

UNIVERSITI TEKNOLOGI MARA

**THE STUDY OF RELATIONSHIP BETWEEN
CANCER MARKERS AND AGE OF PATIENT IN
PRIMARY AND METASTATIC PARAFFINIZED
BREAST CANCER TISSUE**

NUR AZIMAH OSMAN

Thesis submitted in the fulfillment of the requirements
for the degree of
Master of Science

Faculty of Applied Sciences

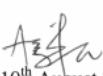
August 2009

Candidate'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 topic has not been submitted to any other academic institution or non-academic institution for any other degree or qualification.

In the event that my thesis be found to violate the conditions mentioned above, I voluntarily waive the right of conferment of my degree and agree be subjected to the disciplinary rules and regulations of Universiti Teknologi MARA.

Name of Candidate	Nur Azimah bt Osman
Candidate's ID No.	2005106899
Programme	Master of Science
Faculty	Applied Sciences
Thesis Title	The Study of Relationship between Cancer Markers and Age of Patient in Primary and Metastatic Paraffinized Breast Cancer Tissue

Signature of Candidate	
Date	10 th August 2008

ABSTRACT

Breast cancer is a major problem among females all over the world. It is the most common cancer among Malaysian women with a prevalence of 39.5 per 100 000 population and consisting of 31% of all female cancers in 2003. There were many factors contributed to this disease including social demography, environmental and genetic. Tumor marker is a substance produced by tumor cells in order to distinguish tumor and normal cells. A total of 26 section paraffinized breast cancer tissues were used to study the relationship between cancer markers and social demography. All the paraffinized breast cancer tissues were reclassified according to the histologic grade (Nottingham Grading System) into grade I (9 samples), grade II (9 samples), grade III (6 samples) and there were 2 samples with unknown grade. Statistical analysis using chi square analysis shows that there was significant difference between Nottingham grading system with hematoxylin and eosin staining (< 0.05). H&E staining is not suitable to be applied as a method for breast cancer grading. Four breast cancer markers namely estrogen receptor (ER), progesterone receptor (PR), c-erbB-2 and hMAM were related with the age of breast cancer patients. The mean age of the patients was 53.3 (SD=10, median 52). Genomic DNA extractions from the samples were achieved by using DNeasy Blood and Tissue Kit (Qiagen, Germany). The detection of hMAM DNA amplification was investigated by using Polymerase Chain Reaction (PCR). Breast cancer cell line (MCF-7), serum and plasma were used as positive controls whilst serum and plasma from normal patients were used as negative controls for the amplification of hMAM DNA. The relationship between cancer markers and age of patient in primary and metastatic paraffinized breast cancer tissue were studied by categorical and relationship modeling (C&R). The variation of relationship between them could provide a better prognostic for the management of breast cancer patients.

TABLE OF CONTENTS

	Page
TITLE PAGE	
CANDIDATE'S DECLARATION	
ABSTRACT	ii
ACKNOWLEDGEMENTS	iii
TABLE OF CONTENTS	iv
LIST OF FIGURES	vii
LIST OF TABLES	ix
ABBREVIATIONS	x
CHAPTER 1: INTRODUCTION	
1.1 Background of the study	1
CHAPTER 2: LITERATURE REVIEW	
2.1 Cancer: an overview	4
2.2 Breast cancer	6
2.2.1 Prevalence	10
2.2.2 Risk factors	11
2.3 The genetics and inheritance of breast cancer	13
2.3.1 Breast cancer susceptibility genes	15
2.4 Tumor markers used in monitoring cancer	17
2.5 Molecular detection of cancers	20
2.5.1 Polymerase chain reaction	21
CHAPTER 3: MATERIALS AND METHODS	
3.1 Chemicals	25
3.1.1 Hematoxylin and eosin staining	25
3.1.2 DNA extraction and polymerase chain reaction	25
3.2 Buffers and Solutions	26
3.2.1 Acid alcohol 0.3%	26

CHAPTER 1

INTRODUCTION

This chapter provides the background and rationale for the study. This study was carried out to assess the relationship between cancer markers and social demography in primary and metastatic paraffinized breast cancer tissue. This chapter also gives details of the significance in this study, the issues and problems that led to this research.

1.1 Background of the study

Nowadays, cancer is one of the major health problems in the world. It becomes the fourth leading cause of death among Malaysian (Lim, 2001). Cancer is a class of diseases when some cells in our body divide out of control and invade other tissues (Hartwell et al., 2004). They invade other tissues either by direct growth into adjacent tissue through invasion or by implantation into distant sites by metastasis (Bourgaize et al., 1999). There are many types of cancer such as lung, liver, colon, ovary and breast cancer. Breast cancer becomes the principal cause of death from cancer among women globally. The second report of the National Cancer Registry, Malaysia reported the incidence of 39.5 per 100 000 population and consisting of 31% of all female cancers (Lim & Halimah, 2002). Yip & Kasule (2005) reported that about 1 in 9 Malaysian women have a chance of developing breast cancer. The disease is associated with many factors that put a woman at high risk for developing breast cancer. The factors included were social demography, environmental and genetic. This study was focused on the relationship between cancer markers; that are ER (estrogen receptor), PR (progesterone receptor), epidermal growth factor receptor