

## LIST OF ABBREVIATIONS

%	percent
$\epsilon$	molar absorptivity
$\alpha$	alpha
$\beta$	beta
$\mu\text{g}$	microgram
$\mu\text{l}$	microliter
$\lambda_{\text{vis-max}}$	maximum visible wavelength
$^{13}\text{C}$ NMR	carbon-thirteen nuclear magnetic resonance
$^1\text{H}$ NMR	proton nuclear magnetic resonance
95D	human highly metastatic lung giant cancer cell line
A549	human lung carcinoma cells
AAS	atomic absorption spectroscopy
$A_{420\text{ nm}}$	absorbance at wavelength 420 nanometer
$A_{700\text{ nm}}$	absorbance at wavelength 700 nanometer
$A_{\lambda_{\text{vis-max}}}$	absorbance at maximum visible wavelength
$A_{\text{control}}$	absorbance of control
$A_{\text{sample}}$	absorbance of sample
ANOVA	analysis of variance
Bel7402	human hepatocarcinoma
BHT	butylated hydroxytoluene
BKF	Bangkok forest herbarium
C18	Covalently-bonded octadecylsilane
Ca	calcium
CC	column chromatography
CCRF-CEM	human leukemia cells

## LIST OF ABBREVIATIONS (continued)

cm	centimeter
CO <sub>2</sub>	carbon dioxide
CORL-23	lung adenocarcinoma cell line
C( <i>sample</i> )	concentration of sample
C( <i>spike</i> )	concentration of sample and standard
C( <i>std</i> )	concentration of standard
<i>d</i>	doublet
<i>dd</i>	doublet of doublet
DF	dilution factor
DLD-1	colorectal adenocarcinoma cells
DMEM	Dulbeco's modified eagle medium
DNA	deoxyribonucleic acid
DPPH	1,1-diphenyl-2-picrylhydrazyl
DU-145	human prostate cancer cells
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e.g.	exempli gratia
EAC	Ehrlich ascitis carcinoma cells
EC <sub>50</sub>	concentration that gave 50% effectiveness
EIMS	electron ionization mass spectrometric
EtOH	ethanol
FBS	fetal bovine serum
FeCl <sub>3</sub>	ferric chloride
FID	flame ionization detector
FIM	foundation for innovation in medicine
g	gram

## LIST OF ABBREVIATIONS (continued)

GAE	gallic acid equivalent
GBC-SD	human gallbladder carcinoma cell lines
GC	gas chromatography
GLC-82	lung cancer
h	hour
H <sub>2</sub> SO <sub>4</sub>	sulfuric acid
H <sub>3</sub> BO <sub>4</sub>	boric acid
HCl	hydrochloric acid
HCT116	colon cancer cells
HDMEC	human dermal microvascular endothelial cell
HGF-2	normal human gingival fibroblasts
HL-60	human promyelocytic leukemia cell line
HMBC	heteronuclear multiple bond correlation
HPLC	high performance liquid chromatography
HS578T	human breast carcinoma
HSC-2	human squamous carcinoma cells
HT29	colon cancer cells
HTST	high temperature short time
IC <sub>50</sub>	concentration of extract that caused a 50% growth inhibition comparing with control
IR	infrared
IU	international unit
K	potassium
KDR	kinase inserts domain receptor
kg	kilogram
KOH	potassium hydroxide

## LIST OF ABBREVIATIONS (continued)

l	liter
LDL	low density lipoprotein
LOD	Limit of detection
LOQ	Limit of quantitation
LTLT	low temperature long time
m	meter
M	molar
MAPK	mitogen activated protein kinase
MCF10A	normal breast epithelial cell line
MCF-7	human breast cancer cells
MEM	minimum essential medium
Mg	magnesium
mg	milligram
min	minute
ml	milliliter
mm	millimeter
mM	millimolar
MRC-5	human lung fibroblast cell
MS	mass spectroscopy
MW	molecular weight
Na	sodium
Na <sup>+</sup> /K <sup>+</sup> -ATPase	sodium-potassium pump
NaOH	sodium hydroxide
nm	nanometer
no.	number
N	normal

### LIST OF ABBREVIATIONS (continued)

°C	degree celcius
OD	optical density
Pb	lead
PBS	phosphate buffer saline
PC-3	human prostate cancer cells
pH	power of hydrogen
R.S.D.	relative standard deviation
$r^2$	correlation coefficient
RE	rutin equivalents
RH	relative humidity
RNS	reactive nitrogen species
RPMI	Roswell park memorial institute
ROS	reactive oxygen species
rpm	round per minute
RPMI	Roswell Park Memorial Institute
RT	retention time
S115	Shionogi 115 mouse breast cancer cells
SMMC7721	human hepatocellular carcinoma cell line
S:N	signal to noise ratio
SPC-A-1	lung adenocarcinoma cell line
SPSS	Statistical Package for the Social Sciences
SRB	sulforhodamine B
std	standard
SW480	colon cancer cells
TBA	thiobarbituric acid

### LIST OF ABBREVIATIONS (continued)

TCA	trichloroacetic acid
TLC	thin layer chromatography
TNF- $\alpha$	tumor necrosis factor alpha
UV	ultraviolet
v/v/v	volume by volume by volume
VEGF	vascular endothelial growth factor
Vis	visible
VLC	vacuum liquid chromatography
WS1	normal skin fibroblasts