Chemomodulatory effects of didox and resveratrol on herceptin cytotoxicity in breast cancer cells

Thesis
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By

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Contents

List of Tables

List of Figures

List of Figures (ctd.)

List of Abbreviations

3D	*3 dimensional*
ADCC	*Antibody-dependent cellular cytotoxicity*
Akt	*Protein kinase B*
AMPK	*Adenosine monophosphate activated protein kinase*
ANOVA	*Analysis of variance*
AR	*Amphiregulin*
ASCO	*American society of clinical oncology*
ATM	*Ataxia telangiectasia mutated*
Bak	*BCL2-antagonist/killer 1*
Bax	*Bcl-2-associated X protein*
Bcl-2	*B cell lymphoma 2*
Bcl-xl	*B cell lymphoma extra large*
BRCA1	*Breast cancer 1 gene*
BRCA2	*Breast cancer 2 gene*
BRIP1	*BRCA1 interacting protein C-terminal helicase 1*
BTC	*Betacellulin*
c-Cbl	*Casitas B-lineage Lymphoma*
CD 16, CD28, CD80	*Cluster of differentiation molecule*
CDK2	*Cyclin dependent kinase 2*
CHEK2	*Check point kinase 2*
CI	*Combination index*
c-kit	*Stem cell factor receptor*
CL	*Light chain constant domain*
COX-2	*Cyclo-oxygenase 2*
CSF	*Cerebrospinal fluid*
dATP	*Deoxyadenosine triphosphate*
dCTP	*Deoxycytidine triphosphate*
dGTP	*Deoxyguanosine triphosphate*
DID	*Didox*
DM1	*Derived from maytansine*
DMSO	*Dimethyl sulfoxide*
DNA	*Deoxy ribonucleic acid*
dNTP	*Deoxy nucleotide triphosphate pool*

DRC	*Dose response curve*
dTTP	*Deoxythymidine triphosphate*
EDTA	*Ethylenediaminetetraacetic acid,*
EGF	*Epidermal growth factor*
ELISA	*Enzyme linked immunosorbent assay*
EPG	*Epigen*
EPR	*Epiregulin*
ER	*Estrogen receptor*
erbB	*Erythroblast B*
ERK	*Extracellular signal-regulated kinase*
ER-β	*Estrogen receptor β*
ET-1	*Endothelin-1*
GAPDH	*Glyceraldehyde 3-phosphate dehydrogenase*
HB-EFG	*Heparin- binding EGF like ligand*
HER	*Herceptin*
HER-2	*Human epidermal growth factor receptor-2*
HGF	*Hepatocyte growth factor*
HMG-Co A reductase	*3-Hydroxyl 3- methyl glutaryl coenzyme A reductase*
HRP	*Horse radish peroxidase*
HRT	*Hormone replacement therapy*
hsp90	*Heat shock protein 90*
IAPs	*Inhibitor of apoptosis proteins*
IC_{50}	*Inhibitory concentration of 50%*
IDC	*Invasive ductal carcinoma*
IFN-γ	*Interferon-γ*
IGF	*Insulin like growth factor*
IgG	*Immunoglobulin G*
IL-1β	*Interleukin 1β*
ILC	*Invasive lobular carcinoma*
iNOS	*Inducible nitric oxide synthase*
MAPK	*Mitogen activated protein kinase*
MBC	*Metastatic breast cancer*
mTOR	*Mammalian target of rapamycin*
NAD	*Nicotinamide adenine dinucleotide*
NBS1	*Nibrin*
NF-κB	*Nuclear factor kappa B*

NK	*Natural killer cells*
NO	*Nitric oxide*
NOS	*Not otherwise specified*
NRG	*Neuregulin*
OD	*Optical density*
p.o.	*Per-os*
PALB2	*Partner and localizer of BRCA2*
PARP	*Poly (ADP-ribose) polymerase*
PDGFR	*Platelet derived growth factor receptor*
PI3K	*Phosphatidylinositol-4,5-bisphosphate 3-kinase*
PKC	*Protein kinase-C*
PR	*Progesterone receptor*
PTEN	*Phosphatase and tensin homolog*
PUMA	*p53 upregulated modulator of apoptosis*
R fraction	*Resistant fraction*
rBM	*Reconstituted basement membrane*
RES	*Resveratrol*
RNA	*Ribonucleic acid*
ROS	*Reactive oxygen species*
RPMI	*Roswell Park Memorial Institute medium*
RR	*Ribonucleotide reductase*
RTK	*Receptor tyrosine kinase*
RT-PCR	*Real time – polymerase chain reaction*
SE	*Standard error*
SIR2	*Silent Information Regulator Two protein*
SRB	*Sulphorhodamine B*
Src	*Sarcoma tyrosine kinase*
STAT	*Signal Transducer and Activator of Transcription*
TBE	*Tris borate/ EDTA*
TCA	*Trichloroacetic acid*
TKI	*Tyrosine kinase inhibitor*
TN	*Triple negative*

TNF-α	*Tumor necrosis factor- α*
TRAIL-R1/DR4	*TNF-related apoptosis-inducing ligand-receptor 1/ death receptor 4*
TRAIL-R2/DR5	*TNF-related apoptosis-inducing ligand-receptor 2/ death receptor5*
TRAMP	*Transgenic adenocarcinoma of the mouse prostate.*
Tyr	*Tyrosine*
VEGF	*Vascular endothelial growth factor*
VH	*Variable heavy chain*
VL	*Variable light chain*
WHO	*World health organization*
XIAP	*X-linked IAP*

Breast cancer

Breast cancer is considered a highly heterogeneous disease under several distinct viewpoints. Different types of this neoplasm exhibit variable histopathological and biological features, different clinical outcome and different response to systemic interventions **(Viale, 2012).**

Classification of breast cancer:

As a general rule, a suitable classification of any disease has to be scientifically sound, clinically useful, easily applicable and widely reproducible.

Several classifications are available for breast cancer from the more traditional histopathological subtypes to the newer molecular classes.

Histopathological classification:

The histopathological classification of breast carcinoma is based on the diversity of the morphological features of the tumors. It includes 20 major tumor types and 18 minor subtypes as endorsed by the WHO in 2003 **(Sencha *et al.*, 2015).**

According to this classification 70%–80% of all breast cancers will eventually belong to either one of the two major histopathological classes, namely invasive ductal carcinomas (IDCs) not otherwise specified (NOS) or invasive lobular carcinoma (ILC). This implies that this classification is unable to actually mirror the much wider heterogeneity of breast cancer, because it groups together, within the same class, tumors that have a very different biological and clinical profile. As a result, the histopathological classification has minimal prognostic and predictive implications, and its clinical utility is quite modest **(Viale, 2012).**