Tricia Jones  
University of Delaware

Florence Malinowski, MS  
St. Georges High School

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**Biotechnology at St. Georges**

Mission: To enlighten the minds of young scientists today, to ensure the miracles of tomorrow.

Students are trained in:

- Laboratory Safety
- Solution Preparation
- Inventory
- General Laboratory Maintenance
- Standard Biological
Proficiency in aseptic techniques is essential for avoiding contamination in the laboratory.
Teaching and Assessment of Aseptic Techniques

- Initial instruction
- Self-assessment (developed by Mary Boggs)
- Address problem areas
- PRACTICE!
- Lab practical
- Assess remaining problem areas and re-teach
# Rubric for assessing sterile technique

<table>
<thead>
<tr>
<th></th>
<th>Poor = 0</th>
<th>Fair = 1</th>
<th>Good = 2</th>
<th>Excellent = 3</th>
<th>Score</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Safety Equipment</strong></td>
<td>Student is not wearing lab coat or safety glasses. Gloves are not worn in the hood, jewelry is left on.</td>
<td>Gloves are worn, but other safety equipment (lab coat and safety glasses) are not.</td>
<td>Most safety equipment is worn, with one minor exception (i.e. bracelets, watches not removed before working in the hood).</td>
<td>Student is wearing gloves, safety glasses, and lab coat. All jewelry (watches, bracelets) is removed from arms.</td>
<td></td>
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<tr>
<td><strong>Prep / Clean-up of hood</strong></td>
<td>Student does not spray the hood with ethanol before use and does not turn on the UV light after use. Blower is not used.</td>
<td>Student attempts to properly prepare and clean up the hood but forgets important details (such as: use of the blower)</td>
<td>Prep / clean-up of the hood are done properly with only minor exceptions.</td>
<td>Hood sprayed liberally with 70% ethanol and wiped down before and after usage. Blower is on during hood use. UV light is turned on when finished.</td>
<td></td>
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<tr>
<td><strong>Pipet technique</strong></td>
<td>Student does not demonstrate knowledge of proper pipet technique.</td>
<td>Student demonstrates weak knowledge of pipet technique, does not change tip between solutions.</td>
<td>Student demonstrates good knowledge of pipet technique, with only few minor mistakes.</td>
<td>Student uses proper pipetting technique and changes pipet tip whenever using a new solution.</td>
<td></td>
</tr>
<tr>
<td><strong>Sterile techniques</strong></td>
<td>Student does not demonstrate knowledge of aseptic techniques. Student is unable to maintain sterility of materials inside the hood.</td>
<td>Student demonstrates familiarity with sterile technique but makes many mistakes, such as forgetting to spray hands with 70% EtOH when they are removed from the hood or working too closely to the front of the hood.</td>
<td>Student demonstrates good knowledge of aseptic techniques, with only few minor mistakes (such as leaving a cap face up in the hood)</td>
<td>Hands are sprayed with 70% EtOH whenever they leave the hood; caps face down in hood; pipets are discarded if there is a chance of contamination; sterile work is not done too closely to the front of the hood.</td>
<td></td>
</tr>
<tr>
<td><strong>Procedure</strong></td>
<td>Student does not follow the procedure closely and makes many mistakes. There is a great likelihood of contamination.</td>
<td>Student attempts to follow the procedure but makes many critical mistakes (such as pipetting into the wrong beaker, etc.)</td>
<td>The lab procedure was followed closely with only minor problems that would not significantly affect the outcome of the experiment.</td>
<td>The lab procedure was followed without mistakes and there is little likelihood of contamination. All materials are carefully labeled.</td>
<td></td>
</tr>
</tbody>
</table>
Learning about proteins: Constructing a polypeptide

Gly - Leu - Val - Ser
How I’ve benefited from the GK-12 program:

I’ve learned to...

- Communicate complex science principles to the appropriate grade level
- Develop classroom materials to enhance student learning
- Assess student learning using formative assessment techniques

I’ve enjoyed...

- Working as a team with Florence to establish and enhance the biotechnology curriculum
- Interacting with the students
Acknowledgments

• Florence Malinowski, MS
• Dr. Randy Duncan
• GK-12 project leaders, teachers, and fellows
• St. Georges Technical High School
• NSF