

Chapter 4

**Materials, instruments, and software
used in the experiments**

4 Material, instruments, and software used in the experiments

A detailed list of different materials used in the present thesis is summarized in Table 4.1.

Table 4.1 List of materials used in the experiments and their sources

Materials	Source
Dihydroartemisinin	Gifted by Mangalam organics limited, Mumbai, Maharashtra, India
Hesperidin	Tokyo Chemical Industries (TCI), Chuo-ku, Tokyo, Japan
4',6-Diamidino-2-phenylindole (DAPI)	Himedia, Mumbai, Maharashtra, India
Crystal violate	Himedia, Mumbai, Maharashtra, India
Dulbecco Modified Egle's Media (DMEM)	Himedia, Mumbai, Maharashtra, India
Fetal Bovine Serum (FBS)	Thermo Fisher, Waltham, MA, USA
2',7'-dichlorodihydrofluorescein diacetate (H ₂ DCFDA)	Himedia, Mumbai, Maharashtra, India
Toluidine Blue	Himedia, Mumbai, Maharashtra, India
Penicillin	Himedia, Mumbai, Maharashtra, India
Streptomycin	Himedia, Mumbai, Maharashtra, India
(E)-5,6-dichloro-2-[3-(5,6-dichloro-1,3- diethyl-1,3-dihydro-2H-benzimidazol-2- ylidene)-1-propenyl]-1,3-diethyl-1H- benzimidazolium iodide) (JC-1)	Thermo Fisher, Waltham, MA, USA
Dimethyl Sulfoxide (DMSO)	Merck, Burlington, Massachusetts, USA
Methanol	Merck, Burlington, Massachusetts, USA
HPLC grade Methanol	Merck, Burlington, Massachusetts, USA

Bradford reagent	Sigma-Aldrich, St. Louis, Missouri, USA
3-(4,5-dimethylthiazol-2-yl)-2,5-diphenyltetrazolium bromide (MTT)	Thermo Fisher, Waltham, MA, USA
Trypsin 0.25%	Himedia, Mumbai, Maharashtra, India
Triton-X-100	Merck, Burlington, Massachusetts, USA
Tween 80	Merck, Burlington, Massachusetts, USA
Bovine serum albumin	Sigma-Aldrich, St. Louis, Missouri, USA
Coumarin-6	Sigma-Aldrich, St. Louis, Missouri, USA
Enhanced chemiluminescence (ECL) prime solution	Cytiva Life Sciences, Marlborough, MA, USA
CD-63 anti-body	Cell Signalling Technologies, Denver, MA, USA
CD-81 anti-body	Cell Signalling Technologies, Denver, MA, USA
TSG 101 anti-body	Cell Signalling Technologies, Denver, MA, USA
Alix anti-body	Cell Signalling Technologies, Denver, MA, USA
β integrin anti-body	Cell Signalling Technologies, Denver, MA, USA
β -actin	Cell Signalling Technologies, Denver, MA, USA
CD-40 anti-body	Cell Signalling Technologies, Denver, MA, USA

P selectin anti-body	Cell Signalling Technologies, Denver, MA, USA
Horseradish peroxidase (HRP) secondary anti-body	Cell Signalling Technologies, Denver, MA, USA
Glycine	Thermo Fisher, Waltham, MA, USA
Tris base	Thermo Fisher, Waltham, MA, USA
Sodium dodecyl sulphate (SDS)	Thermo Fisher, Waltham, MA, USA
Bovine milk	Local dairy farm, Varanasi, Uttar Pradesh, India
Dialysis Membrane-70, MWCO 12000-14,000 Daltons, pore size: 2.4 nm, average flat width - 28.46 mm, average diameter- 17.5 mm, capacity approx. - 2.41 mL/cm	Himedia, Mumbai, Maharashtra, India
Milli Q water	Sartorius, Göttingen, Germany
Distilled water	From the double distilled unit, Borosil Technologies Limited, Mumbai, India
Dacarbazine	Gifted by Neon Laboratories Ltd. Mumbai, Maharashtra, India
Human Embryonic Kidney 293 cells (HEK-293)	National Centre for Cell Science (NCCS), Pune, Maharashtra, India.
Melanoma cell lines (B16F10)	National Centre for Cell Science (NCCS), Pune, Maharashtra, India
T25 cell culture flasks	Tarson, Kolkata, India

T75 cell culture flasks	Tarson, Kolkata, India
100mm cell culture dishes	Tarson, Kolkata, India
DBCO	Sigma-Aldrich, St. Louis, Missouri, USA
N ₂ HPO ₄	Sigma-Aldrich, St. Louis, Missouri, USA
Potassium Chloride (KCL)	Sigma-Aldrich, St. Louis, Missouri, USA
NACL	Sigma-Aldrich, St. Louis, Missouri, USA
KH ₂ PO ₄	Sigma-Aldrich, St. Louis, Missouri, USA
6 transwell chambers	Sigma-Aldrich, St. Louis, Missouri, USA
Hydrogen peroxide (H ₂ O ₂)	Sigma-Aldrich, St. Louis, Missouri, USA
Carboxyl Methylcellulose	Sigma-Aldrich, St. Louis, Missouri, USA
haematoxylin-eosin (H&E)	Merck, Burlington, Massachusetts, USA
Paraffin	Merck, Burlington, Massachusetts, USA
ELISA kits for ALP, ASP, ALT, Creatinine, and Urea	ARKAY Healthcare PVT LTD. Surat, Gujarat, India
Nylon membrane filters	Axiva SicheM, New Delhi, India
Formaldehyde	Sigma-Aldrich, St. Louis, Missouri, USA
Culture insert-2 well	Ibidi, Lochhamer Schlag, Gräfelfing, Germany

A list of major instruments used in the current work is summarized in Table 4.2.

Table 4.2 List of instruments used in the experiments and their sources

Instrument	Model	Make
Ultracentrifuge	Optima XPN-100	Beckman, USA
Benchtop centrifuge	C-24BL	REMI, India
Spectrophotometer	Synergy-HTX	Biotek, Agilent, USA

XRD	Rigaku Miniflex 600 Desktop System	Ringaku, Japan
High-resolution Scanning Transmission Electron Microscopy (TEM)	Tecnai G2 20 TWIN	FEI Company, USA
High-resolution Scanning Electron Microscopy (HR- SEM)	Nova Nano SEM 450	FEI Company, USA
Atomic Force Microscopy (AFM)	NTEGRA Prima	NT-MDT Service & Logistics Ltd
Distilled Water unit		Sartorius, USA
HPLC	1260 Infinity II	Agilent, USA
Fluorescence microscope	BUM800FL	Olympus, Japan
Confocal Laser Scanning Microscope (CLSM)	FV4000	Olympus, Japan
Particle Size analyzer	Delsa Nano	Backman, USA
Rotary vacuum pump	IKA [®] RV 10 digital	IKA, Germany
Stability chamber	SRL/SC-10A	SR Lab Instrument, Mumbai, India
Inverted microscope	Victory Plus	Dewinter, India
CO ₂ Incubator	Heracell [™] VIOS 160i	Thermofisher, USA
Cryostat	CM1950	Leica, Germany
Deep refrigerator	HFC-500	Haier Biomedical
Refrigerator		LG

Water bath sonicator	LMUC-3	Labman, India
Probe sonicator	UP200H	Hielscher ultrasound technology, Germany
SPINIX™ Vertex shaker	3020	Tarsons Products Pvt. Ltd., India
Temperature-controlled magnetic stirrer with a hot plate	IKA C-MAG HS 7	IKA®, Staufen, Germany
Weighing balance	Cubis II MCE125S-2S00-U	Sartorius, USA
Biochemical analyzer	Biomaster R	Fisher Scientific, MA, USA
Digital vernier calipers		Morton Davies Electronic
Oral gauges		
Western blotting	Bio-Rad	Bio-Rad, California, USA

Detailed information about the different softwares has been summarized in Table 4.3 which were used during the formulation development and the analysis of data obtained from different studies.

Table 4.3 List of software used

Software	Version	Country origin
Design-Expert®	v 12	Stat-Ease Inc., Minneapolis, MN, USA
GraphPad Prism	v 5.01	GraphPad Software, Inc., San Diego, California
ImageJ	v 1.53e Java 1.8.0_172	National Institutes of

		Health (NIH), Bethesda, Maryland
Nova Px	v 3.4.0	NT-MDT Service and Logistics Ltd., Amsterdam, Netherlands
Open LAB CDS EZChrom Workstation VL	v 4.1a	Agilent, USA
Sequence Scanner	v1	Applied Biosystems, Life Technologies, USA
Radical ProCam	v 3.7	New Delhi, India
xT Microscope control	v 1.0	FEI, USA
Zen (Blue edition)	v 3.6	Carl Zeiss Microscopy, GMBH, Germany
ZS Xplorer	v 2.3.1	Malvern Panalytical Ltd., UK