EXPERIMENT 2

INTRODUCTION TO ANIMAL EXPERIMENTS

LAB REPORT

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Introduction

For many years, a variety of models were used for understanding human anatomy. Fort his aim, many animals were used as models. The most popular animal experiment model is the mouse due to several reasons: they are easy to fertilize, they are easy to handle, and they are easy to observe, also their genome overlaps with the humans' genome to a large extent (Max Planck Epigenetics, 2021). However, ethical considerations occur regarding animal experiments. 3R approach addresses this concern which is consisted of Refinement, Reduction, and Replacement. Refinement addresses improving the conditions and housing of animals. Reduction addresses reducing the number of animals using. Replacement addresses searching for different options to replace animal experiments as a reference (Natural Sciences, 2021).

A variety of mice are used in animal experiments, referred to as *Mus Musculus*. To name some, the nude mouse has a deficiency in its immunology which makes it a suitable model for drug and cancer-related experiments. Wild mice and albino mice are also used for medical experiments.

The purpose of the experiment was to observe and learn the mouse anatomy by investigating its organs, gain expertise in the vaccine, and acknowledge the importance of animal experiments in biological experiments.

Materials

There is a piece of special equipment concerning animal experiments. Forceps and scissors were used to dissect the mouse body accurately. The injection was utilized to inject the buffer solution into the animal’s body. Pins are utilized to pin down the animal body such that it is unable to move. Ethanol is utilized for cleaning the animal's body and the equipment which touches the body.

Methods

Four types of injection methods were demonstrated in this experiment using a buffer solution. IV (Intravenous Injection) was done by Dursadiye and Çerağ, to the vein in the tail. The purpose was to inject a buffer solution directly into the veins, the buffer solution could be any drug or medicine for practical purposes. SC (Subcutaneous Injection) was done by Çerağ on the skin which is the epidermis or dermis layers, IM (Intramuscular Injection) was done by Dora on the right leg of the mouse, and IP (Intraperitoneal Injection) was done by Dursadiye on the abdominal cavity of the mouse. No bubbles were forming in the injection, special care was given. In the injection methods which considered the skin or tissue, the needle was stuck at 45 degrees and injection was done with 90 degrees angle.

To start with, the outer anatomy of the mouse was examined. The body parts and their color indicating the body's health is observed. The mouse body did not display any abnormalities in the outer anatomy. The mouse was cleansed with Ethanol to provide a disinfected working surface. The mouse was pinned up through ventral view.

The top part of the skin was cut using scissors while holding the anterior skin using forceps. The ventral line which was the stomach of the animal was cut vertically. Also, cuts were placed on the legs and arms of the mouse and the outer peritoneal muscle Wall was pinned to observe the organs. The inner anatomy of the mouse was observed and its organs were at the normal places with their normal colors and conditions, no organ was harmed during the initial cutting. After splitting the rib cage, the lungs, heart were revealed. The liver, heart, spleen, pancreas, lungs, intestines, and kidneys were extracted one by one. Lastly, a piece of the liver was placed into an Eppendorf for tissue analysis for further labs.

Results

The anatomy of the mouse was viewed by dissecting the furry skin, the skin that protects the organs (peritoneal wall incision) and the organs. The organs are subtracted one at a time carefully. Attention was given to this process to prevent the organs from taking damage.

After the rib cage was broken, the liver, heart, spleen, pancreas lungs, intestines, and kidneys were extracted from the mouse body. The spleen was harmed during extracting due to human error. Çerağ extracted the liver, heart and kidneys. Dursadiye extracted the spleen, stomach, intestines. Dora extracted the lungs and pancreas.

Discussion

The animal experiment requires care, attention, and focus because the experimenter mustn't harm the animal body while cutting the body during the injection. The things to consider include making sure no bubbles exist in the injection needle and the needle should be changed for each injection for contamination-related reasons. In our experiment, we used the same needle for injecting multiple areas, this might have carried contamination from one tissue to another, this is not a good practice in general. If the animal is alive, the handling of the animal should be firm and careful. While extracting the organs, It is important to be patient and hold each organ carefully not to damage them. In our experiment, the spleen was harmed by over-cutting.

References

1. "Laboratory Animal Facility." Max Planck Institute of Immunobiology and Epigenetics. https://www.ie-freiburg.mpg.de/animcalfac.
2. "What are the 3Rs principles?" Natural Sciences, https://naturalsciences.ch/animal-experimentation-explained/introduction/3rs_principles.