

## *Chapter – 4*

### *Materials*

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#### **4.1. Chemicals**

The list of chemicals given in Table 4.1. were used for this research.

**Table 4.1. List of chemicals**

| <b>S.No.</b> | <b>Chemicals</b>      | <b>Source</b>                      |
|--------------|-----------------------|------------------------------------|
| 1            | Lupeol                | Sigma Aldrich, India               |
| 2            | Triphenylphosphine    | SRL chemicals, India               |
| 3            | Rhodamine 123         | Sigma Aldrich, India               |
| 4            | Streptozotocin        | Sisco Research Laboratories, India |
| 5            | Glyceryl monostearate | Hospira Pvt. Ltd, India            |
| 6            | Compritol ATO 888     | Shasun Pharmaceuticals, India      |
| 7            | Poloxamer 188         | Hospira Pvt. Ltd, India            |
| 8            | Sodium deoxycholate   | Hospira Pvt. Ltd, India            |
| 9            | Polyvinyl alcohol     | Shasun Pharmaceuticals, India      |
| 10           | Lecithin              | Shasun Pharmaceuticals, India      |
| 11           | Tween 20              | SD Fine Chemicals, India           |

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|----|-------------------------|--------------------------|
| 12 | Dimethylsulphoxide      | Hi Media, India          |
| 13 | Acetonitrile HPLC grade | SRL chemicals, India     |
| 14 | Methanol HPLC grade     | SRL chemicals, India     |
| 15 | Phosphotungstic acid    | SD Fine Chemicals, India |
| 16 | Cadmium acetate         | SD Fine Chemicals, India |
| 17 | Dimethyl formamide      | Hi Media, India          |
| 18 | Mercaptoethanol         | Sigma Aldrich, India     |
| 19 | Sodium sulphite         | SRL chemicals, India     |
| 20 | Selenium powder         | Sigma Aldrich, India     |
| 21 | EDTA                    | Sigma Aldrich, India     |
| 22 | HEPES                   | Hi Media, India          |
| 23 | Acetone                 | SD Fine Chemicals, India |
| 24 | Methanol                | SD Fine Chemicals, India |
| 25 | Ethanol                 | SD Fine Chemicals, India |
| 26 | n-butanol               | SD Fine Chemicals, India |
| 27 | Acetic acid             | SD Fine Chemicals, India |
| 28 | Sulphuric acid          | SD Fine Chemicals, India |
| 29 | Petroleum ether         | SD Fine Chemicals, India |
| 30 | Toluene                 | SRL chemicals, India     |
| 31 | Chloroform              | SRL chemicals, India     |
| 32 | Fructose                | SD Fine Chemicals, India |
| 33 | Ketamine                | SRL chemicals, India     |
| 34 | Mannitol                | SD Fine Chemicals, India |

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| 35 | Sucrose                                 | SD Fine Chemicals, India            |
| 36 | Potassium chloride                      | SD Fine Chemicals, India            |
| 37 | Tris-hydrochloric acid                  | SD Fine Chemicals, India            |
| 38 | D-mannitol                              | SD Fine Chemicals, India            |
| 39 | H <sub>2</sub> O <sub>2</sub>           | Hi Media, India                     |
| 40 | ZnSO <sub>4</sub>                       | Merck Specialities Pvt. Ltd., India |
| 41 | Sodium dodecyl sulphate                 | Merck Specialities Pvt. Ltd., India |
| 42 | Thiobarbuturic acid                     | SD Fine Chemicals, India            |
| 43 | Pyridine                                | SD Fine Chemicals, India            |
| 44 | Glutaraldehyde                          | SD Fine Chemicals, India            |
| 45 | Paraformaldehyde                        | SD Fine Chemicals, India            |
| 46 | Cacodylic acid                          | Merck Specialities Pvt. Ltd., India |
| 47 | Nicotinamide adenine dinucleotide       | Hi Media, India                     |
| 48 | Free-fatty acid bovine serum albumin    | Hi Media, India                     |
| 49 | Sodium pyrophosphate                    | Merck Specialities Pvt. Ltd., India |
| 50 | Phenazolum methane sulphate             | Merck Specialities Pvt. Ltd., India |
| 51 | Nitro-blue tetrazolium chloride         | Merck Specialities Pvt. Ltd., India |
| 52 | Ubiquinone-1                            | Merck Specialities Pvt. Ltd., India |
| 53 | MTT                                     | Sigma Aldrich, India                |
| 54 | Citric acid                             | Merck Specialities Pvt. Ltd., India |
| 55 | Silicagel G                             | Merck Specialities Pvt. Ltd., India |
| 56 | Silica gel 60F254 pre-coated TLC plates | Merck Specialities Pvt. Ltd., India |

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| 57 | Dialysis membrane (cutoff MW<br>12,000–14,000 daltons) | HiMedia, India                      |
| 58 | Cholesterol kit  | Autospan, India                     |
| 59 | Triglyceride liquid gold kit                           | Autospan, India                     |
| 60 | ELISA diagnostic kit                                   | Nexus, India                        |
| 61 | Sodium citrate   | Merck Specialities Pvt. Ltd., India |
| 62 | Sodium hydroxide                                       | SD Fine Chemicals, India            |
| 63 | Tetraethylbenzimidazolylcarbocyanine<br>iodide         | Sigma Aldrich, India                |
| 64 | 2',7' –dichlorofluorescin diacetate                    | Sigma Aldrich, India                |

#### 4.2. Equipments

The list of equipments given in Table 4.2. were used for this research.

**Table 4.2. List of equipments**

| S.No. | Equipment                  | Source                             |
|-------|----------------------------|------------------------------------|
| 1     | Digital electronic balance | Shimadzu, Japan                    |
| 2     | Digital pH meter           | IKON Instruments, India            |
| 3     | Digital magnetic stirrer   | IKA, HS 7, Germany                 |
| 4     | Vortex mixer               | Remi, Cyclomixer, India            |
| 5     | Bath sonicator             | WUC 1.8L, Fisher Scientific, India |
| 6     | Probe ultrasonicator       | UP50H, Hielscher, USA              |
| 7     | UV–VIS spectrophotometer   | UV–Visible 1800, Shimadzu, Japan   |

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| 8  | RP HPLC   | Waters, 5.5, USA   |
| 9  | High speed homogenizer  | IKA T25, Ultra Turrax, Germany                                       |
| 10 | Lyophilizer   | Decibel Digital Technologies, India                                  |
| 11 | Cooling centrifuge  | C-24, Remi   |
| 12 | Particle size analyzer and Zeta sizer                               | Delsa <sup>TM</sup> Nano C, Beckman coulter                          |
| 13 | Differential scanning calorimeter<br>and thermogravimetric analyzer | DSC25, Toledo, Mettler   |
| 14 | Fourier transform infrared<br>spectrophotometer                     | FTIR-8400S, Shimadzu   |
| 15 | Powder X-ray diffractometer   | X'Pert Pro PAN   |
| 16 | NMR spectrometer  | Joel-FT NMR-AL300, Japan   |
| 17 | Scanning electron microscope  | SEM 840 A, JEOL, Japan<br>JSM 5600, JEOL                             |
| 18 | Atomic force microscope   | NT-MDT Solver NEXT, Russia<br>Digital Nanoscope IIIa Instrument Inc. |
| 19 | Rotary evaporator   | IKA RV 10  |
| 20 | Quadrupole time-of-flight<br>spectrometer                           | G6520B, Agilent technologies   |
| 21 | Ultrasonicator  | 200H, Hielscher  |
| 22 | Confocal laser scanning microscope                                  | LSM 510, Zeiss   |
| 23 | Spectrophotometer   | Spex Fluorolog-3 Spectrophotometer                                   |
| 24 | ELISA plate reader  | Labsystem, Multiscan   |
| 25 | Fluorescence microscope   | Laica, Germany   |

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### 4.3. Softwares

The list of softwares given in Table 4.3. were used for this research.

**Table 4.3. List of softwares**

| <b>S. No.</b> | <b>Software</b>               | <b>Source</b>   |
|---------------|-------------------------------|---|
| 1             | Design-Expert (Version 7.0)   | Stat-Ease, Minneapolis                                  |
| 2             | GraphPad Prism (version 5.03) | GraphPad Prism Inc., USA                                |
| 3             | WinNonlin software            | Pharsight Corp., Mountain View,<br>CA, USA, Version 4.1 |