Name _____ Date _____

Biotechnology Research and Development

Project 1.6 Topic: Brain Anatomy

Materials Needed

- Student Information Sheet
- Patient Medical Record
- Student text
- Research resources
- Paper and drawing equipment, software program or a combination of both
- Supplies and materials to set up individual or group experiment

Introduction

Marjolein van der Meulen, Alshad Lalani and Robert Rutschman, who are featured in your text, have their own specialized research skills. If you or someone you love is involved in a motor vehicle crash, you won't be thinking about research. You will, however, be getting emergency care that comes from the work of researchers over time. Bradley Jones' CT scan made it possible to make the quick connection between swelling in his cerebellum and his poor motor function.

Procedure

You probably know from the news that brain research is a hot topic. In order to ask questions or learn about what isn't known about the brain, biotechnologists first need a comprehensive understanding of what IS known. Part 1 of this project will give you an opportunity to develop some background knowledge that a successful biotechnologist would need.

PART 1: Choose one of the following areas of the brain that interests you – frontal lobe, parietal lobe, temporal lobe, occipital lobe, limbic system, cerebellum, brain stem – and complete the following project. The resources at **http://www.brainconnection.com** may be useful for you.

- Sketch and label a diagram of the area.

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- Identify what sensory or autonomic function is processed in the area you explored. Include the appropriate cranial nerve.

- Create a flowchart to illustrate how signals are transmitted to, from and within the system in a healthy individual.

- List injuries, diseases or conditions that could potentially cause short-term or permanent damage to the area. Illustrate or demonstrate the effects of each.

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PART 2: Now it's time for you to think like a researcher. Design an experiment that could be used to test a significant question related to brain function. Be sure to consider legal and ethical issues, as well as safety concerns.

- Specific question
- Hypothesis
- Materials and equipment needed
- Procedural steps
- Data sheets for recording observations

If you can perform the experiment, continue with the following:

- Observations
- Conclusion
- Follow-up or new question(s) for future exploration

PART 3: Finally, reflect on what you know and have learned about human brain function. Read the descriptions of health care workers in your copy of the *American Careers Health Careers Planner.* List job titles for those individuals who would need this information in their work. Add a brief example of a job assignment for each that illustrates why they need the knowledge.