Griffith and Transformation

Like many stories in science, this discovery began with an investigator who was actually looking for something else. In 1928, British scientist Frederick Griffith was trying to figure out how bacteria make people sick. More specifically, Griffith wanted to learn how certain types of bacteria produce a serious lung disease known as pneumonia.

Griffith had isolated two slightly different strains, or types, of pneumonia bacteria from mice. Both strains grew very well in culture plates in the lab, but only one of the strains caused pneumonia in mice. The disease-causing strain of bacteria grew into smooth colonies on culture plates, whereas the harmless strain produced colonies with rough edges. The differences in appearance made the two strains easy to distinguish.

When Griffith injected the mice with the disease-causing strain, the mice developed pneumonia and died. When mice were injected with the harmless strain, they didn’t get sick at all. Next, Griffith took a culture of the disease-causing bacteria, heated the bacteria to kill them, and injected the heat-killed bacteria into the mice. The mice survived.

Griffith’s next experiment produced an amazing result. He mixed his heat-killed, disease-causing bacteria with live, harmless bacteria and injected the mixture into mice. By themselves, neither should have made the mice sick. But to Griffith’s amazement, the mice developed pneumonia and died. When he examined the mice, he found them filled with the disease-causing bacteria.

Questions:

1. Describe the four different experiments that Griffith conducted on mice and give the results of each.
2. What was Griffith’s control group?
3. What was Griffith’s experimental (independent) variable?
4. What was his dependent variable?
5. Write a brief paragraph that explains his results. Make sure to justify your reasoning.
6. Write a brief paragraph explaining what experiment you would carry out next to determine the exact cause of Griffith’s results.