

## TABLE OF CONTENTS

	Page
<b>ACKNOWLEDGEMENTS</b>	<b>iii</b>
<b>ABSTRACT IN ENGLISH</b>	<b>v</b>
<b>ABSTRACT IN THAI</b>	<b>viii</b>
<b>LIST OF TABLES</b>	<b>xix</b>
<b>LIST OF FIGURES</b>	<b>xxi</b>
<b>ABBREVIATIONS AND SYMBOLS</b>	<b>xxvii</b>
<b>CHAPTER 1 INTRODUCTION</b>	<b>1</b>
1.1 Statement and significance of problem	1
1.2 Literature review	8
1.2.1 Carcinogenesis or tumorigenesis	8
1.2.2 Nicotine-derived nitrosamine ketone (NNK)	9
1.2.2.1 The NNK-induced lung tumorigenesis	10
1.2.2.2 NNK-induced DNA methyltransferase 1 (DNMT1) nuclear accumulation	11
1.2.2.3 Studies of NNK in animal models	12
1.2.3 The MAPK/ERK pathway and cancer cell growth	13
1.2.4 The cell cycle	14
1.2.4.1 The cell cycle checkpoints	15
1.2.4.2 The cell cycle regulators	16

1.2.4.3	The cyclin-dependent kinase inhibitors (CKIs)	20
1.2.4.4	The cell cycle and cancer	21
1.2.5	Cell death	25
1.2.5.1	Necrosis or necrotic cell death	25
1.2.5.2	Apoptosis	25
	Morphology of apoptosis	26
	Biochemical features of apoptosis	27
	Mechanisms of apoptosis	27
	Extrinsic pathway	28
	Intrinsic pathway	29
	Execution pathway	32
	Apoptosis and cancer development	34
1.2.6	Inflammation	35
1.2.6.1	Inflammation and colorectal cancer	35
1.2.6.2	Animal models to study the inflammation-related colorectal cancer	37
1.2.6.3	Wnt signaling and colorectal cancer	38
1.2.7	Cancer chemoprevention	39
1.2.8	Fermented brown rice and rice bran (FBRA)	41
1.2.9	Gamma-tocotrienol ( $\gamma$ -T <sub>3</sub> )	41
1.2.10	Inositol hexaphosphate (IP <sub>6</sub> ) or phytate	43
1.3	Objectives	44
1.4	Scopes of study	44

<b>CHAPTER 2 MATERIALS AND METHODS</b>	<b>49</b>
2.1 Chemicals and materials	49
2.2 Preparation of fermented brown rice and rice bran (FBRA)	49
2.3 Animals	51
2.4 Cell lines	51
2.5 Experimental designs for in vivo study	51
2.5.1 Chemopreventive effects of FBRA against NNK-induced lung tumorigenesis in female A/J mice	51
2.5.2 Chemopreventive effects of FBRA against colorectal tumorigenesis in <i>Apc</i> <sup>Min/+</sup> and <i>Apc</i> <sup>+/+</sup> mice	53
2.5.3 Chemopreventive effects of FBRA against DSS-induced colorectal tumorigenesis in <i>Apc</i> <sup>Min/+</sup> and <i>Apc</i> <sup>+/+</sup> mice	54
2.5.4 Chemopreventive effects of FBRA on DSS-induced colitis in <i>Apc</i> <sup>+/+</sup> mice	55
2.6 Total RNA preparation	56
2.6.1 RNA isolation from the lung and liver tissues of A/J mice	56
2.6.2 RNA isolation from the colonic tissues of <i>Apc</i> <sup>+/+</sup> mice	57
2.6.3 RNA isolation from NNK-treated A549 cells	57
2.7 Quantitative real-time reverse transcription polymerase chain reaction (qReal-time RT-PCR)	58
2.7.1 qReal-time RT-PCR analysis of animal tissues	59
2.7.2 qReal-time RT-PCR analysis of NNK-treated A549 cells	60
2.8 Tissue sections staining	61
2.8.1 Hematoxylin and eosin (H&E) staining	61

2.8.2	Immunohistochemical staining or Immunohistochemistry	62
2.9	High-performance liquid chromatography	63
	HPLC analysis for $\gamma$ -tocotrienol content in Thai rice	63
2.10	Measurement of cell viability by MTT assay	64
2.10.1	Effect of NNK on the cell viability of lung cancer cell line A549	64
2.10.2	Effect of $\gamma$ -tocotrienol and phytic acid on the NNK-increased cell viability of A549 cells	65
2.10.3	Effect of $\gamma$ -tocotrienol and phytic acid on the cell viability of A549 cells	65
2.10.4	Effect of $\gamma$ -tocotrienol and phytic acid on the cell viability of colon cancer cell line SW480	66
2.11	Measurement of cell proliferation by BrdU cell proliferation assay	66
2.11.1	Effect of NNK on the cell proliferation of lung cancer cell line A549	67
2.11.2	Effect of $\gamma$ -tocotrienol and phytic acid on the NNK-increased cell proliferation of A549 cells	68
2.11.3	Effect of $\gamma$ -tocotrienol on the cell proliferation of A549 cells	68
2.12	Cell cycle distribution analysis by flow cytometry	68
2.12.1	Effect of $\gamma$ -tocotrienol on cell cycle distribution in NNK-treated A549 cells	69
2.12.2	Effect of $\gamma$ -tocotrienol on cell cycle distribution of A549 cells	69
2.13	Detection of apoptosis by flow cytometry	70
	Effect of $\gamma$ -tocotrienol on the induction of apoptosis in A549 cells, characterized by the externalization of phosphatidylserine (PS)	71

2.14	Scanning electron microscopy	71
	Effect of $\gamma$ -tocotrienol on the induction of apoptosis in A549 cells, characterized by the cell morphology changes	72
2.15	Western blotting	72
2.15.1	Effect of NNK on the expression of cell cycle regulatory proteins and MAPK signal-transducing proteins in A549 cells	74
2.15.2	Effect of $\gamma$ -tocotrienol on the NNK-induced overexpression of cell cycleregulatory proteins and MAPK signal-transducing proteins in A549 cells	75
2.15.3	Effect of NNK on the nuclear accumulation of DNMT1 protein in A549 cells	75
2.15.4	Effect of $\gamma$ -tocotrienol and phytic acid on the NNK-induced nuclear accumulation of DNMT1 protein in A549 cells	76
2.15.5	Effect of NNK on the expression of cytochrome P450 isotypes 2A6 (CYP2A6) and 2A13 (CYP2A13) proteins in A549 cells	76
2.15.6	Effect of $\gamma$ -tocotrienol and phytic acid on the NNK-induced overexpression of CYP2A6 and CYP2A13 proteins in A549 cells	77
2.15.7	Effect of $\gamma$ -tocotrienol on the expression of cyclinD1 protein in A549 cells	77
2.15.8	Effect of $\gamma$ -tocotrienol on the expression of apoptosis-related proteins in A549 cells	78
2.15.9	Effect of LPS on the nuclear accumulation of NF- $\kappa$ B protein in human colon cancer cell line SW480	79
2.15.10	Effect of phytic acid on the NNK-induced nuclear accumulation of NF- $\kappa$ B protein in SW480 cells	80

2.15.11	Effect of LPS on the expression of iNOS and cyclinD1 proteins in SW480 cells	80
2.15.12	Effect of phytic acid on the LPS-induced overexpression of iNOS and cyclinD1 proteins in SW480 cells	81
2.16	DNA damage analysis by Comet assay	81
	Effect of $\gamma$ -tocotrienol and phytic acid on the NNK-induced DNA damage in A549 cells	82
2.17	Cell migration analysis by Boyden chamber assay	82
2.17.1	Effect of LPS on the secretion of chemoattractants from colorectal cancer cell line SW480	83
2.17.2	Effect of $\gamma$ -tocotrienol and phytic acid on the LPS-induced secretion of chemoattractants in SW480 cells	83
2.18	Statistical analysis	83
<b>CHAPTER 3 RESULTS</b>		85
3.1	Toxicity analysis of fermented brown rice and rice bran (FBRA) in A/J mice	85
3.2	Chemopreventive effect of FBRA against NNK-induced lung tumorigenesis	85
3.3	The anti-proliferative effect of FBRA in lung lesions of NNK-injected mice	86
3.4	Effect of FBRA on the Cyp2a5 mRNA expression in the liver and lung tissues	86
3.5	Analysis for $\gamma$ -tocotrienol concentration level in Thai rice	93
3.6	Prevention of the NNK-increased cell viability of lung cancer cell line A549 by $\gamma$ -tocotrienol ( $\gamma$ -T <sub>3</sub> ) but not phytic acid (IP <sub>6</sub> )	96
3.7	Prevention of the NNK-increased cell proliferation of human lung cell line A549 by $\gamma$ -tocotrienol but not phytic acid	100

3.8	The cell cycle arrest activity of $\gamma$ -tocotrienol in NNK-treated A549 cells	104
3.9	Effect of NNK on the expression of cell cycle regulatory proteins and MAPK signal-transducing proteins in A549 cells	106
3.10	Preventive effect of $\gamma$ -tocotrienol on the NNK-induced overexpression of cell cycle regulatory proteins and MAPK signal-transducing proteins in A549 cells	109
3.11	Effect of $\gamma$ -tocotrienol and phytic acid on the NNK-induced DNA damage in A549 cells	112
3.12	Effect of $\gamma$ -tocotrienol and phytic acid on the NNK-induced DNA methyl transferase 1 (DNMT1) nuclear accumulation in A549 cells	112
3.13	Effect of $\gamma$ -tocotrienol and phytic acid on the NNK-induced cytochrome P450 isotype 2A6 (CYP2A6) and isotype 2A13 (CYP2A13) overexpression in A549 cells	115
3.14	Effect of NNK on the mRNA expression from <i>CYP2A6</i> and <i>CYP2A13</i> genes in A549 cells	117
3.15	Decreasing cell viability of A549 cells by $\gamma$ -tocotrienol but not phytic acid	118
3.16	Decreasing cell proliferation of A549 cells by $\gamma$ -tocotrienol	121
3.17	Induction of G <sub>0</sub> /G <sub>1</sub> cell cycle arrest in A549 cells by $\gamma$ -tocotrienol	122
3.18	Induction of apoptosis in A549 cells by $\gamma$ -tocotrienol	124
3.19	Induction of apoptosis via both intrinsic and extrinsic pathways in A549 cells by $\gamma$ -tocotrienol	127
3.20	Toxicity analysis of fermented brown rice and rice bran (FBRA) in <i>Apc</i> <sup>Min/+</sup> and <i>Apc</i> <sup>+/+</sup> mice	129
3.21	Chemopreventive effect of FBRA against the colorectal tumorigenesis in <i>Apc</i> <sup>Min/+</sup> mice	129

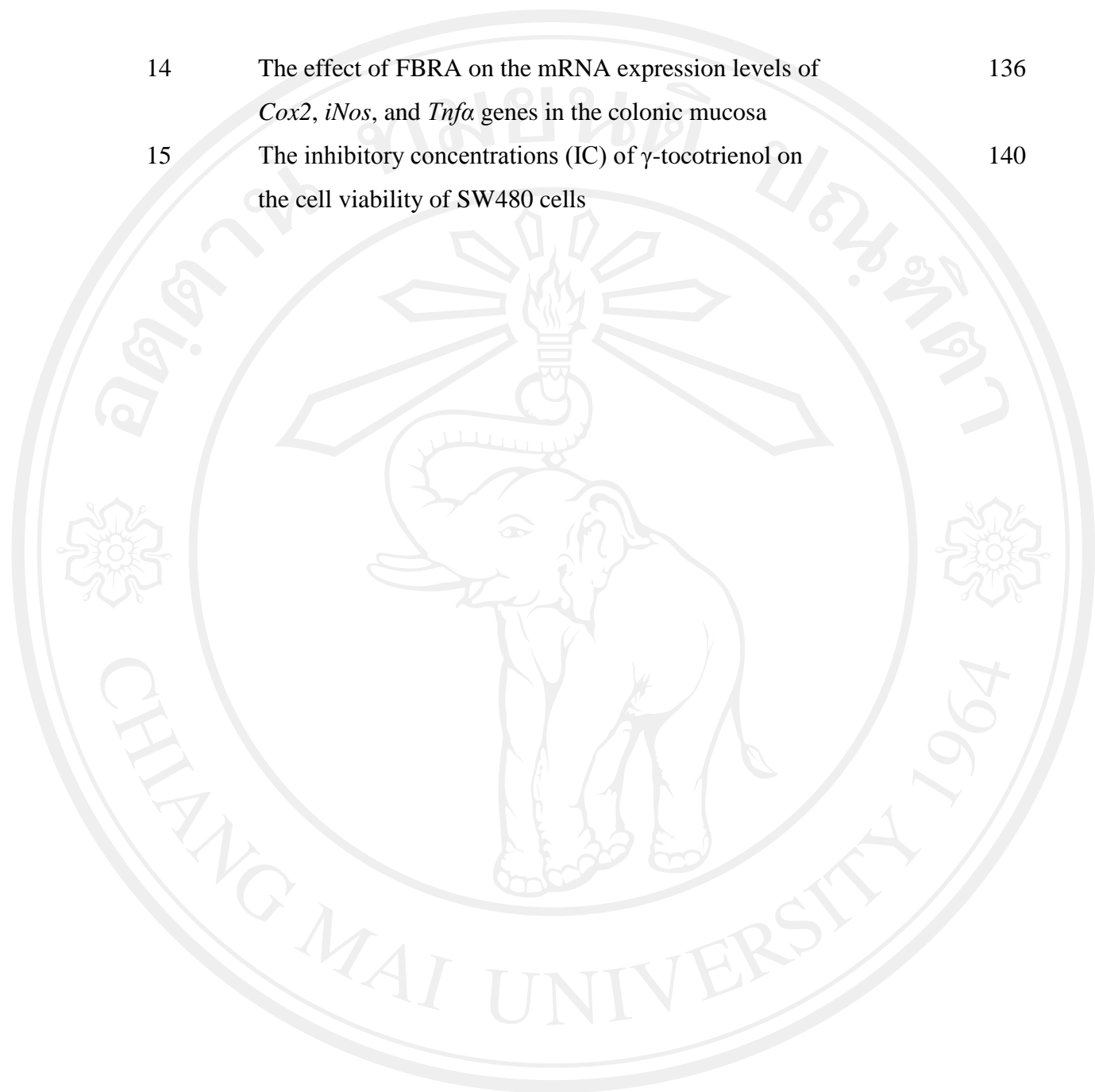
3.22	Toxicity analysis of FBRA in dextran sodium sulfate (DSS)-treated <i>Apc</i> <sup>Min/+</sup> and <i>Apc</i> <sup>+/+</sup> mice	132
3.23	Chemopreventive effect of FBRA against the inflammation-related colorectal tumorigenesis in <i>Apc</i> <sup>Min/+</sup> and <i>Apc</i> <sup>+/+</sup> mice	132
3.24	Effect of FBRA on the mRNA expression of the inflammation-related genes	135
3.25	The anti-proliferative effect of FBRA in colonic crypts of DSS-treated mice	135
3.26	Effect of $\gamma$ -tocotrienol and phytic acid on the cell viability of SW480 cells	139
3.27	Effect of $\gamma$ -tocotrienol and phytic acid on the LPS-induced chemoattractants secretion in colorectal cancer cell line SW480	141
3.28	Effect of phytic acid on the LPS-induced NF- $\kappa$ B nuclear accumulation in SW480 cells	144
3.29	Effect of phytic acid on the LPS-induced overexpression of iNOS protein in SW480 cells	144
3.30	Effect of phytic acid on the LPS-induced cyclinD1 overexpression in SW480 cells	147
	<b>CHAPTER 4 DISCUSSION AND CONCLUSION</b>	149
	<b>REFERENCES</b>	158
	<b>APPENDICES</b>	190
	<b>VITA</b>	204



## LIST OF TABLES

Table		Page
1	Final composition of FBRA	50
2	Oligonucleotide primers for qReal-time RT-PCR analysis in mouse tissues	60
3	Oligonucleotide primers for qReal-time RT-PCR analysis in NNK-treated A549 cells	61
4	The weights of body, liver, kidney and lung of FBRA-treated A/J mice	87
5	Incidences, multiplicities, and size of NNK-induced lung lesions in female A/J mice treated with FBRA	88
6	The content of $\gamma$ -tocotrienol in Thai rice	95
7	The inhibitory concentrations (IC) of $\gamma$ -tocotrienol on the cell viability of NNK-treated A549 cells	100
8	The inhibitory concentrations (IC) of $\gamma$ -tocotrienol on the cell proliferation of NNK-treated A549	104
9	The inhibitory concentrations (IC) of $\gamma$ -tocotrienol in A549 cells	120
10	The weights of body, liver, and kidney of FBRA-treated <i>Apc</i> <sup>Min/+</sup> and <i>Apc</i> <sup>+/+</sup> mice	130
11	Incidences, multiplicities, and size of colonic tumors in colon in FBRA-treated <i>Apc</i> <sup>Min/+</sup> and <i>Apc</i> <sup>+/+</sup> mice	131
12	The weights of body, liver, and kidney of FBRA-administered and DSS-treated <i>Apc</i> <sup>Min/+</sup> and <i>Apc</i> <sup>+/+</sup> mice	133
13	Incidences, multiplicities, and size of colonic tumors in colon in FBRA-treated <i>Apc</i> <sup>Min/+</sup> and <i>Apc</i> <sup>+/+</sup> mice	134

14	The effect of FBRA on the mRNA expression levels of <i>Cox2</i> , <i>iNos</i> , and <i>Tnfa</i> genes in the colonic mucosa	136
15	The inhibitory concentrations (IC) of $\gamma$ -tocotrienol on the cell viability of SW480 cells	140



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## LIST OF FIGURES

<b>Figure</b>		<b>Page</b>
1	Scheme linking nicotine addiction and lung cancer via tobacco smoke carcinogens	2
2	Proposed model of how inflammation associated with colitis promotes the development of colonic dysplasia and cancer	5
3	Scheme diagram of multi-step cancer progression process	9
4	NNK-mediated activation of signaling pathways	11
5	Possible mechanisms of NNK-induced DNMT1 nuclear accumulation	12
6	Possible interactions between MAPK pathways and the cell cycle	14
7	Checkpoints and stages of cell cycle	15
8	The cell cycle regulators	17
9	The kinase activity of CDK4 in the RB pathway	18
10	Retinoblastoma (RB) is bound to both SWI/SNF and histone deacetylase (HDAC) in G1 phase	19
11	Apoptosis via the extrinsic and intrinsic pathways	29
12	Mitochondria mediated (intrinsic) pathway of apoptosis	31
13	A model of apoptotic DNA fragmentation	33
14	Colitis-associated colon cancer	36
15	The canonical Wnt signaling	39

16	Carcinogenesis and mechanisms of chemoprevention	40
17	Structures of various homologs of tocopherol and tocotrienol	42
18	Chemical structure of phytate	43
19	Scope of study in Phase 1	45
20	Scope of study in Phase 2	46
21	Scope of study in Phase 3	47
22	Scope of study in Phase 4	48
23	Experimental design for study the effects of FBRA against NNK-induced lung tumorigenesis in female A/J mice	52
24	Experimental design for study the effects of FBRA against colorectal tumorigenesis in <i>Apc</i> <sup>Min/+</sup> and <i>Apc</i> <sup>+/+</sup> mice	53
25	Experimental design for study the effects of FBRA against DSS-induced colorectal tumorigenesis in <i>Apc</i> <sup>Min/+</sup> and <i>Apc</i> <sup>+/+</sup> mice	54
26	Experimental design for study the effects of FBRA on DSS-induced colitis in <i>Apc</i> <sup>+/+</sup> mice	55
27	Detection of PCR products with SYBR® Green I	59
28	MTT is reduced to formazan by a mitochondrial reductase	64
29	Histopathology of lung adenoma in NNK-treated mice	89
30	Effect of 10% FBRA treatment (B and D) in comparison with control diet (A and C) on the number of Ki67 positive cell in lung lesion	90
31	Effect of 10% FBRA treatment on the cell proliferative index of lung lesions	91

32	Effect of 10% FBRA treatment on the mRNA expression from <i>Cyp2a5</i> gene in both lung and liver tissues	92
33	HPLC profile of standard tocotrienols and tocopherols monitored at 292 nm	94
34	Effect of NNK on the cell viability of human lung cancer cell line A549	97
35	Preventive effect of $\gamma$ -tocotrienol on the NNK-increased cell viability of A549 cells	98
36	Effect of phytic acid on the NNK-increased cell viability of A549 cells	99
37	Effect of NNK on the cell proliferation of A549 cells	101
38	Inhibitory effect of $\gamma$ -tocotrienol on the NNK-induced cell proliferation of A549 cells	102
39	Effect of phytic acid on the NNK-induced cell proliferation of A549 cells	103
40	Effect of $\gamma$ -tocotrienol on cell cycle distribution of NNK-treated A549 cells	105
41	The carcinogenic effect of NNK on the expression of cell cycle regulatory proteins in A549 cells, demonstration in both time-dependent (A) and dose-response (B and C) manner	107
42	The effect of NNK on the expression of p-MEK1/2 (A) and K-ras (B) proteins in A549 cells, demonstration in time-dependent manner	108
43	The preventive effect of $\gamma$ -tocotrienol on the NNK-induced overexpression of cell cycle regulatory proteins in A549 cells, demonstration in both time-dependent (A) and dose-response (B and C) manner	110

44	The preventive effect of $\gamma$ -tocotrienol on the NNK-induced over-expression of p-MEK1/2 (A) and K-ras (B) proteins in A549 cells, demonstration in dose-response manner	111
45	Effects of $\gamma$ -tocotrienol or phytic acid pre-treatment on the NNK-induced DNA damage in A549 cells	113
46	Effect of NNK treatment on the DNA methyl transferase 1 (DNMT1) nuclear accumulation in A549 cells	114
47	Preventive effect of $\gamma$ -tocotrienol pre-treatment on the NNK-induced DNMT1 nuclear accumulation in A549 cells	114
48	Effect of phytic acid pre-treatment on the NNK-induced DNMT1 nuclear accumulation in A549 cells	115
49	Effect of NNK on the expression of cytochrome P450 isotypes 2A6 (CYP2A6) and 2A13 (CYP2A13) proteins in A549 cells	116
50	Suppressive effect of $\gamma$ -tocotrienol pre-treatment on the NNK-induced overexpression of CYP2A6 and CYP2A13 proteins in A549 cells	116
51	Effect of phytic acid pre-treatment on the NNK-induced overexpression of CYP2A6 and CYP2A13 proteins in A549 cells	117
52	Effect of NNK on the mRNA expression from <i>CYP2A6</i> and <i>CYP2A13</i> genes in A549 cells	118
53	Suppressive effect of $\gamma$ -tocotrienol on the cell viability of A549 cells	119
54	Effect of phytic acid on the cell viability of A549 cells	120
55	Effect of $\gamma$ -tocotrienol on the cell proliferation of A549 cells	121

56	Effect of $\gamma$ -tocotrienol on the cell cycle distribution of A549 cells	123
57	Effect of $\gamma$ -tocotrienol on the expression of cyclin D1 protein	123
58	The morphological changes in $\gamma$ -tocotrienol-treated A549 cells	125
59	Effect of $\gamma$ -tocotrienol on the induction of apoptosis in A549 cells, characterized by the translocation of phosphatidylserine (PS)	126
60	Effect of $\gamma$ -tocotrienol on the induction of apoptosis in A549 cells	128
61	Effect of 10% FBRA treatment (B and D) in comparison with control diet (A and C) on the number of Ki67 positive cell in colonic crypts	137
62	Effect of 10%FBRA on the cell proliferative index in colonic crypts of DSS-treated <i>Apc</i> <sup>+/+</sup> mice	138
63	Effect of $\gamma$ -tocotrienol on the cell viability of SW480 cells	139
64	Effect of phytic acid on the cell viability of SW480 cells	140
65	Effect of lipopolysaccharide (LPS) on the leukemic cell migration due to chemoattractants secretion from human colorectal cancer cell line SW480 cells	142
66	Effect of $\gamma$ -tocotrienol and phytic acid on the LPS-induced chemo-attractants secretion in colorectal cancer cell line SW480	143
67	Effect of LPS on the NF- $\kappa$ B nuclear accumulation in SW480 cells	145
68	Suppressive effect of phytic acid on the LPS-induced NF- $\kappa$ B nuclear accumulation in SW480 cells	145
69	Effect of LPS on the expression of iNOS protein in SW480 cells	146

70	Effect of phytic acid on the overexpression of iNOS protein in LPS-treated SW480 cells	146
71	Effect of LPS on the expression of cyclin D1 protein in SW480 cells	147
72	Effect of phytic acid on the overexpression of cyclin D1 protein in LPS-treated SW480 cells	148



## ABBREVIATIONS AND SYMBOLS

A260/A280	Absorbance at 260nm per Absorbance at 280nm
Ab	Antibody
Ag	Antigen
AIDS	Acquired Immune Deficiency Syndrome
Apaf-1	Apoptotic protease activating factor 1
APC	Adenomatous polyposis coli
AT	Ataxia Telangiectasia
ATCC	American Type Culture Collection
ATM	Ataxia telangiectasia mutated
ATP	Adenosine triphosphate
Bad	Bcl-2-associated death promoter protein
BAG	Bcl-2-associated athanogene protein
Bak	Bcl-2 homologous antagonist/killer protein
Bax	Bcl-2-associated X protein
<i>BCL1</i> gene	B-cell leukemia/lymphoma 1 gene
Bcl-2	B-cell lymphoma 2 protein
Bid	BH3 interacting domain death agonist protein
BrdU	5-Bromo-2'-deoxyuridine
BSA	Bovine serum albumin

Ca <sup>2+</sup>	Calcium ion
CAD	Caspase-activated DNase
Caspase	Cysteine-aspartic proteases
CCD	Charged coupled device
CD	Crohn's disease
CDC2	Cell Division Cycle 2
CDK	Cyclin-dependent kinase
cDNA	Complementary DNA
c-FLIP	Cellular FLICE inhibitory protein
CIP/KIP	CDK interacting protein/Kinase inhibitory protein
CKIs	Cyclin-dependent kinase inhibitors
c-Myc	Myelocytomatosis cellular oncogene
CO <sub>2</sub>	Carbondioxide
COX-2	Cyclooxygenase-2
CRC	Colorectal cancer
CYP	Cytochrome P450
CYP2A13	Cytochrome P450 isotype 2A13
Cyp2a5	Cytochrome P450 isotype 2a5
CYP2A6	Cytochrome P450 isotype 2A6
Cyto c	Cytochrome c
DAB	3,3V-Diaminobenzidine
DD	Death domain
DEDs	Death effector domains
DEVD	Aspartic-Glutamic-Valine-Aspartic domain
DHFR	Dihydrofolate reductase
DI water	Deionized water
DISC	Death-inducing signaling complex
dkk	Dickkopf protein
DMEM	Dulbecco's modified Eagle's medium
DMSO	Dimethylsulfoxide
DNA	Deoxyribonucleic acid

DNMT1	DNA methyltransferase 1
DR-4 and DR-5	Death Receptor-4 and Death Receptor-5
DSBs	Double strand breaks in the DNA
DSS	Dextran sodium sulfate
DTT	Dithiothreitol
<i>E. coli</i>	<i>Escherichia coli</i>
e.g.	Exempli gratia
ECL	Enhanced chemiluminescence system
EDTA	Ethylenediaminetetraacetic acid
EGTA	Ethylene glycol tetraacetic acid
ELISA	Enzyme-linked immunosorbent assay
ER	Endoplasmic reticulum
ERK1/2	Extracellular signal-regulated kinases 1 and 2
ET1	Etched1
FACs	Fluorescence activated cell sorter
FADD	Fas-associated death domain
FAP	Familial adenomatous polyposis
Fas/CD95	Fas/cluster of differentiation 95
FasL	Fas ligand
FasR	Fas receptor
FBRA	Fermented brown rice and rice bran
FBS	Fetal bovine serum
FHIT	Fragile histidine triad
FITC	Fluorescein isothiocyanate
g	grams
G1 phase	Gap 1 phase
G12D	The mutation at codon 12 aspartate-for-glycine
G1-G8	Group 1 to Group 8
G2 phase	Gap 2 phase
GDP	Guanosine diphosphate
GSK3 $\beta$	Glycogen synthase kinase 3 beta

GTP	Guanosine triphosphate
h	hour
H <sub>2</sub> O	Water
H <sub>2</sub> O <sub>2</sub>	Hydrogen peroxide
HDACs	Histone deacetylases
HEPES	4-(2-Hydroxyethyl)-1-piperazineethanesulfonic acid
Her2/neu	Human Epidermal Growth Factor Receptor 2
HGD	High-grade dysplasia
HMG box	High Mobility Group box
hnRNP-U	Heterogeneous nuclear ribonucleoprotein U
HPLC	High-performance liquid chromatography
HPV	Human papillomavirus
i.p.	Intra-peritoneal
IAPs	Inhibitor of apoptosis family of proteins
IARC	International Agency for Research on Cancer
IBD	Inflammatory bowel diseases
IC	Inhibitory concentration
IC50	Inhibitory concentration at 50%
ICAD	Inhibitor of caspase activated Dnase
IgG	Immunoglobulin G
IHC	Immunohistochemistry
iNOS	Inducible Nitric Oxide Synthase
inv (11) (p15; q13)	The inversion in chromosomal 11 between codon 15 of short arm and 13 of long arm
IOM	Institute of Medicine
IP <sub>6</sub>	Inositol hexaphosphate
JNK	c-Jun N-terminal kinases
KCl	Potassium Chloride
KDa	Kilodalton
KH <sub>2</sub> PO <sub>4</sub>	Potassium dihydrogen phosphate

KOH	Potassium hydroxide
K-ras	Kirsten rat sarcoma viral oncogene homolog
LEF/TCF	Lymphoid-enhancer-factor/T-cell factor
LGD	Low-grade dysplasia
LOH	Loss of heterozygosity
LPS	Lipopolysaccharide
LRP	Low density lipoprotein receptor-related protein
M phase	Mitosis phase
MAPK	Microtubule-associated protein kinase
mcr	Mutation cluster region
MEK	MAPK/ERK kinase
MEKK1	MEK kinase 1
mg	Milligrams
mg/g	Milligrams per gram
Mg <sup>2+</sup>	Magnesium ion
Min	Multiple intestinal neoplasia
min	Minute
MKK1/2	Mitogen-activated protein kinase (MAPK) kinase 1 and 2
mL	milliliter
mm	millimeter
mM	Millimolar
mm <sup>2</sup>	Square millimeter
MMPs	Matrix metalloproteinases
Mre11	Meiotic recombination 11
mRNA	Messenger ribonucleic acid
MTT	3-(4,5-Dimethylthiazol-2-yl)-2,5-diphenyltetrazolium bromide
MW	Molecular weight
Myc	Myelocytomatosis
Na <sub>2</sub> CO <sub>3</sub>	Sodium carbonate

$\text{Na}_2\text{HPO}_4$	Monobasic sodium phosphate
$\text{Na}_3\text{VO}_4$	Sodium vanadate
$\text{NaCl}$	Sodium chloride
NADH	Nicotinamide adenine dinucleotide
NADPH	Nicotinamide adenine dinucleotide phosphate
$\text{NaF}$	Sodium fluoride
$\text{NaH}_2\text{PO}_4$	Dibasic sodium phosphate
$\text{NaHCO}_3$	Sodium bicarbonate
$\text{NaOH}$	Sodium hydroxide
NBS	Nijmegen breakage syndrome
NCCD	The Nomenclature Committee on Cell Death
ND	Not determined
NF- $\kappa$ B	Nuclear factor- $\kappa$ B
nm	Nanometer
NNK	Nicotine-derived nitrosamine ketone
N-ras	Neuroblastoma RAS
NSAIDs	Non-steroidal anti-inflammatory drugs
NSCLC	Non-small-cell lung cancer
NuMA	Nuclear mitotic apparatus protein
O6MG	O6-methylguanine
$^{\circ}\text{C}$	Celsius degree
$\text{OsO}_4$	Osmium tetroxide
PACs	Pulmonary adenocarcinomas
PARP	Poly (ADP-ribose) polymerase
PBS	Phosphate buffered saline
PBST	Phosphate Buffered Saline solution with the detergent Tween 20
PCNA	Proliferating cell nuclear antigen
PCR	Polymerase chain reaction
PDGF	Platelet-derived growth factor
pH	Potential of Hydrogen ion

PHA	Polycyclic aromatic hydrocarbon
PI	Propidium iodide
PI3K/Akt	Phosphatidylinositol 3-kinases/Akt
<i>PIK3CA</i>	Phosphoinositide-3-kinase, catalytic, alpha polypeptide
PKC $\alpha$	Protein kinase C isozyme $\alpha$
p-MEK1/2	Phosphorylated MAPK/ERK kinase 1 and 2
PMSF	Phenylmethanesulfonylfluoride
ppm	Parts per million
<i>PRAD1/CCND1</i>	Parathyroid adenomatosis 1/Cyclin D1
PS	Phosphatidylserine
PTEN	Phosphatase and tensin homolog
Puma	p53 upregulated modulator of apoptosis protein
PVDF	Polyvinylidene fluoride
qReal-time RT-PCR	Quantitative Real-time reverse-transcriptase PCR
R point	Restriction point
Ras	Rat sarcoma
Rb	Retinoblastoma
RIP	Receptor interacting protein
RONs	Reactive oxygen and nitrogen species
ROS	Reactive oxygen specie
RP	Reverse-phase
rpm	Revolutions per minute
RT-PCR	Reverse transcription polymerase chain reaction
s	Seconds
S phase	Synthesis phase
SCF complex	S-phase-kinase- associated protein, Cullin, F-box containing complex
SCLC	Small-cell lung cancer
SD	Standard deviation
SDS	Sodium dodecyl sulfate

SDS-PAGE	Sodium dodecyl sulfate polyacrylamide gel electrophoresis
SEM	Scanning electron microscopy
ser9	Phosphorylated at serine 9
Smac	Second Mitochondria-derived Activator of Caspases protein
SWI/SNF	SWItch/Sucrose NonFermentable
t (11; 14)	The chromosomal translocation between codon 11 and 14
T14	Threonine at 14
T161	Threonine at 161
TBS	Tris buffered saline
TEM	Transmission electron microscopy
TEMED	<i>N,N,N,N</i> -tetamethyl ethylene-diamine
TGF- $\beta$	Transforming growth factor beta
TK	Thymidine kinase
TMB	3,3,5,5-Tetramethylbenzidine
TNF	Tumor necrosis factor
TNFR	Tumor necrosis factor receptor
<i>Tnfa</i>	Tumor necrosis factor-alpha
TRADD	Tumor necrosis factor receptor type 1-associated DEATH domain
TRAIL	TNF-related apoptosis-inducing ligand
TS	Thymidylate synthase
TSGs	Tumor suppressor genes
U/ml	Units per milliliter
UC	Ulcerative colitis
UV	Ultraviolet
vs.	Versus
w/v	weight by volume
wks	Weeks



Y15	Tyrosine at 15
$\alpha$	Alpha
$\beta$	Beta
$\beta$ -ME	$\beta$ -mercaptoethanol
$\gamma$	Gamma
$\gamma$ -T3	Gamma-tocotrienol
$\delta$	Delta
$\mu$ g	Micrograms
$\mu$ g/ml	Micrograms per milliliter
$\mu$ L	Microliter
$\mu$ M	Micromolars
$\mu$ m	Micrometer
$\mu$ mol/L	Micromoles/Liter
-	Minus
%	Percent
$\pm$	Plus or Minus
$\times$	Multiply
$\times$ g	Times gravity
$\text{\textcircled{f}}$	Female
1/500	1 per 500 in dilution
7-AAD	7-Aminoactinomycin D