**How Do You Feel? Investigating Touch and Temperature Receptors**

*Graded out of 21 points*

\*Note – Due to the data being provided to you the point values of some questions have been changed. Changes are indicated with red text.\*

Watch the video at the following link for a demonstration for how data is collected for this part of the lab. <https://youtu.be/_l7KbtRwvBk>

Find two narrow and blunt, not too sharp, objects to use as calipers (e.g., pencils, paper clips, toothpicks, chopsticks, etc.) and a ruler with metric measurements (millimeters/centimeters). Find a partner to use as the subject (if possible). Follow the instructions as outlined in the book while using your “calipers”. Once you have found the “1” point threshold (when the subject can only feel one object touching their skin), hold the objects in place and use the ruler to determine the distance between them.

**Table 1**. Two-Point Thresholds in Different Body Areas (1 pt)

|  |  |
| --- | --- |
| **Body Area** | **Minimum Distance (mm)** |
| Back of hand |  |
| Palm of hand |  |
| Fingertip of index finger |  |
| Forearm |  |
| Upper arm |  |
| Shin |  |

**Table 2**. Sensations Reported during Cold-Probe Stimulus (0 pts)

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| T | T | T | C | C | T | T | C |
| C | T | C | T | T | T | C | T |
| C | C | T | T | C | T | C | T |
| T | T | C | C | T | C | T | C |
| C | C | T | T | T | T | T | C |
| T | T | T | T | T | C | C | T |
| T | C | C | T | T | C | T | T |
| T | C | T | T | T | T | C | C |

Estimated size of a sensory field, in mm: 14mm (0 pts)

Gather 3 bowls or large cups and conduct Part 3 of this lab. Use hot water that is a little steamy (but NOT scalding hot!) and cold water that has a couple of ice cubes in them (if possible). Follow the rest of the instructions as outlined in the manual.

**Table 3**: Perception of Temperature change. (1 pt)

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Hand (Left or Right)** | **Initial Water Temperature** | **Neurons Stimulated (Heat or Cold)** | **Final Water Temperature** | **How did the temperature Feel?** | **Neurons Stimulated (Heat or Cold)** |
|  | Hot |  | Room Temperature |  |  |
|  | Cold |  | Room Temperature |  |  |

1. Review your data in Table 1. If small sensory fields indicate a high density of neurons, which body parts seem to have the most sensory neurons? Why do you think this is? Cite your data. (4 pts)
2. Compare your data in Table 1 to Figure 5. How is the size of the sensory field of a body region related to the size of its sensory cortex area? (2 pts)
3. Why don’t all body parts have the same density of sensory neurons? (1 pt)
4. Describe your results from Table 2. Did anything surprise you? Based on your data, explain whether all areas of skin are sensitive to all stimuli. Explain. (3 pts)
5. Based on your data from Part 1 and Part 2, which do you think have larger sensory fields – touch receptors or cold receptors? Explain and cite your data. (3 pts)
6. Review and describe your results from Table 3. Based on your observations, would you say that your body senses precise temperatures or changes in temperatures? Explain. (3 pts)
7. Based on Table 3, explain why touching someone’s forehead is not an effective way to detect a fever unless you touch your own forehead first. (Hint: refer back to question 6.) Explain your reasoning (3 pts)