

## Specifications of Materials approved by SSC on July 28, 2010-07-29

### List of Perishable Enzymes

Name of Item
<p><b>1. Apal:</b> (10 units/ul) The enzyme should be provided with specific buffers and any other required supplementary materials like BSA, Triton, Tween or DTT solutions. One unit of the restriction enzyme should completely digest 1 µg of lambda DNA in one hour. The enzyme should preferably utilize a universal buffer. The prices should be quoted for only required number of units but not bulk packs. The specifications should be easily accessible as a brochure with the quote/supply or internet search using catalogue number, which should be clearly provided.</p>
<p><b>2. PstI:</b> (10 units /ul) The enzyme should be provided with specific buffers and any other required supplementary materials like BSA, Triton, Tween or DTT solutions. One unit of the restriction enzyme should completely digest 1 µg of lambda DNA in one hour. The enzyme should preferably utilize a universal buffer. The prices should be quoted for only required number of units but not bulk packs. The specifications should be easily accessible as a brochure with the quote/supply or internet search using catalogue number, which should be clearly provided.</p>
<p><b>3. SpeI:</b> (10 units /ul) The enzyme should be provided with specific buffers and any other required supplementary materials like BSA, Triton, Tween or DTT solutions. One unit of the restriction enzyme should completely digest 1 µg of lambda DNA in one hour. The enzyme should preferably utilize a universal buffer. The prices should be quoted for only required number of units but not bulk packs. The specifications should be easily accessible as a brochure with the quote/supply or internet search using catalogue number, which should be clearly provided.</p>
<p><b>4. DNase, Rnase Free, Strength 1u/µl</b> Required for digestion of single and double stranded DNA and preparation of DNA free RNA prior to RT-PCR.</p>
<p><b>5. Apal</b> (10 units /ul) The enzyme should be provided with specific buffers and any other required supplementary materials like BSA, Triton, Tween or DTT solutions. One unit of the restriction enzyme should completely digest 1 µg of lambda DNA in one hour. The enzyme should preferably utilize a universal buffer. The prices should be quoted for only required number of units but not bulk packs. The specifications should be easily accessible as a brochure with the quote/supply or internet search using catalogue number, which should be clearly provided.</p>
<p><b>6. BamHI</b> (10 units /ul) The enzyme should be provided with specific buffers and any other required supplementary materials like BSA, Triton, Tween or DTT solutions. One unit of the restriction enzyme should completely digest 1 µg of lambda DNA in one hour. The enzyme should preferably utilize a universal buffer. The prices should be quoted for only required number of units but not bulk packs. The</p>

<p>specifications should be easily accessible as a brochure with the quote/supply or internet search using catalogue number, which should be clearly provided.</p>
<p><b>7. ClaI</b> (10 units /ul)  The enzyme should be provided with specific buffers and any other required supplementary materials like BSA, Triton, Tween or DTT solutions. One unit of the restriction enzyme should completely digest 1 µg of lambda DNA in one hour. The enzyme should preferably utilize a universal buffer. The prices should be quoted for only required number of units but not bulk packs. The specifications should be easily accessible as a brochure with the quote/supply or internet search using catalogue number, which should be clearly provided.</p>
<p><b>8. EcoRI</b> (10 units /ul)  The enzyme should be provided with specific buffers and any other required supplementary materials like BSA, Triton, Tween or DTT solutions. One unit of the restriction enzyme should completely digest 1 µg of lambda DNA in one hour. The enzyme should preferably utilize a universal buffer. The prices should be quoted for only required number of units but not bulk packs. The specifications should be easily accessible as a brochure with the quote/supply or internet search using catalogue number, which should be clearly provided.</p>
<p><b>9. HindIII</b> (10 units /ul)  The enzyme should be provided with specific buffers and any other required supplementary materials like BSA, Triton, Tween or DTT solutions. One unit of the restriction enzyme should completely digest 1 µg of lambda DNA in one hour. The enzyme should preferably utilize a universal buffer. The prices should be quoted for only required number of units but not bulk packs. The specifications should be easily accessible as a brochure with the quote/supply or internet search using catalogue number, which should be clearly provided.</p>
<p><b>10. KpnI</b> (10 units /ul)  The enzyme should be provided with specific buffers and any other required supplementary materials like BSA, Triton, Tween or DTT solutions. One unit of the restriction enzyme should completely digest 1 µg of lambda DNA in one hour. The enzyme should preferably utilize a universal buffer. The prices should be quoted for only required number of units but not bulk packs. The specifications should be easily accessible as a brochure with the quote/supply or internet search using catalogue number, which should be clearly provided.</p>
<p><b>11. PstI</b> (10 units /ul)  The enzyme should be provided with specific buffers and any other required supplementary materials like BSA, Triton, Tween or DTT solutions. One unit of the restriction enzyme should completely digest 1 µg of lambda DNA in one hour. The enzyme should preferably utilize a universal buffer. The prices should be quoted for only required number of units but not bulk packs. The specifications should be easily accessible as a brochure with the quote/supply or internet search using catalogue number, which should be clearly provided.</p>
<p><b>12. SacI</b> (10 units /ul)  The enzyme should be provided with specific buffers and any other required supplementary materials like BSA, Triton, Tween or DTT solutions. One unit of the restriction enzyme should completely digest 1 µg of lambda DNA in one hour. The enzyme should preferably utilize a universal buffer. The prices should be quoted for only required number of units but not bulk packs. The</p>

<p>specifications should be easily accessible as a brochure with the quote/supply or internet search using catalogue number, which should be clearly provided.</p>
<p><b>13. SnaBI / Eco1051</b> (10 units /ul)  The enzyme should be provided with specific buffers and any other required supplementary materials like BSA, Triton, Tween or DTT solutions. One unit of the restriction enzyme should completely digest 1 µg of lambda DNA in one hour. The enzyme should preferably utilize a universal buffer. The prices should be quoted for only required number of units but not bulk packs. The specifications should be easily accessible as a brochure with the quote/supply or internet search using catalogue number, which should be clearly provided.</p>
<p><b>14. SpeI / BcuI</b> (10 units /ul)  The enzyme should be provided with specific buffers and any other required supplementary materials like BSA, Triton, Tween or DTT solutions. One unit of the restriction enzyme should completely digest 1 µg of lambda DNA in one hour. The enzyme should preferably utilize a universal buffer. The prices should be quoted for only required number of units but not bulk packs. The specifications should be easily accessible as a brochure with the quote/supply or internet search using catalogue number, which should be clearly provided.</p>
<p><b>15. XbaI</b> (10 units /ul)  The enzyme should be provided with specific buffers and any other required supplementary materials like BSA, Triton, Tween or DTT solutions. One unit of the restriction enzyme should completely digest 1 µg of lambda DNA in one hour. The enzyme should preferably utilize a universal buffer. The prices should be quoted for only required number of units but not bulk packs. The specifications should be easily accessible as a brochure with the quote/supply or internet search using catalogue number, which should be clearly provided.</p>
<p><b>16. XhoI</b> (10 units /ul)  The enzyme should be provided with specific buffers and any other required supplementary materials like BSA, Triton, Tween or DTT solutions. One unit of the restriction enzyme should completely digest 1 µg of lambda DNA in one hour. The enzyme should preferably utilize a universal buffer. The prices should be quoted for only required number of units but not bulk packs. The specifications should be easily accessible as a brochure with the quote/supply or internet search using catalogue number, which should be clearly provided.</p>
<p><b>17. XmaI / Crf 91</b> (10 units/µl)  The enzyme should be provided with specific buffers and any other required supplementary materials like BSA, Triton, Tween or DTT solutions. One unit of the restriction enzyme should completely digest 1 µg of lambda DNA in one hour. The enzyme should preferably utilize a universal buffer. The prices should be quoted for only required number of units but not bulk packs. The specifications should be easily accessible as a brochure with the quote/supply or internet search using catalogue number, which should be clearly provided.</p>
<p><b>18. Lysozymes:</b> (Molecular Biology Grade) Salt Free, Albumin Free, Lypholized</p>

## Molecular Biology Kits and Reagents

Name of Item
<p><b>1. 1-Naphthalene acetic acid (NAA):</b> Formula: C<sub>12</sub>H<sub>10</sub>O<sub>2</sub>, FW: 186.2, Plant Cell Culture Tested, Storage Temp: 2-8 C, Solubility: acetone: 50mg/ml, crystalline, light yellow, Purity: 99%.</p>
<p><b>2. Carbencillin, α-carboxybenzylpenicillin, disodium salt:</b> Plant Cell Culture Tested, Formula: C<sub>17</sub>H<sub>16</sub>N<sub>2</sub>O<sub>6</sub>SN<sub>2</sub>, FW: 422.41, Storage: 2-6 C, water soluble, Whit to off-white powder, water soluble.</p>
<p><b>3. Murashige &amp; Skoog (MS) Basal Medium with macro and micro nutrients, and Vitamins as described by Murashige &amp; Skoog (1962):</b> Ammonium Nitrate: 37.21 %, Potassium Nitrate: 42.85 %, EDTA, Disodium Salt, Dihydrate: 0.84 %, Cobalt Chloride, Hexahydrate: 0.0006 %, Cupric Sulfate, Pentahydrate: 0.0006 %, Sodium Molybdate(VI), Dihydrate: 0.006 %, Manganese Sulfate, Monohydrate: 0.38 %, Potassium Iodide: 0.019 %, Boric Acid: 0.14 %. Plant Cell Culture Tested, Storage Temp: 2-6 C, pH: 3.5 - 4.5, soluble in water, off-white to yellow powder, odorless.</p>
<p><b>4. Indole-3-Acetic Acid (IAA):</b> formula: C<sub>10</sub>H<sub>9</sub>NO<sub>2</sub>, FW: 175.2, Plant Cell Culture Tested, purity: 99%, off white to tan crystals.</p>
<p><b>5. IPTG:</b> (Molecular Biology Reagent), purity 99%, Molecular Formula: C<sub>9</sub>H<sub>18</sub>O<sub>5</sub>S; Molecular mass: 238.3 g mol<sup>-1</sup> ; Isopropyl-B-D-thiogalactopyranoside, dioxane free, IPTG is required for induction of transcription of the gene coding for beta-galactosidase a hydrolase enzyme that catalyzes the hydrolysis of β-galactosides into monosaccharides. blue white selection</p>
<p><b>6. X-Gal</b> (Molecular Biology grade, 99% pure), 5-Bromo-4-Chloro-3-Indolylyle-B-D-Glactosidase, C<sub>14</sub>H<sub>15</sub>BrClNO<sub>6</sub>, MW 408.64; Suitable for blue white selection. Required for differentiation of recombinants from non-recombinants in cloning experiments using vectors containing the lacZ or lacZ a-peptide gene.</p>
<p><b>7. Chloroform:</b> (Molecular Biology grade): Purity 99+%, Required for nucleic acid purification.</p>
<p><b>8. Ethanol:</b> Absolute 99.5 % (Molecular Biology grade).Required for DNA precipitation</p>
<p><b>9. Isoamylalcohol:</b> Molecular Biology grade, purity 98%, Required for nucleic acid purification</p>
<p><b>10. Ampicillin:</b>, Antibiotic; D(-)-α-Aminobenzylpenicillin sodium salt (Molecular Biology grade-required for plasmid selection). Formula: C<sub>16</sub>H<sub>18</sub>N<sub>3</sub>NaO<sub>4</sub>S; FW: 371.4. water soluble.</p>
<p><b>11. Rifampicin:</b> Antibiotic; Plant Cell Culture Tested); Formula: C<sub>43</sub>H<sub>58</sub>N<sub>4</sub>O<sub>12</sub>; MW: 822.9; Required for effective killing of bacteria.</p>
<p><b>12. Sucrose:</b> (Plant Cell Culture Tested), D(+)-Sucrose, 99+% pure, RNase, DNase free (FW=C<sub>12</sub> H<sub>22</sub>O<sub>11</sub>), Soluble in water @ 1970g/l ( at15°C).</p>
<p><b>13. MES:</b> 2-(N-Morpholino)ethanesulfonic Acid; Plant Cell Culture Tested, Formula: C<sub>6</sub>H<sub>13</sub>NO<sub>4</sub>S; FW:195.2; white crystalline powder; purity &gt; 98% , free acid, monohydrate crystalline, pKa = 6.15 at 25 °C.</p>
<p><b>14. Kinetin:</b> 6-Furfurylaminopurine; C<sub>10</sub>H<sub>9</sub>N<sub>5</sub>O,Plant Cell Culture Tested, White to</p>

Yellow Crystalline Powder, MW: 215.21
<b>15. BAP:</b> 6-BENZYLAMINOPURINE, C <sub>12</sub> H <sub>11</sub> N <sub>5</sub> ; Plant Cell Culture Tested, 98%, MW: 225.25; White to off white Powder.
<b>16. 2,4-D:</b> 2-4-Dichlorophenoxyacetic acid, C <sub>8</sub> H <sub>6</sub> Cl <sub>2</sub> O <sub>3</sub> ; Plant Cell Culture Tested, Purity 98%, Crystalline white to light yellow, MW:221.04;
<b>17. Tris-HCL (Tris hydrochloride):</b> Molecular Biology grade, (C <sub>4</sub> H <sub>11</sub> NO <sub>3</sub> -HCL) Mol. wt. 157.6 Purity 99% Nuclease Free, White Crystalline Powder, pH 7-9, pKa:8.1 (25°C), Storage: Room temperature, Heavy Metals ≤5 PPM.
<b>18. Phytigel ( or Gellan Gum or Gelrite):</b> Gelling agent, Plant Cell Culture tested Powder, Strength 550-850 g/cm <sup>2</sup> , Provide clear, colorless and high strength gel. Loss on drying ~ 15.0 %. Gel structure should support plant cells and microbial growth. Polysaccharide comprising glucuronic acid, rhamnose and glucose.
<b>19. DIG DNA Labeling and Detection kit (10-15 reactions kit)</b> Random primed DNA labeling with digoxigenin-dUTP, alkali-labile and chemiluminescence detection with CSPD, ready-to-use. DIG-labeled DNA probes should be generated with DIG-High Prime according to the random primed labeling technique. DIG-High Prime should develop reaction mixture containing digoxigenindUTP, alkali-labile and all reagents, including enzyme necessary for random primed labeling, premixed in an optimized 5 × concentrated reaction buffer. Should be used for all types of filter hybridization. Should be used for single copy gene detection in total genomic DNA, even from organisms with high complexity, e.g. human, barley, and wheat. DIG-labeled probes must be capable of hybridizing to membrane blotted nucleic acids and easily re-hybridize with a second DIG-labeled probe. The hybridized probes should be immunodetected with anti-digoxigenin-AP, and visualized with the chemiluminescence substrate CSPD. Hybridization solutions should be reused 3 – 5 times. DIG-labeled probes should be stored for at least one year.
<b>20. Gene Ruler 1Kb DNA Ladder</b> Ready to Use, premixed with 6x DNA loading dye; Conc. 0.5 ug/ul
<b>21. Gel Red (DNA Staining Dye, non carcinogenic, biologically safe and easy to handle)</b>
<b>22. Plant Genomic DNA purification kit</b> Required for rapid and high quality plant genomic DNA purification. The kit should utilize a silica based membrane technology in the form of a spin column. The purified DNA would be up to 50 kb in size. Purified DNA could be utilized for Southern PCR and other downstream applications.
<b>23. Glycogen (Highly pure, DNA/ RNA Free, Molecular Biology Grade. Conc. 20mg/ml aqueous solution. Required for precipitation of nucleic acids</b>
<b>24. Plant RNA Extraction Reagent</b> Required for isolation of high quality total RNA from plant tissues. The volume supplied should be sufficient for 200 reactions using 100mg tissues and give high yield. Reagent should contain b-mercaptoethanol and sodium azide. Isolated RNA must of high quality than can be used for Northern blot, cDNA synthesis and other applications.
<b>25. RNase (DNase Free)</b> RNase required for degradation of RNA. Conc. 10mg/ml, Applications in plasmid and genomic DNA purifications

<p><b>26. Salmon Sperm DNA</b> (Single stranded). Molecular Biology Grade. Conc. 10mg/ml; Use as blocking agent in Southern/Northern blot.</p>
<p><b>27. Trizol Reagent:</b> (DNA/RNA and Protein Extraction) Ready to use and suitable for isolating total RNA, genomic DNA and proteins from variety of tissues and cell types in single prep or in separate prep.</p>
<p><b>28. Low electroendosmosis agarose (LE Agarose)</b> <b>Specifications:</b> EEO (mr) <math>\leq 0.12</math>, Gelling Temp (1.5%) <math>35^{\circ}\text{C} \pm 1.5^{\circ}</math>, Melting Point <math>89^{\circ}\text{C} \pm 1.5^{\circ}</math>, Gel Strength (1%) <math>\geq 1800 \text{ gm/cm}^2</math>, Moisture <math>&lt; 6\%</math>, Sulfate <math>&lt; 0.2\%</math>, Ash <math>&lt; 0.2\%</math>; Powder stable at room temperature. <b>Quality Control:</b> Should not have nonspecific Endonuclease, Exonuclease or RNase activity. Must be suitable for <b>separation, elution and ligation of 100 bp to 30Kbp</b> DNA fragments.</p>

## List of Plant Tissue culture tested and Molecular Biology Grade Chemicals

Name of Item
<b>1. Isopropanol:</b> 2-Propanol, Isopropyl Alcohol, (CH <sub>3</sub> ) <sub>2</sub> CHOH, structural isomer of propanol (Molecular Biology Grade), Purity 99%
<b>2. Acetic Acid:</b> (Molecular Biology Grade), Purity 99%, (CH <sub>3</sub> COOH)
<b>3. Ammonium Acetate:</b> (Molecular Biology Grade) 98% Pure Dnase/Rnase Free (CH <sub>3</sub> COONH <sub>4</sub> ) FW 77.08
<b>4. Ammonium Nitrate:</b> (NH <sub>4</sub> NO <sub>3</sub> ) FW 80.04, Plant Tissue Culture Tested (PTCT) Ultra Pure, Purity 99%
<b>5. Ammonium Per Sulphate:</b> (Molecular Biology Grade) Min 98% purity level, (NH <sub>4</sub> ) <sub>2</sub> S <sub>2</sub> O <sub>8</sub> FW 228.2
<b>6. Ammonium Sulphate:</b> (NH <sub>4</sub> ) <sub>2</sub> SO <sub>4</sub> FW 132.14, Plant Tissue Culture Tested (PTCT), Purity 99%
<b>7. Ascorbic Acid:</b> (C <sub>15</sub> H <sub>20</sub> O <sub>4</sub> ) FW 264.32, Plant Tissue Culture Tested (PTCT), Min Purity 99%
<b>8. Boric Acid:</b> Formula (H <sub>3</sub> BO <sub>3</sub> ), FW 61.83, Plant Tissue Culture Tested (PTCT), Purity 99%
<b>9. Bromo Phenol Blue:</b> (Molecular Biology Grade), Formula (C <sub>19</sub> H <sub>10</sub> Br <sub>4</sub> O <sub>5</sub> S), FW 670.0
<b>10. Calcium Chloride Dihydrate:</b> CaCl <sub>2</sub> .2H <sub>2</sub> O FW 147.02 Plant Tissue Culture Tested (PTCT) Purity 99%
<b>11. Calcium Pantothenate:</b> (C <sub>18</sub> H <sub>32</sub> O <sub>10</sub> N <sub>2</sub> Ca) FW 476.54, Plant Tissue Culture Tested (PTCT) Purity 99%
<b>12. Carbenic disodium salt:</b> Carbenicillin (alpha-carboxybenzylpenicillin) is a synthetic penicillin derivative used as a selection agent for carbenicillin-resistant plasmids, (Molecular Biology Grade) C <sub>17</sub> H <sub>16</sub> N <sub>2</sub> O <sub>6</sub> SNa <sub>2</sub> , Mol Wt 422.4
<b>13. Casein Hydrolysate:</b> A preparation made from the milk protein casein, which is hydrolyzed to break it down into its constituent amino acids, Plant Tissue Culture Tested (PTCT) Purity 99%
<b>14. Chloroform:</b> (CHCl <sub>3</sub> ), Purity 99+%, Required for nucleic acid purification. FW 119.4
<b>15. Cobalt Chloride Hexahydrate:</b> (CoCl <sub>2</sub> .6H <sub>2</sub> O) FW 237.84, Plant Tissue Culture Tested (PTCT)
<b>16. CTAB Cetyl trimethyl ammonium bromide:</b> (Molecular Biology Grade) Purity 98% (C <sub>19</sub> H <sub>42</sub> BrN) FW 364.5, required for DNA Isolation.
<b>17. Cupper Sulphate Pentahydrate:</b> (CuSO <sub>4</sub> .5H <sub>2</sub> O) FW 249.68, Plant Tissue Culture Tested (PTCT)
<b>18. DEPC Diethylpyrocarbonate:</b> (Molecular Biology Grade), Formula O(COOC <sub>2</sub> H <sub>5</sub> ), Mol Wt 162.1, NMR Purity 97%
<b>19. Dextran Sulphate:</b> (MW > 500000), (C <sub>18</sub> H <sub>32</sub> O <sub>16</sub> ), H-Bond Donor 11, H-Bond Acceptor 16 (Molecular Biology Grade)
<b>20. Difco/Bactoagar:</b>

(Molecular Biology Grade) Clarity, 1.5%, Gelation Point (°C) 35°C, Melting Point (°C) 88°C
<b>21. DMSO Dimethyl sulfoxide:</b> Purity 99% (Molecular Biology Grade) (CH <sub>3</sub> ) <sub>2</sub> SO, Mol Wt 78.13
<b>22. EDTA Ethylenediamine-N,N-diacetic acid:</b> (Molecular Biology Grade) Purity 99% (C <sub>10</sub> H <sub>16</sub> N <sub>2</sub> O <sub>8</sub> ) FW 292.2
<b>23. Ethidium Bromide:</b> (Molecular Biology Grade) Purity 98% (C <sub>21</sub> H <sub>20</sub> N <sub>3</sub> Br) FW 394.3
<b>24. Fe-EDTA Ferrous Sulphate Chelate Sol</b> Contains 2.785 g/L FeSO <sub>4</sub> · 7H <sub>2</sub> O and 3.725g/L EDTA 2Na · 2H <sub>2</sub> O, sterile-filtered, 100 × concentration, plant cell culture tested.
<b>25. Ferrous Sulphate Heptahydrate:</b> Formula (FeSO <sub>4</sub> ·7H <sub>2</sub> O), FW 278.02, Plant Tissue Culture Tested (PTCT)
<b>26. Formamide:</b> (Molecular Biology Grade) Purity 99%, Formula (CH <sub>3</sub> NO) FW 45
<b>27. Glucose Anhydrous:</b> (Molecular Biology Grade) (C <sub>6</sub> H <sub>12</sub> O <sub>6</sub> ) FW 198.2 Purity 99%
<b>28. Glutamine 2,5 Diamino-5-Oxopentanoic Acid:</b> FW 146.14, Plant Tissue Culture Tested (PTCT), Purity 99%
<b>29. Glycerol:</b> (Molecular Biology Grade), Formula (C <sub>3</sub> H <sub>8</sub> O <sub>3</sub> ) FW 92.09 Purity 99%
<b>30. Glycine:</b> (MB Grade), Formula (C <sub>2</sub> H <sub>5</sub> NO <sub>2</sub> ) FW 75.07 Purity 99%
<b>31. IPTG Isopropyl β-D-1-thiogalactopyranoside:</b> (Molecular Biology Grade), Formula (C <sub>9</sub> H <sub>18</sub> O <sub>5</sub> S), FW 238.3 Purity 99%
<b>32. Isoamyl Alcohol:</b> (Molecular Biology Grade), Formula (C <sub>5</sub> H <sub>12</sub> O) FW 88.15 Purity 99%
<b>33. Kanamycine Monosulphate</b> (Molecular Biology Grade), Formula (C <sub>18</sub> H <sub>36</sub> N <sub>4</sub> O <sub>11</sub> ·H <sub>2</sub> SO <sub>4</sub> ) FW 582.6 Purity 99%
<b>34. Magnesium Chloride Hexahydrate:</b> (Molecular Biology Grade), Formula (MgCl <sub>2</sub> ·6H <sub>2</sub> O) FW 203.3 Purity 99%
<b>35. Magnesium Sulphate Anhydrous</b> (Molecular Biology Grade), Formula (MgSO <sub>4</sub> ) FW 120.4 Purity 99%
<b>36. Magnesium Sulphate Heptahydrate</b> (Molecular Biology Grade), Formula (MgSO <sub>4</sub> ·7H <sub>2</sub> O), FW 246.48, Plant Tissue Culture Tested (PTCT)
<b>37. Maltose Monohydrate:</b> (Molecular Biology Grade), Formula (C <sub>12</sub> H <sub>22</sub> O <sub>11</sub> ·H <sub>2</sub> O) FW 360.32, Plant Tissue Culture Tested (PTCT)
<b>38. Mercaptoethanol:</b> (Molecular Biology Grade), Formula (C <sub>2</sub> H <sub>6</sub> OS), FW 78.13
<b>39. MES 2-(N-Morpholino)ethanesulphonic Acid</b> (Molecular Biology Grade), Formula (C <sub>6</sub> H <sub>13</sub> NO <sub>4</sub> S), FW 195.2, Plant Tissue Culture Tested (PTCT)
<b>40. MOPS 3-(N-morpholino)propanesulfonic acid</b> (Molecular Biology Grade), Formula (C <sub>7</sub> H <sub>14</sub> NO <sub>4</sub> SNa) FW 231.2 Purity 99%
<b>41. MS Salt with vitamins:</b> Plant Tissue Culture Tested (PTCT), Purity 99%
<b>42. Myoinositol:</b> (Molecular Biology Grade), Formula (C <sub>8</sub> H <sub>12</sub> O <sub>6</sub> ) FW 180.16, Plant Tissue Culture Tested (PTCT)
<b>43. Nicotinic Acid:</b>

(Molecular Biology Grade), Formula (C <sub>6</sub> H <sub>5</sub> NO <sub>2</sub> ) FW 123.12 Plant Tissue Culture Tested (PTCT) Purity 99%
<b>44. Phenol chloroform:</b> (Molecular Biology Grade), ready to use with pH 7.00-7.8
<b>45. Polyvinylpyrrolidone PVP:</b> (Mol Wt 40000), Molecular Biology Grade, Plant Tissue Culture Tested (PTCT)
<b>46. Potassium Acetate:</b> (Molecular Biology Grade), Formula (CH <sub>3</sub> COOK) FW 98.14 Purity 99% Dnase/Rnase Free
<b>47. Potassium Chloride:</b> (Molecular Biology Grade), Formula (KCl) FW 74.55 Purity 99%
<b>48. Potassium Hydroxide</b> (Molecular Biology Grade), Formula (KOH) FW 56.11 Purity 85%
<b>49. Potassium Iodide:</b> (Molecular Biology Grade), Formula (KI) FW 166.00, Plant Tissue Culture Tested (PTCT)
<b>50. Potassium Nitrate:</b> (Molecular Biology Grade), Formula (KNO <sub>3</sub> ) FW 101.10, Plant Tissue Culture Tested (PTCT)
<b>51. Potassium Phosphate Monobasic:</b> (Molecular Biology Grade), Formula KH <sub>2</sub> PO <sub>4</sub> FW 136.09 Plant Tissue Culture Tested (PTCT)
<b>52. Protenase K:</b> (Molecular Biology Grade) Nuclease Free
<b>53. Pyridoxine-Hydrochloride:</b> (Molecular Biology Grade), Formula (C <sub>8</sub> H <sub>11</sub> NO <sub>3</sub> .HCL), FW 205.64, Plant Tissue Culture Tested (PTCT)
<b>54. Rifampicin:</b> (Molecular Biology Grade), Formula (C <sub>43</sub> H <sub>58</sub> N <sub>4</sub> O <sub>12</sub> ), FW 822.94, Plant Tissue Culture Tested (PTCT)
<b>55. Sodium Acetate:</b> (Molecular Biology Grade), Formula (CH <sub>3</sub> COONa) FW 82.03 Purity 99%
<b>56. Sodium Chloride:</b> (Molecular Biology Grade), Formula (NaCl), DNase, RNase, and protease
<b>57. Sodium Citrate:</b> (Molecular Biology Grade), Formula (C <sub>6</sub> H <sub>5</sub> O <sub>7</sub> Na <sub>3</sub> ·2H <sub>2</sub> O) Mol.Wt 294.1 Purity 99%
<b>58. Sodium Dodycyl Sulphate SDS</b> (Molecular Biology Grade), (Mol 288.38) Purity 99%
<b>59. Sodium Hydroxide Anhydrous</b> (Molecular Biology Grade), Formula (NaOH), FW 40 Purity 99%
<b>60. Sodium Molybdate:</b> (Molecular Biology Grade), Formula (Na <sub>2</sub> MoO <sub>4</sub> ·2H <sub>2</sub> O), FW 241.95, Plant Tissue Culture Tested (PTCT)
<b>61. Sodium Phosphate:</b> (Molecular Biology Grade), Formula (NaH <sub>2</sub> PO <sub>4</sub> ·H <sub>2</sub> O)FW 137.99, Purity 99%
<b>62. Spermidine</b> Formula (C <sub>7</sub> H <sub>19</sub> N <sub>3</sub> ) FW 145.25, Plant Tissue Culture Tested (PTCT)
<b>63. TEMED Tetramethylethylenediamine:</b> (Molecular Biology Grade), Formula C <sub>6</sub> H <sub>16</sub> N <sub>2</sub> ) Mol Wt 116.2 Purity 99%
<b>64. Tris-Base 2Amino-2hydroxymethyl-1,3propanediol:</b> (Molecular Biology Grade), Formula C <sub>4</sub> H <sub>11</sub> NO <sub>3</sub> FW 121.13, Purity 99%
<b>65. Tris-HCl (MB):</b>

Formula (C <sub>4</sub> H <sub>11</sub> NO <sub>3</sub> -HCL) Mol Wt 157.6 Purity 99% Nuclease Free
<b>66. Tryptone:</b> (Molecular Biology Grade), Powder is homogeneous, free-flowing and light beige to tan, pH 6.8 - 7.3
<b>67. Xgal 5bromo-4chloro-3indolyl-β-D-galactopyranoside:</b> (Molecular Biology Grade), Formula (C <sub>14</sub> H <sub>15</sub> BrClNO <sub>6</sub> ), FW 408.63, Plant Tissue Culture Tested (PTCT)
<b>68. X-Gluc, 5-Bromo-4-chloro-3-indolyl b-D-glucuronide:</b> (Molecular Biology Grade), C <sub>14</sub> H <sub>12</sub> BrClNO <sub>7</sub> Na FW 444.59 Purity 99%
<b>69. Yeast Extract:</b> (Molecular Biology Grade) Powder should be homogeneous, free-flowing, and light beige to tan.
<b>70. Zinc Sulphate Heptahydrate:</b> (Molecular Biology Grade), Formula ZnSO <sub>4</sub> .7H <sub>2</sub> O, FW 287.54, Plant Tissue Culture Tested (PTCT)
<b>71. Thiamine-Hydrochloride:</b> Molecular Biology Grade Formula (C <sub>12</sub> H <sub>17</sub> ClN <sub>4</sub> OS.HCL) FW 337.27 Plant Tissue Culture Tested (PTCT)

## List of Plasticware

Name of Item
<p><b>1. Parafilm Roll (4 inch x 125 ft)</b> It should stretch up to 200 % and cling (seal) around laboratory vessels on even and uneven surfaces. Made of disposable, non-toxic translucent material mainly polyolefins and paraffin waxes. Good gas and water permeability. It should withstand saline, alkaline and inorganic solutions for 48 hours. Withstand temperature from -45 °C to +45 °C</p>
<p><b>2. Falcon Tubes (50ml)</b> Approximate dimensions: 30 mm O. D.; 115 mm length, sterilized by gamma irradiation and non-pyrogenic, dark color printed graduations and white writing patch, high-density polyethylene flat-top screw cap to allows one hand manipulation, provides a level writing area. Modified polystyrene to improved stress resistance. The top of the cap must have a frosted writing surface for labeling. RNase and DNase free.</p>
<p><b>3. Beaker 2L, 1L, 500ml, 250ml,100ml</b> (Pyrex or equivalent) Autoclavable, capable of tolerating high temperature, pressure and corrosive chemicals.</p>
<p><b>4. Blue or White Tips (0.01ml-1ml)</b> Should accurately fit Gilson, Eppendorf and BioHit pipetman</p>
<p><b>5. Electroporator Cuvettes</b> Gap width 0.1cm and 0.2cm. Should fit BTX electroporator for bacterial transformations</p>
<p><b>6. Enzyme Storage Boxes</b> Requires for protection of enzymes and temperature sensitive reagents during transport and storage. Remain cool for 2-3 hours. Contain non-toxic cooling gel. 20 places polycarbonate block for 1.5 ml tubes, Temp-10 to -20 C. clear non-filled lid.</p>
<p><b>7. Face Mask:</b> To protect digestive and respiratory track for inhalation of corrosive materials</p>
<p><b>8. Falcon Tubes (15ml)</b> Sterilized, DNase, RNase Free Approximate dimensions: 16 mm O. D.; 115 mm length, sterilized by gamma irradiation and non-pyrogenic, dark color printed graduations and white writing patch, high-density polyethylene flat-top screw cap to allows one hand manipulation, provides a level writing area. Modified polystyrene to improved stress resistance. The top of the cap must have a frosted writing surface for labeling. RNase and DNase free</p>
<p><b>9. Falcon Tubes (50ml)</b> Sterilized, DNase, RNase Free Approximate dimensions: 30 mm O. D.; 115 mm length, sterilized by gamma irradiation and non-pyrogenic, dark color printed graduations and white writing patch, high-density polyethylene flat-top screw cap to allows one hand manipulation, provides a level writing area. Modified polystyrene to improved stress resistance. The top of the cap must have a frosted writing surface for labeling. RNase and DNase free</p>
<p><b>10. Conical Flasks</b></p>

1L, 2L, 500ml, 250 ml (Pyrex or equivalent)
<b>11. Measuring Cylinders: 2L, 1L, 500ml, 250ml, 100ml</b> Transparent Plastic with legible measuring points, autoclavable.
<b>12. Parafilm Roll 4"X125Ft</b> It should stretch up to 200 % and cling (seal) around laboratory vessels on even and uneven surfaces. Made of disposable, non-toxic translucent material mainly polyolefins and paraffin waxes. Good gas and water permeability. It should withstand saline, alkaline and inorganic solutions for 48 hours. Withstand temperature from -45°C to +45 °C
<b>13. Strips of eight PCR Tubes (0.2ml)</b> Thin walled, DNase/RNase Freee, Temp Range -4°C to 121°C with cap strips
<b>14. Disposable and sterile plastic petriplates</b> Disposable and sterile plastic petriplates for plant tissue culture, size 90-100mm (dia) and 15-16mm deep, ; 20 per pack. Quantity 2,000 plates
<b>15. Storage Boxes:</b> Plastic with lid/cap for 1.6ml eppendorf tubes Polycarbonate boxes with 80-100 places for 1.5 ml tubes for storage in freezer.
<b>16. Storage Racks:</b> Made of steel or any other metallic material to keep in order storage boxes of 1.6ml eppendorf storage boxes with handle on the top. Height 18-20 inches that can hold 9-10 boxes of 2"H.
<b>17. Filtered Tips.</b> Pre Sterlized, Cap .1µl-10µl should accurately fit Gilson, Eppendorf and BioHit pipetman
<b>18. Dewar container for liquid nitrogen</b> Temp Range -196 to 100C with and handle; Capacity 4L; Dimension; 287X146mm
<b>19. Syringe Filter 0.2µm pore, diameter 33mm.</b> Required for filter sterilization of antibiotics and other heat labile chemicals. Membrane made of Polyvenylidene fluoride (PVDF), sterile, single packed.
<b>20. Sterile Filtration System</b> Capacity 250ml, Accepts 47mm filters, Autoclaveable.

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## List of Equipments approved by SSC dated July 28, 2010

### 1) Specifications for Electrical Conductivity Meter

#### Description

Probe:	Conductivity probe with 1 meter cable and built in temperature sensor
Size:	164mm x 76mm x 45mm
Battery Power:	9 V (DC)
Conductivity range:	0.0 to 199.00 uS/cm = (0.0 to 19.99 mS/cm) = 0.0 to 19.99 dS/m
Accuracy:	1% full scale
Temperature:	0-40 °C with built in temperature sensor, adjustable temperature coefficient 0-2.5% per °C.
Display type:	LCD display

#### Accessories:

Dust cover  
Calibration solutions: Two (500 ml each)

### 2) Specifications for Laminar Flow Cabinet

#### Description

Horizontal Laminar Flow Cabinet to provide class 100 or better environment  
Locally fabricated 6 Ft Cabinet  
External Dimension: W (70-80) x H (50-60) x D (25-30) inches Approx.  
Internal Dimension: W (75-75) x H (20-25) x D (20-25) inches Approx.  
External Construction: Oven baked epoxy painted steel body

#### Fitted With:

HEPA Filter efficiency: 99.99 % @ 0.3 micron  
Washable synthetic pre-filter dust holding capacity: 90%  
Fitted with stainless steel working surface  
Front cover-removable/foldable (steel or fine Perspex) for protection from UV and dust  
Fluorescent light and UV-germicidal light  
Inlets for water and Gas (2 sets, one on each side)  
Two electric receptacles to work with equipment  
Blower capable to maintain 0.45 m/s face velocity +/- 20 %.  
Variable speed control  
Main structure fitted on an iron stand  
Motor: 1/3 HP single phase, low noise  
Power requirement: 220v, 50 Hz

#### Accessories:

Two additional fluorescent light rods and two UV-germicidal light rods.  
One set of fine quality pre-filter (dust holder)  
Two HEPA Filters efficiency: 99.99 % @ 0.3 micron (size: 3 x 2 feet each)  
One Motor: 1/3 HP single phase, low noise

### 3) Specifications for Power supply for horizontal gel electrophoresis unites:

#### 1. Power Supply:

Power supply required for horizontal and vertical gel electrophoresis.

Output Terminals:	4-pairs
Display:	LED screen with 3 digits
Output Voltage:	10-400 V
Voltage Accuracy:	± 2% of reading or 3 volts
Output Current:	4-450 mA
Current Accuracy:	± 2% of reading or 3 mA, whichever is more
Power:	60-100 W.
Readout Stability:	Volts ±1 V, Current ± 1 mA
Power cord:	Included
On power failure:	Detection and resumption.
Timer control:	0 to 999 minutes
Pause and resume:	Yes
Input power:	220-240V, 50Hz
Operating Temperature:	0-40°C
Humidity:	0-95%
Dimensions:	24-26 cm (L) x 20-22 cm (W) x 8-9 cm (H)
Weight range:	1-1.5 kg
Safety features:	Overload, overvoltage and short circuit detection and protection
Warranty:	1-2 years
Make:	USA, Canada, Europe or Japan

### 4) Specifications for Freezer -20 °C and accessories

#### Description

Temperature Range:	-18 to -25 °C
Storage capacity:	18-25 cubic foot (500-600 Liters)
Dimensions:	(H x W x D) 1500 to 1700mm x 600 to 700mm x 800 to 900mm
Refrigerant:	134a CFC free
Voltage:	220-240; 50Hz
Body:	Metallic body
Type:	Chest
Door:	Double
Net weight:	80 to 100 kg

#### Accessories:

Voltage Stabilizer	One (2000Watt)
Vertical Racks:	15 Nos. metallic racks (Stainless steel) Rack size: (H x W x D) 24 x 6 x 6 inches (Column type) for storage of plastic boxes of size: (H x W x D) 5 x 5 x 2 inches

## 5) Specifications for Pipettman (Set of 4)

- Volume Range: (Nos)
 

1.	0.5-10 $\mu$ l	one
2.	2 -20 $\mu$ l	one
3.	10 -100 $\mu$ l	one
4.	100 – 1000 $\mu$ l	one
- Precision volume adjustment
- Tip Ejection system
- Made of highly resistant material
- Lower part autoclave able
- Make: USA, Europe or Japan
- Warranty: 2-3 years
- Acceptable accuracy and error at 20-30 °C
- **Specifications standards of Pipettman**

Sr. No.	Accuracy	Permissible Error
Pipettman II Volume (0.5 $\mu$ l-10 $\mu$ l)	Min. $\pm$ 4.0 Max. $\pm$ 0.5	Min. $\pm$ 0.025 Max. $\pm$ 0.100
Pipettman III Volume (2 $\mu$ l-20 $\mu$ l)	Min. $\pm$ 4.0 Max. $\pm$ 0.8	Min. $\pm$ 0.10 Max. $\pm$ 0.20
Pipettman I V Volume ( 10 $\mu$ l-100 $\mu$ l)	Min. $\pm$ 1.6 Max. $\pm$ 0.8	Min. $\pm$ 0.35 Max. $\pm$ 0.80
Pipettman VI Volume ( 100 $\mu$ l-1000 $\mu$ l)	Min. $\pm$ 0.9 Max. $\pm$ 0.6	Min. $\pm$ 0.6 Max. $\pm$ 1.5

## 6) Specifications for Single Distillation Still Water Unit

Capacity: 4 liters per hour  
 Heater: Quartz  
 Wattage: 2 x 1.5 KW  
 Water supply pressure: Minimum 5 psi  
 Distillation conductivity: Less than 2.5  $\mu$ s/cm, pH range: 5.5-6.5, Resistance 0.4 MOhm $\times$ cm

Evaporator and Condenser made of borosilicate glass

Protected by safety features and thermostatically shut-off function

Electrics connection: 220-240 V; 50 Hz; Single phase

Manufactred: USA, Europe or Japan

**Required accessory:** Heating Rod: 4 Nos

**7) Specifications of PCR Machine:**

Number of wells:	96 well; Aluminum or alloy block for efficient heat transfer.
Tube capacity:	0.2 ml (volume: 10-80 $\mu$ l)
Temperature range:	04-99 $^{\circ}$ C
Thermal Accuracy:	$\pm$ 0.2 to 0.3 $^{\circ}$ C
Thermal uniformity:	$\pm$ 0.4 $^{\circ}$ C well to well within 10 sec of arrival at 90 $^{\circ}$ C.
Thermal Ramping:	Average ramp rate 2.5 to 4.0 $^{\circ}$ C
Voltage:	220-240 VAC; 50-60 Hz single phase
Heated lid:	110-115 $^{\circ}$ C
Display:	Wide Digital LCD display for clear visualization. The minimum display area should be 6-7cm high and 12-14cm wide.
Touch Button system but not touch pad	
Auto-start on power failure	
Auto-adjusting top lid heating plate	
Capable of storing 80-400 programs	
USB port for data transfer	
Warranty:	2-3 years, licensed and authorized for PCR
Manufactured in:	USA, Canada, Europe or Japan

**8) Specifications for Ultra Low Temperature Freezer (-80  $^{\circ}$ C).**

## Specifications:

Capacity:	320 - 500 Liters
Temperature Range:	-40 / -86 $^{\circ}$ C
Temperature control:	Microprocessor control, digital LED display and keyboard control panel.
Lock and key:	Door handles/Latch with lock
Alarm:	Multifunction high and low temp battery back-up alarm system
Voltage:	220-240 V; 50 (60) Hz (single phase)
Number of shelves:	2-3
Outer Door:	1 - metallic
Inner Doors:	3-4
Compressor;	Two air cooled compressors
Gas Refrigerant:	R404A or R407D/R 508, CFC free
Pre-filter:	Washable pre-filter for protection of condenser fins against dust build-up
Body:	Stainless Steel interior and powder coated steel finish outer.
Make:	USA, Europe or Japan only
Warranty:	2-3 years

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**9) Computer and printer for PARB project**

Processor: Intel Dual Core 2.93 GHz  
Mother Board: Intel DG41 RQ  
RAM: Kingston DDRII, 2.0GB  
Hard Disk: Western Digital, 500GB, 7200RPM, SATA  
CD/DVD Rom: Super Driver  
LAN Card: D-Link Wireless  
Casing: BTX Tower, 400 Watt Power Supply  
Key Board + Mouse: Standard PS2  
Monitor: LCD 19”  
Printer: Laserjet 3 in1 (Printer, Photocopier and Scanner)  
UPS: 600VA, Solid cell batteries, 30 min backup time.

Dr. Aftab Bashir, P.S. (convener SSC): \_\_\_\_\_

Dr. Zahid Mukhtar, P.S. (member SSC): \_\_\_\_\_

Dr. Shaheen Asad, P.S. (member SSC): \_\_\_\_\_

Dr. Naseer A. Saeed, P.S. (member SSC): \_\_\_\_\_

Dr. M. Arif, P.S. (member SSC): \_\_\_\_\_