

# PhysioEx Lab Report

Exercise 4: Endocrine System Physiology

Activity 3: Hormone Replacement Therapy

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Date: 10 October 2025

Session ID: session-52187623-0172-fdff-1ac2-5ff232e9bbca

## Pre-lab Quiz Results

You scored 100% by answering 4 out of 4 questions correctly.

**1** Follicle-stimulating hormone (FSH)

You correctly answered: **stimulates ovarian follicle development.**

**2** Estrogen

You correctly answered: **is produced by developing ovarian follicles.**

**3** Calcitonin

You correctly answered: **works against the development of osteoporosis.**

**4** Which of the following statements is *true*?

You correctly answered: **The ovaries stop secreting estrogen after menopause.**

## Experiment Results

### Predict Questions

**1** Predict Question 1: What effect will the saline injections have on the control rat's vertebral bone density?

Your answer: **The saline injections will not change the rat's vertebral bone density (indicated by an unchanging T score).**

**2** Predict Question 2: What effect will the estrogen injections have on the estrogen-treated rat's vertebral bone density?

Your answer: **The estrogen injections will increase the rat's vertebral bone density (indicated by a less-negative T score).**

**3** Predict Question 3: What effect will the calcitonin injections have on the calcitonin-treated rat's vertebral bone density?

Your answer: The calcitonin injections will not change the rat's vertebral bone density (indicated by an unchanging T score).

## Stop & Think Questions

### Experiment Data

Rat	Elapsed Days	Saline injections	Estrogen injections	Calcitonin injections	T score
Control	7	7	0	0	-2.83
Estrogen	7	0	7	0	-1.71
Calcitonin	7	0	0	7	-2.12

### Post-lab Quiz Results

You scored 100% by answering 4 out of 4 questions correctly.

- 1 Saline injections were used in this experiment to measure the effect of

You correctly answered: a placebo on bone density.

- 2 In the ovariectomized rats used in this experiment

You correctly answered: osteoporosis was evident prior to the injections of estrogen.

- 3 Injection of calcitonin into an ovariectomized rat will

You correctly answered: inhibit osteoclast activity and stimulate calcium uptake and deposition in long bones.

- 4 As the rat's bone density increases

You correctly answered: the X-ray scanning assay reports a less-negative T-score.

### Review Sheet Results

- 1 Why were ovariectomized rats used in this experiment? How does the fact that the rats are ovariectomized explain their baseline T scores?

Your answer:

Ovariectomized rats were used in this experiment to ensure control over the hormones in the rats. Without the ovaries, the rats were not able to produce estrogen, and therefore had low baseline T scores already, since estrogen stimulates bone growth and protects against osteoporosis.

**2** What effect did the administration of saline injections have on the control rat? How well did the results compare with your prediction?

Your answer:

The saline did not affect the rat's bone density. This is what I predicted before the experiment.

**3** What effect did the administration of estrogen injections have on the estrogen-treated rat? How well did the results compare with your prediction?

Your answer:

The estrogen increased the rats bone density as predicted.

**4** What effect did the administration of calcitonin injections have on the calcitonin-treated rat? How well did the results compare with your prediction?

Your answer:

Calcitonin did increase the rats bone density, it was hypothesized otherwise.

**5** What are some health risks that postmenopausal women must consider when contemplating estrogen hormone-replacement therapy?

Your answer:

Increased risk of cancer.