

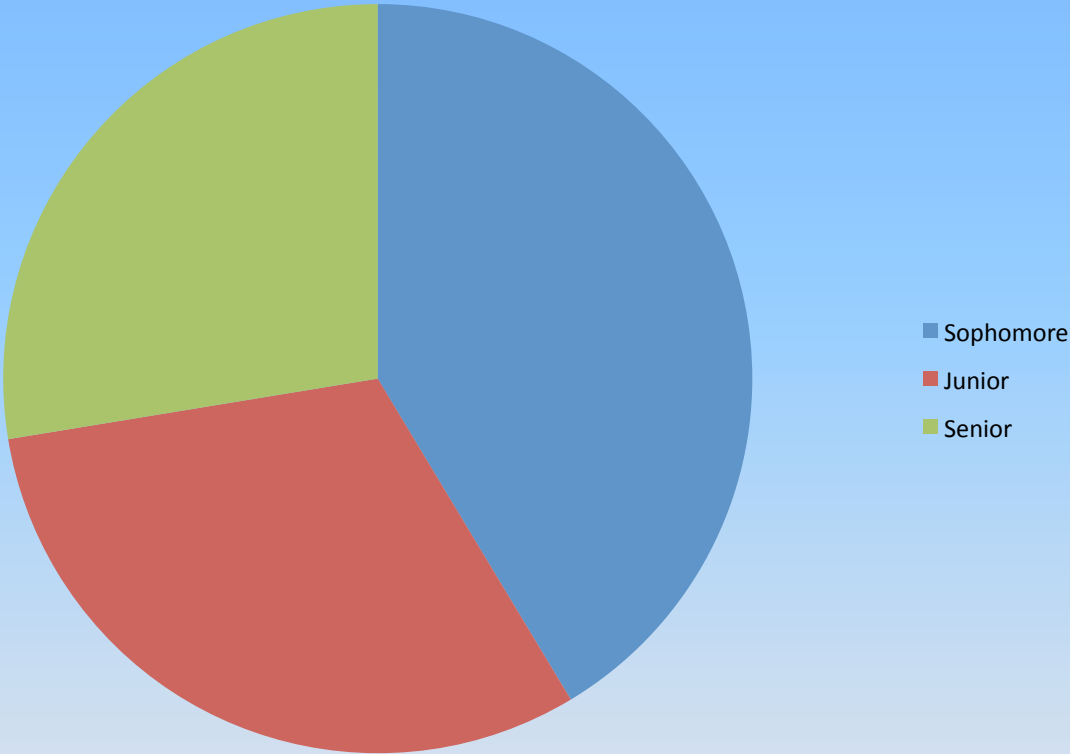
SFC Biology Division

April 6, 2009

Agenda

- The things that are going well.
- Bioengineering as a new independent option
- CNS most likely not become an option
- Bio suboptions.
- Introductory Bio classes: Bi1, Bi8, Bi9, and Bi1x.
- Other issues.

ASCIT student Survey Participation



Sophomore	12
Junior	9
Senior	8
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Total	29

Compliments to the Bio Department

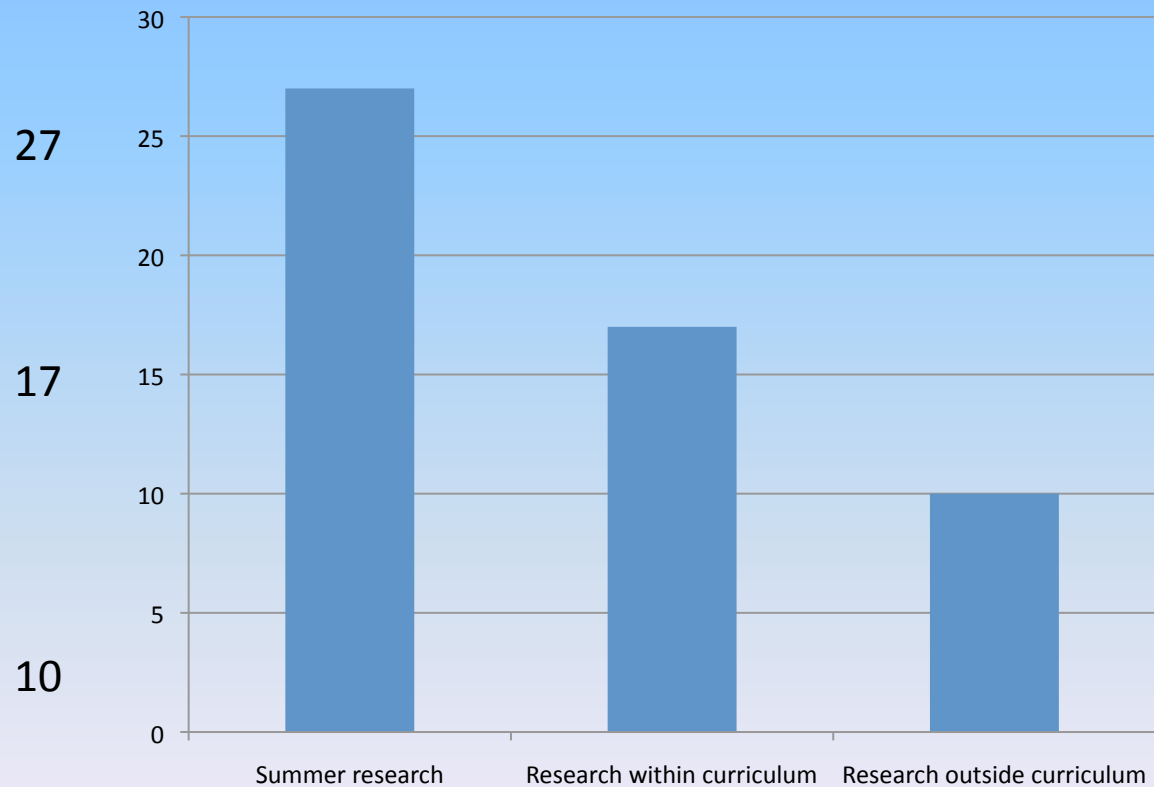
- The majority of bio majors are quite content with their research experience at Caltech.
- Bio majors are generally happy as bio majors in Caltech
- Always being positive and receptive to feedback. Diligence and patience for continually trying to improve the Caltech bio department. (ex. The new Bi1x: intro to concepts and lab methods in biology. <http://www.rpgroup.caltech.edu/courses/bi1x/syllabus.html>)

Which of these describes your research experience at Caltech?

Summer research

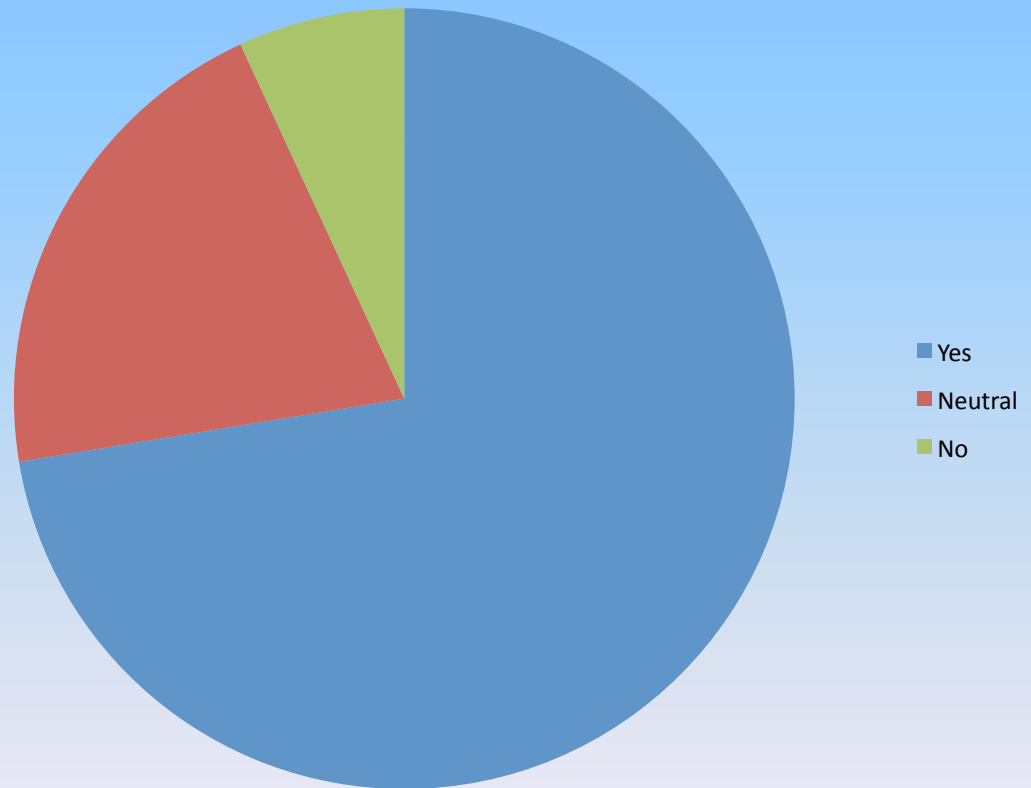
Research within curriculum

Research outside curriculum



Are you satisfied with your research experience at Caltech?

Yes	21
Neutral	6
No	2

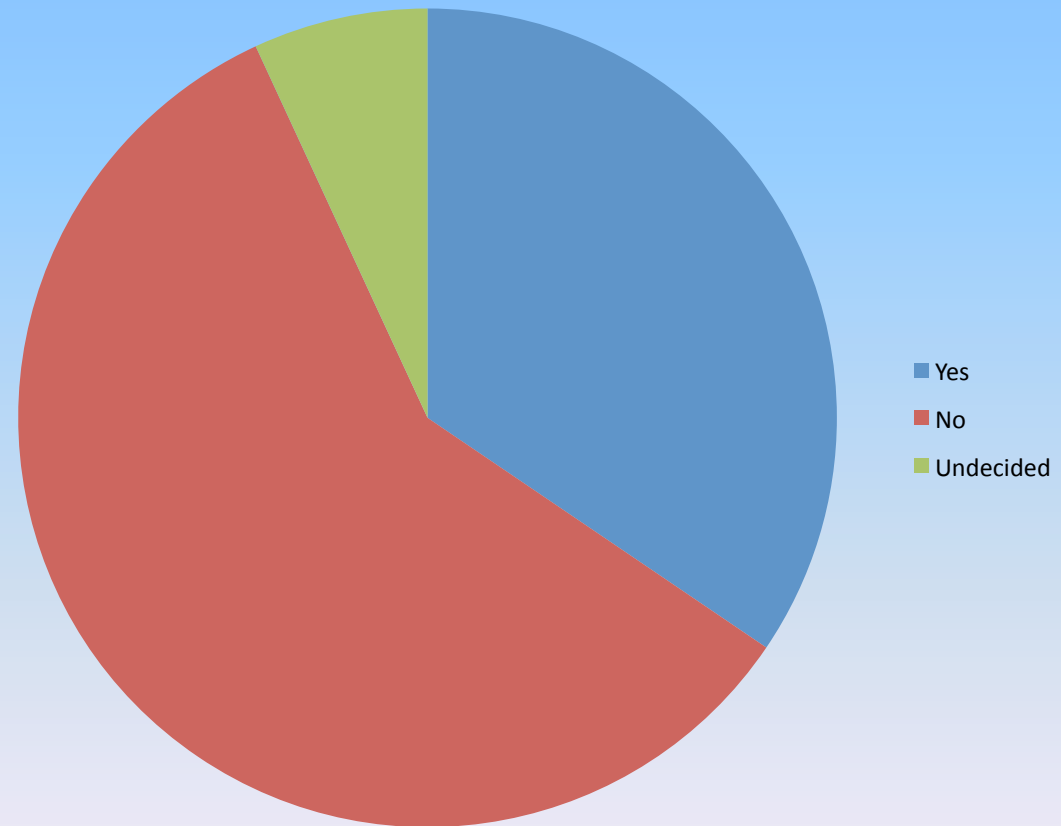


Bioengineering

- A considerable number of Bio undergrads are thinking of majoring in Bio Engineering
- BioE curriculum v 0.9 (most recent) and basically completed.
- Almost all survey takers said they are quite content with the curriculum.

Are you interested in majoring in Bioengineering?

Yes	10
No	17
Undecided	2



Q & A and Suggestions

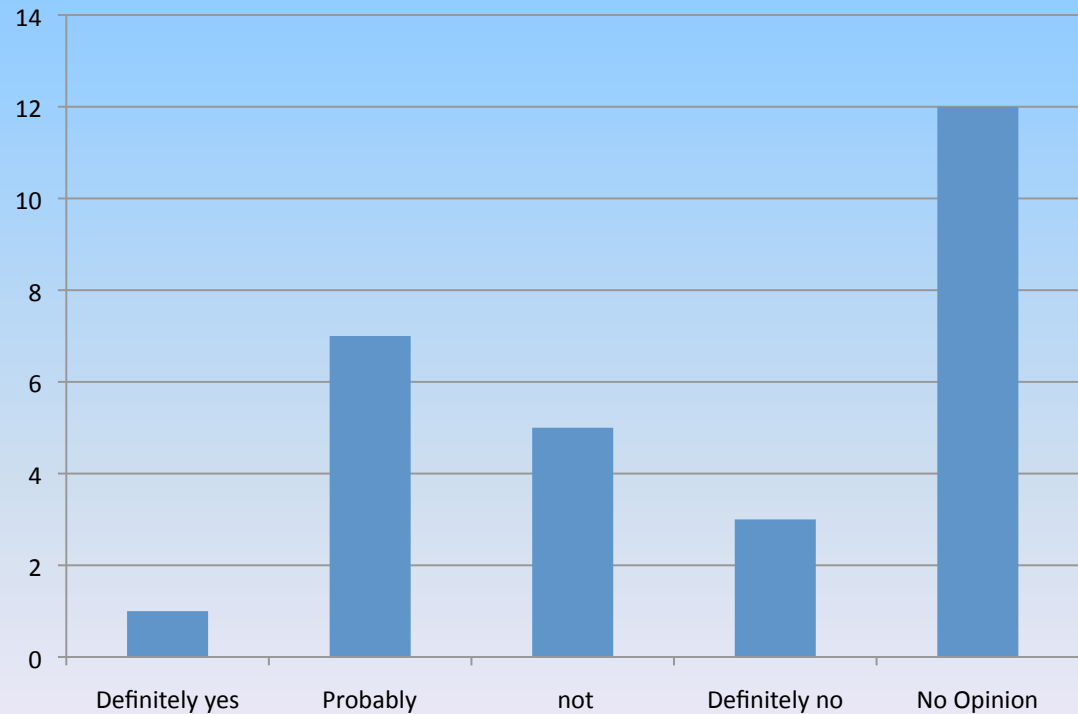
- If you have any questions, please ask now.
- Also if you have any ideas or suggestions, please tell us so we can consider them.
- If you have any questions, please talk to Prof. Pierce or Lucas Hartsough. Prof. Pierce is holding BioE sessions every Tuesday.
- A concern may be class conflicts between the different fields of classes required. Curriculum should stabilize as more BioE's take classes.

Computational Neural Science (CNS)

- Should CNS become its own major? Why?
- Are the courses required for the CNS concentration reasonable?
- Currently, CNS is a “concentration” under EAS and requires EAS requirements.
- CNS requires a good background in neurobiology, mathematics, and engineering.

If Computation and Neural Systems (CNS) was a separate major (not under the general EAS degree), would you be much more likely to major in it?

Definitely yes	1
Probably	7
not	5
Definitely no	3
No Opinion	12



Q & A

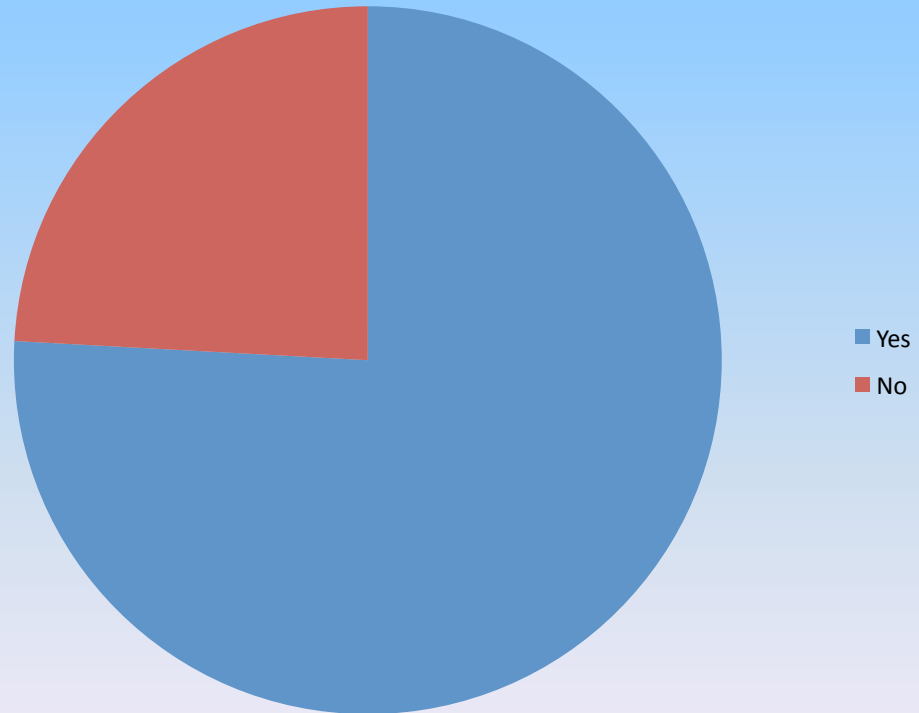
- CNS works better as a focus after undergraduate studies in math, neurobiology, and engineering
- Also, survey does not indicate a strong demand and there is no faculty who are strongly supporting it.
- If you have more questions and comments about CNS or making it an option, please contact Karthik Sarma: ksarma@caltech.edu

Bio Suboptions

- Currently there are 7 bio tracks that work as “guidelines”:
 - 1) Biochemistry and molecular biology
 - 2) Genetics
 - 3) Developmental biology and evolution
 - 4) Neurobiology
 - 5) Computational and systems biology
 - 6) Organismal
 - 7) Cell Biology
 - 8) Interdisciplinary, technology approaches

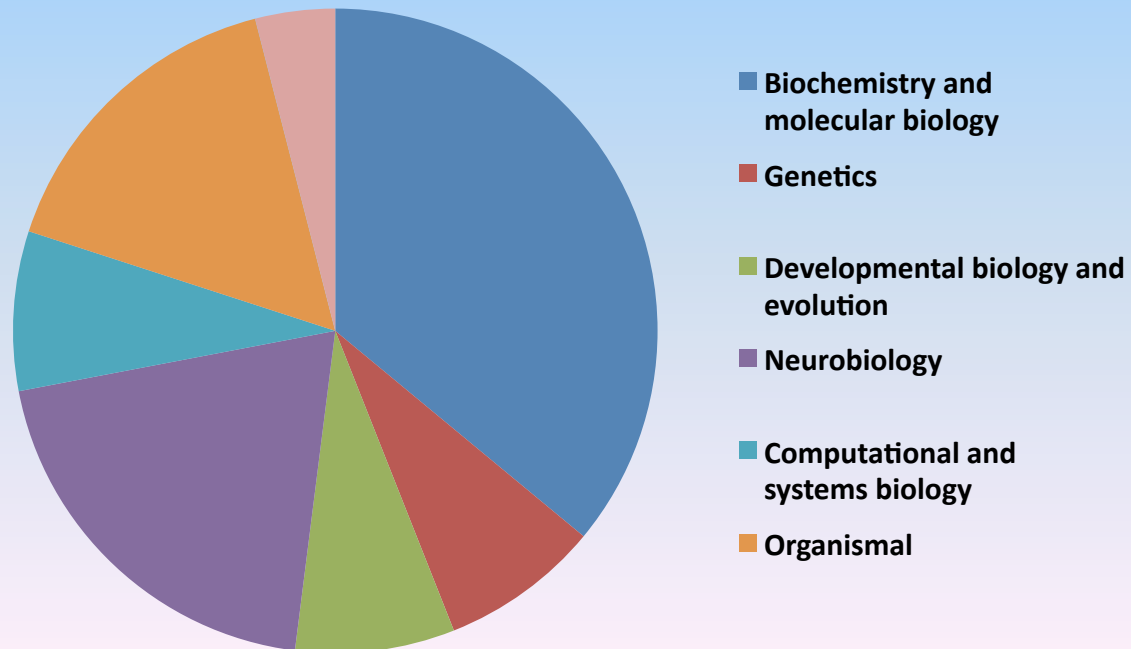
Are you aware that Biology option has
“Biology tracks” that focus on more
specific fields?

Yes	22
No	7



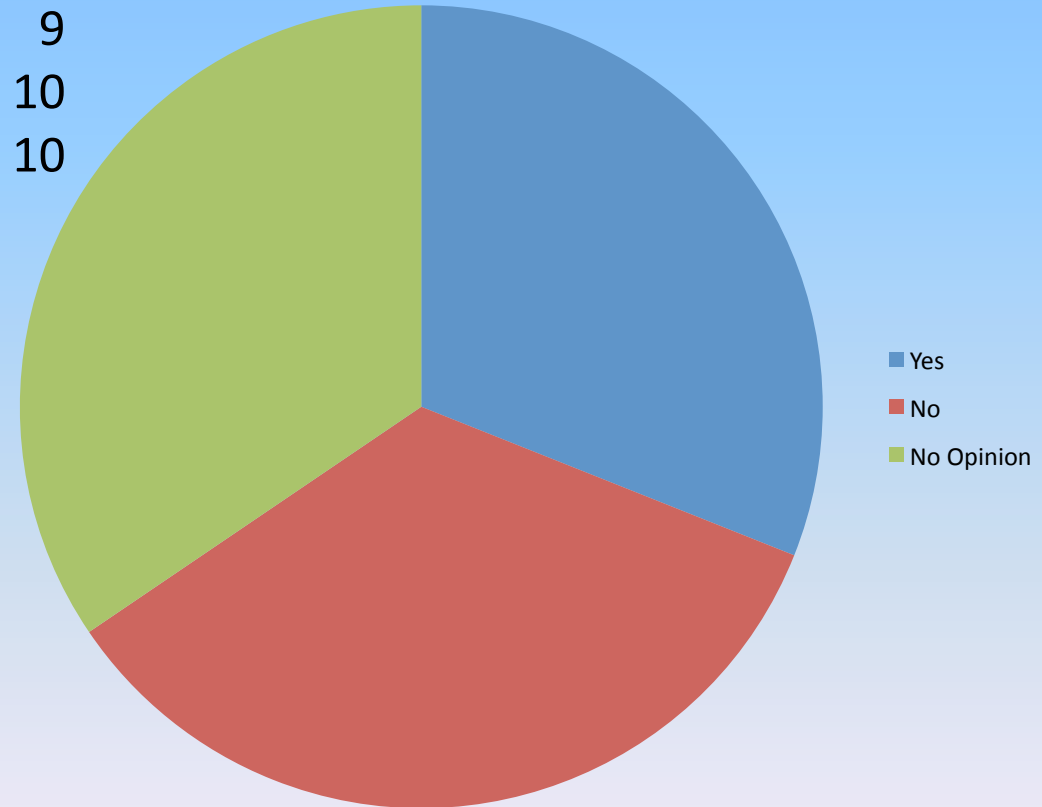
If yes, which track are you in? If no, which track would you consider yourself to be in?

Biochemistry and molecular biology	9
Genetics	2
Developmental biology and evolution	2
Neurobiology	5
Computational and systems biology	2
Organismal	4
Cell biology	0
Interdisciplinary and technology approaches	1



Would you like the Biology option become more “specific” by setting a more concrete Biology track system with well-defined set of classes? This may entail your track showing up in your transcript.

Yes
No
No Opinion



Pros and Cons

- Pros: Helpful in finding out which field of biology is appealing and pursue it
If more official, may help in admissions
- Cons: less likely to try all different fields of biology
- With BioE option, may assume Interdisciplinary and technology approaches to be BioE.

Introductory Bio classes

- Bi1 for nonmajors and Bi8/9 for majors. Have to take either to satisfy the bio core requirement.
- These are the classes with the most complaints.
- The big questions: **What should every Caltech graduate know about Bio? How do we find the *real* problems and how do we correct them?**

Bi1

- The core committee thought every Caltech grad needs some basic Bio: Bi1 created.
- The topic and subject of the class depends mostly on the instructor. Current main topic: viruses & HIV.
- Bio is a broad subject. Impossible to teach too much in one term. Make it specific to an interesting topic?
- The purpose: To stimulate scientific thinking in Bio, to make students aware of issues with Bio.
- Efforts are being made to improve the problem sets to meet this goal.
- Is it an intrinsic problem that cannot be solved?
(2008-9 TQFR data: Avg. interest of material: 3.7)

Bi8

- There seems to be a spectrum of opinions, where some (perhaps high school AP Bio takers) who feel it is easy and complain, while some (perhaps non AP Bio takers) who feel it is difficult.
- It is usually taken during pass/fail, so students may not be motivated to work as hard. Then complain if shadow grade is low.
- To compensate for this, Bi8 is sending out placement exams over the summer like other subject areas (math, physics, chemistry).

Note

- Note that there is indeed a way to place out of Bi8:

“Students may place out of the option requirement to take Bi 8 or Bi 9 by passing an exam and then earning a passing grade in Bi/Ch 111 or Bi/Ch 113, respectively, instead.”

- but the system requires that the students passes out of both Bi8 AND Bi9.
- Some professors feel that even after Bi8, students are not solid in fundamental biology.
- Is the source of complaint the attitude towards the class or the material itself?

Bi1 and Bi8/9

- Some students may take Bi1 and become interested in biology, but still have to take Bi8/9 next year to fulfill requirement. → They usually graduate in time, but they get “behind” and class conflicts occur.
- Some students may take Bi8 and become uninterested in biology, so decide to take Bi1 the next year (rarer occurrence; most who take Bi8 are bio majors and they go on to take Bi9)

Suggestions for Solutions

- Would Bi8 credit from a B to A+ in Bi1 (and vice versa) be OK to fulfill institution's requirement?
→ Potential problem: too many people taking Bi1/8 just to fulfill requirement and avoid Bi1
- Have “advanced sections” such as in Ch1a, where topics beyond the lectures are taught.
- If the subject interest of Bi1 and Bi8 are similar, have a “combined” course with “practical” and “analytical tracks” like math and physics.

Other Issues

- Some have expressed their desire for more organismal stress in the institution. Yet, the faculty and the research of Caltech is molecular, therefore organismal focus is unrealistic.
- How to prevent underclassmen hating the class before they even go to the first lecture. How to change the atmosphere.
- What is a reliable way of evaluating/distinguishing the problem?
- BUSAC will carry on with these topics.

Thank you

- Thank you for taking your time to attend this meeting and expressing your thoughts.
- If you have any questions/comments/concerns, please contact me Dongkook (DK) Lim at dongkook@caltech.edu.
- The opinions will be discussed and appropriate changes will continue to take place through BUSAC.