

Muscles of Mastication Group

Client: Dr. McLean Gunderson - mclean.gunderson@wisc.edu

Advisor: Dr. Cameron Casey - cpcasey3@wisc.edu

Team: Jensen Weik - jweik@wisc.edu (Leader)

Kaiya Merritt - kgmerritt@wisc.edu (Communicator)

An Hua - ahua4@wisc.edu (BPAG)

Noah Kalthoff - nkalthoff@wisc.edu (BSAC)

Leah Nelson - lnelson7@wisc.edu (BWIG)

Date: October 25 - 31, 2024

Problem Statement

In veterinary anatomy education, there is a notable absence of interactive, hands-on models that illustrate the muscles of mastication for both carnivores and herbivores. This gap limits students' ability to engage in effective learning and understanding of the complex relationships between muscular and bony structures. Our goal is to develop two models that accurately replicate the anatomy of mastication muscles in two carnivores and herbivores allowing for the visualization of muscle function and clearly define individual muscles to enhance educational outcomes.

Brief Status Update

We printed three spring designs at the MakerSpace. None of the designs will work for our muscles, so we are pivoting to ordering stainless steel springs. We will be presenting at Show and Tell on Friday to receive advice from fellow students.

Summary of Weekly Team Member Design Accomplishments

- Team:
 - 3D printed multiple prototypes
 - Prepared for Show and Tell
- Jensen Weik:
 - Helped write a script for show and tell
 - Created a “flexible pipe” design to print
- Kaiya Merritt:
 - 3D printed the springs for show and tell
 - Met with the team, discussed next steps, and prepped for show and tell
- An Hua:
 - Met with team to discuss alternatives to the spring

- Prepped for Show and Tell
- Noah Kalthoff:
 - Met with the team to prep for show and tell and discussed 3D printed springs
- Leah Nelson:
 - Went to makerspace to print out springs for show and tell
 - Reviewed show and tell meeting and script

Weekly/Ongoing Difficulties

We are still struggling with a design for the muscles. We are moving on from trying to make a more realistic model and instead are hoping to accurately replicate the movement of the jaw.

Upcoming Team and Individual Goals

- Team:
 - Obtain advice from fellow BME students
 - Order springs and hooks for attachment
 - Locate the origins and insertions of each muscle on the skull
- Jensen Weik:
 - Find springs that have the correct dimensions
- Kaiya Merritt:
 - Find springs and start attaching them
 - Find hooks to attach to skulls
- An Hua:
 - Look into the hook attachment method again, think about spring dimensions
- Noah Kalthoff:
 - Help springs for our designs and look into other design ideas
- Leah Nelson:
 - Look into our other design matrix ideas
 - Find springs that would work and attach to our design

Project Timeline

Project Goal	Deadline	Team Assigned	Progress	Completed
Meet with client	9/6	All	100%	9/13
Product Design Specification	9/19	All	100%	9/19 (ongoing with edits)
Preliminary Presentations	10/4	All	100%	10/4
Preliminary Report	10/9	All	100%	10/9
Show and Tell	11/1	All		
Poster Presentations	12/6	All		
Final Deliverables	12/11	All		

Expenses

Horse Skull				
Item	Location Purchased	Quantity	Cost Each	Total Cost
PLA	Makerspace	1	18.5	18.5
				0
				0
				0
				0
				0
				0
				0
				0
Total:				18.5

Dog Skull				
Item	Location Purchased	Quantity	Cost Each	Total Cost
PLA	Makerspace	1	13	13
				0
				0
				0
				0
				0
				0
				0
				0
Total:				13

Both				
Item	Location Purchased	Quantity	Cost Each	Total Cost
TPU	Makerspace	1	2.93	2.93
Elastic 50A	Makerspace	1	11.64	11.64
				0
				0
				0
				0
				0
				0
				0
				0
Total:				14.57