Science & Engineering Fair Research Plan
Vertebrate Animal Research

Name
School
Category
Research Teacher

Question or Problem being addressed - Title

Rationale

Brief synopsis of the background that supports your research problem and explain why this research is important scientifically and if applicable, explain any societal impact of your research.

Research Question/Hypothesis/Engineering Goals/Expected Outcomes

Materials List

List of all items used in research. Make sure to include concentrations of all chemicals, source and amount of all living organisms, and all equipment used.

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Procedures

Detail all procedures and experimental design to be used for data collection (see Research Plan/Project Summary Instructions, ISEF Rules and Guidelines, page 31). See pages 7-23 of the ISEF Rules and Guidelines for specific inclusions involving Human subjects, vertebrate animal, potentially hazardous biological agents, and/or hazardous chemicals, activities or devices. **Make sure to clarify which procedures were completed by the researcher and which were completed by others**.

Vertebrate animal research: Procedure must include the following items!

- **Describe potential ALTERNATIVES to vertebrate animal use and present a detailed justification for use of vertebrate animals.**
- Explain potential impact or contribution this research may have to science.

- Include **methods used to minimize potential discomfort**, distress, pain and injury to the animals during experimentation.
- Detail chemical concentrations and drug dosages (if applicable).
- **Animal species (common and scientific name)**
- **Detail animal numbers, strain, sex, age, source, etc.**
- Describe housing and oversight of daily care and **disposition of animals during the study**.
- Describe in detail the **disposition of animals at the termination of the study**.
- **Complete a Mortality Form** after experimentation has ended**.**

Potentially Hazardous Biological Agents: Procedure must include the following items!

- Describe **Biosafety Level Assessment process and resultant BSL determination**.
- Complete appropriate Biosafety Form. **Include source of agent, source of specific cell line**, etc.
- **Detail** safety precautions and **specify methods of disposal**.

Hazardous Chemicals, Activities & Devices: Procedure must include the following items!

- **Describe Risk Assessment process.**
- **Detail chemical concentrations and drug dosages.**
- **Describe safety precautions and procedures to minimize risk.**
- **Specify methods of disposal.**

Procedures (Research Methods)

Description in detail of method/procedures, risk and safety, and proper disposal if needed. See statements above for more information.

Data Analysis

Describe the procedures you will use to **analyze the data** that answer research question, hypothesis, or engineering goals.

Bibliography

List at least five (5) major references (e.g. science journal articles, books, internet sites) from your literature review. Please use a **variety of sources**, five sources from the internet will not suffice.

- If you plan to use **vertebrate animals**, one of these references must be an animal care reference.
- If you plan on using **human subjects**, one of these references must be from the listing of human subject reference in the ISEF Rules and Guidelines.
- Include MSDS/SDS citation for all **hazardous chemicals** used in experimentation.
- If you plan on using **PHBA**s, one of the references must include aseptic technique.

SSEF FY25 Rulebook:
State Science and Engineering Fair of Florida. "2024-25 Rules Supplement to the International Science and Engineering Fair Rules." Retrieved August 27, 2024, from https://sseffflorida.com/rules/.

ISEF FY25 Rulebook:
Regeneron ISEF, A Program of Society for Science & The Public. "International Rules for Pre-college Science. Research: Guidelines for Science and Engineering Fairs 2023-2024." Retrieved August 27, 2024, from https://sspcdn.blob.core.windows.net/files/Documents/SEP/ISEF/2022/Rules/Book.pdf.