

Project of Quality Enhancement Plan

Integration of a discovery-based project into a Biology course

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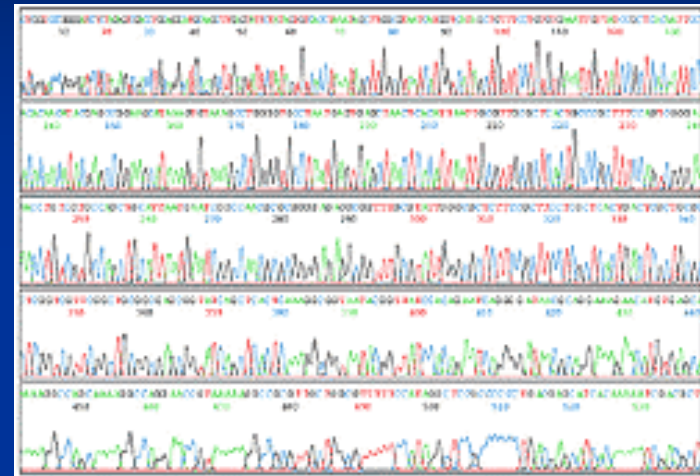
Integration of a discovery-based project into a Biology course

- *The scenario and execution*
- *The assessment*
- *What we have learned so far*

The basis of our project scenario:

1. Bad (mutated) genes are linked to occurrence of some human diseases

- Sickle cell anemia
- Cystic Fibrosis
- Huntington's disease
- Certain types of cancer



2. Available genetic database makes it possible to find bad genes

The scenario:

1. Use certain genetic information in the form of a DNA sequence to identify gene mutations
2. Establish a linkage of identified gene mutations to human diseases
3. Do a research on the identified human disease
4. Develop a project to enhance public awareness of the disease

An example of the project:

	approach	activity
1	Computation search and lab experiment, e.g.: identifying APP gene	during the course
2	Mutated APP gene is linked to inheritable form of Alzheimer's disease	during the course
3	About Alzheimer's disease	Term paper and poster exhibition
4	Alzheimer's disease awareness week: seminar and 5K run	Term paper and poster exhibition

The assessment:

Basic technique learning:

Learning of basic techniques such as genetic information data search (genomic data mining) and DNA amplification experiment will be assessed by the instructor during the course.



The assessment:

Written report:

- ***Evaluation standards:*** based on a rubric that will already be posted in the syllabus.
- ***Evaluation:*** through *anonymous peer review process* by students and the instructor, and finally by the instructor who will grade the final report.

The assessment:

Poster presentation:

Each poster will be evaluated by fellow students from other groups, using a rubric posted in the course syllabus.

In addition to the instructor and students of the class, the poster exhibition will be available to invited guest faculty members.

The Budget

- Grant workshop
- Computer
- Experiment supplies
- Poster materials



What has been done in the genetics course:

1. Basic technique learning in the class
2. Term paper “about the genetic disease.....”, in the essay:
 - a. Information about the disease (literature search)
 - b. What you intend to do about what you find out (the project)

Score (0-3)	Element	Comment
	1. Information about the disease	
	2. Logic and Organization of the introduction	
	3. Completeness & breadth of the literature reviewed	
	4. Clear statement of the research proposed activity	
	5. Method of the proposed activity	
	6. Predicted results	
	7. Discussion	
	8. Quality of writing: Is the paper understandable?	
	9. Quality of writing: Is there lots of typo and grammar mistakes?	
	10. References	
	11. Overall impression of the paper.	
X	12. others	Other comments:

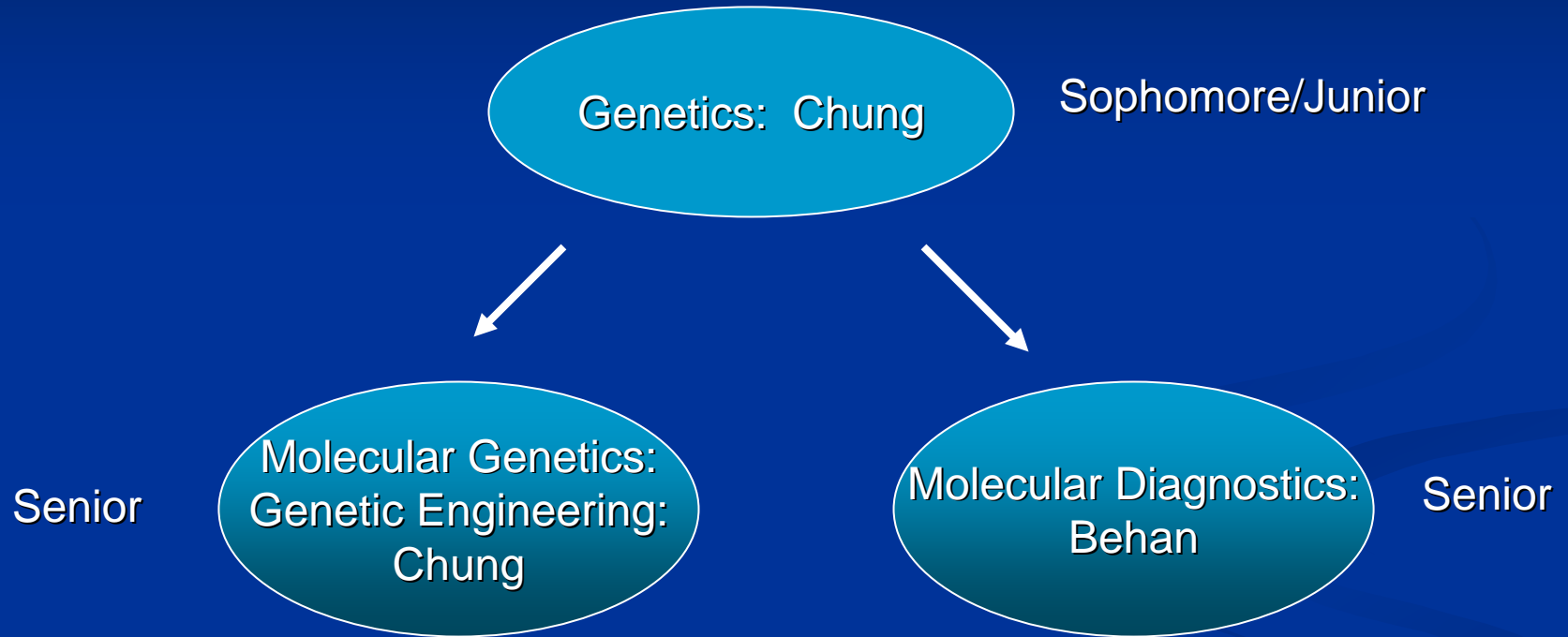
What we have learned so far:

Elements of this project activity can be executed in different combination.

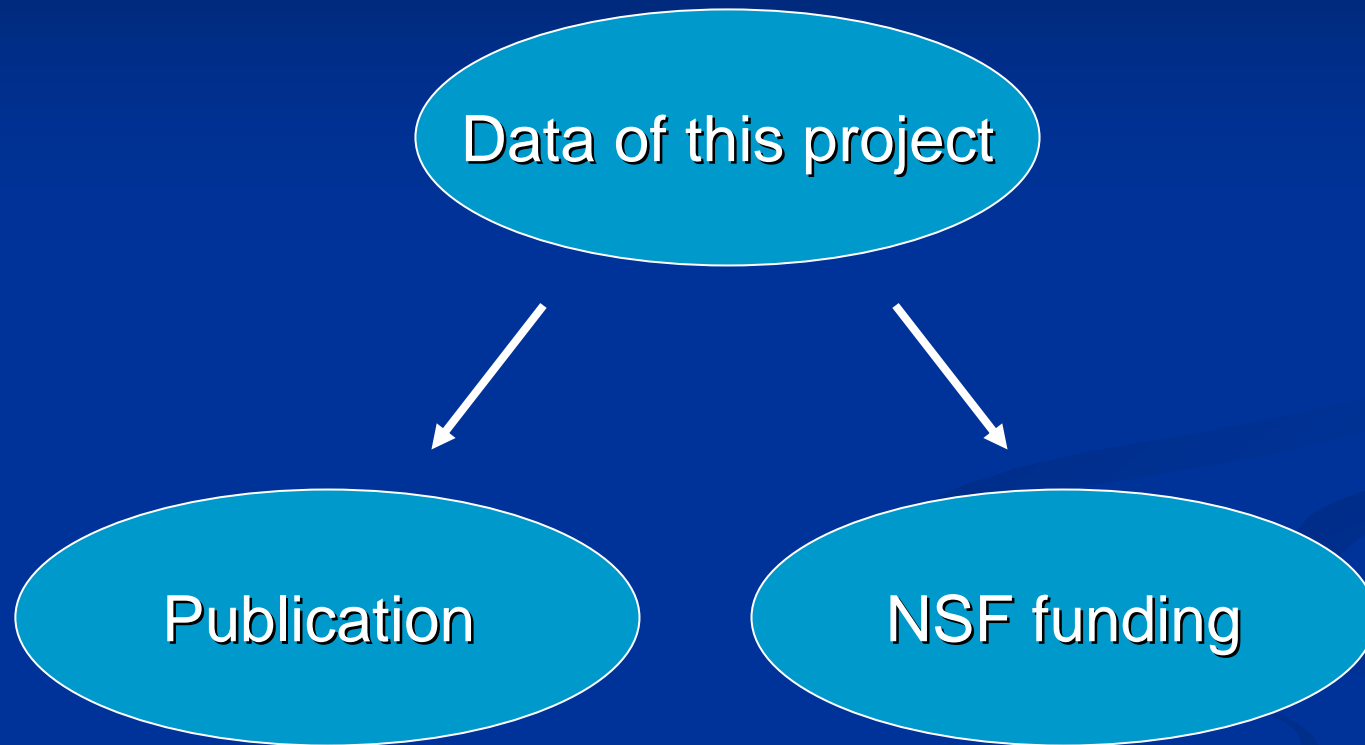
Students like to participate peer review process

Incorporation of project activity is a tricky thing

Project management and peer review introduced in Genetics, woven through higher division class



Future implication on publication and grant funding opportunities



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