<table>
<thead>
<tr>
<th>Research</th>
<th>Classification</th>
<th>Minimum Required Biosafety Level</th>
<th>Example Activity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cloning of insert genes from Risk Group 2 agents (including mammals)</td>
<td>III-D-2a</td>
<td>1</td>
<td>Cloning into Risk Group 1 strains of <em>E. coli</em> (K12, DH5alpha, BL21, and TOP10) or <em>S. cerevisiae</em></td>
</tr>
<tr>
<td>into bacteria and yeasts</td>
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<tr>
<td>Cloning of insert genes from Risk Group 2 (including mammals), 3 or 4</td>
<td>III-D-2a</td>
<td>2</td>
<td>Transflecting plasmids into cultured mammalian or insect cells</td>
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<td>agents into mammalian or insect cells</td>
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<tr>
<td>Cloning into viral vectors not requiring a helper virus</td>
<td>III-D-1a and either III-D-2a (in</td>
<td>2</td>
<td>Cloning into Retroviral or Adenoviral vectors (classified as III-D-1a) and either</td>
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<tr>
<td></td>
<td>vitro) or III-D-4 (in vivo)</td>
<td></td>
<td>- <em>In vitro</em> infection of cell lines (classified as III-D-2a)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>- <em>In vivo</em> infection of animals (classified as III-D-4)</td>
</tr>
<tr>
<td>Cloning into viral vectors requiring a helper virus</td>
<td>III-D-3a and either III-D-2a (in</td>
<td>2</td>
<td>Cloning into Adeno-Associated Viral vectors (classified as III-D-3a) and either</td>
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<tr>
<td></td>
<td>vitro) or III-D-4 (in vivo)</td>
<td></td>
<td>- <em>In vitro</em> infection of cell lines (classified as III-D-2a)</td>
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<tr>
<td></td>
<td></td>
<td></td>
<td>- <em>In vivo</em> infection of animals (classified as III-D-4)</td>
</tr>
<tr>
<td>Administering recombinant DNA or cells modified with recombinant DNA</td>
<td>III-D-4</td>
<td>2</td>
<td>Gene transfer into animals using plasmids or viral vectors</td>
</tr>
<tr>
<td>into animals</td>
<td></td>
<td></td>
<td>Transfer of cells or organisms (including viral vectors) modified with recombinant DNA into animals</td>
</tr>
<tr>
<td>Activity</td>
<td>Section</td>
<td>Level</td>
<td>Description</td>
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<td>------------------------------------------------------------------------</td>
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<tr>
<td>Using, creating or purchasing genetically modified animals</td>
<td>III-D-4c</td>
<td>1</td>
<td>Includes knockout or transgenic animals. Note: Animals treated with viral vectors must be classified as D4, requiring BSL2 containment.</td>
</tr>
<tr>
<td>Administering recombinant DNA into humans</td>
<td>III-C-1</td>
<td>2</td>
<td>Cloning into plants</td>
</tr>
<tr>
<td>Propagating cultures modified with recombinant DNA with volumes exceeding 10 liters</td>
<td>III-D-6</td>
<td>2</td>
<td>Industrial scale protein expression experiments</td>
</tr>
<tr>
<td>Administering recombinant DNA into humans</td>
<td>III-C-1</td>
<td>2</td>
<td>Human gene transfer or gene therapy</td>
</tr>
<tr>
<td>Cloning of biological toxins</td>
<td>III-B-1</td>
<td>2</td>
<td>Cloning of biological toxins into bacteria for protein expression</td>
</tr>
<tr>
<td>Transferring drug resistance into Risk Group 2, 3, or 4 microorganisms that do not acquire it naturally</td>
<td>III-A-1a</td>
<td>2</td>
<td>Providing antibiotic resistance to pathogenic microorganisms that would impair medical intervention in the event of infection.</td>
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</tbody>
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