

List of abbreviations

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°C	Degree Celsius
%	Percentage
AAALAC	Association for Assessment and Accreditation of Laboratory Animal Care
ALP	Alkaline phosphatase
ALT	Alanine transaminase
AST	Aspartate transaminase
ASH	Alcoholic steatohepatitis
2-AAF	2-Acetylaminofluorene
AFLD	Alcoholic fatty liver disease
AFP	Alfa-fetoprotein
AFU	Alpha-1-Fucosidase
AGA	American Gastroenterological Association
ANOVA	Analysis of variance
BBN	N-butyl-N-(4-hydroxybutyl)-nitrosamine
BCA	Bicinchoninic acid assay
BCLC	Barcelona clinic liver cancer
BSA	Bovine serum albumin
CCl ₄	Carbon tetrachloride
CDX	Cell derived xenograft
CFU	Colony forming unit
CMC	Carboxymethylcellulose
CO ₂	Carbon dioxide
CoA	Certificate of Analysis
CPCSEA	Committee for the Purpose of Control and Supervision of Experiments on Animals
Cr	Creatinine
CYP2E1	Cytochrome p450 2E1
DAB	Diaminobenzidine tablet
DAL	Dalton's ascitic lymphoma

List of abbreviations

DCP	Des- γ - carboxy prothrombin
DEN/DENA	Diethyl nitrosamine
DKK1	Dickkopf-1
DMBA	7,12-dimethylbenz(a) anthracene
DMSO	Dimethyl sulphoxide
EAC	Ehrlich's Ascitic Carcinoma
ECL	Enhanced chemiluminescence
EMEM	Eagle's minimum essential medium
FBS	Fetal bovine serum
EGF	Epidermal growth factor
ESLD	End-stage liver disease
ESR	Erythrocyte sedimentation rate
ER	Endoplasmic reticulum
FDA	Food and drug administration
FFPE	Formalin-fixed paraffin-embedded
FGF	Fibroblast growth factor
FNA	Fine-needle aspiration
G	Gram
GEM	Genetically engineered mouse
GP73	Golgi protein 73
HBV	Hepatitis B virus
HBx	Hepatitis B X protein
HCC	Hepatocellular carcinoma
HCV	Hepatitis C virus
HGF	Hepatocyte growth factor
Hr	Hour
HRP	Horseradish peroxidase
Hcl	Hydrochloric acid
Hh	Hedgehog
HIF	Hypoxia inducible factors

List of abbreviations

HIF-1	Hypoxia-inducible factor 1
H ₂ O ₂	Hydrogen peroxide
H&E	Hematoxylin and eosin
IAEC	Institutional animal ethics committee
IGF	Insulin like growth factor
i.g.	Intragastric
IHC	Immunohistochemistry
IHCC	Intrahepatic cholangiocarcinoma
IHBD	Intrahepatic bile duct carcinoma
IOD	integrated optical density
i.p.	Intraperitoneal
IRE	Irreversible electroporation
IV	Intravenous
IVC	Individually ventilated cages
LPO	Lipid peroxidation
MKI	Multi Kinase Inhibitors
MDA	Malondialdehyde
Mol Wt	Molecular weight
ml/Kg	Milliliter per kilogram
Mg	Milligram
Mg/kg	Milligram per kilogram
MNU	N-methyl-N-nitrosourea
MSU	Maharaja Sayajirao University
MTT	3-4, 5- dimethylthiazol-2, 5 biphenyl tetrazolium bromide
MVD	Microvessel density
MWA	Microwave ablation
N	No of animals
NAFLD	Nonalcoholic fatty liver disease
NASH	Non-alcoholic steatohepatitis
NCI	National cancer institute

List of abbreviations

NDEA	N-nitrosodiethylamine
NIDDM	Non-insulin dependent diabetes mellitus
NMT	Not more than
NMPA	National Medical Products Administration
NTCU	N-nitroso-tris-chloroethylurea
OECD	Organization for Economic Co-operation and Development
OS	Overall survival
PDGF	Platelet-derived growth factor
PDB	Protein data bank
PD-1	Programmed death receptor-1
PEI	Percutaneous ethanol injection
PFA	Paraformaldehyde
PI	Propidium iodide
PST	Performance status
PVDF	Polyvinylidene difluoride
PLC	Primary liver cancers
PO	Per oral
RFA	Radio frequency ablation
RIPA	Radioimmunoassay precipitation assay
RO	Reverse osmosis
ROS	Reactive oxygen species
Rt	Retention time
SD	Standard deviation
SPARCL	Sun Pharma Advanced Research Committee Limited
SP	Standard Precision
SFL	Simple fatty liver
TAE/TACE	Transcatheter arterial (chemo) embolization
TBS	Tris-buffered saline
TBST	Tris-buffered saline containing 0.1% Tween 20
TERT	Telomerase reverse transcriptase

List of abbreviations

TKI	Tyrosine kinase inhibitor
TGF β 1	Transforming growth factor β 1
μ g	Microgram
μ L	Microliter
μ M	Micromolar
VEGF	Vascular endothelial growth factor
WBC	White blood cells
w/w	Weight by weight
XP	Extra precision