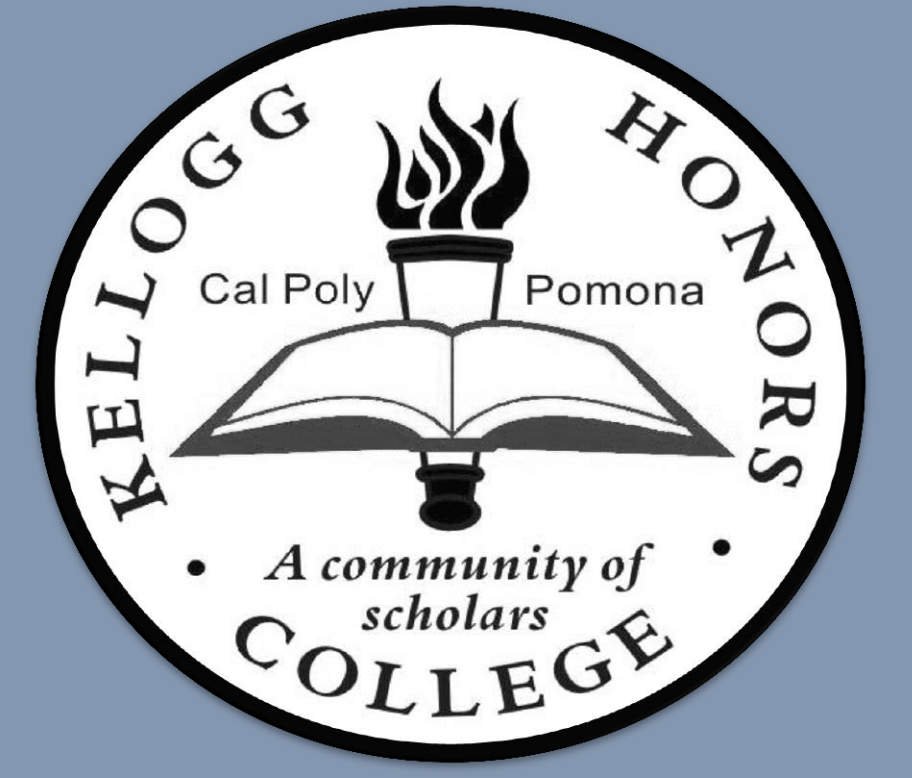


# Muscular Anatomy of the Rabbit: A Dissection Guide



Jennifer Giron, Animal Science (Pre-vet)  
Mentor: Dr. L. Allen Pettey  
Kellogg Honors College Capstone Project



## Abstract

With the switch from quarters to semesters approaching for Cal Poly Pomona faculty and students, certain courses will need to be expanded in order to provide an enriching and informative experience for students. One of these courses is the AVS department's Anatomy and Physiology of Domestic Animals Laboratory. The purpose of this project was to develop a muscle module to augment to the anatomy lab by using rabbits as the model organism. Rabbits are an ideal organism to utilize for this purpose because the muscles are large enough for students to identify, but not so heavily-muscled that they appear convoluted and difficult to differentiate. This project prepared a laboratory procedure that future students will use to dissect rabbits and learn about muscular anatomy. It was accomplished in three stages. The first stage was to select and research which muscle groups the lab would focus on. The second stage was to physically dissect a rabbit and take visual records by photographing the desired muscles. The third stage was to bring all of this information together and create a laboratory procedure. As a result, this project provides an introductory guide that directs students through the dissection process. The step-by-step directions will aid them in removing the skin to make the muscles visible. Photographs of what the muscles look like in actuality provide students with a reference that will aid in comparing their own specimen to the structures they should be looking for. Although not all mammals possess the exact same size and development of muscles as does the rabbit, many share similar location, naming and function of muscles in the body. The rabbit will serve as a model for future students to gain knowledge that they can apply to various species and that they can carry to veterinary school or future careers.

## Introduction

The dissection of an animal is not merely cutting organs open and "poking around" inside. If performed correctly, a dissection can be a very powerful tool to learn about the intricate anatomy of an animal and to experience the complexity of various bodily systems via a hands-on approach. This project focused on muscular dissection and identification. By carefully removing the skin and fascia off of a rabbit specimen, students can observe the various muscles that allow movement and motion in the animals that many of them see, study, or work with daily. **The goals of this project were to determine if the rabbit is a good model for muscle anatomy education, as well as to create a compilation of images of the muscular system of a rabbit to aid future students with muscular identification and study.**

## Materials and Methods

### Materials:

- Deceased rabbit specimen (frozen)
- Dissection Kit
  - Scalpel
  - Scissors
  - Dissecting needle, straight
  - Dissecting needle, curved
- Muscular anatomy sketches (Wingerd)
- Dissection tray and mat
- Dissection T-pins
- Labels
- Camera

### Thawing the Rabbit:

- The rabbit was initially frozen in a large industrial freezer
- It was removed from the freezer and placed into a refrigerator 42 hours before dissection to thaw
- The rabbit was removed from the refrigerator and skinned
  - It was then placed back into the refrigerator wrapped in its skin
- The rabbit was later removed from the refrigerator to identify muscles
  - It was then placed back into the refrigerator wrapped in its skin
  - This process was repeated two more times

### Skinning the Rabbit:

1. Laid the rabbit on its ventral surface
  - i. Lifted the skin on the dorsal neck
  - ii. Made a small longitudinal incision through the skin in the midline
2. Continued incision down the center of the back to the base of the tail (Fig. 2)
3. Made incisions through the skin:
  - i. Around the neck
  - ii. Down the lateral surface of each limb
  - iii. Around the wrists and ankles
  - iv. Around the tail
4. Beginning on the back, the skin was slowly separated from the underlying muscles
  - i. Skin was pulled back while using a scalpel to gently separate skin from fascia
5. Continued removing the skin from the back and continued onto the lateral surface of the rabbit
6. Began to remove skin from the limbs, starting on the dorsal side and moving to the ventral side
7. Removed skin from the ventral surface of the neck and continued removing it down to the groin
8. After following the above steps, the skin was removed from the specimen in one piece

### Identifying the Muscles:

- A list of superficial muscles was compiled for identification
- A set of sketches (Wingerd) was referenced to aid in the identification of selected muscles
- After a muscle was correctly identified, a labeled pin was placed in the muscle
- A photograph was taken of the muscle
- This was repeated for each specified muscle

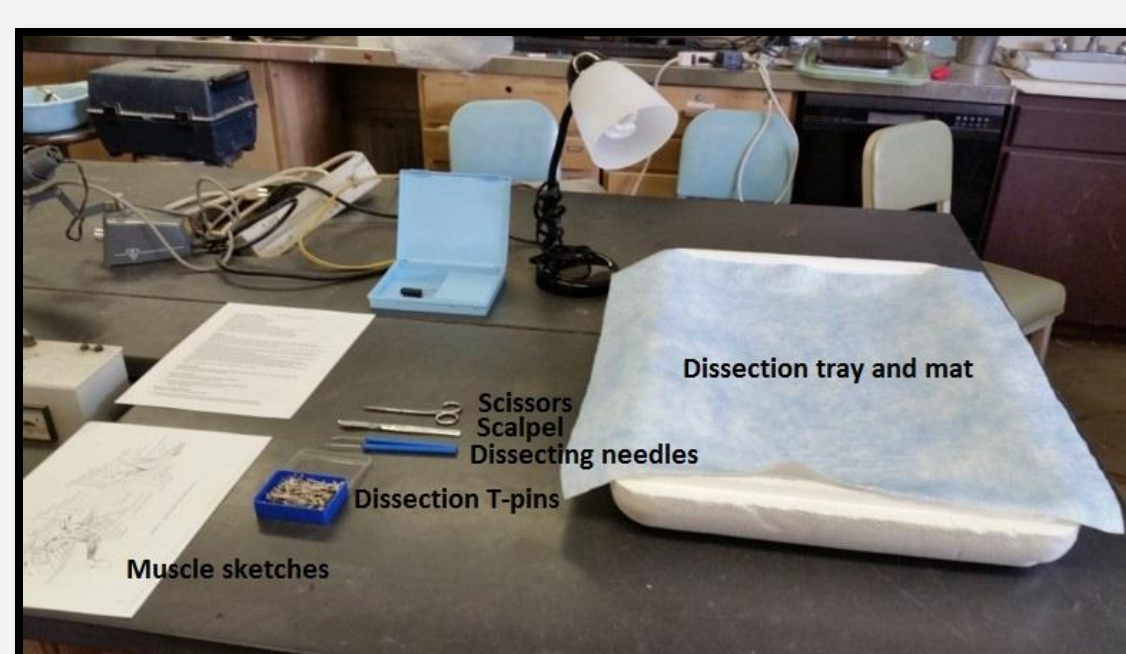


Figure 1. Set up of materials prior to dissection

## Muscles Identified

### Head

1. Masseter

### Neck and Pectoral Regions (Dorsal)

1. Acromiotrapezius
2. Spinotrapezius
3. Latissimus dorsi

### Pectoral Region (Ventral)

1. Pectoralis tenuis
2. Pectoralis major

### Shoulder

1. Acromiodeltoideus
2. Cleidodeltoideus

### Brachium (Foreleg)

1. Triceps brachii (long head)
2. Triceps brachii (lateral head)
3. Brachialis
4. Biceps brachii

### Abdomen

1. External abdominal oblique
2. Internal abdominal oblique

### Pelvic Muscles

1. Gluteus maximus

### Thigh (Hind leg)

1. Biceps femoris (cranial portion)
2. Biceps femoris (caudal portion)
3. Rectus femoris
4. Gracilis
5. Vastus medialis
6. Tensor fascia latae
7. Gastrocnemius
8. Soleus



Figure 2. Long incision made down the back of the rabbit on the dorsal side to remove the skin



Figure 3. The skinned rabbit specimen after following the skinning procedure

## Results

### Skinning the Rabbit

- The rabbit was skinned successfully (Fig. 3)

### Identifying the Muscles

- Most muscles were successfully identified
- Some muscles from the list were too difficult to identify due to:
  - Thick layers of fascia that were difficult to remove
  - Obstruction by blood vessels
- Some muscles were added to the list during the dissection because they were clearly visible

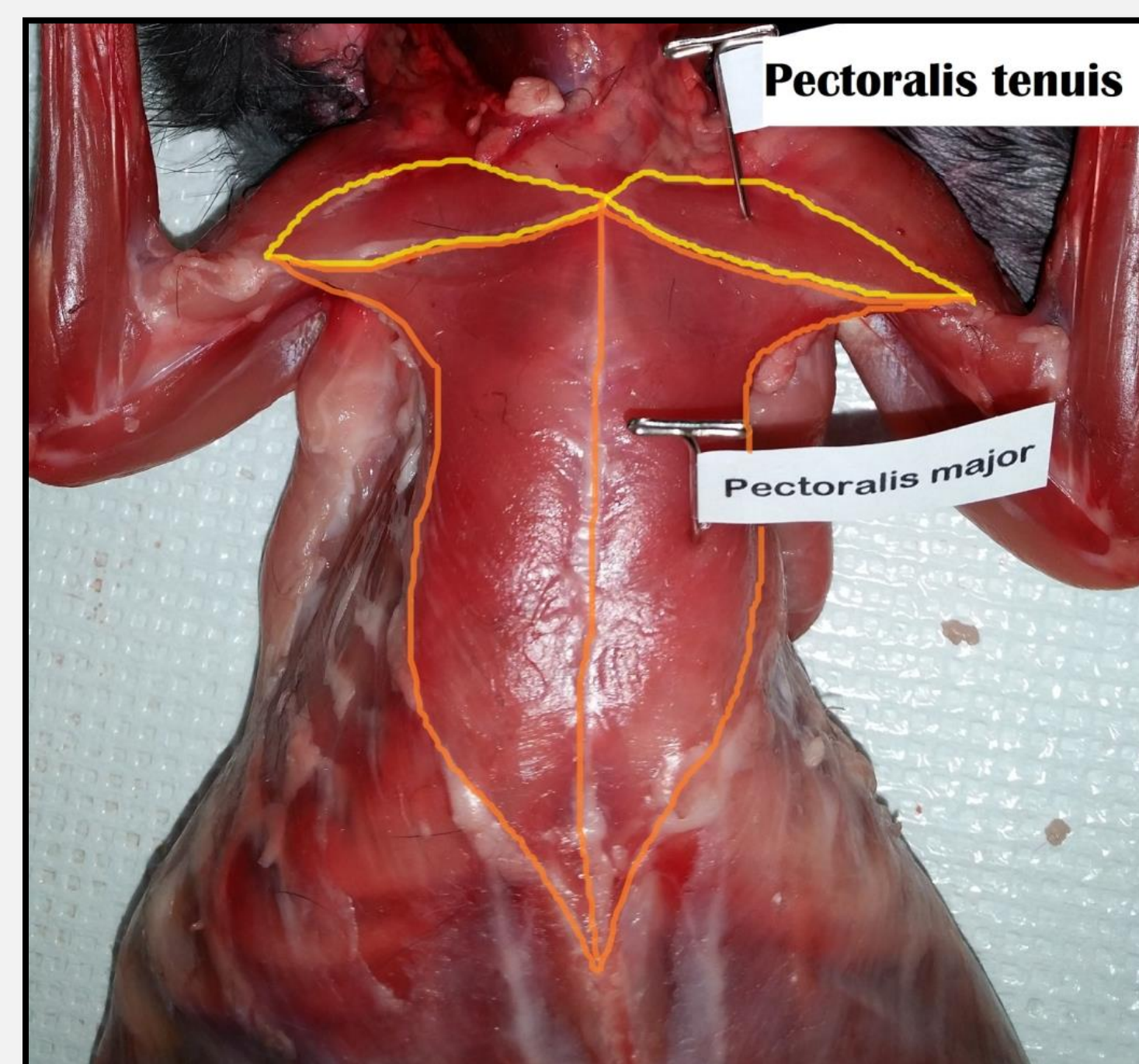


Figure 5. Pectoralis tenuis (yellow) and pectoralis major (orange) identified on the ventral pectoral region

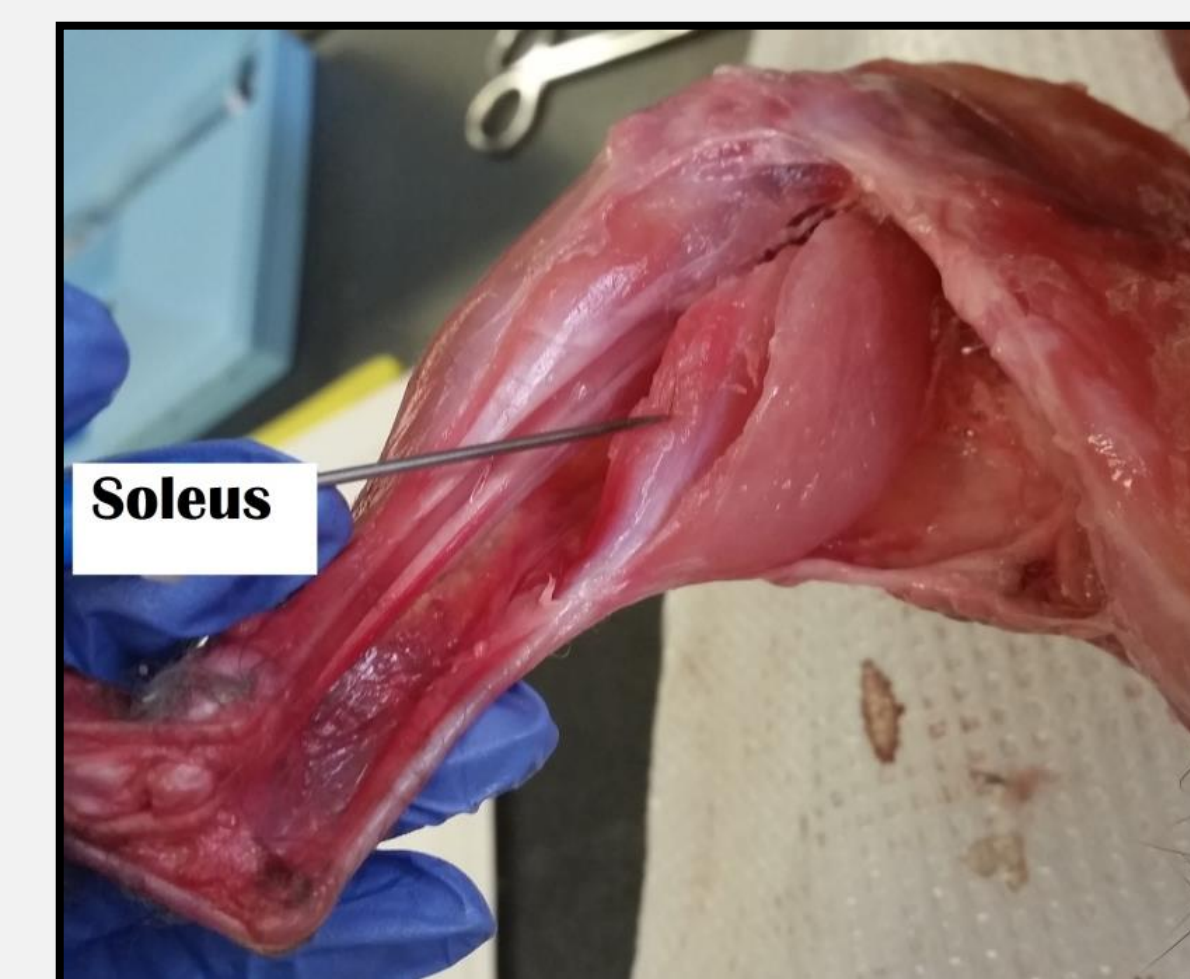


Figure 6. The dissection needle identifies the soleus of the right ventral pelvic appendage

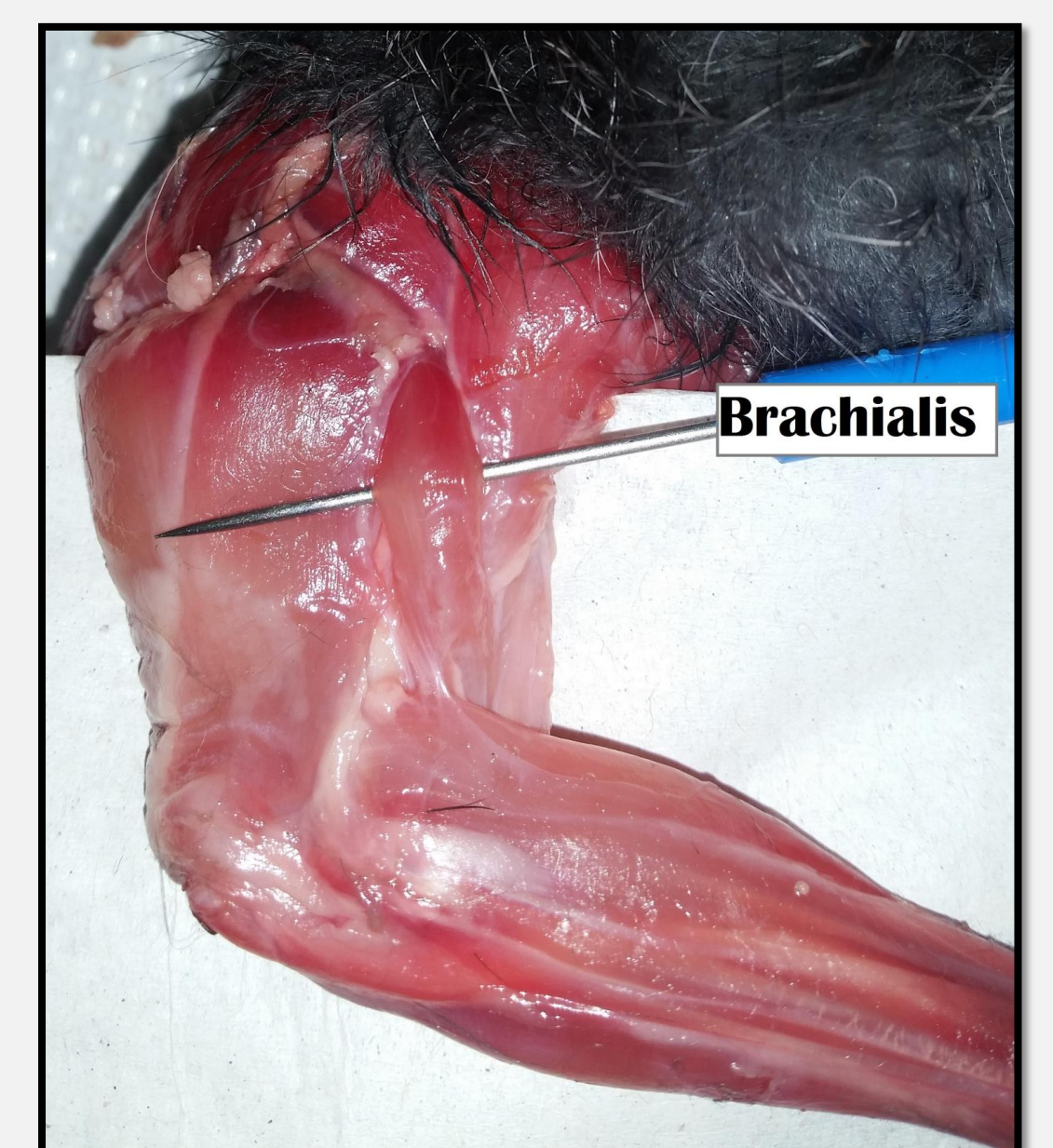


Figure 4. The dissection needle passes underneath and identifies the brachialis of the right dorsal brachium

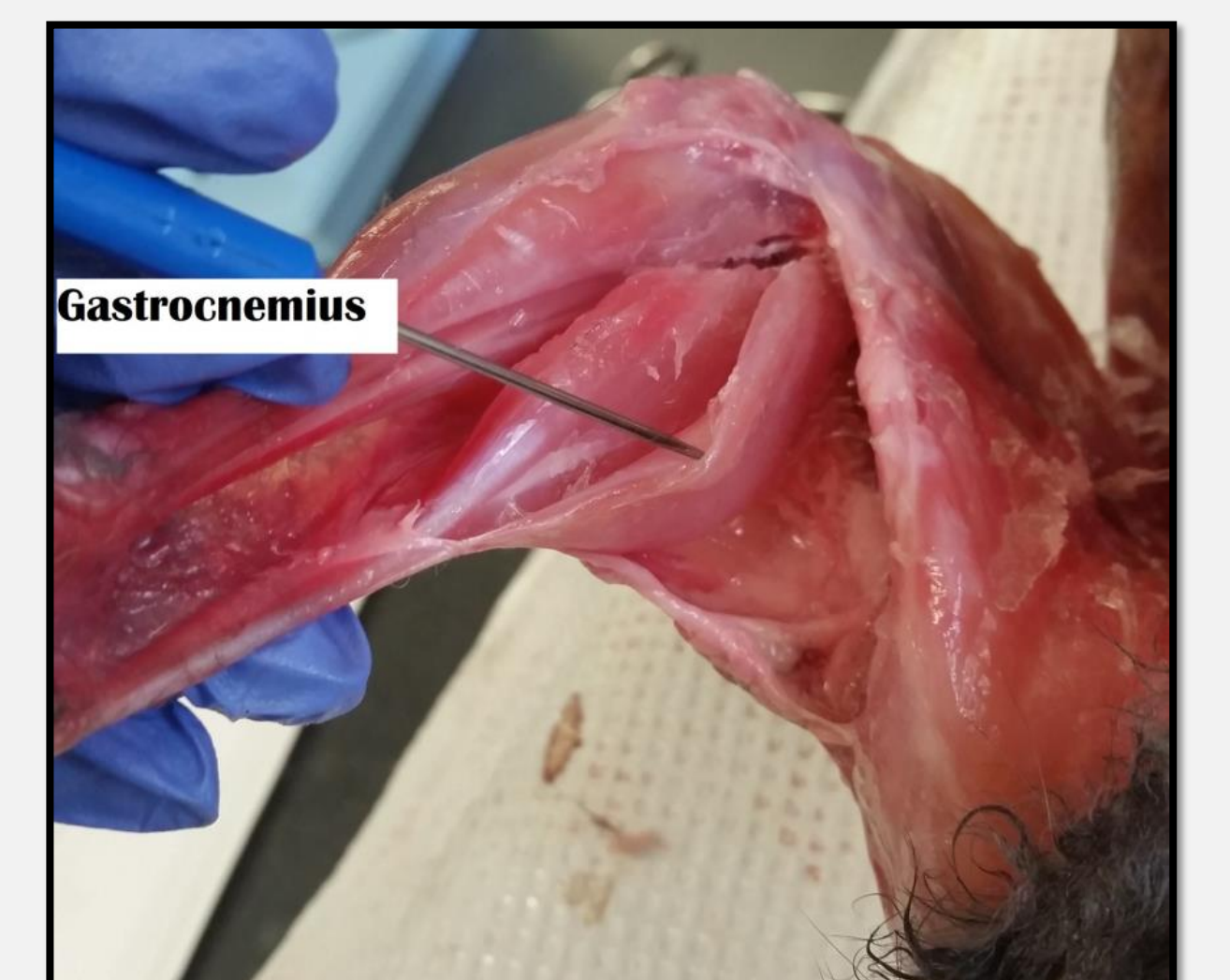


Figure 7. The dissection needle identifies the gastrocnemius of the right ventral pelvic appendage

## Discussion

The purpose of this project was to develop a compilation of muscle images that students can use to study muscular anatomy. This was accomplished by using a rabbit as the model organism. The rabbit has not traditionally been used for muscle dissections, but this organism has become more popular in recent times. While conducting this project, there were a few minor issues. After the frozen rabbit was moved to the refrigerator and allowed to thaw there for 42 hours, it was still frozen when removed from the refrigerator. This made the removal of the skin difficult because it was stiff and inflexible. It is important to keep this in mind for future dissections so that a better thawing process can be achieved. This will allow improved thawing, which in turn will allow the skin to be removed faster—time is an important factor to keep in mind in a short three-hour anatomy lab. Another minor problem that was encountered during the dissection was the fascia that adhered very tightly over certain muscles. This fascia was difficult to remove and it made it difficult to observe some of the underlying muscles. This did not affect the entire dissection, but it is another aspect that students should be aware of before beginning their dissection.

All in all, this project was successful in preparing a reference guide that future students can use when dissecting a rabbit. It was also useful for identifying some issues that anyone repeating this dissection in the future should be watchful for. The images that were acquired for this project will serve as a reference for future students to gain knowledge about muscular location and identification.

## References

1. Wingerd, Bruce D. *Rabbit Dissection Manual*. Baltimore: Johns Hopkins UP, 1985. Print.

## Acknowledgements

1. Brad Foyle: Sheep and Swine Unit Manager—Acquired the rabbit specimen