarkers in MI....8

2.4 Microarray technique for detection of ncRNA....9

2.5 RNA sequencing technique for detection of ncRNA....9

3. OBJECTIVES……..11

4. MATERIALS AND METHODS 12

4.1 Workflow 12

4.2. Protocol to execute Goal 1a 12

4.2.1 Screening for Research papers that reported biomolecules involved in causing MI 12

4.2.2. The standard query sets #1 and #2 were subjected to comprehensive search on PubMed 13

4.2.3. Advanced search page 14

4.3. Protocol to execute Goal 1b 15

4.4. Protocol to execute Goal 1c 16

4.5. Protocol to execute Goal 2 16

5. RESULTS AND DISCUSSION 17

5.1. Results for Protocol to execute Goal 1a 17

5.2. Results for Protocol to execute Goal 1b 17

5.3. Results for Protocol to execute Goal 1c 21

5.4. Results for Protocol to execute Goal 2 22

5.4.1. Retrieval of coding and non-coding biomolecules through biocuration 22

5.4.2. Comment on non-coding biomolecules retrieved through biocuration 23

5.4.3. Comments on coding biomolecules retrieved through biocuration 29

6. CONCLUSIONS 36

7. FUTURE SCOPE 37

8. REFERENCES 38

LIST OF TABLES

TABLE Page No.

Table 5.1 Tabulation of non-coding molecules repeated three times or more 22

Table 5.2 Tabulation of coding molecules repeated three times or more 23

Table 5.3 List of identified non-coding and coding biomolecules concluded as significant in MI …25

Table 5.4 Results of biocuration of non-coding molecules 28

Table 5.5 Results of biocuration of coding molecules 34

LIST OF FIGURES

Figure Page No.

Figure 1.1: Human heart..... 1
Figure 1.2 Schematic representation of classification of non-coding RNA 3
Figure 1.3 Snapshot of PubMed web page 4
Figure 1.4 Snapshot of PubMed web page showing use of 'Boolean operator' and 'SEND TO'.....5
Figure 1.5 Snapshot of PubMed web page showing 'CREATE ALERT' and 'FILTER APPLICATION' …….....5
Figure 4.1 Workflow (Future work enclosed within '---') 14
Figure 4.2 Screenshot of query set #1.....16
Figure 4.3 Screenshot of query set #2.....17
Figure 4.4 Screenshot displaying the advanced option on PubMed.....17
Figure 4.5 Screenshot of Advanced search page on PubMed.....18
Figure 4.6 Compilation of the non-coding biomolecules data retrieved from PubMed.....19
Figure 5.1 Brief Explanation of comprehensive search used on PubMed 20
Figure 5.2 Snapshot of excel sheet showing sorted non-coding biomolecules.....21
Figure 5.3 Snapshot of excel sheet showing sorted coding biomolecules.....22
Figure 5.4 Graphical representation of the frequency of non-coding molecules reported three times or more in papers 23
Figure 5.5 Graphical representation of the frequency of coding molecules reported three times or more in papers …….....25

ABSTRACT

World health organization (WHO) had estimated 17.7 million deaths due to cardiovascular disease (CVD) worldwide in the year 2015. 7.6 million of these deaths were due to Coronary heart disease in particular, with Myocardial Infarction (MI) being the main manifestation of CVDs. Most research work is focused on finding a cure for MI, however, minimal research is done on deducing the pathway involved in MI and determining biomarkers that could indicate the probability of suffering from MI well before its onset. Recent discoveries prove that ncRNAs have the ability to affect the translation and stability of mRNA and also regulate gene expression. Although individual studies have been done to identify ncRNAs that are involved in MI, no such mass scale bioinformatics study has been done for meticulous determination of a particular ncRNA that plays a significant role in triggering pathways that lead to MI. This study is aimed at retrieving biological molecules reported to be significant in causing the disease, by performing a detailed analysis on the data collected and drawing a logical relevance between the differential expression of ncRNAs in healthy and diseased humans. Standard and comprehensive search techniques were used to efficiently collect relevant papers on PubMed. The 2,247 papers thus obtained, were thoroughly biocurated to obtain biological molecule data reported in the cases of MI and were further cumulated systematically in MS Excel sheets. This intricate screening technique helped in the retrieval and standardization of 84 non-coding biomolecules from 174 individual papers and 117 coding biomolecules from 194 individual papers. These biomolecules have been found to show differential expression when compared in healthy and diseased MI patients. Further research on the identified non-coding and coding biomolecules can determine their future as potential biomarkers that can help mitigate or delay the progression of MI. According to our study, the coding molecules that are most used as biomarkers in MI are Interleukin and Toll-like receptors and the non-coding RNAs most used as biomarkers are miR-133 and miR-208