UNIVERSITI TEKNOLOGI MARA

IDENTIFICATION OF POTENTIAL SERUM BIOMARKERS FOR MOLAR PREGNANCY AND GESTATIONAL CHORIOCARCINOMA USING 2D-GEL ELECTROPHORESIS/MALDI-TOF

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MSc

January 2019

AUTHOR'S DECLARATION

I declare that the work in this thesis was carried out in accordance with the regulations of Universiti Teknologi MARA. It is original and is the result of my own work, unless otherwise indicated or acknowledged as referenced work. This thesis has not been submitted to any other academic institution or non-academic institution for any degree or qualification.

I, hereby, acknowledge that I have been supplied with the Academic Rules and Regulations for Post Graduates, Universiti Teknologi MARA, regulating the conduct of my study and research.

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Thesis Title	:	Identification of Potential Serum Biomarkers for Molar Pregnancy and Gestational Choriocarcinoma using 2D-Gel Electrophoresis/ MALDI-TOF
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Date	:	January 2019

ABSTRACT

Gestational trophoblastic disease (GTD) is a variety of cellular proliferation arising from the placental villous trophoblast. It comprises a group of disorders of benign conditions such as hydatidiform moles, molar pregnancy and the malignant forms such as invasive mole, choriocarcinoma (CC), placental site trophoblastic tumour (PSTT) and epithelioid trophoblastic tumour (ETT). Currently, GTD can only be diagnosed with a high hCG level, ultrasound, an imaging test, pelvic and histopathological examination. Limited studies have been done to determine the specific biomarkers in different types of trophoblastic diseases. This study aims to investigate the potential serum biomarkers for GTD especially molar pregnancy and choriocarcinoma. Briefly, serum samples collected from 24 normal pregnant women, 12 molar pregnancy patients, and 4 choriocarcinoma patients were subjected to measurement of hCG levels using ELISA, followed by 2D-Gel Electrophoresis (2D-GE). The results obtained from 2D-GE were then compared against normal pregnancy and analysed using Progenesis Same spot software (Nonlinear dynamics). Differentially expressed protein spots were then excised and identified using MALDI-TOF Mass Spectrometry. The findings showed that 9 significantly different proteins have been identified from the comparisons made against normal pregnancy. Alpha-1-acid glycoprotein, Ig gamma-1 chain C region, Clusterin were upregulated while Serotransferrin and Ig gamma-3 chain C region were downregulated in molar pregnancy. Apolipoprotein A-1, Ig kappa chain C region, Haptoglobin were upregulated while human serum albumin was downregulated in gestational choriocarcinoma. In conclusion, identification on the presence of these specific serum markers other than hCG in GTD will enable the physicians for early diagnosis, therapy and consequently allow complete remission of the disease. Extensive studies should be done to further investigate the roles of these proteins in the pathogenesis of GTD.

ACKNOWLEDGEMENT

First and foremost, I would like to say Alhamdulillah and utmost gratitude to Allah S.W.T for giving me the chance to embark on my MSc and for completing this long and hard journey successfully.

I am truly thankful to my main supervisor Dr Thanikasalam Kathiresan Pillai for always being helpful with the best guidance, valuables sights and being supportive throughout the project and writing phase. I would also like to thank and express sincere appreciation towards my co-supervisor, Dr Wang Seok Mui for believing me that I am capable in doing this project, patience and ideas in assisting me with this project and thesis. They are truly invaluable. The acknowledgement must also go towards the funding of this project, Ministry of Higher Education for Fundamental Research Grant Scheme (FRGS) funding.

I would also like to take this opportunity to thank both of my dear parents, Mr Mohamed Affandi bin Mohamed Yusoff and Mrs Khairun Adida bt Ishak, and not to forget my siblings for the endless supports along this tough journey.

My gratitude and thanks go to medical specialist Dr Vigneswaran and Dr Chopra for a very valuable help during sample collection. Big thanks also go to Institute of Medical Molecular and Biotechnology (IMMB), Faculty of Medicine, UiTM Sg. Buloh Campus for giving me the permission to use all the facilities in the building. Special thanks to Mr Mohd Yusri b. Idorus for the knowledge and assistance especially in the protein laboratory, and all IMMB staff for being helpful whenever needed.

Last but not least, I would like to especially thank my amazing lab mates, Siti Yatimah, Faizatul Isyraqiah, Putri Syafinaz, Nurul Hamirah, Julia Ashazila and a lot more for being very supportive and helpful from the beginning until the end of my study.

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