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Humble ISD Education Foundation Innovative Education Grant Signature Page

APPLICATION HINT: USE YOUR TAB KEY TO MOVE TO THE NEXT FORM FIELD. USE YOUR MOUSE TO CLICK ON A CHECK BOX.

PRIMARY APPLICANT NAME	GRADE & SUBJECT TEACHING (OR DEPARTMENT IF NOT A TEACHER)	NAME OF CAMPUS
Debra Howsmon	9 th and 10 th Grade Biology Honors	Atascocita High School

ADDITIONAL APPLICANT NAMES	GRADE & SUBJECT CURRENTLY TEACHING	NAME OF CAMPUS
Nicole Campbell	11 th & 12 th Grade AP Biology	Atascocita High School

If more than six applicants, please include additional applicants on a separate piece of paper and insert after this page in your application.

Title of Project: Shining a Little Light on Molecular Biology

Brief Project Summary (about 50 words or 4-5 sentences): The pGLO Bacterial Transformation Kit uses the process of genetic engineering to manipulate the DNA of a harmless bacterial species. In this activity, students will transform bacteria by introducing a gene from glowing jellyfish. Students will use the same procedures to create "designer genes" and "designer proteins" that has led to the explosion of new health treatments, agricultural applications, and environmental solutions. To keep students interested in biology and to provide examples of the roles of biology in society today, laboratory investigations such as the pGLO Bacterial Transformation lab expose students to relevant, real-life situations where their knowledge of biology is put into action.

Signature of Principal/Supervisor:



In signing this application, I am certifying that this proposed project would be a good use of funds for our school or department.

If your project involves adding or supplementing curriculum, you are required to receive prior approval from the appropriate Academics Coordinator before submitting your proposal to the Education Foundation.

Signature of Academic Coordinator

Date

Humble ISD Education Foundation Innovative Education Grant Proposal

DO NOT INCLUDE YOUR NAME OR THE NAME OF YOUR SCHOOL IN THE SUBSEQUENT PAGES OF YOUR GRANT PROPOSAL.

Type of Activity:

(Check all that apply)

Student Development

Staff Development

Grade Level:

(Check all that apply)

Elementary School

Middle School

High School

Level of Activity:

(Check all that apply)

One Site Activity

Multi-site Activity

District-wide Activity

How many students will this project impact in one year?

(Do not state a grade level or "the whole school". Please give a numerical answer)

Current enrollment figures indicate that 350 students will be enrolled in Biology Honors and AP Biology for the 2008-2009 school year.

This project is:

A new grant project

A request to continue a grant that was previously awarded to me *(If you check this box, be sure and explain under Project Description how this year's project will be different than last year's project)*

A new grant request for me but replicates a previously funded project for a different teacher at my school or at a different school *(If you check this, explain success of previously funded project)*

Project Description

Provide a thorough description of the project and the need it addresses. Explain the duration of your project (i.e., two weeks, one year) and if available, include data to support your project. How is this project relevant to your campus or district vision?

You are able to change the formatting in the two answer sections below. When you are finished typing your answer below, put your cursor on the next blank line (following a question) to begin typing your next answer. If you hit the TAB key, it will not take you to the next answer field but will only create an additional line.

Needs and Purpose

The overall goal of this project is to provide practical, hands-on, real-world experience in the field of biotechnology. Students have a genuine interest in "designer genes" and how genes from one organism can be inserted into the DNA of a completely unrelated organism. One of the biggest challenges for first-time students of biotechnology or molecular biology is that many of the events and processes they are studying are "invisible." In this lab activity, students will introduce the bioluminescent gene from glowing jellyfish into bacteria that normally form white colonies when growing on a petri dish. Using the pGLO Bacterial Transformation Lab to produce genetically engineered bacteria, students can actually observe gene expression in real time. The end product, glowing bacteria, is made visible with a hand held UV light.

The other two products being requested with this grant are to ensure student safety and to prevent contamination of the culture plates. It is standard lab procedure that students wear exam gloves when doing any lab work that involves the interaction with bacteria. Latex free, powder free gloves are being requested to reduce skin irritation of students while they are wearing gloves. Parafilm is also being requested as it is used to seal the petri dishes once the bacteria have been added to the culture plates. This will help reduce cross contamination during the incubation process.

Duration of the Project

The pGLO Bacterial Transformation Lab will be completed during our genetic engineering unit. The unit will last approximately two and one-half weeks, with the lab lasting approximately one week. One class period will be devoted to pre-lab instruction to explain to students the processes they will be completing, two class periods will be spent on completing the lab, and one class period will be devoted to post-lab discussion of the results obtained. However, the lab experience itself will create lasting memories in the students' learning process because students will have had hands-on experience with the concepts taught in the genetic engineering unit.

Relevance of Campus / District Goals

Inquiry investigations within the science classroom are an important part of the Humble Independent School District's goals. The focus of the pGLO Bacterial Transformation is *not* on the answer or the result, but rather on *how* the result is actually obtained and *how* the results can be substantiated through careful observations and analysis of data. At each step along the way student understanding of the process and the analysis of data is stressed.

Creative Use of Facilities and Equipment

The pGLO bacterial transformation experiment is one of the most innovative experiments on the market today. We currently have incubators for growing bacterial cultures; however, we have not been able to use the incubators due to lack of materials for performing simple microbiology investigations. The pGLO Bacterial Transformation lab will make use of the incubators because the bacterial cultures will need a warm environment in which to grow and reproduce overnight.

How will your project improve, advance or enrich student learning? How does this project support the district's mission of personalizing instruction and learning for every student?

Improving Student Learning

Assessment For Learning is extremely important of our campus improvement plan. The inquiry based pGLO Bacterial Transformation lab uses a series of guided questions throughout the lab to help students understand the processes that are occurring within the experiment. Student involvement in this process will result in increased understanding of the scientific process and the value of proceeding into a task in an organized and logical way. Research shows that students who engage in this type of thought process will start to develop a more positive sense of their ability to understand the scientific method.

Innovative Solutions to a Problem

While studying methods and procedures used in genetic engineering, students often have difficulty comprehending the concepts because the events and processes occur on a microscopic level. Knowing whether the intended outcome of the experiment has been achieved would be impossible without using some sort of visual marker such as the pGLO gene.

Collaboration Between Parents and Students

In early September 2008, students will be asked to return a signed permission form allowing their photo to be taken while they are performing the pGLO Bacterial Transformation lab and posted on the teacher web page. To enable parents to experience what their student is doing in class during the genetic engineering unit, pictures will be taken of the set-up, procedure, and outcome of the experiment. The pictures will then be posted on the teacher web page for parents to view. To ensure student safety, access to this portion of the teacher web page can be password protected so that only parents, students, and school district professionals can actually access this portion of the participating teachers' web page. In addition, as always, class notes on the genetic engineering unit are available on the teacher web pages for both parents and students.

Visualizing the pGLO Bacterial Transformation Lab:

To get an idea of what students will be producing during this lab experience, please refer to the attachment to the end of this grant.

Detailed Workplan

List below the steps involved in completing your project. Include the positions (not names) of staff responsible for carrying out the activity, date activity will begin and end, and how much money is needed for each activity.

Description of Activity	Positions Responsible	Timeline		Funds Requested for this Activity
		Date Initiated	Anticipated Completion Date	
Order 12 pGLO Bacterial Transformation Kits from Bio-Rad	Grant Originator	August 15, 2008	August 15, 2008	\$900.00
Order exam gloves and parafilm for pGLO Bacterial Transformation lab	Grant Originator	August 15, 2008	August 15, 2008	\$ 250.00
Send permission slips home with students (allow students to be photographed during lab & photos posted on teacher web page)	Grant Originator	September 2008	September 2008	\$0.00
Prepare media plates and bacterial plates	Grant Originator	January 2009	January 2009	\$0.00
Complete pGLO Bacterial Transformation lab in class & take photos of students	Grant Originator	January 2009	January 2009	\$0.00
Upload photos on teacher webpage	Grant Originator	February 2009	February 2009	\$0.00
Complete mid year report	Grant Originator	February 2009	February 2009	\$0.00
Complete end of year report	Grant Originator	May 2009	May 2009	\$0.00

Grant #26

Budget

List detailed information on how the grant funds will be spent. **DO NOT** guess at prices. Please research what the actual cost will be for each budget item. Don't forget to include shipping and handling costs. Also, contact the Purchasing Department to see if the district has a vendor that can provide the items requested at bid price.

If you need additional lines for your budget, continue on a separate page, print the additional page and then attach to all copies of your proposal.

Budget Item	Vendor	Cost
12 pGLO Bacterial Transformation Kits @ \$68.00 / kit	Bio-Rad Laboratories	\$ 816.00
Estimated Shipping Costs for 12 kits	Bio-Rad Laboratories	\$ 84.00
Exam gloves (14 boxes of 100 gloves each) & parafilm (4 boxes)	Fisher Scientific	\$ 237.60
Shipping and Handling Charges for exam gloves and parafilm	Fisher Scientific	\$ 12.40
Sciencelab.com will donate	exam gloves	
		900
Total Cost		\$ 1,150.00

Can this project be implemented with partial funding? Yes No

If yes, explain. Each kit contains enough materials for one class section. It is estimated by our school counselor that we will have 10 sections of Biology Honors and 2 sections of AP Biology for the 2008 – 2009 school year.

Have you requested funding from other sources for this project? Yes No

If yes, please list the name of the funder and the status of the request:

Measurement of Accomplishments

List the outcomes that you will use to measure success of your project (outside of standardized testing). In other words, how will you know that this project was successful and should be replicated in other classrooms?

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Measurable Objectives and Their Evaluation Will Indicate the Success of the Project:

The success of this project will be measured based on the following science TEKS-based student objectives and evaluations:

1. Applying their knowledge of the scientific method, student participants will be able to *predict* with 100% accuracy the final outcome of the experiment: 1 petri dish with no bacterial growth, 1 petri dish with a white bacterial "lawn", 1 petri dish containing white colonies, and 1 petri dish containing fluorescent green colonies under UV light.
2. 90% of student lab groups will produce the predicted results using the pGLO Bacterial Transformation Lab.

How do you plan to share the results of this project and who will receive this information?

The knowledge gained by the students participating in the grant will be shared with others in two different ways.

1. After completing the analysis questions for the pGLO Bacterial Transformation lab, students will be required to share and explain their photos with 3 adults (teachers, administrators, counselors, secretaries, etc) on our school campus. Adults will sign off on a participant card that the student has satisfactorily explained the purpose and results of the experiment.
2. Student volunteers will present the lab experience (what they did, how they did the lab, and the outcome of the lab) to another science class within our campus.

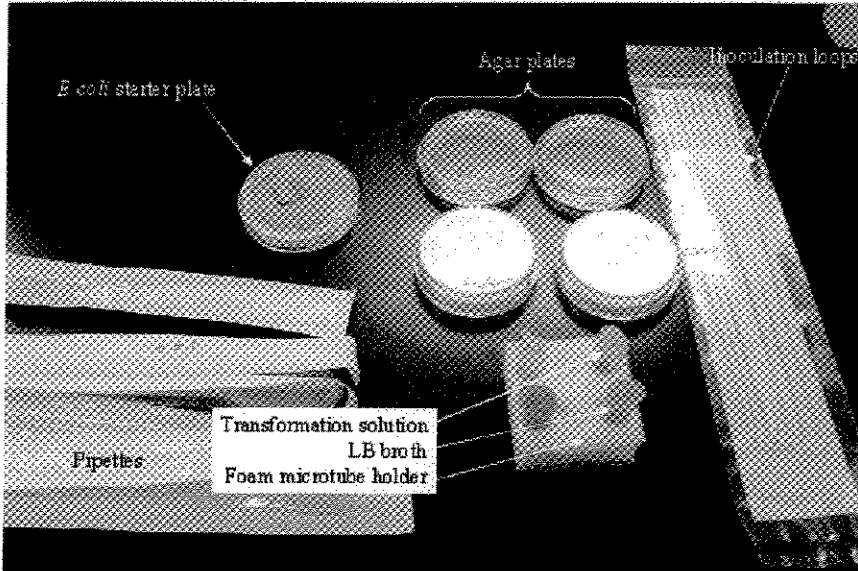
How will the Education Foundation be recognized as the financial supporter of this project?

The Humble ISD Education Foundation will be recognized as the financial supporter of this project in two ways.

1. Students will write personal thank you notes back to the foundation after they have completed the pGLO Bacterial Transformation Lab. A representative sample from each participating grant originator will be sent to the Humble ISD Education Foundation Office.

2. Participating grant originators will set up a special grants section on their teacher web – page to display the results of the pGLO Bacterial Transformation lab with a special thank you section to the Humble ISD Education Foundation for providing the funding to make the lab experience possible.

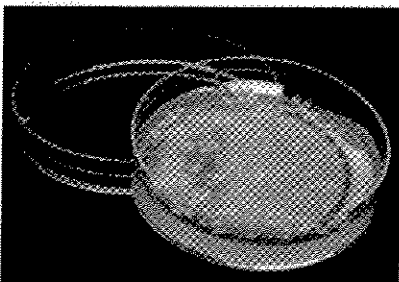
Shining a Little Light on Molecular Biology



Lab Station Set Up for pGLO Bacterial Transformation Lab



Inoculating a petri dish in the GLO Bacterial Transformation Lab



Genetically altered bacteria that contain the green fluorescent gene from glowing jellyfish