Advisory Board Records 2018-2022

Year	Date of Meeting	External Attendees (Affiliation)
2018	December 15	Alejandra Vasco (BRIT) Courtland Imel (Ceutical Labs) Suzanne Armand (Ceutical Labs) JeanMarie Verchot (Texas Agrilife)
2020	October 2	Juan Gonzales (UTD) Courtland Imel (Ceutical Labs) Bill Bryan (Microconsult, Inc.) Peggy Shadduck (UNT)
2021	March 19	Courtland Imel (Ceutical Labs) Suzanne Armand (Ceutical Labs)
	October 8	Bill Bryan (Microconsult, Inc.) Michael Mathis (UNTHSC) Tom Tubon (BioMade) Bruce Bonnell (UNT) Kathleen Otto (BioNorthTX) Megan Marcus (UTA) Ron Branning (retired biotech) Jill Baker (Signature Biologics) Subrata Batabyal (Nanoscope) Courtland Imel (Ceutical Labs)
2022	March 30	Courtland Imel (Ceutical Labs) Suzanne Armand (Ceutical Labs) Charles Randklev (Agrilife) Kathleen Otto (BioNorthTX) Jenny Ligon (TAMU) Bruce Bonnell (UNTHSC) Ben Magill (DCC) Subrata Batabyal (Nanoscope)
	November 18	Kathleen Otto (BioNorthTX) Jenny Ligon (TAMU) Bruce Bonnell (UNTHSC) Ben Magill (DCC) Subrata Batabyal (Nanoscope) Sophia Hines (Signature Biologics) Michael Mathis (UNTHSC)

Advisory Board Recommendations

Year	Recommendations	Implemented?
2018	1. We should look into articulations with UTGalveston; they have a biotech setup (CI) 2. We should discuss with UTAustin regarding molecular biology degree Contact Candas Mehmet regarding partnership treat it like a	1. No; we have pursued an articulation with TAMU-CC but it was not approved by Collin 2. Not explored

	business. They need supervision, but after 3 chances, they're out. Put it on the syllabus – 3 chances. 3. (AV) do a facilities tour (at BRIT) as a group. Would it work for individuals? 4. (JV) do you have a professional skills course? Bring in industry reps. Teach how to interview. 5. Skills Recommended (Courtland/Suzanne) 1. Gram staining, PCR, cell culture, organism ID, bacterial ID, fungi ID a. Is this a potential module for 1415? 6. Focus on normality instead of molarity. Explore this for genetics or microbiology 7. Maybe a student could do an internship at Ceutical and bring back information 8. (Alejandra) 1. Microscopy, SEM (there might be joint projects with Alejandra on this) 9. Be able to read and do protocols, understand protocols 10. Be able to troubleshoot 11. Suggestion: give them a lab without instructions and have them figure it out by themselves 12. (Jeanmarie) 1. Colorimetric and fluorescent assays; biosensor techniques, like ELISA 13. Water quality, pathogens of humans or plants a. The goal is to create easy tech that can be given to farmers to use in the field and gives immediate results; Lab on a chip 14. Chromatographic, antibody diffusion, instead of western blotting or immunoblotting 15. Question: are there biosensor companies around? i. Answer (CI) there are 4; one from Frisco, 3 from F. Worth; also Texas Instruments 16. (Steve Saunders) 1. Attention to detail 17. Protocol SOP, correct first time, every time 18. Be able to work unsupervised 19. Suggest a pipetting qualification before proceeding 20. Start a pipetting test in genetics based on the colored dye 21. Make sure that all group members are competent in all skills iv. Need to verify skills before they are ready for lab 22. (JL) we should model our expectations on documentation, demonstrate and repeat, then assess 23. (CI) they need to be able to use a balance 24. Texas Agrilife uses e -notebooks (One Note)	3. One student began an internship at BRIT, but it was too long a commute to continue 4. We have courses through the career center. Industry rep visits are being considered by Academic Affairs 5. All of these, with the exception of fungal ID, are done in biotech courses or other biology courses 6. 1415 added an exercise on normality 7. A student did their internship at Ceutical but they were dissatisfied with the job site 8. Microscopy is part of the program, but not SEM. 1414 students analyze data from a TEM. 9. Incorporated into all courses 10. Incorporated into 1415 and other courses 11. Not explored, but protocol design is covered in 1415 12. Colorimetric assays are possible, and an ELISA lab is part of 1414 and 1415 13. Not explored 14. Antibody diffusion, chromatography are part of 1414 15. Not explored 16. Added to courses 17. Added to courses 18. Important and added to courses 19. Considered for 1415 20. Incorporated 21. Difficult to determine 22. Considered for 1415 23. Integrated into 1414 24. Rejected

	25. (JV) bioinformatics tools are important 26. Add software validation in 1340	25. Integrated into 1414, 1415 and 2416 26. Not implemented
2020	1. They suggest that we introduce a 16S PCR identification of Clostridium and Salmonella species into a course. We should look into multiple primer sets or kits. 2. Teaching math and standard curves are important. 3. We should ask grad students and post-docs if they would like a free technician, but be clear what the requirements are from them. Co-op students should be able to read an SOP, have good sterile technique and have communication and writing skills. 4. Students should learn how a business works, customer service. Management or leadership courses would not be useful. 5. We should connect with Harold Strong at UNT for information about industry in the area, also Tom Kowalski at THBI. We should also find a strong contact at UTSW. 6. Students need to be able to understand SOPs, pipetting, balances, aseptic technique. If the 2431 course is structured as described, it could be a good substitution for 2486. 7. There is no need to teach today's students electronic recordkeeping. 8. We should email our AB members when an intern is coming soon. Ceutical needs full-timers. Ceutical also has ex-FDA employees that could present to BITC 1340 class (John Mysock, Laurel Aragonal) Students that wish to apply to Microconsult should display an attention to detail and focus their resume to the job they want, also should include a cover letter, which is one of their biggest issues in finding good applicants.	1. Not integrated 2. Emphasized highly in 1414, and assessed – we made this a PLO 3. Not yet implemented, due to pandemic 4. Considered for articulations 5. Not yet done. Contacted Kowalski's replacement. 6. Integrated into courses. 2431 is now a substitution for 2486 7. Good. We had rejected that already. 8. Student did an internship at Ceutical, but not at Microconsult. Microconsult was purchased.
March 2021	1. Courtland asked if we had contacted Tom Kowalski at THBI, 2. Students interested in part-time or full-time microbiology work should apply to Ceutical now. We will create an advertisement for classes and ask students that are nearing completion to submit their resumes.	1. so far no but he is not usually ready for one-on-one; has been replaced 2. student did an internship at Ceutical

October 2021	1. Kathleen asked if we practice interviewing, 2. Lindsay spoke on the Department of Labor's push for apprenticeship programs in biotech, described how it works 3. Courtland emphasized the need for knowledge of normality Bill and Courtland both emphasized the importance of sterile technique 4. Subrata asked about viability assays 5. The importance of practical assessments was mentioned and Courtland recounted that many applicants have not had actual experience in lab techniques in school 6. Primer design, sequencing and annotation was asked about – our students do annotation, but only do sequencing and primer design if it pertains to their specific research project; was done in genetics last spring 7. Asked about RNA-seq – we do not do this, but we do DNA barcoding in projects 8. Carole asked how resumes are submitted – almost all online What do you look for in an online resume? – spelling, detailed information, don't be vague; have a cover letter to make yourself stand out and highlight communication ability, writing Courtland asked if our students do StrengthsFinder, and recommended that it be put on their resumes Tom said that his industry advisors say that an application without a cover letter is not even considered 9. Jill wants students to understand the difference between R&D and manufacturing, and to emphasize that a new hire is an investment that students should prove that they are worthy of. She recommended that we have alumni speak to new students. 10. Tom said that students should make sure that their references are prepared to reference them 11. Kathleen suggested that our school does outreach with lower grades 12. Tom asked if our students learn online interviewing skills 13. Courtland and Tom emphasized the importance of being punctual and without technical issues for interviews 14. Bill recommended that students no put "gaming" as a hobby because it is perceived as time-wasting; they should clean up their	1. Scott said what opportunities for that are available to students, mentioned that part of co-op course is training in soft skills 2. We would like to explore this 3. Normality has been added to 1415; sterile technique is introduced in 1414 and elaborated on in 2431 4. Carole said that students only do cell counts, vital staining and apoptotic staining 5. 1414 gives a practical assessment 6. Students in 2441 will do primer design in spring of 2023 7. So far, we have not added any RNA-seq 8. Cover letters are being emphasized to students 9. The differences in the departments is addressed in 1340; employee visits are being considered 10. Emphasized to students 11. Not yet done 12. Scott said that this is slowly being integrated into workshops 13. Emphasized by career coaches 14. Not yet mentioned to students 15. Not yet mentioned to students

	Instagram, but it is helpful if students do have a Linked In account and an Instagram 15. Tom pointed out that there is a communications gap between the generations and new hires should be able to communicate with earlier generations. Phone etiquette was mentioned in the discussion.	
March 2022	1. Suzanne expressed her concerns that new hires do not understand laws and regulations related to drug development and the FDA process. She also said that she thinks that precalculus should be included in the bachelor's degree planned by UNTHSC. Bruce mentioned that his department is in discussions with their law school to integrate some lessons on legal aspects of biotech into the courses. 2. Courtland suggested using guest speakers, and looking into TRUE grants, both for workforce preparations but funding for internships. 3. Carole asked Courtland if he would be willing to send some real-life problems in normality; he suggested that we look in the USB. 4. Bridgette suggested that Collin could create a short CE course in their job-specific needs if those needs could be defined.	1. Handled by UNTHSC 2. Not yet explored 3. Not yet explored 4. Not requested yet, but being considered for Evolve
November 2022	1. Kathleen Otto suggested that BionorthTX's industry advisory council should look at the BACE practice exam. BKirkpatrick said that she could do a quick presentation at their next meeting. The next meeting is Dec. 9 at Tarrant County College. 2. The industry advisory council could be invited to Collin to see new equipment and students, perhaps in Q2 in spring. The deans will need to be consulted. 3. Kathleen Otto said that cell and gene therapies are the big new industry for the area 4. Ben Magill suggested that the grant could build an asset map to promote all of the biotech programs in the area. He said, "We have your back." 5. Subrata Batabyal said that students should focus on upstream and downstream analytics, common standards, purity assays and ELISA 6. Sophia Hines said that students should focus on write-up and presenting data (graphing, other); they should not become complacent about typos, units or labeling	1. Not yet done 2. Plans are not yet in place 3. Biomanufacturing is being emphasized in 1415 and 2431 4. Not started 5. Focused on in 1414, 1415; ELISA is done as well 6. Will be emphasized in all courses 7. Students have not yet expressed a desire to work at Nanos 8. Not yet encouraged students to attend 9. Antibodies are introduced in 1414 and manufactured in 2431

	7. For students who want jobs at Nanos, they should send emails directly to Subrata. He likes LinkedIn, and they use Handshake, but he finds it to be not as targeted. 8. Sophia Hines said that Signature likes personal introductions, and that potential students should attend networking events and meet people from Signature. She suggested the Women in Science meetings given by BionorthTX. She said that LinkedIn is very important to create an online presence. Students should not wait for Indeed to find them a job but get involved in the science community. 9. Antibodies, cell therapy and gene therapy are all "hot" now	