<table>
<thead>
<tr>
<th>Chapter 4</th>
<th>Phytochemical evaluation, antioxidant activity and HPTLC studies</th>
</tr>
</thead>
<tbody>
<tr>
<td>Figure 4.1</td>
<td>HPTLC analysis of MUM/fractions with lupeol and β-sitosterol as standards 45</td>
</tr>
<tr>
<td>Figure 4.2</td>
<td>HPTLC analysis of NJM/fractions with lupeol and β-sitosterol as standards 46</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Chapter 5</th>
<th>Bioactivity-guided fractionation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Figure 5.1a</td>
<td>Partitioning scheme of methanol extract of <em>Memecylon umbellatum</em> (MUM) 53</td>
</tr>
<tr>
<td>Figure 5.2a</td>
<td>HPTLC chromatogram for MU extract and fractions 54</td>
</tr>
<tr>
<td>Figure 5.3a</td>
<td>Column chromatography of the active fraction MUEA 58</td>
</tr>
<tr>
<td>Figure 5.4a</td>
<td>HPTLC fingerprint for sub-fractions F3-F6 59</td>
</tr>
<tr>
<td>Figure 5.5a</td>
<td>HPTLC fingerprint for sub-fractions F6-F11 60</td>
</tr>
<tr>
<td>Figure 5.6a</td>
<td>Pooling of column sub-fractions 61</td>
</tr>
<tr>
<td>Figure 5.7a</td>
<td>Column chromatography of the active fraction MUEA/C1/F7/40/60 65</td>
</tr>
<tr>
<td>Figure 5.7-1a</td>
<td>Column chromatography of the active fraction MUEA/C2/F15/70/30 68</td>
</tr>
<tr>
<td>Figure 5.8a</td>
<td>GC-MS analysis of MU2 71</td>
</tr>
<tr>
<td>Figure 5.9a</td>
<td>Mass spectra of MU2 71</td>
</tr>
<tr>
<td>Figure 5.10a</td>
<td>FTIR spectra of MU2 72</td>
</tr>
<tr>
<td>Figure 5.11a</td>
<td>$^1$H-NMR spectra of MU2 71</td>
</tr>
<tr>
<td>Figure 5.12a</td>
<td>$^{13}$C-NMR spectra of MU2 73</td>
</tr>
<tr>
<td>Figure 5.13a</td>
<td>Mass spectra of MU3 74</td>
</tr>
<tr>
<td>Figure 5.14a</td>
<td>FTIR of MU3 74</td>
</tr>
<tr>
<td>Figure 5.15a</td>
<td>$^1$H-NMR of MU3 75</td>
</tr>
<tr>
<td>Figure 5.16a</td>
<td>$^{13}$C-NMR of MU3 75</td>
</tr>
<tr>
<td>Figure 5.17a</td>
<td>Mass spectra of compound MU4 77</td>
</tr>
<tr>
<td>Figure 5.18a</td>
<td>FTIR spectra of MU4 77</td>
</tr>
<tr>
<td>Figure 5.19a</td>
<td>$^1$H-NMR of MU4 78</td>
</tr>
<tr>
<td>Figure 5.20a</td>
<td>$^{13}$C-NMR of MU4 78</td>
</tr>
<tr>
<td>Figure 5.21a</td>
<td>HPTLC quantification of active compounds, pyrogallol, quercetin, and gallic acid in MUEA and active MUEA/C2/F15/70/30 sub-fraction 81</td>
</tr>
<tr>
<td>Figure</td>
<td>Description</td>
</tr>
<tr>
<td>--------</td>
<td>-----------------------------------------------------------------------------</td>
</tr>
<tr>
<td>5.1b</td>
<td>Partitioning scheme of methanol extract of <em>Nardostachys jatamansi</em> (NJM)</td>
</tr>
<tr>
<td>5.2b</td>
<td>HPTLC chromatogram for NJ extract and fractions</td>
</tr>
<tr>
<td>5.3b</td>
<td>Column chromatography of the active fraction NJDE (I)</td>
</tr>
<tr>
<td>5.4b</td>
<td>HPTLC fingerprint for sub-fractions F1-F7</td>
</tr>
<tr>
<td>5.5b</td>
<td>HPTLC fingerprint for column (I) sub-fractions F6-F14</td>
</tr>
<tr>
<td>5.6b</td>
<td>HPTLC fingerprint for column (I) sub-fractions F14-F19</td>
</tr>
<tr>
<td>5.7b</td>
<td>Pooling of column sub-fractions</td>
</tr>
<tr>
<td>5.8b</td>
<td>Column chromatography of the active fraction NJDE/C1/F2/95/5</td>
</tr>
<tr>
<td>5.9b</td>
<td>Mass spectra of NJ1</td>
</tr>
<tr>
<td>5.10b</td>
<td>FTIR spectra of NJ1</td>
</tr>
<tr>
<td>5.11b</td>
<td>$^1$H-NMR of NJ1 (I)</td>
</tr>
<tr>
<td>5.12b</td>
<td>$^1$H-NMR of NJ1 (II)</td>
</tr>
<tr>
<td>5.13b</td>
<td>$^1$H-NMR of NJ1 (III)</td>
</tr>
<tr>
<td>5.14b</td>
<td>$^{13}$C-NMR of NJ1</td>
</tr>
<tr>
<td>5.15b</td>
<td>GC-MS analysis of NJDE/F2/C2/99/1</td>
</tr>
<tr>
<td>5.16b.1</td>
<td>Patchouli alcohol</td>
</tr>
<tr>
<td>5.16b.2</td>
<td>Globulol</td>
</tr>
<tr>
<td>5.16b.3</td>
<td>Spathulenol</td>
</tr>
<tr>
<td>5.16b.4</td>
<td>Juniper Camphor</td>
</tr>
<tr>
<td>5.16b.5</td>
<td>Valeric acid, 2,6-dimethylnon-1-en-3-yn-5-yl ester</td>
</tr>
</tbody>
</table>

**Chapter 6  In vivo anticancer activity**

<table>
<thead>
<tr>
<th>Figure</th>
<th>Description</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>6.1</td>
<td>Effect of treatments on tumor growth</td>
<td>118</td>
</tr>
<tr>
<td>Figure</td>
<td>Description</td>
<td>Page</td>
</tr>
<tr>
<td>--------</td>
<td>-----------------------------------------------------------------------------</td>
<td>------</td>
</tr>
<tr>
<td>6.2</td>
<td>Effect of treatments on tumor weight</td>
<td>118</td>
</tr>
<tr>
<td>6.3</td>
<td>Effect of treatments on hematological parameters in Sprague Dawley rats.</td>
<td>119</td>
</tr>
<tr>
<td>6.4</td>
<td>Effect of treatments on serum biochemical parameters</td>
<td>120</td>
</tr>
<tr>
<td>6.5</td>
<td>Effect of treatment on serum elements</td>
<td>121</td>
</tr>
<tr>
<td>6.6</td>
<td>Organ Index</td>
<td>122</td>
</tr>
<tr>
<td>6.7</td>
<td>Effect of treatments on liver antioxidant enzymes</td>
<td>123</td>
</tr>
<tr>
<td>6.8</td>
<td>Effect of treatments on mammary tissue antioxidant enzymes</td>
<td>124</td>
</tr>
<tr>
<td>6.9</td>
<td>Effect of treatments on DNA fragmentation in breast tumor</td>
<td>125</td>
</tr>
<tr>
<td>6.10</td>
<td>Histopathology (hematoxylin and eosin staining) of breast tumor (40X)</td>
<td>126</td>
</tr>
<tr>
<td>6.11</td>
<td>Whole mount of breast tissue (carmine alum staining)</td>
<td>127</td>
</tr>
<tr>
<td>6.12</td>
<td>Effect of treatments on heart tissue (40X)</td>
<td>128</td>
</tr>
<tr>
<td>6.13</td>
<td>Tumor growth inhibition in MDA-MB-231Br Xenograft</td>
<td>130</td>
</tr>
</tbody>
</table>

**Chapter 7**  
**Mechanistic evaluation of selected sub-fractions/compounds**

<table>
<thead>
<tr>
<th>Figure</th>
<th>Description</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>7.1</td>
<td>NJM/fractions induce cell cycle arrest in MDA-MB-231 cells analyzed by flow cytometry.</td>
<td>137</td>
</tr>
<tr>
<td>7.2</td>
<td>NJDE fraction/sub-fraction/nardin induce cell cycle arrest in HCT-116 cells analyzed by flow cytometry.</td>
<td>138</td>
</tr>
<tr>
<td>7.3</td>
<td>MUEA fraction/sub-fractions/isolated compounds induce cell cycle arrest in HCT-116 cells analyzed by flow cytometry.</td>
<td>139</td>
</tr>
<tr>
<td>7.4</td>
<td>MUEA sub-fraction/isolated compounds induce cell cycle arrest in MCF-7 cells analyzed by flow cytometry.</td>
<td>140</td>
</tr>
<tr>
<td>7.5</td>
<td>NJDE fraction/sub-fraction induce cell cycle arrest in MCF-7 cells analyzed by flow cytometry.</td>
<td>141</td>
</tr>
<tr>
<td>7.6</td>
<td>NJM/fractions induce apoptosis in MDA-MB-231 cells by Hoechst 33258 staining.</td>
<td>143</td>
</tr>
<tr>
<td>7.7</td>
<td>NJM/fractions induce apoptosis in MCF-7 cells by AO/EB staining.</td>
<td>144</td>
</tr>
<tr>
<td>7.8</td>
<td>MUEA/fractions induce apoptosis in MCF-7 cells by AO/EB staining.</td>
<td>145</td>
</tr>
<tr>
<td>7.9</td>
<td>NJM/fractions reduce clonogenic capacity of MDA-MB-231 cells.</td>
<td>146</td>
</tr>
<tr>
<td>7.10</td>
<td>Effect of treatments on cell viability of MDA-MB-231Br cells by CellTiter-Glo® Luminescent Cell assay.</td>
<td>147</td>
</tr>
<tr>
<td>7.11</td>
<td>Effect of treatments on fold expression of Caspase 3/7 in MDA-MB-231Br cells by CellTiter-Glo® Luminescent Cell assay.</td>
<td>148</td>
</tr>
</tbody>
</table>