

BIOCHEMICAL PARAMETERS, HEXOKINASE II EXPRESSION AND METHYLATION
OF BREAST CANCER PATIENTS IN LAGOS, NIGERIA

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ACCEPTANCE

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It is hereby declared that this research work titled “**Biochemical Parameters, Hexokinase II Expression and Methylation of Breast Cancer Patients in Nigeria**” was undertaken by Udegbe, Sandra Amarachi. It is based on my original study in the Department of Biological Sciences, College of Science and Technology, Covenant University, Ota, under the supervision of Prof. E.E.J. Iweala and the ideas and the views of other researchers have been dully expressed and acknowledged.

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DEDICATION

This research work is dedicated to God Almighty for the completion of this work. I thank you Lord.

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TABLE OF CONTENT

ACCEPTANCE	ii
DECLARATION	iii
CERTIFICATION	iv
DEDICATION	v
ACKNOWLEDGEMENTS	vi
TABLE OF CONTENT	vii
LIST OF TABLES	xi
LIST OF FIGURES	xii
GLOSSARY	xiii
ABSTRACT	xiv
CHAPTER ONE	1
INTRODUCTION	1
1.1 Overview	1
1.2. Statement of problem	2
1.3 Justification	2
1.4 Aim and objectives.....	2
CHAPTER TWO	3
LITERATURE REVIEW	3
2.1 Cancer.....	3
2.1.1 The clonal origin of cancer.....	4
2.2 Classification of cancer	6
2.2.1 Classes of cancer based on origin.....	6
2.2.2 Classes of breast cancer based on site of origin	6
2.2.3 Classes of cancer based on behaviors.....	7
2.3 Causes of cancer.....	7
2.4 Cancer risk factors.....	9
2.5 Breast cancer	9
2.5.1 Stages of breast cancer	10
2.5.2 Distinct explanation of tnm staging of cancer	16

2.5.3 Grading of mammary carcinoma.....	22
2.5.4 Causes of breast carcinoma	22
2.5.5 Types of breast cancer	23
2.5.6 Risk factors for breast carcinoma	24
2.5.7 Prevention.....	25
2.5.8 Symptoms of breast cancer.....	26
2.5.9 Screening for breast cancer.....	27
2.5.10 Treatment for breast cancer	28
2.5.11 Myths and facts of breast cancer	32
2.6 BIOCHEMICAL PARAMETERS.....	32
2.6.1 CHOLESTEROL	32
2.6.2 High density lipoprotein	35
2.6.3 Low density lipoprotein.....	37
2.7 TRIGLYCERIDE.....	38
2.8 LIVER ENZYMES	40
2.8.1 Alanine amino transferase (ALT).....	40
2.8.3 Aspartate aminotransferase (AST)	41
2.8.4 Alkaline phosphatase (ALP).....	41
2.9 GENE EXPRESSION	42
2.9.1 Process of gene expression	43
2.9.2 Gene expression and cancer	44
2.9.3 Reverse transcription polymerase chain reaction	48
2.9.4 One step rt-qpcr and two step rt-qpcr	48
2.9.5 Applications of rt-qpcr.....	49
2.10 GENE METHYLATION	50
2.10.1 DNA Methylation and Breast cancer.....	57
2.11 HEXOKINASE II AND CANCER.....	60
2.11.1 Metabolism function of Hexokinase II.....	61
2.11.2 Isoform of Hexokinase	62
2.11.3 Hexokinase II, glycolysis and cancer	63
CHAPTER THREE	65

MATERIALS AND METHODS.....	65
3.1 MATERIALS	65
3.1.1 Kits.....	65
3.1.2 Patients.....	65
3.2 METHODS.....	65
3.2.1 Experimental design	65
3.2.2 Collection of blood samples	65
3.2.3 Preparation of Reagents.....	66
3.2.4 Determination of biochemical parameters.....	66
3.2.5 Determination of Hexokinase II Expression	71
3.2.6 Determination of Hexokinase II Methylation.....	72
3.2.7 Statistical analysis.....	74
CHAPTER FOUR.....	75
RESULTS AND DISCUSSION.....	75
4.1 CHOLESTEROL	75
4.1.1 LDL	75
4.1.2 HDL	77
4.2 TRIGLYCERIDE.....	79
4.3 LIVER ENZYMES	81
4.3.1 Alanine aminotransferase (ALT).....	81
4.3.2 Aspartate aminotransferase (AST)	83
4.3.3 Alkaline phosphatase (ALP).....	85
4.4 Expression of Hexokinase II gene.....	88
4.5 Methylation of Hexokinase II gene.....	89
4.2 DISCUSSION	91
CHAPTER FIVE	94
CONCLUSION AND RECOMMENDATION.....	94
References.....	95
APPENDIX 1	110
Informed consent form.....	111
APPENDIX 2.....	112

Chemical and reagents	112
Laboratory equipment	113
Patients	113
Collection of blood samples	113
Experimental design	114
Extraction of RNA	114
Extraction of DNA	115
Quantification of DNA	115
Reverse transcriptase PCR (one-step RT-PCR supermix)	116
Preparation of a 1% agarose gel	117
Gel electrophoresis	118
Quantification of gel images	118
Data/image processing	118
Cholesterol	119
Triglycerides	121
Assay of liver enzymes	125
Hexokinase II methylation	126

LIST OF TABLES

Table 1.1: Breast cancer staging	17
Table 1.2: Classes of plasma lipoproteins and their characteristics.....	35
Table 1.3: Genes in methylation in breast carcinogenesis (Widschwendter and Jones, 2002).....	59
Table 4.1: Levels of LDL in breast cancer patients and controls (mg/dl).	75
Table 4.2: Levels of HDL in breast cancer patients and controls (mg/dl).....	77
Table 4.3: Levels of triglyceride in breast cancer patients and control (mg/dl)	79
Table 4.4: Levels of ALT in breast cancer patients and control (U/I).....	81
Table 4.5: Levels of AST in breast cancer patents and control (U/I).	83
Table 4.6: Levels of ALP in breast cancer patients and control (U/I).	85
Table 4.7: Summary results of biochemical parameters of breast cancer patients and controls ..	87

LIST OF FIGURES

Figure 1.1 a: Clonal expansion (Lan, 2011)	5
Figure 1.1b: Clonal expansion (Lan, 2011)	5
Figure 2.1: Sizes of tumor (Carlson <i>et al.</i> , 2009).....	11
Figure 2.2: Stages of breast cancer (Carlson <i>et al.</i> , 2009).....	13
Figure.2.3: Normal mammary gland (Carlson <i>et al.</i> , 2009).....	13
Figure 2.4: Self examination (Carlson <i>et al.</i> , 2009).....	14
Figure 2.5: Cancerous breast cell (Carlson <i>et al.</i> , 2009).....	15
Figure 2.6: Mammary carcinoma stage 1 ^A and 1 ^B (Siteman Cancer Center, 2016)	18
Figure 2.8: Mammary carcinoma stage III ^A (Siteman Cancer Center, 2016).....	20
Figure 2.8: Mammary carcinoma stage III ^B (Siteman Cancer Center, 2016).....	20
Figure 2.9: Mammary carcinoma stage IV (Siteman Cancer Center, 2016)	21
Figure 2.10: Prevention of breast cancer (WHO, 2014)	25
Figure 2.11: Symptoms of breast cancer (Carlson <i>et al.</i> , 2009)	27
Figure 2.12: Hormonal therapy (Carlson <i>et al.</i> , 2009).....	30
Figure 2.13: Chemical structure of cholesterol (Berg <i>et al.</i> , 2002).	33
Figure 2.14: Classification of lipids (New health advisor, 2015).	40
Figure 2.15: One step and two step RT-qPCR (Wang and Brown, 1999).....	49
Figure 2.16: Hypothetical model that explain how CpG island promoter hypermethylation.....	51
Figure 2.17: Methylation of a cytosine base in DNA (Lars <i>et al.</i> , 2007)	54
Figure 2.18: DNA methylation and cancer (Widschwendter ang Jones, 2002).....	57
Figure 2.19: Metabolic roles of Hexokinase	62
Figure 2.20: Isoform of Hexokinase (Sebastian and Kenkare, 1998).....	62
Figure 2.21: Delivery of glucose and ATP to hexokinase (HK) II.....	64
Figure 4.1: The expression level of Hexokinase II gene in breast cancer patients and control subjects.....	88
Figure 4.2a: The methylation of Hexokinase II gene in breast cancer patients	89
Figure 4.2b: The methylation of Hexokinase II gene in breast cancer patients.....	89
Figure 4.2c: The methylation of Hexokinase II gene in breast cancer patients	90
Figure 4.3: The methylation of Hexokinase II gene in control subjects.....	90

GLOSSARY

Fru-2,6-BP	fructose-2,6-bisphosphatase
G-6P	glucose-6-phosphate
GLUT	glucose transporter
GPI	glucose-6-phosphate isomerase
GSK-3 β	glycogen synthase kinase-3 β
H ₂ O ₂	hydrogen peroxide
HK	Hexokinase
miRNA	microRNA
mRNA	messenger RNA
DCIS	Ductal carcinoma <i>in situ</i>
LCIS	Lobular carcinoma <i>in situ</i>

ABSTRACT

Breast cancer is the most common cancer among women and the second most common cancer in the world. It is a leading public health problem, with over one million new cases and 459,000 related deaths annually. Studies have revealed the importance of differential biochemical parameters and glucose metabolism in the development of critical biomarkers for accurate diagnosis and treatment of breast cancer. Forestalling the heavy burden of breast cancer is predicated upon the delineation of its related biomarkers hence the aim of this study which was to assess the biochemical parameters and expression and methylation of Hexokinase II gene of breast cancer patients in Nigeria. In this line of investigation, using standard methods, the expression and methylation of hexokinase II and some biochemical parameters including Alanine transaminase (ALT), Aspartate transaminase (AST), Alkaline phosphatase (ALP), Low density lipoprotein (LDL), High density lipoprotein (HDL) and triglycerides (TRIG) were examined in the plasma of 50 breast cancer patients attending the cancer clinic of Lagos State University Teaching Hospital (LASUTH) and 10 healthy control subjects. Students T-test was used to compare the test and control samples with ($P < 0.05$) considered as significant. The data obtained indicates that there were no significant ($P < 0.05$) differences in the AST, ALP, LDL and TRIG while there was a significant difference in the values of ALT (0.166 ± 0.019 U/L) and HDL (48.042 ± 5.737 mg/dL). There was also a significantly higher expression of Hexokinase II in the breast cancer patients. The hexokinase gene of the breast cancer patients were seen to be unmethylated as opposed to the control which were methylated. The data obtained from this study indicates the possible implication of ALT and HDL in breast cancer disease in Nigeria and their potential to be further developed into biomarkers for diagnosis of the disease. Also, the significant expression and unmethylation of Hexokinase II shows its possible association with breast cancer progression in Nigerian patients. The findings from this study provide a deeper understanding of breast cancer and a wider scope for improvement in the diagnosis and management of the disease.