



# Santiago Canyon College

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## Orange Education Center

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## BIOTECH ADVISORY MEETING

November 8, 2013

**Members in attendance:** Bruce Aird, Michael Dixon, Dean Gilbert, Karilyn Gonzales, Nicole Johnson, Wendie Johnson, Kirk McMullin, Christopher Meyer, Dina Moser, Zakir Murtaza, Quynh Nguyen, Jesse Ouwens, Susan Polen, Katrina Roth, Diane Vu, Dean Williams, Dan Woods

**Ex-officio:** Corine Doughty, Denise Foley, Terry Giugni, Bart Hoffman, Kari Irwin, Anson Lui, Kim Mathews, Scott McKenzie, Martin Stringer, Kathy Takahashi, Jo Wu

## HIGHLIGHTS

### I. Welcome & Introductions

Meeting co-chaired by Kari Irwin, Director Business & Career Technical Education, and Denise Foley, full-time Biology professor

### II. Curriculum Status

Denise gave the curriculum status update explaining the stackable certificates at all three colleges, Santa Ana, Santiago Canyon, and Fullerton. (*Attached to the end of these highlights.*)

Terry Giugni suggested that the Internship be required. Denise says they have considered that, but some students aren't really internship material. Several people (Karilyn Gonzales, Kirk McMullin) said it would be difficult for industry to find work for all those interns, if it were a requirement. Bart Hoffman mentioned legal ramifications if internships are required, and student is not placeable.

Kathy Takahashi proposed a Work Exposure class that would include industry tours and give students an awareness of what's out there. Susan Polen's company does that for Chapman students. Quynh Nguyen suggests a Career Development seminar with tours.

Scott McKenzie asked if the internship would be in the industry the student is pursuing? Yes, they place students according to their focus (i.e., Food Safety students placed in a food safety internship).

Bruce Aird asked if the internships are directed. Will they be doing useful work or just be a gofer? While you wouldn't want a newbie student with no experience placed in the lab, they would be working on related tasks and learn the flow of work. Jo Wu explained the Instructor site visits, and how she trains her students prior to their internships. They are prepared with the skills they need.

Wendie Johnson says that she has been able to help "difficult people" find their place using group rotations in her incubator environment.

### III. Program Level Outcomes

Students will develop knowledge necessary to select and develop STEM careers.

PRESIDENT: Juan A. Vázquez

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CHANCELLOR: Raúl Rodríguez, Ph.D.

#### **IV. Community/Industry Updates & Employment Needs:**

Anson Lui presented the results of the industry survey. (*Attached to the end of these highlights.*)

There is not a lot of LMI data supporting this industry. To help us search for statistics, Kari asked:

Biotechnology Advisory Meeting 1/23/15  
4 college representation (SAC, SCC, FC, IVC)  
Highlights

**I. Welcome and Introduction-** all attendees briefly introduced themselves

**II. Highlights of last advisory-** Brief overview of curriculum vetting and commentary of last meeting. Referenced needed changes that will be discussed shortly

**III. Reviewed program level outcomes and sought comment.** Several questions were raised and discussed.

The program level outcomes are broadly written and the advisory members asked about measurable objectives.

**IV. Curriculum Revision Review**

1. Justification for needed changes explained. The state requirement for Cell and Molecular prerequisite of General Chemistry will prevent students from taking the courses are previously arranged. This revised certificate structure was arrived at by consensus of the collaborating colleges.
2. A question regarding the evaluation of incoming students was raised. The biotechnology sector navigator presented to the group that the majority of students enrolling in the biotechnology programs already have a degree but no employable skills. They enroll to gain those skills. She said in her experience there is no need to erect barriers as students will self-eliminate if they are unable to successfully navigate the courses and if they can't work in a team.

3. A question from a faculty member at IVC was raised- Is a course in tissue culture good training for these students?

A representative from Bio-Rad indicated it was definitely needed. Several other members concurred and the comment was made that even if the tissue culture itself was not a needed skill, the training in aseptic technique was very valuable. A representative from a staffing agency indicated that very many postings did require tissue culture or aseptic technique skills.

Kirk McMullin said that tissue culture is not a requirement for all jobs but Allergan and Edwards Life sciences both have tissue culture facilities and having the skill is a big plus.

4. A question regarding whether mammalian tissue culture was the requirement or whether plant or insect tissue culture a viable alternative was raised.

Some thought that the aseptic technique skills were transferable so that as long as you were using adherent cell lines it was a reasonable alternative but the representative from Lab

Support (Quynh Nguyen) indicated that she often comes across clients job listings specifying mammalian tissue culture skills.

Luis-Moto Bravo, a professor at UCI reminded the group that when the recession hit and budgets were tight, UCs eliminated labs from lower division courses. Thus, the need for the types of courses in this certificate program that build skills is very real.

5. A question regarding whether a B.S. degree was the minimum requirement for many jobs was raised. Some jobs in labs do not even need an A.S. A.S. degrees or certifications were needed for some positions but at higher levels, it really often depended more on experience with the specific instruments.

6. An advisory member asked for clarification of the purpose of the certificates. Discussion ensued that the students in the program wanted jobs. The certificates was something for the resume but they really needed to acquire skills. It was acknowledged that as time went on, if the students emerging from the program really did have the skills we want them to acquire, the reputation and value for the certificates would grow.

Discussion ensued regarding familiarity with versus proficiency in a skill. If it gets listed on the resume, the expectation is proficiency.

7. The value of internships was relayed by other representatives who had that opportunity as undergraduates themselves. A question from the faculty was relayed to the advisory members---Do they believe students are ready for an internship after the first set of courses? One advisory committee member humorously remarked that the term internship has taken on mysterious power ---they used to call it a summer job. Even hauling boxes of product from one point to another as a starting point gives a student exposure to a) the workings of the company, b) the need for education and experience for certain valued positions c) soft skills needed (and the need to be on time every day to retain employment). Several representatives concurred that they started out in a dishwashing type position and worked up.

8. It was commented that follow ups to the first regulation and compliance course may be important. Several comments were made about alternative systems to discuss in more detail with representatives from various aspects of the industry indicating various levels of importance to some of these:

ISO9000/9001

510K

GMP

Six Sigma

Lean

Audits/performing mock audits

## **V. What skills and equipment are needed?**

Advisory members examined page 16 from the middle skills report. The following comments were made:

1. maintaining integrity of documentation
2. paper based documentation is still important
3. microbiology skills are really important for many OC area jobs

- a comment about the specialty certificate in QC microbiology at SAC and the plan to put microbiology skills into biology 190lab as it gets re-written was relayed

As far as equipment or methods, the following were specifically mentioned

PCR,

ELISA/immunoassays

Aseptic technique

Common protein methods and common nucleic acid methods

5S and housekeeping skills

Ethics of documentation and other applications for ethical considerations

FTIR,

HPLC,

LCMS

Mass spec

GC

LC triple quads

ICP

A comment that most of these are more advanced than our entry-level job/certificate seekers would likely employ. As time was running short, we did not have time to press further into methodologies needed.

Comments about needed skills for specific sectors (like for the food industry) was noted. Sensory skills needed for food industry. Foreign object detection and foreign object elimination (FOD/FOE) important in clean room operations

## **VI. Closing**

The deputy sector navigator for biotechnology complimented the group on their engagement, all the efforts in the curriculum alignment process, and the willingness of the colleges involved to overcome the “naysayers” to the collaboration efforts.

A request for generic letters of support for the purpose of showing engagement of the industry for grant writing purposes was relayed. A template that can be modified will be sent out.

*What are the job titles of entry-level positions?*

- Lab Assistant/Technician
- Quality/Clinical Associate
- Research Assistant
- Technologist
- Lab/Technical Representative
- Production Clerk

Edwards Life Sciences shared they have a technical path and a quality path. There is a career path in biotechnology.

*What are the skills you are looking for in these entry-level positions?*

- Ability to write concise analysis reports
- Leadership and communication skills
- Demonstrate competencies
- Ability to work on team projects

*How is the job market?*

- There are entry-level positions to be had. (Some are in Atlanta, but still).
- Most interns end up getting hired. You want to keep them after you invest all that time in them.
- Some hire “temps” first, and then bring them on as permanent employees.

*Is a certificate enough for you to hire them? Or do you require a 2-year or 4-year degree?*

- Many reluctantly admitted that a 2-year degree was listed on the job requirements.

## **V. Program Improvement Discussion:**

The committee was divided into four smaller groups to discuss what should be **added, emphasized more, and emphasized less** in the following courses:

- A. BIO 191–Biotechnology A: Basic Laboratory Skills  
BIO 194/125 Quality and Regulatory Compliance in Bioscience
- B. BIO 192/115–Biotechnology B: Proteins  
BIO 194/125 Quality and Regulatory Compliance in Bioscience
- C. BIO 193/120–Biotechnology C: Nucleic Acids Upstream Processing  
BIO 194/125 Quality and Regulatory Compliance in Bioscience
- D. BIO 196–Food Safety & Microbiology  
BIO 195–QC Microbiology  
BIO 194/125 Quality and Regulatory Compliance in Bioscience

### Group A

BIO 191 Biotechnology A: Basic Laboratory Skills  
No Changes

BIO 194/125 Quality and Regulatory Compliance in Bioscience

Add:

ISO 1435

OSHA & Industry safety

Emphasize Less:

General exposure (survey) of Sigma & lean

Group B

BIO 192/115–Biotechnology B: Proteins

Change from 48 lec/48 lab to 24 lec (1 unit)/64 lab (3 units)

Add:

Data collection, charting graphing

Statistical process control of manufacturing within parameter. Need to know the max & min limits and yield

Enzyme kinetics assay, steady/state, rate constant, equivalent

Protein purification/quantitation (Bradford, BCA)

w/protein production

Standard Operating Procedures (SOP)

Other:

Add to certificate program: Basic Statistics OR Survey of Biostatistics.

Group C

BIO 193/120–Biotechnology C: Nucleic Acids Upstream Processing

Add:

Data Analysis

Emphasize More:

Cloning – cover more on laboratory emphasis than lecture (troubleshooting)

PRC – emphasize more in lab

Emphasize Less:

Brief overview of Bioinformatics second round

BIO 194/125 Quality and Regulatory Compliance in Bioscience

A lot of validation Corrective Action Prevention Action (CAPA) Good!

PDCA – Knowledge Good/Great!

Add:

Regulatory (MSP, FDA, USDA, EPA, OSHA)

Group D

BIO 195 & 196 –Food Safety & QC Micro

Looked good. Glad to see an emphasis on aseptic technique.

Would like to see discussions of outside body regulatory audits and compliance issues discussed in all courses.

BIO 194 – RA/QC course

Add:

More of an International Regulations emphasis.

Would like to see courses add a finance/budget accountability piece.

Emphasize More:

Would like to see statistical Process Controls stressed heavily.

Make sure kappa analysis and the different regulatory agencies are discussed.

Other:

Possible elective classes - International Regulations, Six Sigma–Green Belt level.

#### **VI. Summary of Recommendations:**

A structured internship program is highly recommended. Those students for whom an internship is not likely, a work exposure opportunity should be provided. The advisory members enthusiastically support the stackable certificate program and look forward to continuing the relationship with the colleges.

#### **VII. Closing**

Thank you for attending. We look forward to continuing the dialogue through a survey and follow up meetings. –*Kari*