# Question 3

Some nerve cells have the ability to regenerate. Researchers think that these cells may generate creatine phosphate (CP) to stimulate new cell growth.

To test this hypothesis, researchers cut the nerves emanating from the left side of the spinal cord in a sample of rhesus monkeys, while the nerves on the right side were kept intact. They then compared the CP levels (mg/100g) in nerve cells on both sides.

| **Monkey ID** | **CP on Left Side** *(regenerating)* | **CP on Right Side** *(control)* |
|---|---|---|
| 1 | 16.3 | 11.5 |
| 2 | 4.8 | 3.5 |
| 3 | 10.7 | 12.8 |
| 4 | 14.0 | 7.9 |
| 5 | 15.7 | 15.2 |
| 6 | 9.9 | 9.8 |
| 7 | 29.3 | 24.0 |
| 8 | 20.4 | 14.9 |
| 9 | 15.7 | 12.6 |
| 10 | 7.6 | 8.2 |
| 11 | 16.2 | 8.4 |

R Tutorial Videos

**Pre-Lab**
Pre-Lab due May 03, 2016 at 17:00 UTC

**Lab**
Lab due May 03, 2016 at 17:00 UTC

**Problem Set**
Problem Set due May 03, 2016 at 17:00 UTC

▸ Week 4: Hypothesis Testing (Categorical Data)

| | | |
|---|---|---|
| 12 | 14.7 | 11.0 |
| 13 | 15.0 | 12.5 |
| 14 | 8.4 | 9.2 |
| 15 | 23.3 | 17.5 |
| 16 | 17.7 | 11.1 |

(1/1 point)
3a. Which is the appropriate method for testing the researchers' hypothesis?

- (●) Dependent t-test ✔
- ( ) Independent samples t-test
- ( ) Single sample z-test

*You have used 1 of 1 submissions*

Assume the researchers calculated the difference scores as d = CPleft - CPright.

They set α = 0.05.

(1/1 point)
3b. How many **degrees of freedom** are there?

15 ✔

**Answer:** 15

15

*You have used 1 of 1 submissions*

(1/1 point)
3c. What is the **t-critical** value? *(Round to 3 decimal places.)*

1.753 ✔

**Answer:** 1.753

**1.753**

*You have used 1 of 1 submissions*

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(1/1 point)
3d. How much of a **difference** in creatine phosphate was observed, on average, between the left and right nerve cells? *(Report as a positive value rounded 1 decimal place).*

3.1 ✔

**Answer:** 3.1

**3.1**

*You have used 1 of 1 submissions*

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(1/1 point)
3e. What is the **Standard Deviation** of the difference scores? *(Round to 2 decimal places.)*

3.05 ✔

**Answer:** 3.05

**3.05**

*You have used 1 of 1 submissions*

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(1/1 point)
3f. What is the **Standard Error** for your t-test? *(Round to 2 decimal places.)*

0.76 ✔

**Answer:** .76

**0.76**

*You have used 1 of 1 submissions*

(1/1 point)

3g. What is your **test statistic**? *(Round to 2 decimal places.)*

4.08 ✔

**Answer:** 4.06

4.08

*You have used 1 of 1 submissions*

(1/1 point)

3h. Is there sufficient evidence to suggest that the levels of creatine phosphate are higher in regenerating cells than they are in the normal (control) cells?

- (•) Yes ✔
- ( ) No

*You have used 1 of 1 submissions*

(1/1 point)

3i. The researchers finish their analysis by calculating a **95% confidence interval** for the true increase in CP levels in rejuvenating nerve cells. What are the lower and upper bounds? *(Round each to 1 decimal place.)*

**Lower bound**

1.8 ✔

**Answer:** 1.5

1.8

*You have used 1 of 1 submissions*

(1/1 point)

**Upper bound** *(Round to 1 decimal place.)*

4.4 ✔

**Answer:** 4.7

4.4

*You have used 1 of 1 submissions*