

Muscle action analysis

Your goal: Analyze agonist and antagonist muscle pairs and revise your model labels.

One product: Agonist-antagonist-synergist analysis for one chosen movement, plus a revised Maniken label card showing each muscle's role.

Question: How can the same muscle have a different role when the chosen movement changes?

Start the work

Name the view, trace the attachments, and state the action; a paper placement plan does not prove a physical build.

1. Read the notes on agonist, antagonist, and synergist roles in movement.
2. Choose one joint movement and identify the agonist and antagonist muscles.
3. Complete the PLTW online task on muscle pairing.
4. Revise your Maniken labels to mark each muscle's role in one movement.
5. Submit your agonist-antagonist analysis and revised labels.

If access is blocked, save locally and record the missing input or destination. After uploading, check that Schoology shows Submitted.

Words you will use

joint

A place where bones meet.

action

The movement a muscle can help produce.

elbow flexion

Bending the elbow so the angle between upper arm and forearm decreases.

elbow extension

Straightening the elbow so that angle increases.

agonist or prime mover

A muscle assigned the leading role for the specified action in this model.

antagonist

A muscle whose action opposes the specified action; the name does not mean it is inactive.

synergist

A muscle that assists an action; assistance can include producing that action or helping stabilize a structure.

stabilize

Help maintain position or control unwanted movement.

contraction

Active force generation by muscle; it does not always mean that the whole muscle shortens.

coactivation

Activity in muscles with opposing actions at the same time.

activation

Activity of a muscle; a role label alone does not measure its amount or timing.

context

The specified action and conditions used to interpret a role.

origin and insertion

Conventional names for a muscle's attachments; these names alone do not prove which end moved in a real task.

tendon

Connective tissue that transfers a muscle's pull to an attachment.

humerus

The upper-arm bone between shoulder and elbow.

radius and ulna

The two forearm bones; radius is on the thumb side in anatomical position.

scapula

The shoulder blade.

anterior and posterior

Toward the front and toward the back, using anatomical position as a reference.

anatomical position

A reference position with the body upright, arms at the sides and palms facing forward; you do not need to assume it.

forearm supination

Rotation that turns the palm toward the front in anatomical position, or upward with the elbow bent.

proximal

Nearer the limb's attachment to the trunk.

distal

Farther from the limb's attachment to the trunk.

deep

Farther beneath the surface.

bony landmark

A named region or projection of a bone used to locate an attachment.

role label

A muscle name paired with its role for a named movement.

revision

A documented change from an identified earlier version.

evidence limit

What a source or observation cannot establish.

Submission check

After uploading, check that Schoology shows Submitted; ask for help if it does not.

H1: Start with one movement

Choose one route. If the assigned movement, references and real model labels are available, use that actual work. Otherwise use the complete original C1 paper case. Ask the teacher for missing assigned inputs; do not replace them with invented values.

Opening facts: elbow flexion bends the joint; extension straightens it. An agonist leads the named action, an antagonist has an opposing action, and a synergist assists. These are roles for a movement, not permanent names for a muscle.

Original opening: distinguish bending from straightening using those words. Actual opening: name the movement in your assigned evidence, or ask for the missing input. Give one response only. No arm movement or physical test is required.

R1: Reference for the original elbow case

A1, biceps brachii: its two heads begin on the scapula, at the coracoid process and supraglenoid tubercle. Its bony insertion is the radial tuberosity. It can flex the elbow and supinate the forearm. Only elbow flexion is assessed in C1. Source: UAMS-MUSCLES.

A2, triceps brachii: its long head begins on the scapula below the socket; the other heads begin on the posterior humerus. Its shared tendon reaches the olecranon of the ulna. It can extend the elbow. Source: UAMS-MUSCLES.

A3, brachialis: it lies deep to biceps at the anterior upper arm. It begins on the anterior distal half of the humerus and related connective partitions. It attaches to the proximal ulna at the coronoid region and helps flex the elbow. Source: UAMS-MUSCLES and OS-ROLES.

Landmark guide: coracoid process is a forward scapular projection; supraglenoid tubercle is above the shoulder socket. Radial tuberosity is near the upper radius. Olecranon is the back projection of the upper ulna; coronoid region is at its front. These locate attachments, not measured lever arms.

Simple text map: biceps links scapula to radius across the elbow; brachialis links humerus to ulna across the elbow; triceps links scapula/humerus to ulna. Anterior means front and posterior means back. This map omits many structures and does not show activity or force.

Role guide: OpenStax uses a cup-lifting elbow-flexion example with biceps as prime mover, brachialis as assisting synergist and triceps as the opposing muscle. Use that stated model for C1. This is not a ranking of force for every posture or person. Source: OS-ROLES.

Activity limit: human elbow research has recorded antagonist activity during movement. Therefore an antagonist label does not prove complete relaxation, and simultaneous activity does not by itself prove a locked joint. No activity measurements are supplied here. Source: COACTIVATION-STUDY.

C1: Complete original movement and starting labels

C1 is an original teaching case, not a learner performance. Picture a right upper arm held beside the trunk, with the forearm turning toward the upper arm. The elbow angle becomes smaller as a pictured cup is raised. The palm faces upward. Do not perform this movement.

For this simplified cup-lifting model, use the three muscles in A1-A3 and the R1 role guide. Treat biceps as the named prime mover. Brachialis assists flexion; triceps has the opposing extension action. No force, speed, weight, muscle activity or injury data are given.

L0, supplied initial PAPER label card: movement, elbow flexion; biceps brachii, antagonist; triceps brachii, agonist; brachialis, not listed. This deliberately incomplete and incorrect card is an input to revise, not a photograph or actual student mistake.

Keep L0 identifiable. Create L1 on the same record by correcting the role labels and adding the missing muscle. Name elbow flexion on every set of role labels. A role without its movement can be misleading.

At 25-45 minutes, use the genuine enrolled muscle-pairing task if available. Otherwise study C1/L0 against R1 and plan this same analysis. Original preparation does not mark that official task complete. Actual route: use the assigned movement, genuine reference, model labels and teacher rubric instead. Skip the original case response; do not complete both.

A4: Analyze the case and revise one label card

Original route: choose supplied C1. On one record, name the movement and write three rows: muscle, relevant action, role in C1, and a reason using A1-A3 or the role guide. No second movement analysis is required.

At 62-75 minutes, place L1 beside L0. Show all three muscle-role pairs and the movement. Explain one changed label using a supplied fact. You may use text rows, sticky-note style labels or a simple diagram; no full muscle build is required.

Add one limit: these labels do not reveal measured activity or prove that a real model was revised. Keep the role explanation separate from any observation you did not make. Actual route: use the assigned movement, genuine reference, model labels and teacher rubric instead. Skip the original case response; do not complete both.

Recovery: locate the movement first. Compare each muscle's action with flexion. Then use the named leading role in R1 to distinguish the agonist from its helper. Return to the same rows and L1; do not create another report. Actual route: use the assigned movement, genuine reference, model labels and teacher rubric instead. Skip the original case response; do not complete both.

Q1: Review and share without inventing participation

Check the same combined analysis and label card. Original C1 needs all three role rows, corrected L1 labels, one change reason and a limit. Actual route uses the genuine assigned scope and teacher criteria instead; original row counts are not an extra quota.

In the final five minutes, discuss one label that needed clarification if a peer exchange actually occurs. Alone, name a possible ambiguity and resolve it using a supplied source. Label that self-review; do not invent a class disagreement or a partner's comment.

If an actual label was changed, identify the real version and change. If only the original paper card changed, say paper revision. Saving a document, changing a physical model and uploading to Schoology are separate actions.

S1: Check actual work and official-task directions

Keep separate checks and next actions for the actual work. First check assigned movement/reference, real model and existing labels, and teacher rubric. Also check physical setup/supervision, actual label revision, and real peer exchange if required. Finally confirm the official task and stopping point, use evidence from that task and check Schoology after uploading. Name the missing evidence and a specific next action.

Begin these brief notes during work and update only changes. The paper route requires no materials handling, force test, patient case or new simulation. Use your existing check record if one is available.

The expected task is Activity 1.2.2 Makeup of a Muscle. Confirm actual enrolled directions and stopping point. Neither pointer proves that an online task was opened or completed.

Both sections use Wk6 Lab notebook: Muscle action analysis. Confirm current directions and deadline. Submit the analysis and revised label card as one document or photo only through the confirmed route. If access is blocked, save locally and tell the teacher. Check Schoology after uploading.

Next class is February 25, wearable-data privacy. Carry the habit of separating a label or proposed claim from what was actually observed. No extra preparation task is added here.

M1: Distinct worked extension label card

M1 is a separate teaching model of elbow extension, with the upper arm stationary in the picture and the elbow angle increasing. It is not C1 and is not another required response. The model assigns triceps the leading extension role.

M1 inputs: triceps extends the elbow; biceps can flex it. Anconeus runs from the outer end of the humerus to the upper ulna and can assist extension. These actions support the model's selected three roles. Source: UAMS-MUSCLES.

M0 initial paper labels: elbow extension; triceps, antagonist; biceps, agonist; anconeus, missing.

Worked M2: triceps, agonist because it leads the modeled extension; biceps, antagonist because flexion opposes extension; anconeus, synergist because it assists extension.

Worked revision reason: change the triceps role because the named movement is extension, not C1's flexion. Worked limit: this card does not measure activation or prove any real muscle was fully relaxed. Use the method without copying M1 as extra work. Actual route: use the assigned movement, genuine reference, model labels and teacher rubric instead. Skip the original case response; do not complete both.

Try the decision

Original route: a revised label card calls one muscle an antagonist in C1. What can that label support? Actual route: use the assigned movement, genuine reference, model labels and teacher rubric instead. Skip the original case response; do not complete both.

- That muscle has an action opposing C1 flexion; its actual activity is not measured here.
- Labeling a muscle an antagonist means it must be completely inactive during every flexion movement.
- This antagonist label proves a dangerous muscle imbalance without measuring actual muscle activity.

Explain your choice using the reading. Discuss it or say it to yourself. This practice does not add another submission.

Your 80-minute flow

0–8 minutes	Read H1 and opening definitions; make the one chosen-route note. Ask for the missing assigned input.
8–25 minutes	Read R1 and the role definitions; compare actions without measuring movement. Actual route: use the assigned movement, genuine reference, model labels and teacher rubric instead. Skip the original case response; do not complete both.
25–45 minutes	Use the confirmed enrolled task. Without access, study C1/L0 and plan the same paper analysis; ask for the official-task directions. Actual route: use the assigned movement, genuine reference, model labels and teacher rubric instead. Skip the original case response; do not complete both.
45–62 minutes	Complete the three original C1 rows with action, role and reason. Actual route: use the assigned movement, genuine reference, model labels and teacher rubric instead. Skip the original case response; do not complete both.
62–75 minutes	Revise the original L0 into L1 and check one change reason and limit. Actual route: use the assigned movement, genuine reference, model labels and teacher rubric instead. Skip the original case response; do not complete both.
75–80 minutes	Share a real clarification if possible; otherwise label a source-based solo check. After uploading, check that Schoology shows Submitted; ask for help if the upload fails.

Your response record

Use these labels on paper or in your document. The space below also works when this page is printed.

T1: One chosen-route opening

Original route: name the difference between elbow flexion and extension from H1. Actual route: name the assigned movement or missing input.

One brief note in the same record. No physical demonstration is needed. Actual route: use the assigned movement, genuine reference, model labels and teacher rubric instead. Skip the original case response; do not complete both.

Use this space or the same labeled section in your existing document. Add paper when your table, graph or drawing needs more room.

T2: One movement analysis

Original route: write C1's movement and the three muscle/action/role/reason rows using R1.

Plan in the online-task slot if actual access is missing; finish during 45-62. Actual route: use the assigned movement, genuine reference, model labels and teacher rubric instead. Skip the original case response; do not complete both.

Use this space or the same labeled section in your existing document. Add paper when your table, graph or drawing needs more room.

T3: Revise the label card

Original route: retain L0 and make L1 with all three corrected role labels, the movement, one change reason and one evidence limit.

Use the same combined record. A paper revision does not prove a physical revision. Actual route: use the assigned movement, genuine reference, model labels and teacher rubric instead. Skip the original case response; do not complete both.

Use this space or the same labeled section in your existing document. Add paper when your table, graph or drawing needs more room.

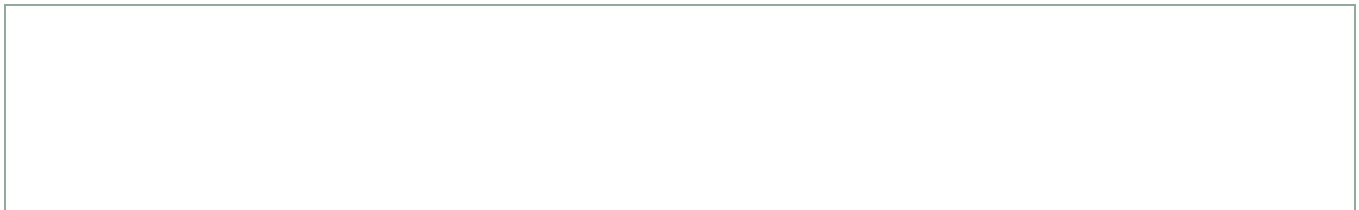


T4: Check, share or self-review, and identify your next action

Review Q1 and use S1 to identify your next actions. Identify a real discussion point or label a solo ambiguity as self-review.

Actual route: use the assigned rubric and your existing check record. Include only peer contributions that occur, keep evidence from the assigned official work and check Schoology after uploading.

Use this space or the same labeled section in your existing document. Add paper when your table, graph or drawing needs more room.



Check your product

- Original route: one record names C1 elbow flexion and explains the three muscle roles using supplied actions.
- Original route: L0 remains identifiable and L1 corrects all three roles; one change has a reason and an evidence limit.
- Actual route: the genuine movement, reference, model labels and rubric replace original counts and responses; no duplicate C1 analysis.
- Both routes: role labels do not establish complete relaxation, force, injury or a physical revision.
- Both routes: identify whether you shared with a peer or checked alone, use evidence from your actual task and check Schoology after uploading.

Keep the limit: A paper role analysis explains the stated movement model. It cannot measure activation, force, health or injury risk, prove a physical revision, or complete official work.

Turn in your work

Submit the analysis and revised label card as a single document or photo. Section 1292 uses assignment 8544570329; section 6792 uses 8544570366. Confirm current rubric, directions and deadline. Actual route: use the assigned movement, genuine reference, model labels and teacher rubric instead. Skip the original case response; do not complete both.

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[Section 1292: Wk6 Lab notebook: Muscle action analysis](#)

[Section 6792: Wk6 Lab notebook: Muscle action analysis](#)

Carry forward

Name the movement before assigning muscle roles; a role label does not measure activity or prove a physical revision.

On February 25, apply evidence limits to Bioethics: wearable data privacy. Which wearable-data claim would require evidence beyond the recorded signal?

Sources and resources

[Open today's page](#)

UAMS-MUSCLES · Muscles of the Upper Limb

University of Arkansas for Medical Sciences, Department of Neuroscience

<https://medicine.uams.edu/neuroscience/education/medical-school-courses/human-structure-module/anatomy-tables/muscle-tables/muscles-of-the-upper-limb/>

OS-ROLES · Interactions of Skeletal Muscles

OpenStax Anatomy and Physiology 2e, section 11.1

<https://openstax.org/books/anatomy-and-physiology-2e/pages/11-1-interactions-of-skeletal-muscles-their-fascicle-arrangement-and-their-lever-systems>

COACTIVATION-STUDY · Electromyogram coactivation patterns of the elbow antagonist muscles during slow isokinetic movement

Solomonow and colleagues, Experimental Neurology, 1988; original human research; DOI

10.1016/0014-4886(88)90032-5

<https://pubmed.ncbi.nlm.nih.gov/3366200/>

OS-TENSION · Nervous System Control of Muscle Tension

OpenStax Anatomy and Physiology 2e, section 10.4

<https://openstax.org/books/anatomy-and-physiology-2e/pages/10-4-nervous-system-control-of-muscle-tension>