Advisory Board Minutes 2021

(Pertinenet information on the BS in Biomanufacturing is highlighted on pages 6 and 7.)

LOS ANGELES MISSION COLLEGE
Department of Life Sciences

Biotechnology Advisory Board – Meeting Minutes
Friday, September 17th, 2021, at 02:00-03:30 PM
Zoom: Registration Link
Meeting ID: 961 4653 3665 -- Passcode: 294008

NSF Award # 2054891

Welcome, Introduction, & Approval of the Agenda

- Chander Arora (Los Angeles Mission College – Biotech Faculty) starts the meeting at 02:02 PM.
- Members/attendees introduce themselves.
  - List of Members/Attendees: Refer to **Registrants List** and **Attendees List**.
- Chander Arora presents a quick overview of the Agenda.
  - Agenda & Materials: Refer to **2021 Biotech AdvBoard--Agenda & Materials.docx**.

Biotechnology Programs* (Presentation & Discussion by Chander Arora)

- Review of Programs: Stackable Certificates and AS Degree
  Refer to pages 3, 4, and 5 of **2021 Biotech AdvBoard--Agenda & Materials.docx**.
  **Included in I-TRAIN.*

- Job Skills Validation (Chander Arora)
  Some of the job skills mentioned include: biosafety, solution-making, cGMP (Current Good Manufacturing Practice), documentation, and cleanroom behavior.

- Contextualized Soft Skills (Chander Arora)
  Contextualized soft skills (from project-based learning included in curriculum as part of **BIOTECH 003 - Biotechnology II**) mentioned include: teamwork; time management; critical thinking; problem solving (root cause analysis); effective communication; scientific study design and hypothesis development; data collection and tabulation; public presentation; and sense of engagement, ownership, and pride.

- High School Biotech Classes & Agreement (Chander Arora)
  - Some are currently in development to be incorporated into Dual Enrollment.
  - Some are already part of Dual Enrollment.

- Courses & Curriculum: Validation & Approval
  - Chander Arora asks for validation/approval and comments from members/attendees.
  - Wendie Johnston (Pasadena Bio Collaborative – Lab Director):
    - Wendie has worked with Los Angeles Mission College (LAMC) Biotechnology interns; they do a great job.
  - Magdalena Duran (El Proyecto WorkSource Center – Snr. Admin Center Director):
    - This is a comprehensive curriculum because it includes skill sets required and recognized by the industry and corporate culture/employability (work environment, soft skills, and good attitude) for successful hiring and employment.

- Resume-Building and Interviewing Guidance
  - Ira Clark (UCLA – Asst. Adj. Professor/Assoc. Dir. Biomedical Research Minor) asks if the curriculum include guidance on resume-building and interviewing.
  - Chander Arora:
    - Starting on the 2nd week of **BIOTECH 002 - Biotechnology I**, students would start working on their resume per direction from the faculty. Starting within the last two semesters, LAMC partners with Network Kinection, an organization which provides a team of people who would work one-on-one with the students on their resume. The students' resumes are collected approximately mid-October for review by the faculty. The resumes would then be updated with skills learned before being finalized and sent to industry partners to be reviewed for internship/externship opportunities that are available.
    - The faculty is in contact with industry partners regarding interview schedule. After completing their resumes, students would do mock interviews one-on-one with the faculty before the actual interviews with industry partners.
- Feedback From Industry Partners Are Valuable and Essential
  - Par Mohammadian (LAMC – Life Sciences Department – Vice Chair & Faculty):
    - Industry partners giving feedback regarding the interview process is very valuable.
  - Chander Arora:
    - Industry partners giving feedback regarding the interview process is essential for our improvement.
  - Stephen Brown (LAMC – Life Sciences Department Chair) commends Chander for all the hard work and the industry partners for working together to build on LAMC Biotechnology programs' success and betterment.
- LAMC Biotechnology Programs as Pathway for Anyone
  - Dr. Ellsworth James (El Proyecto WorkSource – Business Development): We have some of the best medical facilities and services in the nation here, in Los Angeles. LAMC Biotechnology programs create a pathway for anyone who would like to get started in the industry, especially working individuals who are looking for a new pathway.
- Lack of Awareness Limits Enrollment
  - Stephen Brown: Lack of awareness limits our enrollment. Any effort to help increase awareness for the opportunity to join LAMC Biotechnology programs and get started on this pathway would certainly be appreciated.
- LAMC Biotechnology Programs Provide Job Skills
  - Terri Richardson (CSUN – Biology Department Advisor): CSUN Biology degree provides book-learning aspect of the industry but not the skills. LAMC Biotechnology programs provide the skills for the students to be employable in the industry.
  - Chander Arora: Some of the students referred by Terri already contacted Chander for Spring 2022.

- Enrollment Numbers
  - Stephen Brown asks Chander Arora to share current enrollment number.
  - Chander Arora: Enrollment is currently 13 students this semester (Fall 2021).
  - Stephen Brown: We can accommodate a lot more than 13.
- Supply and Demand: Talent Shortage and Acquisition
  - Dhruv Sareen (Cedars-Sinai Medical Center – Executive Director): The last four decades belonged to computer and information technology; the next four decades would be for biology and biotechnology. We would continue to face talent shortage; we need all avenues to educate and train the talent we need.
- Validation of Curriculum and Opportunities for Middle-Skill & Entry-Level Employment
  - Richard Verches (Center for a Competitive Workforce – Executive Director) would like to echo everyone's comments. The curriculum is impressive and very much appreciated due to the focus on both the technical skills and the additional (soft) skills that businesses emphasize as necessary for students to understand—that they are not coming to work at a lab; they are coming to work at a lab for a company (business).
    - In addition, LAMC Biotechnology programs provide a pathway not only for those who may continue toward a PhD but also for those seeking middle-skill and entry-level employment and career opportunities that would support the thriving bioscience-biotech industry.
- Chander Arora concludes the validation/approval portion of the meeting by thanking all members/attendees for their participation.

- Changes Due to COVID-19 Pandemic (Presentation & Discussion by Chander Arora)
  Refer to pages 6, 7, and 8 of **2021 Biotech AdvBoard--Agenda & Materials.docx**.
  - Fall 2020 & Spring 2021: BIOTECH 002 & 003 Courses (Chander Arora)
    Refer to page 6 of **2021 Biotech AdvBoard--Agenda & Materials.docx**.
    - Also in Spring 2021: **BIOTECH 006 – Biotechnology: Quality Control/Assurance** on Zoom.
  - Fall 2021 Class Schedule (Chander Arora)
    - **BIOTECH 002 – Biotechnology I** (UC/CSU) – 4 Units (08/30-10/24/2021)
      - LEC 07:50 am – 10:00 am MW ZOOM
      - LAB 10:20 am – 01:00 pm MW ZOOM
      - LAB 07:50 am – 11:10 am TuTh CMS 106 (On Campus)
    - **BIOTECH 003 – Biotechnology II** (UC/CSU) – 4 Units (10/25-12/19/2021)
      - LEC 07:50 am – 09:55 am MW ZOOM
      - LAB 10:10 am – 01:30 pm MW ZOOM
      - LAB 07:50 am – 11:10 am TuTh CMS 106 (On Campus)
  - Cell Culture Room: Stephen Brown mentions that there would be funds for cell culture room. Chander Arora confirms that there would be.

- Virtual Activities (Chander Arora)
  Refer to page 7 of **2021 Biotech AdvBoard--Agenda & Materials.docx**.
  - Speakers (on Zoom).
  - Fieldtrips (on Zoom).
  - High School Summer Workshop
  - Summer Non-Credit Biotech Course: Voc Ed
  - Internship, Research, & Employment Opportunities
- Additional Comments by Chander Arora:
  - Hands-On Lab Training During COVID-19 Pandemic:
    - Safe distancing.
    - One person per table.
  - Virtual Biotech Exhibition (Student Presentations) topics include:
    - Biofilms
    - Biofuel
    - ELISA
    - GMO vs. Non-GMO
  - Student Presentations at NSF-ATE Conference 2020 (Virtual/On Zoom)
    - NSF-ATE = National Science Foundation – Advanced Technological Education.
    - Students received certificates from NSF.
- Inclusion of Non-Traditional Students (Chander Arora)
  Refer to page 9 of **2021 Biotech AdvBoard--Agenda & Materials.docx**.
  - Thanks to Par Mohammadian, LAMC Biotechnology programs have just received a new grant from NSF for inclusion of non-traditional students. The grant started in May 2021.
- High Schools: Workshops & Amgen Biotech Program (ABE) (Chander Arora)
  Refer to page 9 of **2021 Biotech AdvBoard--Agenda & Materials.docx**.
- Partnership with WorkSource Centers (Chander Arora)
  Refer to page 9 of **2021 Biotech AdvBoard--Agenda & Materials.docx**.
- Biotechnology Technician Credential Certification (BioTC) (Chander Arora)
  Refer to page 9 of **2021 Biotech AdvBoard--Agenda & Materials.docx**.

Labor Market Analysis (Presentation & Discussion by Chander Arora)

Refer to page 10 of **2021 Biotech AdvBoard--Agenda & Materials.docx**.

Discussion & Recommendations for Improvement

Chander Arora invites discussion and recommendations from the members/attendees.

- Offering Biomanufacturing Bachelor's Degree Program at LAMC
  - Par Mohammadian puts forth that LAMC is exploring the opportunity to offer a bachelor's degree program in the field of biotechnology at the community-college level and invites feedback from the members/attendees.
  - Wendie Johnston (Pasadena Bio Collaborative – Lab Director):
    - The title for the bachelor's degree program at community college would need to be different than any titles currently used by UC (University of California) or CSU (California State University) schools.
    - There are currently two community colleges in California (CA) that offer bachelor's degree program in the field of biotechnology, one in Vacaville/surrounding area (Solano Community College, Solano County) and the other in San Diego County (MiraCosta College). These two schools offer Biomanufacturing Bachelor's Degree Program.
    - Wendie would be happy to write a letter of support for LAMC to offer bachelor's degree program in the field of biotechnology.
  - Par Mohammadian confirms that the program should be different than any programs currently used by UC or CSU schools. Par clarifies that the same program of "Biomanufacturing" can be used by LAMC for its bachelor's degree offering since that title is being used by community colleges only (no UC or CSU schools).
    - There are LAMC students who would like to pursue bachelor's degree program in the field of biotechnology; however, the two community colleges currently offering the bachelor's degree program are located too far from where LAMC students reside (Los Angeles County).
    - Offering the bachelor's degree at LAMC would create opportunity for the students' advancement in education and for advancement in employment with our industry partners.
  - Cost-Efficiency: Community College (LAMC) vs. CSU/UC Schools – Lower Total Tuition Cost at Community College (LAMC)
    - Adel Villalobos (Lief Labs – President/CEO) would support the endeavor if it provides more cost-efficient path for students.
    - Par Mohammadian: For lower division courses, the cost is currently $46 per unit at LAMC. For upper division courses, the cost would be a little bit higher; however, in general, the total tuition cost would be much less if the students complete the degree at a community college compared to a four-year university.
  - Bringing the Bachelor's Degree Program to Los Angeles (LA) County vs. Providing Transportation to Existing Programs Outside of LA County
    - Wendie Johnston (Pasadena Bio Collaborative – Lab Director): Each of the people who currently runs the bachelor's degree program, James DeKloe (Solano Community College, Solano County) and Barbara Juncosa (MiraCosta College, San Diego County), are incredibly

forthcoming with help to the colleges in LA County regarding what our students can do to facilitate their transfer and to work on articulation agreement. However, there is still the issue of transportation. Wendie thinks that we need to bring the bachelor's degree program to LA County instead of providing transportation.

- Any Concerns from CSUN Representative?
  - Stephen Brown would like to know if representative from CSUN (who is in attendance) would have any concerns.
  - Terri Richardson (CSUN – Biology Department Advisor) does not speak for the CSU. Terri personally supports any opportunity for students to have as many options as possible with the least expensive cost as possible and whatever would provide them with opportunity for more job skills.
- CSUN-LAMC Collaboration
  - Adel Villalobos (Lief Labs – President/CEO): A degree is an achievement that people get inspired by and gives them self-confidence.
    - Adel puts forth the idea that CSUN and LAMC could collaborate, not in the sense that LAMC would offer a "lower" degree, but that CSUN does not offer the type of degree/training that LAMC would offer, and vice versa.
      - This collaboration would give students a path to self-confidence in the achievement portion of their journey, growth, and development.
  - Terri Richardson (CSUN – Biology Department Advisor): Collaboration would be better than competition.
  - Par Mohammadian: Regarding the collaboration, LAMC students can transfer to CSUN only through the transfer process.
    - One of the things that prevents the students from transferring to CSUN is the math requirement. We have a very low number of Biology transfer students due to CSUN's math requirement (calculus).
    - One way to promote student advancement is for CSUN to change its math requirement to be more suitable for Biology/Biotechnology/Biomanufacturing transfer students; for these students, statistics may be more applicable than calculus.
  - Marla Uliana (LAMC – Dean of Career & Workforce Education):
    - Offering Biomanufacturing degree program at LAMC might work in conjunction with CSUN's degree program(s).
    - LAMC collaborating with CSUN would be great idea.
    - Marla expresses a special thank you to Chander Arora and thanks all members/attendees for their input.

- Geographical Challenge
  - Providing Housing for Students
    - Erum Syed (Los Angeles Southwest College – Professor) puts forth the possibility that, with the establishment of bachelor's degree program(s) at community colleges, in the future, LACCD could have more funding and opportunities incorporated into making the program more flexible and lessening student challenges.
      - Transportation challenges could be mitigated by providing dormitory living arrangements for the students like at university.
    - Chander Arora supports Erum Syed's vision of providing dormitory living arrangements for students. Chander is always in support of cost-efficient opportunities for students, and transportation is one of the big challenges.
    - Par Mohammadian thinks that providing housing for students is a great suggestion. The overly long commute (geographical challenge) is the reason why students are confined to their area of residence and cannot go to the campuses of the schools that already offer bachelor's degree program in the field of biotechnology. Having the opportunity to be living close by is an option.
  - Offering Bachelor's Degree Programs at More Community Colleges Throughout LA County and Orange County
    - Willie Zuniga (Grifols – President): There are more community colleges in LA County and Orange County that are starting biotechnology programs. These schools could eventually offer the bachelor's degree program. Eventually, we could have bachelor's degree programs in the field of biotechnology available throughout LA County and Orange County.
  - Curriculum: Online Theoretical and Off-Site Laboratory
    - Par Mohammadian puts forth the idea to offer the theoretical aspect of biotechnology courses online and to offer the laboratory portion of the courses off-site at industry partners' location (e.g., Grifols) instead of on LAMC campus.
- Adding Laboratory Portion to Quality Control/Assurance Course
  - Chander Arora: Quality control/quality assurance (QC/QA) classes are in demand. Once LAMC has a bachelor's program in the field of biotechnology, there would be opportunity to add laboratory portion (for bioassay development and validation) to the currently lecture-only **BIOTECH 006 – Biotechnology: Quality Control/Assurance** course.
- Opportunity for Advancement of the Current Workforce
  - Mario Solares (Pharmavite – Operations Manager): Offering bachelor's degree program in the field of biotechnology at LAMC would open doors to advancement for the current workforce. Usually, people that are working in the industry at the entry-level positions do not have any degrees. For those people to get promoted, it would usually require some level of education.
  - Greta Setian (WDACS LA County – Deputy Director of LA County WDB):
    - WDACS = Workforce Development Aging & Community Services; WDB = Workforce Development Board.

- LA County WDACS-WDB has funding opportunities available for the current workforce, including:
  - Funding incumbent worker training to help employers advance the skill levels of their current employees.
  - Funding a percentage of a new employee's wage rate while doing OJT (on-the-job) training with the employer/business.

- High School/Dual Enrollment: Scheduling Biotechnology Courses
  - Selma Duran (San Fernando HS-LAUSD – Science Teacher): Would the first stackable certificate courses be available in the summer to be taken by high school students (graduating seniors or juniors going into their senior year)?
    - Having the first stackable certificate before their college years would open opportunities for the students to find a job to cover their college expenses when they graduate from high school.
  - Par Mohammadian: Stephen Brown, Chander Arora, and Par Mohammadian are working with Wendy Wooten (Reseda Charter High School Biomedical Science Pathway – Biomedical Science Pathway Lead Teacher) on a project for her students to enroll in LAMC biotech courses.
    - This project can be used as a model to apply to other high schools as well.
  - Stephen Brown thanks Wendy Wooten for the collaboration on the project and looks forward to expanding enrollment through the project.
    - Stephen emphasizes that enrollment is the number one challenge for the viability of biotech courses.
      - Some students are not aware that the biotech courses exist. Some may lack confidence and think that they would not be capable to successfully complete these courses when in fact they really could.
      - As mentioned by Chander Arora earlier, the current enrollment for biotech course is 13 students. Technically, a class with less than 15 students is supposed to be cancelled since 15 students are needed per class to break even.
    - Stephen invites thoughts from the members/attendees on how to get the word out.
  - Selma Duran (San Fernando HS-LAUSD – Science Teacher):
    - Some of the high school students are interested in biotech courses but would be unable to join during high school hours.
      - Selma expresses the idea of scheduling the biotech courses after high school hours.
      - Selma also expresses the idea of expanding Dual Enrollment established for Health Occupations to include Biotechnology.

- Promoting/Advertising/Marketing
  - Employer Testimonials -- Richard Verches (Center for a Competitive Workforce – Executive Director):
    - We need employers to communicate publicly and to be quoted on the record, validating and promoting that programs at community colleges (e.g., Biotechnology programs at LAMC) are the accessible and affordable way to qualify for the job opportunities that are abundantly available at their companies.
  - Alumni Testimonials -- Stephen Brown:
    - To hear from alumni while they are on the job would be a fantastic selling point.
    - Packaging alumni testimonials and making them as accessible as possible would go a long way toward promoting the programs.
  - Faculty Bios, Employer Testimonials, and Alumni Testimonials on Website -- Richard Verches (Center for a Competitive Workforce – Executive Director):
    - The website should be optimized in its design, content, and layout.
    - Faculty bios, employer testimonials, and alumni testimonials should be captured and should be made conveniently accessible on the website.
  - Alumni Testimonials/Website/Social Media -- Ira Clark (UCLA – Asst. Adj. Professor/Assoc. Dir. Biomedical Research Minor):
    - Ira agrees that alumni testimonials are incredibly powerful. Alumni testimonials inspire prospective/current students in their pathway to employment with vision of their future. These students would be able to visualize their future careers because of the testimonials by the currently-employed alumni sharing about their journey and career achievements.
    - Ira expresses the idea to incorporate alumni testimonials to showcase the programs on the website.
    - Ira also expresses the idea to leverage social media platforms, such as LinkedIn and Twitter.
  - Social Media/Informing Parents -- Erum Syed (Los Angeles Southwest College – Professor):
    - The majority of our target prospective students do not use LinkedIn or Twitter; they use YouTube, Instagram, and/or TikTok. Erum expresses the idea to post lab videos on YouTube, Instagram, and/or TikTok.
    - Erum expresses the idea to inform the parents of middle school and elementary school students about biotechnology (e.g., via telephone calls). The informed parents could then transfer that information about biotechnology to their children.
  - Field Trips Open to High School Students to Attend with College Students -- Chander Arora:
    - Just before the pandemic, Grifols had made it possible for high school students to tour their company. Chander was able to take some high school students along with the college students for a field trip to Grifols.
      - The parents of these high school students later contacted Chander and expressed their children's excitement about the field trip.

- □ These high school students later contacted Chander and joined LAMC's biotech program.
- ♦ Having a field trip open to high school students to attend with the college students is one way to bring about excitement about the biotech program.

⌑ Systematic Approach to Recruitment: From Education to Employment – Introduction of Biotechnology Early in Educational Pathway -- Par Mohammadian:

- ♦ LAMC Biotechnology programs have a website, and LAMC Biotechnology team also engages in a little bit of Instagram.
  - □ There was difficulty in recruiting students during the pandemic. For Fall 2021 semester, on-campus registration events were established and promoted; during these events, the faculty set up tables, met with students, and explained to the students what biotechnology is all about.
    - ▪ Through those events, more students were registered into the courses, starting from approximately 7 students to approximately 17 students.
    - ▪ A few students dropped in the beginning of the semester, which is a common occurrence; however, the one-on-one introduction to biotechnology contributed significantly to increase in enrollment.
  - □ High school students should be invited to field trips and guest-speaker events to become familiar with the field of biotechnology.
    - ▪ These high school students may not be in serious consideration to pursue a career in biotechnology during these events; however, the familiarity that they gain from these events will make a big impact when they are ready to make a decision at one point in the future.
    - ▪ Introducing students to the field of biotechnology could even start as early as middle school.
  - □ This systematic approach to recruitment introduces the field of biotechnology early in the students' educational pathway so they would be ready to make the decision to pursue a career in biotechnology by the time they attend college.

Final Comments & Adjournment

- Chander Arora and Par Mohammadian communicate their final comments and the meeting adjournment at 03:40 PM.
- Members/attendees express their thanks and farewell.
- Meeting ends at 03:42 PM.

Meeting Minutes prepared by: Crescentia Muljawan
Reviewed by: Chander Arora, Par Mohammadian, and Stephen Brown