### 1. RECORD OF ANIMAL USAGE:

<table>
<thead>
<tr>
<th>Animal Species</th>
<th>Total # Approved</th>
<th># Used this FY</th>
<th>Total # Used to Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rattus norvegicus</td>
<td>51</td>
<td>40</td>
<td>40</td>
</tr>
</tbody>
</table>

### 2. PROTOCOL TYPE / CHARACTERISTICS: (Check all applicable terms in EACH column)

- Training: Live Animal
- Training: non-Live Animal
- Research: Survival (chronic)
- X Research: non-Survival (acute)
- Other (
- Medical Readiness
- Health Promotion
- Prevention
- Utilization Mgt.
- Other (Treatment )
- Prolonged Restraint
- Multiple Survival Surgery
- Behavioral Study
- Biohazard

### 3. PROTOCOL PAIN CATEGORY (USDA): (Check applicable)  

- C
- _X_ D
- E

### 4. PROTOCOL STATUS:

*Request Protocol Closure:*

- Inactive, protocol never initiated
- Inactive, protocol initiated but has not/will not be completed
- _X_ Completed, all approved procedures/animal uses have been completed

### 5. Previous Amendments:

List all amendments made to the protocol.  IF none occurred, state NONE. **Do not use N/A.**

**For the Entire Study Chronologically**

<table>
<thead>
<tr>
<th>Amendment Number</th>
<th>Date of Approval</th>
<th>Summary of the Change</th>
</tr>
</thead>
<tbody>
<tr>
<td>None</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
6. **FUNDING STATUS:** Funding allocated: $12,254
   Funds remaining: $ 0

7. **PROTOCOL PERSONNEL CHANGES:**

   Have there been any personnel/staffing changes (PI/CII/II/II/IC/II) since the last IACUC approval of protocol,
   or annual review?  
   
   ____ Yes   ___X_ No

   If yes, complete the following sections (Additions/Deletions). For additions, indicate whether or not the IACUC has
   approved this addition.

   **ADDITIONS:** (Include Name, Protocol function - PI/CII/II/II/IC/II, IACUC approval - Yes/No)

   **DELETIONS:** (Include Name, Protocol function - PI/CII/II/II/IC/II, Effective date of deletion)

8. **PROBLEMS / ADVERSE EVENTS:** Identify any problems or adverse events that have affected study
   progress. Itemize adverse events that have led to unanticipated animal illness, distress, injury, or death; and
   indicate whether or not these events were reported to the IACUC.

   No problems or adverse events were identified.

9. **REDUCTION, REFINEMENT, OR REPLACEMENT OF ANIMAL USE:**

   **REPLACEMENT (ALTERNATIVES):** Since the last IACUC approval, have alternatives to animal use become
   available that could be substituted in this protocol without adversely affecting study or training objectives?

   No.

   **REFINEMENT:** Since the last IACUC approval, have any study refinements been implemented to reduce the
   degree of pain or distress experienced by study animals, or have animals of lower phylogenetic status or sentence
   been identified as potential study/training models in this protocol?

   No.

   **REDUCTION:** Since the last IACUC approval, have any methods been identified to reduce the number of live
   animals used in this protocol?

   Our pilot study used less than the allotted number of rats.

10. **PUBLICATIONS / PRESENTATIONS:** (List any scientific publications and/or presentations that have
    resulted from this protocol. Include pending/scheduled publications or presentations).

    Currently, the DGMC Research Symposium.

11. **Were the protocol objectives met, and how will the outcome or training benefit the DoD/USAF?**
    
    Yes. The outcome will hopefully further delineate whether the use of surgical loupes or surgical microscope will
    result in improved wound closure.

12. **PROTOCOL OUTCOME SUMMARY:** (Please provide, in "ABSTRACT" format, a summary of the protocol
    objectives, materials and methods, results - include tables/figures, and conclusions/applications.)

    Obtaining a cosmetically acceptable scar depends on various factors such as wound tension, alignment of the
    wound edges, and proper wound eversion. Suture size and strength also play an important role in wound healing
    and have been studied widely. However, no studies exist which examine the effects of closure method on scar
    formation. Our purpose in this study was to compare the cosmetic outcome, healing and strength of linear incisions
    in rats after repair with naked eye, surgical loupes or a surgical microscope. We surgically created two, parallel, 3
    cm long linear incisions on the dorsal skin of male Sprague Dawley rats (n=36) and randomized the incisions into
    four groups. A single surgeon repaired the incisions with the naked eye in group I, surgical loupes in group II,
microscope in group III using 5/0 monocril, and with microscope in group IV using 6/0 monocril. Wound strength was measured using a published method. A harvested incision was suspended with forceps and water was slowly added to a freely suspended container until any tears of the incision occurred. The force necessary to achieve dehiscence was recorded. Wound healing was evaluated histologically using published methods to examine vascularization, fibroblast proliferation, inflammation and epithelialization. Statistical analysis between groups using ANOVA testing was performed and significance was defined as \( p < 0.05 \). Initial results were not significant for wound tensile strength, vascularity, fibroblast proliferation, inflammatory cells or epithelialization between all groups at 1, 3 and 6 weeks. Our initial conclusion is there is no difference in scar healing in wounds sutured with surgical loupes or surgical microscope versus traditional techniques using the naked eye.
Objectives: To compare the cosmetic outcome, healing and strength of linear incisions in rats after repair with naked eye, surgical loupes or a surgical microscope.

Methods: A single surgeon created two, parallel, 3 cm long linear incisions on the dorsal skin of male Sprague Dawley rats (n=36) and randomized the incisions into four groups. The incisions were repaired with the naked eye, surgical loupes, microscope using 5/0 monocril, and microscope using 6/0 monocril. Wound strength was measured using a published method. A harvested incision was suspended with forceps and water was slowly added to a freely suspended container until any tears of the incision occurred. The force necessary to achieve dehiscence was recorded. Wound healing was evaluated histologically using published methods to examine vascularization, fibroblast proliferation, inflammation and epithelialization.

Results: Statistical analysis between groups using ANOVA testing was performed and significance was defined as p < 0.05. Initial results were not significant for wound tensile strength, vascularity, fibroblast proliferation, inflammatory cells or epithelialization between all groups at 1, 3 and 6 weeks.

Conclusion: Our initial conclusion is there is no difference in scar healing in wounds sutured with surgical loupes or surgical microscope versus traditional techniques using the naked eye.