



**Ain Shams University
Faculty of Women for Arts
Science and Education**

**Diagnostic and Biochemical Characterization of Hepatitis C Virus
Envelope Protein Using Specific Monoclonal Antibodies**

Thesis

**Submitted in Fulfillment of the Requirements for
the Degree of Ph.D. of Science in Microbiology**

By

Iman Ali Mohamed El Demerdash Touni, M.Sc.

Botany Department

Faculty of Women for Arts, Science and Education

Ain Shams University

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Acknowledgment

I sincerely acknowledge the help of my supervisors, Dr. Maha Hewedy, Professor of Microbiology, Botany Department, Faculty of Women for Arts, Science and Education, Ain Shams University, Cairo, Egypt, for her thorough supervision, valuable suggestions and constant encouragement. Dr.Hanan Elmohammady, Laboratory Manager, Bacterial and Parasitic Disease Research Program, Naval Medical Research Unit 3, Cairo, Egypt, for her skillful supervision, sincere guidance and help in solving problems. Dr.Ashraf Tabll, Professor of Medical Biotechnology and Head of Microbial Biotechnology Department, National Research Center, Giza, Egypt, for his distinguished supervision, support and help in overcoming all obstacles throughout the study. Dr.Shaimaa Sobieh, Lecturer of Cytology and Genetics, Botany Department, Faculty of Women for Arts, Science and Education, Ain Shams University, Cairo, Egypt, for her meticulous supervision, generous advices and offering me much of her time.

I would like to express my deepest thanks to my colleagues in Bacterial and Parasitic Disease Research Program, Naval Medical Research Unit 3, Cairo, Egypt, who offered me their valuable time, facilities and constant cooperation. I would like to express my thanks and gratitude to Dr.Rania Nada, Head of Molecular Biology Unit, Bacterial and Parasitic Disease Research Program, Naval Medical Research Unit 3, Cairo, Egypt, for her help to start this thesis. I would like also to express my deepest appreciation to my colleagues in Virology and Zoonotic Disease Research Program, Naval Medical Research Unit 3, Cairo, Egypt, for their help and support.

I wish to thank Dr. Yasmin El Abd Assistant Professor, Microbial Biotechnology Department, National Research Center, Giza, Egypt, and the staff members of Microbial Biotechnology Department, National Research Center, Giza, Egypt, for their sincere cooperation and providing me with the samples.

Abstract

Diagnostic and Biochemical Characterization of Hepatitis C Virus Envelope Protein Using Specific Monoclonal Antibodies

Hepatitis C virus was proven to be a major disease over the world until the present and especially in Egypt. The aim of this study was to detect HCV E1/E2 antigens using specific generated mouse monoclonal antibodies as an alternative approach for the confirmation of HCV viremia. Propagation of four hybrid cell lines (7G9), (6D11), (3F6) and (6E4) producing mouse monoclonal antibodies, purification and characterization were performed. Peptide mapping for these monoclonal antibodies was done by ELISA as well testing against positive HCV samples and negative samples was carried out. Relying on these tests, the monoclonal antibody (7G9) giving the highest value was selected to fulfill this study. The molecular weight of monoclonal antibody (7G9) was determined by SDS-PAGE and the Western Blot transfer method where E1 was identified at 31 kDa and E2 at 63 kDa. High specificity was shown when testing the monoclonal antibody (7G9) against antigens derived from some bacterial and viral pathogens. The sensitivity of the monoclonal antibody (7G9) was detected till 2.00 µg/ml of the coated antigen HCV E1 (a.a 315-323). The ELISA and the Dot-ELISA were optimized to detect HCV infected samples where ELISA had a sensitivity of 80.0% detecting samples, a specificity of 96 % and an efficiency of 82.2% and Dot-ELISA had a sensitivity of 76.8% detecting samples, a specificity of 88.0 % and an efficiency of 78.5%. The assays were shown to be reliable in the confirmation of HCV infection. However, there was no correlation between serum HCV viral load and HCV E1/E2 antigen detection.

Keywords: Hepatitis C Virus (HCV) - Envelope Protein (E1/E2) - Hybridoma cell line (7G9).

List of Contents

Title	Page No.
Literature Review	1
1-Introduction to Hepatitis C Virus	1
2-History of HCV	4
3-Taxonomy	5
4- Hepatitis C Virion	7
4-1- Description of virus particle	7
4-2- HCV genome organization	7
4-2-1- Core protein	8
4-2-2 E1-E2	9
4-2-3- P7 protein	11
4-2-4- NS2 protein	11
4-2-5- NS3 protein	11
4-2-6- NS4A protein	12
4-2-7- NS4B protein	12
4-2-8- NS5A protein	12
4-2-9- NS5B protein	13
5-Life Cycle of Hepatitis C virus	14
6-Immune Evasion by HCV	16

7-Mode of Transmissions	17
8-Diagnosis of HCV	18
8-1-Histological examination	18
8-2-Laboratory testing for Hepatitis C	18
9-Circulating Immune Complexes	24
10-Monoclonal Antibodies and their applications	25
Aim of work	30
Materials and Methods	31
I-Materials	31
1- Monoclonal Antibodies	31
1.1-Revival and propagation of hybrid cells from frozen stocks	31
1.1.1-Hybrid cell lines	31
1.1.2-Complete Medium DMEM	31
1.2- Freezing medium	32
2-Samples	32
3-Antigens	32
3.1-Synthetic peptides	32
3.2- <i>Brucella abortus</i> antigen and <i>Salmonella typhi</i> antigen	32
3.3-HBV antigen	33
4-Buffers and Reagents for ELISA and Dot-Elisa	33

4.1-Phosphate Buffer Saline (10X PBS) pH 7	33
4.2-Phosphate Buffer Saline-Tween20 (PBST)	33
4.3-Carbonate/Bicarbonate Coating Buffer pH 9.6	34
4.4-Blocking Buffer 5% FCS	34
4.5-Diluent 3% FCS	34
4.6-Blocking Buffer 0.1% Non-Fat Dry Milk	35
4.7-Diluent 0.1% Non-Fat Dry Milk	35
4.8-Blocking Buffer 0.2% BSA	35
4.9-Blocking Buffer 5% BSA/PBS-T	36
4.10-Citrate Substrate Buffer pH 4.5	36
4.11-10% Diethanolamine Substrate Buffer pH 9.8	36
4.12-Orthophenylene Diamine (OPD) substrate	37
4.13-para-Nitrophenylphosphate (p- NPP) substrate	37
4.14-3N Sodium Hydroxide Stop Solution	37
4.15-3M Hydrochloric Acid Stop Solution	37
4.16-Borate Buffer Saline (BBS)	38
5-Characterization of Monoclonal Antibodies	38
5.1-Precipitation of the four monoclonal antibodies by ammonium sulphate protocol using saturated solution of ammonium sulphate	38
5.2-Determination of isotypes of the four monoclonal antibodies by the Pierce Rapid ELISA isotyping kit # 37503	39

5.3-Determination of the protein content of the four monoclonal antibodies by the BIORAD-DC protein assay kit II # 500-0112	39
5.4-Stock Reagents to Sodium Dodecyl Sulphate Polyacrylamide Gel Electrophoresis (SDS-PAGE) and Western Blot Transfer	39
5.4.1-Acrylamide/Bis	39
5.4.2-10% (w/v)Sodium Dodecyl Sulphate (SDS)	39
5.4.3-1.5 M Tris-HCl, pH 8.8	40
5.4.4-0.5 M Tris-HCl, pH 6.8	40
5.4.5-10% (w/v) Ammonium Persulphate –APS	40
5.4.6-Separating Gel at 12.0%	41
5.4.7-Stacking Gel at 4.0%	41
5.4.8-Sample Buffer (SDS Reducing Buffer)	42
5.4.9-10X Electrode (Running) Buffer, pH 8.3	42
5.4.10-Stain	43
5.4.11-Destain	43
5.4.12-Transfer Buffer (20% Methanol)	43
5.4.13-Tris Buffer Saline (10X TBS)	44
5.4.14-Tris Buffer Saline-Tween 20 (TBST)	44
5.4.15-Diluent Buffer 3% BSA/TBST	44
5.4.16- Blocking Buffer 5% BSA/TBST	45
5.4.17- 4-Chloro-1-Naphthol (CN) Peroxidase Substrate System	45

5.4.18- 5-Bromo-4-Chloro-3-Indolyl-Phosphate / Nitro Blue Tetrazolium (BCIP/NBT) Phosphatase Substrate	45
Supplies and Equipment	46
II-Methods	49
1-Monoclonal antibodies	50
1.1-Revival and propagation of hybrid cells from frozen stocks	50
1.2-Preservation of cell lines producing monoclonal antibodies in liquid nitrogen	52
2- Detection of the reactivity of the four mouse monoclonal antibodies in culture supernatants by ELISA	52
3-Characterization of the four mouse monoclonal antibodies targeting HCV E1/E2 antigens	53
3.1-Precipitation of the four mouse monoclonal antibodies by saturated ammonium sulphate solution followed by dialysis	53
3.2-Determination of the isotypes of the four mouse monoclonal antibodies by the Pierce Rapid ELISA isotyping kit#37503	55
3.3-Determination of the protein content of the four monoclonal antibodies by BIORAD-DC protein assay kit II # 500-012	56
3.4-Testing of epitope mapping of the four monoclonal antibodies for three synthetic peptides, one peptide from HCV E1 and two peptides from HCV E2	57
3.5-Testing of the four monoclonal antibodies to screen HCV positive and negative samples by ELISA	58
3.6-Determination of the molecular weight of the monoclonal antibody (7G9) by SDS-PAGE mini protean II dual slab gel procedure	59

3.7-Determination of the molecular weight of the monoclonal antibody (7G9) by Western blot transfer procedure	61
4-Detection of HCV E1/E2 antigens in samples by ELISA	64
4.1-Dissociation and precipitation of the immune complexes (antibody-antigen) in serum to detect the antigen	64
4.2-Optimization of ELISA for the detection of HCV E1/E2 antigens in samples	65
4.3-Evaluation of the specificity of the mouse monoclonal antibody (7G9)	66
4.4-Evaluation of the sensitivity of the mouse monoclonal antibody (7G9)	67
4.5-Screening of positive and negative samples using the monoclonal antibody (7G9) by the optimized ELISA	68
5-Detection of HCV E1/E2 antigens in samples by Dot-ELISA	70
5.1-Detection of HCV E1/E2 antigens in samples by Dot-ELISA (method1)	70
5.2-Detection of HCV E1/E2 antigens in samples by Dot-ELISA (method 2)	72
5.3-Detection of HCV E1/E2 antigens in samples by Dot-ELISA (method 3) based on molecular mimicry	73
6- Statistical Analyses	74
Results	75
1-Revival and propagation of hybrid cells from frozen stocks	75
2-Detection of the four mouse monoclonal antibodies in supernatants of cell lines by ELISA	76

3-Characterization of the four mouse monoclonal antibodies targeting HCV E1/E2 antigens	77
3.1-Determination of the isotypes of the four monoclonal antibodies	77
3.2-Determination of the protein content of the four monoclonal antibodies	78
3.3-Testing of epitope mapping of the four monoclonal antibodies for three synthetic peptides, one peptide from HCV E1 and two peptides from HCV E2	79
3.4-Testing of the four mouse monoclonal antibodies to screen HCV positive and negative samples	81
3.5-Determination of the molecular weight of the monoclonal antibody (7G9) by SDS-PAGE	83
3.6-Determination of the molecular weight of the monoclonal antibody(7G9) by Western blot transfer procedure	85
4-Detection of HCV E1/E2 antigens in samples by ELISA	87
4.1-Optimization of the ELISA assay for the detection of HCV E1/E2 antigens in samples	87
4.2- Evaluation of the specificity of the monoclonal antibody(7G9)	88
4.3- Evaluation of the sensitivity of the monoclonal antibody (7G9)	91
4.4- Screening of positive and negative samples using the monoclonal antibody (7G9) by the optimized ELISA	92
4.4.1-Scattering of positive and negative samples by ELISA	92
4.4.2-Results of HCV E1/E2 antigens in samples by the optimized ELISA	94

4.4.3-Relation of viral load detected in positive HCV RNA tested samples and OD of HCV E1/E2 antigens measured by ELISA	95
5- Detection of HCV E1/E2 antigens in samples by Dot-ELISA	97
5.1-Optimization of Dot-ELISA(1)	97
5.2- Results of HCV E1/E2 antigens in samples by Dot- ELISA(1)	99
5.3- Optimization of Dot-ELISA(2)	100
5.4- Results of HCV E1/E2 antigens in samples by Dot-ELISA(2)	102
5.5- Optimization of Dot-ELISA (3) based on molecular mimicry	103
5.6. Screening of positive and negative samples using the monoclonal antibody (7G9) by the optimized Dot-ELISA (3)	106
5.6.1-Scattering of positive and negative samples by Dot-ELISA(3)	106
5.6.2- Results of HCV E1/E2 antigens in samples by Dot ELISA(3) based on molecular mimicry	108
Discussion	110
Summary	119
References	122
Arabic Summary	\

List of Figures

Title of figure	Page No.
Figure 1 : The hybrid cell line (7G9) producing mouse monoclonal antibodies targeting HCV E1/E2 antigens	75
Figure 2 :Illustration of the standard protein (BSA) curve	78
Figure 3 :Illustration of the four monoclonal antibodies with the three different peptides P1 , P2 and P3 and showing the positive result of (7G9)	81
Figure 4 : Coomassie Brilliant Blue stained SDS-PAGE	83
Figure 5: Determination of bands size resolved on SDS-PAGE	85
Figure 6: Western blot showing pattern of healthy individuals, standard marker and HCV infected sera	86
Figure 7: Reactivity of the monoclonal antibody (7G9) towards <i>Brucella abortus</i> , <i>Salmonella typhi</i> and HBV antigens	90
Figure 8: The sensitivity of monoclonal antibody (7G9) on serial dilution of HCV E1 coated antigen	92
Figure 9: Spread of the HCV infected samples and the non-infected samples by ELISA	93
Figure 10:Detection of HCV E1/E2 antigens by ELISA in samples	95
Figure 11 : Correlation of viral load identified in positive HCV RNA tested samples and OD of the HCV E1 /E2 antigens level measured by ELISA	96
Figure 12: Spread of the HCV infected samples and the non-infected samples by Dot-ELISA	107
Figure 13: Detection of HCV E1/E2 antigens by Dot-ELISA in samples	109

List of Tables

Title of table	Page No.
Table 1: ELISA detection of the four monoclonal antibodies in the culture supernatants	76
Table 2: Identification of the isotype of the four monoclonal antibodies present in the culture supernatants	77
Table 3 : Determination of the protein content for each of the monoclonal antibodies obtained from the culture supernatants	79
Table 4: The reactivity of the monoclonal antibodies on three different HCV peptides	80
Table 5: Determination of OD values of different monoclonal antibodies from different mouse hybrid cell lines	82
Table 6: List of parameters to calculate the molecular weight	84
Table 7: Titration of immune complex (IC) treated sera and untreated sera using two different dilutions of anti-mouse IgM antibody conjugate	87
Table 8: Titration of two different dilutions of each of four different IC positive sera and two different dilutions of the anti-mouse IgM antibody conjugate	88
Table 9 : Testing the specificity of the four monoclonal antibodies with HBV antigen	89
Table 10: Testing of specificity of monoclonal antibody (7G9) on <i>Brucella abortus</i> and <i>Salmonella typhi</i> antigens	89
Table 11: Testing of sensitivity of monoclonal antibody (7G9) on serial dilution of HCV E1 coated antigen	91