

Intel ISEF OFFICIAL ABSTRACT and CERTIFICATION



The Production of Haploid Homozygous Zebrafish for the Study of Recessive Mutations
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Danio rerio, commonly known as Zebrafish, are metastasizing in their use throughout laboratories. Due to the fact that they are vertebrates, and therefore closer to humans than their invertebrate counterpart (Drosophila), they are more likely to share common biological traits such as: anatomy, physiology, behavioral characteristics, developmental processes and genes with humans. Zebrafish embryos are very useful because their development out side of the womb and clear appearance allow easy access to study how each body part is formed from single cell to mature zebrafish. If zebrafish sperm is exposed to ultraviolet light to create infertile sperm that is still capable of completing gynogenesis to produce haploid embryos through the process of in vitro fertilization, the homozygous haploid zebrafish will be produced for the study of recessive mutations. The purpose of the project is to detect what mutations occur if the Y chromosome is depleted from an embryo. Through the collection of sperm and eggs from viable Zebrafish, in vitro fertilization can be performed. In order to deplete the Y chromosome, sperm must be exposed to UV light. The UV light creates links within the sacromeres in DNA which prohibits the transfer of paternal DNA. After experimentation, it is evident that fish with no paternal chromosomes have vacuolated body cavities, truncated or bent tails, enlarged heads, and develop along the chorion sac for a longer period of time than that of diploid zebrafish. The fish must be observed and photographed during each stage of their development to identify all mutations

Category
 Pick one only--
 mark an "X" in
 box at right

- Animal Sciences
- Behavioral and Social Science
- Biochemistry
- Cellular & Molecular Biology
- Chemistry
- Computer Science
- Earth Science
- Eng. Electrical & Mechanical
- Eng. Materials & Bioengineering
- Energy & Transportation
- Environmental Management
- Environmental Sciences
- Mathematical Sciences
- Medicine and Health
- Microbiology
- Physics and Astronomy
- Plant Sciences

1. As a part of this research project, the student directly handled, manipulated, or interacted with (check ALL that apply): human subjects vertebrate animals
 Potentially hazardous biological agents: microorganisms rDNA tissue
2. Student independently performed all procedures as outlined in this abstract. Yes No
3. Student worked or used equipment in a site other than school, field or home. Yes No
4. This project is a continuation of previous research. Yes No
5. My display board includes non-published photographs/visual depictions of humans (other than myself): Yes No

I/We hereby certify that the above statements are correct and the information provided in the Abstract is the result of one year s research. I/We also attest that the above properly reflects my/our own work.

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 Date



This embossed seal attests that this project is in compliance with all federal and state laws and regulations and that all appropriate reviews and approvals have been obtained including the final clearance by the Intel ISEF Scientific Review Committee.

ABSTRACT & CERTIFICATION INSTRUCTIONS

This abstract form and the instructions below are intended for Intel ISEF finalists. Entrants of regional and state fairs may also be directed to use this form. Please follow all local, regional or state instructions. As an Intel ISEF finalist, you will receive further information and will be required to complete this abstract in an on-line abstract system immediately after winning at your regional or state fair.

WRITING REQUIREMENTS

Abstracts should be **single-spaced using 12-point type** from a black ribbon or laser cartridge. Abstracts may not exceed 250 words and must be typed within the predefined area (5.5 tall by 6 wide). Type title (Title Case required); your first name, middle initial and last name; and your school's name, city and state within the first .75 inches of space within the box. Two lines may be used for the title. *Teams must include all team member names.*

Example: Effects of Marine Engine Exhaust Water on Algae
Mary E. Jones
Hometown High School, Hometown, Pennsylvania

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TIPS ON WRITING

The three most common reasons that a student is asked to rewrite the abstract are 1) including acknowledgements (this includes naming the research institution and/or mentor with which you were working) 2) describing research not completed by the student finalist and 3) describing research done in previous years. Please limit yourself to describing research **you** have done in the current year.

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Because your Abstract & Certification will not be considered an official one until it is stamped/embossed at the Intel ISEF, you must NOT mount a copy of any abstract on your vertical display board before arriving at the Intel ISEF. If you plan to have an Abstract & Certification on your vertical display board (recommended), you should leave a space (8.5 by 11 inches) for it to be mounted after you have arrived at the ISEF and your Official Abstract & Certification has been returned with the embossed approval.

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After finishing research and experimentation, you are required to write a (maximum) 250 word, one-page abstract. This should be written on the Official Abstract and Certification Form as provided by Science Service. The abstract **should include the following:**

- a) *purpose of the experiment*
- b) *procedure*
- c) *data*
- d) *conclusions*

It may also include any possible research applications. Only minimal reference to previous work may be included. An abstract **must not include the following:**

- a) *acknowledgments (including naming the research institution and/or mentor with which you were working), or self-promotions and external endorsements*
- b) *work or procedures done by the mentor*

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At the bottom of the Abstract & Certification form there are five questions. Please read each carefully, answer appropriately, and sign in the signature box to certify your answers. The Intel ISEF Scientific Research Committee will review and approve the abstract and answers to the questions.

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Intel ISEF Sample Abstract & Certification

<p>Title _____</p> <p>Finalist s Name _____</p> <p>School Name, City and State, Country _____</p> <hr/> <p style="text-align: center;">Start Typing the Body of Your Abstract Here Beginning at the Left Margin</p>	<p>Category</p> <p>Pick one only-- mark an "X" in box at right</p> <ul style="list-style-type: none"> Animal Sciences <input type="checkbox"/> Behavioral and Social Science <input type="checkbox"/> Biochemistry <input type="checkbox"/> Cellular & Molecular Biology <input type="checkbox"/> Chemistry <input type="checkbox"/> Computer Science <input type="checkbox"/> Earth Science <input type="checkbox"/> Eng. Materials & Bioengineering <input type="checkbox"/> Eng.: Electrical & Mechanical <input type="checkbox"/> Energy & Transportation <input type="checkbox"/> Environmental Sciences <input type="checkbox"/> Environmental Management <input type="checkbox"/> Mathematical Sciences <input type="checkbox"/> Medicine and Health <input type="checkbox"/> Microbiology <input type="checkbox"/> Physics & Astronomy <input type="checkbox"/> Plant Sciences <input type="checkbox"/>
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