

UNIVERSITY SYSTEM OF MARYLAND INSTITUTION PROPOSAL FOR

_____ New Instructional Program
_____ Substantial Expansion/Major Modification
_____ Cooperative Degree Program

University of Maryland, Baltimore County - UMBC
Institution Submitting Proposal

Translational Life Science Technology: Proposal II-to offer program off campus
Title of Proposed Program

Bachelor of Science – B.S.
Degree to be Awarded

Fall 2017
Projected Implementation Date

Proposed HEGIS Code

26.12
Proposed CIP Code

College of Natural and Mathematical Sciences
College in which program will be located

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College Contact

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Signature of President or Designee

Date

1. Introduction

UMBC seeks approval to offer off-campus the new Bachelor of Science in Translational Life Science Technology (TLST). UMBC plans to offer the TLST program in Montgomery County - specifically at the Universities at Shady Grove (USG) and Montgomery College (MC) as described below in this proposal. A separate proposal, submitted simultaneously, seeks initial approval for UMBC to offer the TLST program.

As explained in the new program proposal, the proposed Bachelor of Science in TLST responds to the dual needs of improving human health and promoting economic development by preparing students for roles in translational science with career applications in the biomedical and behavioral disciplines. Translational (science) medicine, as defined by the NIH, is the application of knowledge and techniques to clinical practice at the front lines of patient care. It integrates basic knowledge with the aim of optimizing all aspects of patient care.

2. Resource Requirements and Source of Funds

The comprehensive project budget for the TLST program, which is provided in Appendix A, is based on the projected five-year student enrollment provided in Table 1. The source of funds is USM and tuition. The program budget establishes an administrative structure at USG, provides funds for additional faculty, and provides support for equipment, supplies, and library needs. In addition to teaching and advising duties, the Program Director and Assistant Program Director, who will be stationed at USG as an administrative arm of UMBC's College of Natural and Mathematical Sciences (CNMS), will be responsible for the daily operation of the TLST program. Lecturers (2) are needed to support the program as it grows. An Assistant Professor (tenure-track) with experience in Biotechnology will augment the content expertise of the TLST program and balance the resource commitment by the departments supporting the TLST program. Operating expenditures focus on academic support (e.g., professional development of faculty, travel, and library augmentation funds), administrative support (e.g., marketing, website, and technology infrastructure), office supplies and equipment, contractual services (e.g., USG space rental), and student help. Please see Appendix B for the Memorandum of Understanding between UMBC, the Universities of Shady Grove, and Montgomery College.

Table 1. Projected Five-Year Student Enrollment

Headcount	Year One	Year Two	Year Three	Year Four	Year Five	
Junior	16	24	32	40	48	
Senior 1		12	18	24	30	
Senior 2			5	7	10	
Total Headcount	16	36	54	71	87	
Graduates		6	14	19	25	
Net new student rate of growth	1	1.5	1.33	1.25	1.25	
Return ratio						
Jr to Sr	0.75					
Sr 1 to Sr2 (inclusive of grads)	0.4					

3. Need and Demand for the Program

a. Specific local, regional, and State need for graduates:

The proposed TLST program responds to the crucial need as highlighted in the Maryland State Plan for Postsecondary Education (2013-2017) “to offer a diverse array of high-quality postsecondary opportunities for Maryland residents” so they have the opportunities and support “needed to complete a postsecondary degree, certificate, or training program” while ensuring Maryland attracts “high-quality jobs”...by ensuring that its graduates “have the requisite skills desired by employers” (p. 8). One of the plan’s key goals is to increase the number of STEM degrees awarded to students because STEM-related occupations “are closely tied to technological innovation, economic growth, and increased productivity” (p. 12). This plan cites data from the Georgetown University Center for Education and the Workforce (2012) that ranks “STEM jobs as the second fastest-growing occupation category in the nation, behind health care.” It further notes that academic preparation in STEM disciplines is “of particular interest to the State” and cites the U.S. Chamber of Commerce report that “Maryland has the second highest concentration of STEM jobs in the nation, and is adding employment opportunities in these areas faster than all but five other states” (p. 12). The proposed TLST program will fill a gap in Maryland higher education while helping to strengthen Maryland’s skilled workforce in applied life science technology. Although Maryland possesses one of the largest concentrations of medical and core biotechnology-related companies in the US – specifically in the Montgomery County area-- very few biotechnology undergraduate degree programs in the state train students for direct admission into the life science technology workforce.

The proposed TLST course of study offers a path to career and post-baccalaureate educational opportunities in bioscience to a diverse community with the important potential of increasing the number and retention of students in STEM. The rigorous academic program is complemented by lab-based instruction to ensure graduates are well prepared for an array of opportunities in Maryland’s bioscience community. As a 2 + 2 program, the proposed Bachelor of Science in TLST will attract and encourage community college students to complete their Associate’s degrees, earn Bachelor’s degrees and pursue careers related to biotechnology and translational science. It also provides a promising new pathway for other Maryland undergraduates with an interest in the biological and life sciences. STEM education was established as a high priority in the University System of Maryland (USM) 2020 Strategic Plan, which called for a 40 percent increase in STEM graduates between 2010 and 2020.

In addition, the TLST Program responds to the need to support Maryland’s knowledge-based economy and improve the quality of Maryland citizens’ lives by “increasing the number of graduates produced in workforce areas that are key to the state’s ability to thrive and compete (including STEM...) and...promoting improved health care” (p. 16). Furthermore, the TLST Program addresses the statewide goals of developing “seamless articulation and transfer agreements” and promoting programs to “boost training and research in such vital health-care fields” (p. 17).

b. Job opportunities:

The Bachelor of Science in TLST is a new degree that supports a growing demand for skills and education in the specialized area of applied, translational biotechnology. As such, there are very little statistics available to demonstrate the need, which is evidenced in the 2014 EAB report referenced in the next section. One comparable position would be that of biological technicians with bachelor’s degrees, which is expected to grow 10 percent from 2012 to 2022 and “continued

growth in biotechnology and medical research is expected to increase demand for these workers” (<http://www.bls.gov/ooh/life-physical-and-social-science/biological-technicians.htm>). Therefore, UMBC expects students graduating from the TLST Program will have numerous job prospects with promising futures in Maryland and nationally.

c. Evidence of market demand through supporting data:

The curriculum for the proposed TLST program was developed in a collaborative relationship between UMBC and Montgomery College (MC) that was started through a comprehensive multi-partner transfer success initiative funded by the Bill and Melinda Gates Foundation. MC faculty designed the first two years of the program at MC and UMBC faculty developed the last two years of the program at UMBC. Conversations between administrators, staff, and faculty of both institutions identified a need and transfer opportunity for a four-year degree in translational life science that incorporated both academic rigor and university-guided, lab-based instruction. The Education Advisory Board of The Advisory Board Company was enlisted to research the need for such a four-year degree in Maryland. The report methodically determined employer demand for bachelor’s degrees in translational life sciences in four areas: the mid-Atlantic region, metropolitan Baltimore-Towson, Washington, D.C., and Montgomery County, MD. Key findings of the 2014 EAB report guided the program development and included information that enrollment in general biotechnology programs typically have shown steady growth, noting that “Montgomery County represents the highest demand for biotechnical graduates in the entire Mid-Atlantic region” with increases in program enrollment in biotechnology expected once institutions “offer a bachelor’s degree that balance practical skills with theoretical knowledge” (p. 4). The report notes that baseline expectations of employers included competencies in communication, writing, and organizational with “proven lab and experimental skills” (pp. 13-14). The report indicated that higher numbers of adult learners were attracted to programs that emphasized commitment and “hard science skills” (p. 16) and that most employers required biotechnical bachelor’s degrees rather than associate’s degrees (p 18).

4. Descriptions

a. Similarities or differences in the degree to be awarded:

The proposed new Bachelor of Science in TLST is unique in Maryland. It provides the best fit to the combined market segments for those who resident in Montgomery County and plan to attend a public university and to seek employment in Biotechnology & Medicine.

Although a few existing programs in the State include similar lower-level course content, the proposed TLST program differs from other programs in the region of Maryland, where the program will be offered, in the Upper Level (UL) content, in the UL laboratory work and in the mathematics, bioinformatics, and professional experience requirements.

The MC/University of Maryland, School of Medicine Biotechnology Research Track is offered in the greater Baltimore region and requires upper-level laboratory coursework, professional experience, courses in biotechnology/bioengineering, but no upper-level credit in bioinformatics or mathematics. In contrast, the proposed UMBC TLST program is planned for the Montgomery County region and requires eight upper-level credits in bioinformatics and mathematics.

The BS in Biotechnology at Stevenson University is offered in the greater Baltimore region and

offers no upper-level credits in bioinformatics. In contrast, the proposed TLST program differs by focusing on the Montgomery County region and extending its upper-level emphasis on laboratory instruction, professional experience, biotechnology/bioengineering, and mathematics to include four upper-level credits in bioinformatics.

The UMUC degrees in biotechnology (BS and BTPS) are available to students with AAS degrees from community colleges with which UMUC has articulation agreements (Montgomery College and Baltimore City Community College). The UMUC programs do not include upper level laboratory instruction or upper-level classroom or laboratory courses in bioinformatics, mathematics, biotechnology and bioengineering. UMUC students receive laboratory training through a 6-credit workplace learning internship, which requires affiliation or employment with a biotech research facility. In contrast, the proposed UMBC TLST program provides extensive on-campus applied laboratory and computer-based instruction in addition to its required internships or project-based coursework. Also, UMBC's proposed TLST program also requires upper-level coursework in biotechnology/bioengineering, bioinformatics and mathematics, which are not required in the UMUC degrees.

b. Area of specialization:

The goal of UMBC's proposed TLST program is to establish an innovative and practical course of study based in Montgomery County that will educate individuals to be well versed in the foundational concepts of translational science and to be professionally trained in translational research methods. The proposed TLST program is designed as a collaborative, 2 + 2 initiative for community colleges in the Montgomery County and surrounding areas, specifically Montgomery College students pursuing an Applied Associate's Degree in Biotechnology.

Additionally, the proposed TLST program represents a degree-based opportunity for UMBC and other eligible students to prepare for careers and/or graduate-level education in the translational sciences. It is anticipated that the proposed TLST program will be of interest to current students in the high-enrollment UMBC majors of biology and chemical engineering. The proposed new program also provides a pathway to the existing UMBC Professional Studies (PBC) focused on Biotechnology, as well as to the Master's in Professional Studies in Biotechnology, which prepares science professionals to fill management and leadership roles.

UMBC's plan to offer the proposed new TLST program in Montgomery County allows the institution to expand its STEM offerings in the evolving direction of translational sciences without placing additional demands on the existing STEM infrastructure and high-enrollment science programs on the UMBC campus.

c. Specific academic content:

See UMBC's simultaneously-submitted Proposal I for a listing of the course listings for the proposed UMBC TLST program, which total 120 credits, and for the course descriptions of the 13 upper-level courses developed for the TLST Program.

The comprehensive curriculum for the Bachelor of Science in TLST includes 13 upper-level biotechnology courses offered by UMBC. The proposed program allows UMBC to educate and train students with an optimal balance of "know what" and "know how" as the amounts of laboratory and computer instruction triple the amount in a standard BS in biology, and surpass

most BS degrees in biochemistry, biotechnology, or biochemical engineering currently offered in the State of Maryland. Salient features of the TLST Program curriculum are:

- A total of 98 credit hours of instruction in biology, chemistry and biochemistry, biochemical engineering, math and physics courses with segments of the three courses in biochemistry, bioprocessing, and bio-manufacturing incorporating instruction applied at the bench.
- A total of 7 credit hours of computer instruction in software applications and bioinformatics with an additional three-weeks of computer-based bioengineering instruction.
- A total of 15 credit hours of pure laboratory course instruction, including a two-semester (6 credit hours) internship or research project based course.

Careful review by the program planning committee has ensured that all general education requirements and course prerequisites will be met by both native UMBC students and students transferring into the program based on articulation agreements.

5. Instructional Delivery

The TLST program will be based at the Universities of Shady Grove (USG) in Montgomery County, MD, with parts of the program also offered at Montgomery College (MC). (For details on the articulation agreement with MC, see UMBC's simultaneously-submitted Proposal I.) UMBC's Division of Professional Studies (DPS) has an existing infrastructure at USG that includes four onsite staff who coordinate services to the academic programs. DPS is the liaison to the USG staff that plans an essential connecting role to offices and resources on the UMBC campus. As detailed in the MOU (Appendix B), a planned Biomedical Sciences and Engineering Education (BSE) Building is to be completed in spring 2019 and classes beginning in fall of 2019. The BSE Facility will provide state-of-the-art teaching laboratories, active learning classrooms, clinical training facilities, academic offices, and an expanded level of student services necessary to support program and enrollment growth. Specialized laboratories, support space, and general student support services at MC are scheduled for use to support the launch of the TLST program as early as Fall 2017.

The College of Natural and Mathematical Sciences at UMBC will administer the proposed TLST program through a full-time Program Director and a full-time Assistant Program Director. The Directors will be housed at the Universities of Shady Grove (USG). In addition to the resident faculty at UMBC (below), two (2) full-time lecturers and a new assistant professor with expertise in Biotechnology will provide program support. These positions are to be filled upon approval of the proposed TLST program. Note: No distance learning is included in this proposal. See Appendix C for tables of TLST program faculty positions, including those to be hired, and the members of the TLST Faculty Advisory Committee, who will support the teaching mission of the proposed TLST program. It is important to note that all TLST faculty will be hired by the TLST Faculty Advisory Committee and will have terminal degrees. At least 50% of the TLST program will be offered by full time faculty.

6. Description of the Academic Oversight, Quality Control, and Student Services to be Provided

Program-specific evaluation: The TLST program, which will be under the purview of the CNMS, will undergo a biennial assessment that includes review of program learning goals, assessment measures, and student learning outcomes. The results of the program assessment and review will be used to develop strategies for improving the education of TLST majors. A Faculty Advisory Committee, comprised of faculty associated with the TLST program, will lead the assessment efforts under the procedures mandated by the CNMS. In addition, a representative from the TLST program will serve with other CNMS department representatives on the CNMS Student Learning Assessment Advisory Committee (SLAAC). The SLAAC members create templates for general education course and program assessment in the CNMS that are used by each department to create individualized but uniform assessment plans to promote continuous improvement. SLAAC members also serve as assessment liaisons to their departments/programs and help facilitate best practices and the use of the CNMS SLA templates to complete plans. Committee members also facilitate the timely completion of the assessment reports to fulfill the approved plans for the assessment of departmental general education courses and overall program assessment, and serve as the primary contacts between the Dean's Office and the department/program to address questions and/or issues involving the submitted assessment plans. It is the intent of the College to conduct exit interviews with graduating seniors as part of evaluating the TLST program.

UMBC will continue to employ assessment tools and methods in evaluating student outcomes, courses, and faculty consistent with COMAR 13B.02.03.15 expectations and with curriculum review procedures established by UMBC.

Also, as detailed in the attached memorandum of understanding (MOU) (Appendix B), UMBC will provide administrative services and support for all UMBC TLST students, regardless of instructional location, at USG. These services will include: 1) orientation for newly-admitted students, 2) career and academic advising, 3) disability accommodation services, 4) basic financial aid and billing support, 5) transfer course processing, 6) UMBC Campus Cards, 7) commencement preparations, 8) student conduct proceedings, 9) Study Abroad offerings, and 10) service learning opportunities. UMBC will offer other necessary services and support via phone and email as currently offered to UMBC students in existing programs at the Shady Grove location. Also, UMBC will continue to work with USG on other student services and support per an existing agreement. This agreement specifically addresses support for student organizations, after-hours resources, career and internship services, academic success, recruitment efforts, veteran services, additional scholarship opportunities, etc. USG will issue student identification cards to UMBC TLST students so they can access the services provided for all undergraduate UMBC students at USG and to comply with existing security procedures at the USG campus. As detailed in the MOU, MC will provide UMBC TLST students taking courses at MC-Germantown access to the following resources: 1) student tutoring centers, 2) recreational facilities, 3) emergency counseling services, 4) internship and career services/resources coordinated with existing UMBC agreements with USG, and 5) emergency notification of MC closings due to weather conditions and other notifications

7. Adequacy of Library Resources

The Director of the Albin O. Kuhn Library, Patrick Dawson, at UMBC has affirmed in a letter of support that library resources for the proposed new degree are sufficient in light of the proposed budget allocation. Two critical resources for this program will be JoVE: Clinical & Translational Medicine and JoVE: Bioengineering. These two resources offer fully online

visualized experiments in areas critical to this program. This will allow students in Montgomery County to have online access to these and other excellent library resources. As part of the comprehensive services and academic support provided to UMBC students by USG, students in the TLST program will have full access to the materials and services of the Priddy Library at USG. Also, as detailed in a memorandum of understanding with UMBC (Appendix B), Montgomery College will provide UMBC TLST students taking courses at MC-Germantown free access to its library resources both on and off campus. Therefore, the UMBC President assures that appropriate library resources are available to support the needs of this program.

Appendix A: Projected Budget for UMBC's proposed BS in Translational Life Science Technology at The Universities at Shady Grove						
	Year Zero	Year One	Year Two	Year Three	Year Four	Year Five
PROJECTED ENROLLMENT AND TUITION REVENUE	FY2017	FY2018	FY2019	FY2020	FY2021	FY2022
Full-time Resident Students (64% of enrolled students)		10	23	35	45	56
Annual Full-time Resident Credits		246	553	829	1091	1336
Projected Tuition Rate (projected annual increase = 3%)		\$ 8,450	\$ 8,704	\$ 8,965	\$ 9,234	\$ 9,511
Full-Time Student Tuition Revenue (inclusive of 4% tuition discount rate; i.e. 96% of full tuition)		\$ 83,068	\$ 192,510	\$ 297,428	\$ 402,795	\$ 508,373
Part-time Resident Students (36% of enrolled students)		6	13	19	26	31
Annual Part-time Resident Credits		104	233	350	460	564
Tuition Revenue Per Credit (projected annual increase = 3%)		\$ 351	\$ 362	\$ 373	\$ 384	\$ 395
Part-Time Student Tuition and Fee Revenue (inclusive of 4% tuition discount rate; i.e. 96% of full tuition)		\$ 34,959	\$ 81,017	\$ 125,172	\$ 169,515	\$ 213,947
TOTAL PROJECTED TUITION REVENUE		\$ 118,027	\$ 273,527	\$ 422,600	\$ 572,310	\$ 722,320
PRELIMINARY PROGRAM EXPENSES	FY2017	FY2018	FY2019	FY2020	FY2021	FY2022
<i>Expenses to be supported by tuition revenue</i>						
PERSONNEL (costs rise at 3% per year unless otherwise noted)						
Lecturer # 1 (12 month; salary + 33% fringe)	-	-	\$93,100	\$95,893	\$98,770	\$101,733
Lecturer # 2 (12 month; salary + 33% fringe)	-	-	-	\$93,100	\$95,893	\$98,770
SUBTOTAL PERSONNEL EXPENDITURES	\$0	\$0	\$93,100	\$188,993	\$194,663	\$200,503
OPERATING EXPENDITURES (costs rise at 3% per year unless otherwise noted)						
Special & Technical (i.e. honorariums, student payments)	\$0	\$5,000	\$7,500	\$10,000	\$10,300	\$10,609
Travel (routine in-state travel; conference travel)	\$1,000	\$50,000	\$10,000	\$20,000	\$20,600	\$21,218
Contractual Services (i.e. marketing, website, USG space rental)	\$0	\$20,000	\$40,000	\$50,000	\$51,500	\$53,045
Supplies (i.e. office, research, items less than \$1,000)	\$1,000	\$5,000	\$7,000	\$7,210	\$7,426	\$7,649
Equipment Capital or Sensitive (includes AOK Library; 6% rise per year)	\$3,000	\$15,000	\$15,900	\$16,854	\$17,865	\$18,937
Fixed Charges (i.e. association dues, subscriptions, rental charges)	\$0	\$5,000	\$10,000	\$15,000	\$15,450	\$15,914
UMBC at Shady Grove Academic & Administrative Support	\$0	\$58,100	\$59,843	\$61,638	\$63,487	\$65,392
SUBTOTAL OPERATING EXPENDITURES	\$5,000	\$158,100	\$150,243	\$180,702	\$186,629	\$192,764
TOTAL DIRECT EXPENDITURES	\$5,000	\$158,100	\$243,343	\$369,695	\$381,292	\$393,266
DPS administrative indirect (10% gross tuition revenue)		\$11,803	\$27,353	\$42,260	\$57,231	\$72,232

	TOTAL PROJECTED TUITION-SUPPORTED EXPENSES	\$5,000	\$169,903	\$270,696	\$411,955	\$438,523	\$465,498
	<i>Expenses to be supported by USM</i>						
	<i>PERSONNEL(costs rise at 3% per year unless otherwise noted)</i>						
	Program Director Salary (12 month faculty)	\$125,000	\$128,750	\$132,613	\$136,591	\$140,689	\$144,909
	33% Fringe for Program Director	\$43,750	\$42,488	\$43,762	\$45,075	\$46,427	\$50,718
	subtotal PD	\$168,750	\$171,238	\$176,375	\$181,666	\$187,116	\$195,628
	Assistant Program Director for Curriculum & Advising (12 month faculty)	-	\$80,000	\$82,400	\$84,872	\$87,418	\$90,041
	33% Fringe for Assistant Program Director	-	\$26,400	\$27,192	\$28,008	\$28,848	\$29,713
	subtotal APD		\$106,400	\$109,592	\$112,880	\$116,266	\$119,754
	Assistant Professor (9 month; expertise in biotechnology)		\$80,000	\$82,400	\$84,872	\$87,418	\$90,041
	33% Fringe for Assistant Professor		\$26,400	\$27,192	\$28,008	\$28,848	\$29,713
	Faculty Startup		\$200,000	\$150,000	\$150,000	\$0	\$0
	subtotal Assistant Professor		\$306,400	\$259,592	\$262,880	\$116,266	\$119,754
	SUBTOTAL USM SUPPORTED EXPENSES	\$168,750	\$584,038	\$545,559	\$557,425	\$419,648	\$435,136
	SUMMARY	FY2017	FY2018	FY2019	FY2020	FY2021	FY2022
	Tuition Revenue Total	\$0	\$118,027	\$273,527	\$422,600	\$572,310	\$722,320
	Tuition-supported Expenses	\$5,000	\$169,903	\$270,696	\$411,955	\$438,523	\$465,498
	Annual Projected Net +/- Tuition	(\$5,000)	(\$51,876)	\$2,832	\$10,645	\$133,787	\$256,821
	Net +/- assuming underattainment of tuition revenue by 25%	(\$5,000)	(\$81,382)	(\$65,550)	(\$95,005)	(\$9,290)	\$76,241
	Net +/- assuming overattainment of tuition revenue by 25%	(\$5,000)	(\$22,369)	\$71,214	\$116,295	\$276,865	\$437,401
	Anticipated USM Support	\$168,750	\$584,038	\$545,559	\$557,425	\$419,648	\$435,136

Appendix B

Memorandum of Understanding (MOU)

between

University of Maryland, Baltimore County (UMBC)

and

The Universities at Shady Grove (USG)

and

Montgomery College (MC)

I. IDENTIFICATION OF PARTIES

UMBC is a constituent institution of the University System of Maryland, an agency of the State of Maryland, located at 1000 Hilltop Circle, Baltimore, Maryland, 21250.

Montgomery College (MC) is a public, open admissions community college located at 20200 Observation Drive, Germantown, MD 20876. MC has three campuses plus workforce development/continuing education centers and off-site programs throughout Montgomery County.

The Universities at Shady Grove (USG), a Regional Higher Education Center, is a partnership of nine University System of Maryland (USM) universities on one campus in Montgomery County, located at 9630 Gudelsky Drive, Rockville, MD 20850. UMBC offers undergraduate and graduate programs for credit at USG.

II. PREAMBLE

This MOU constitutes an agreement between UMBC, MC, and USG. The agreement has been developed jointly in order to facilitate the launch of UMBC's 2+2 Bachelor of Science (BS) program in Translational Life Science Technology (TLST) which articulates with Montgomery College's Biotechnology Program, as described in a separate Articulation Agreement: Associate of Applied Science (A.A.S.) degree in Biotechnology.

UMBC and MC faculty have worked as equal partners to design the TLST program, which we believe will serve as a national model for life science education and for community college-university collaboration. In addition to the TLST program's curricular distinctiveness, the upper division of the program will be offered in Montgomery County in the heart of the life science research corridor.

UMBC and USG have been partners in offering upper division undergraduate and graduate programs for nearly two decades.

The TLST program is designed to address the need for biotechnology and life science professionals in Montgomery County and the state of Maryland. As institutions with steadfast commitments to offering every student our very best, UMBC, MC, and USG are committed to a strong TLST partnership. This MOU is our roadmap for program implementation.

III. DUTIES AND OBLIGATIONS

It is the intention of all parties to start offering the UMBC TLST program in fall 2017, providing that program approval by UMBC, USM, and MHEC is obtained, and funding is in place.

UMBC will initially offer all the upper division Biotechnology (BTEC) courses of the UMBC TLST program, as shown in the table below, at the MC Germantown campus. The additional courses listed below, General Education Program (GEP) and program electives, will be offered by UMBC at the USG campus. If the program start date occurs fall 2017, UMBC will offer the 3rd year BTEC courses during AY 2017-18 at MC and all 4th year BTEC courses at MC during AY 2018-19. Independent of the start date, the 3rd and 4th year BTEC courses will be offered at MC across two consecutive academic years. Offering all upper division BTEC courses at one location at MC for the first two years of development and implementation of the UMBC TLST program, per this plan, will provide for a strong and smooth program start, continuity for students, and for interaction among all program faculty.

Starting with the fall semester after the program has been at MC for two years, (e.g. fall 2019 if the program starts fall 2017), UMBC will begin to transition upper division BTEC courses of the UMBC TLST program to USG, based on a plan mutually agreed upon by UMBC, MC, and USG. The transition will begin to occur two academic years after the first fall semester start date. The planning of the transition will begin the fall after the first fall semester (e.g. fall 2018 if the program starts fall 2017). In developing and implementing the transition plan, the parties will determine the best approach for the

program going forward consistent with the terms of the renewal of this agreement. Considerations in developing the transition plan will include, among other factors, the level of readiness of the Biomedical Sciences and Engineering Education (BSE) building at USG, establishing a class schedule for the UMBC TLST students that will have the students attending classes only at one location on the same day, and offering all the BTEC courses for the first four semesters at MC. The transition plan will take into consideration any implications of a possible delay in completion of the BSE building at USG by fall 2019. UMBC will offer the UMBC TLST program fully at USG as expeditiously as feasible.

If UMBC finds that it needs to offer any 100- or 200-level STEM courses at USG, UMBC will apply to MC for a waiver to do so.

Table 1 – UMBC TLST Year Three and Year Four Courses

Year Three – UMBC			
Fall Semester	Cr	Spring Semester	Cr
BTEC 300 - Translational Life Science Tech	3	BTEC 330 - Software Applications	3
BTEC 303 - Applied Cell Biology	4	BTEC 344 - Epidemiology	3
BTEC 310 - Instrumentation & Methods	3	BTEC 430 - Translational Biochemistry	4
BTEC 350 - Stats for Life Sciences	4	Program Elective	3
GEP Course	3	GEP Course	3
Total Credits	17	Total Credits	16

Year Four - UMBC			
Fall Semester	Cr	Spring Semester	Cr
BTEC 395 - Translational Bioinformatics	4	BTEC 462 - Bioprocess Design & Control	4
BTEC 444 - Translational Cancer Biotech	3	BTEC 470 - Advanced Bio-manufacturing	4
BTEC 453 - Biochemical Engineering	4	BTEC 495 - Internship or Project-Based Course	3
BTEC 495 - Internship or Project-Based Course	3	Program Elective	3
Total Credits	14	Total Credits	14

A. Facilities – General

Montgomery College's new 145,000 square foot Bioscience Education Center building (BE) with 25 laboratories and a mock manufacturing suite offers state-of-the-art equipment and hands-on learning opportunities. Two dedicated laboratory classrooms, two lab prep rooms, a recitation room, four faculty offices, and access to the Science Learning Center in BE will support the UMBC TLST program and students.

More than 600 UMBC students - and dozens of faculty and staff - benefit from the full complement of state-of-the-art classrooms, services, and academic support offered on the USG campus. USG is expanding its campus to include a new 220,000 GSF/135,414 NASF instructional facility, the Biomedical Sciences and Engineering Education building (BSE), scheduled to open in the fall of 2019. With this addition, USG will provide state-of-the-art laboratories, active learning classrooms, clinical training facilities, academic offices and an expanded level of student services necessary to support program and enrollment growth in the STEM fields.

UMBC does not have at this time laboratory facilities on the main campus to support the TLST program.

B. Faculty:

1. Through the partnership being fostered by this MOU, UMBC TLST faculty and MC Biotechnology Program faculty will establish and nurture an ongoing collegial relationship with strong collaboration between the two groups through the following activities: joint course development, periodic (i.e., quarterly) faculty meetings, mentoring of student research projects, joint presentations at conferences, and shared professional development opportunities, among others.
2. Montgomery College faculty will continue to teach the associate's degree program in biotechnology, which is the first two years of the TLST Program, and will maintain the established brand and currency of the program through its ongoing collaboration with local biotechnology industry. Courses will continue to be taught by MC's highly-qualified faculty.
3. UMBC will appoint, contract with, and supervise all faculty in the upper division (Years 3 and 4) portion of the UMBC TLST program and will conduct all instruction in the upper division (Years 3 and 4).
 - a. If UMBC requests, Montgomery College will assist with faculty recruitment in the following ways: recommending adjunct faculty, facilitating connections with experts in biotechnology companies, etc.
4. Montgomery College will provide UMBC faculty teaching in the TLST program with a free orientation to Montgomery College and to the Germantown Campus; free library and use of recreational facilities; Montgomery College e-mail addresses; and access to the emergency notification system.
5. UMBC faculty will use UMBC course management systems (i.e., Blackboard and myUMBC) to conduct course business with students and staff.
6. USG will issue faculty identification cards to UMBC TLST faculty assigned to the USG campus in order to access the services provided for all UMBC faculty assigned to USG and to comply with existing security policy at the USG campus.

C. Existing Agreements:

1. UMBC will honor all previously executed or subsequently executed agreements with USG and its partner institutions including agreements on: counseling services, the delivery of student and academic services, support for students with disabilities, student information and data sharing.
2. UMBC will honor all previously executed agreements with MC.

D. Program Location:

The parties intend to start offering the UMBC TLST program in fall 2017, if program approval by UMBC, USM and MHEC, as well as funding, are in place.

1. The location(s) and time frame at which UMBC's TLST courses, GEP courses, and program electives shall be offered are described in Section III. Duties and Obligations of this MOU.
2. UMBC will base TLST administrative activity on the USG campus.
 - a. TLST program faculty and staff will have offices at MC and at USG.
 - b. UMBC will identify all TLST students with the Shady Grove campus (SHGR) designation. This campus designation will remain the same regardless of the location of coursework (MC-Germantown or USG).
 - c. UMBC will lead scheduling of program activity and faculty assignment each semester in accordance with UMBC scheduling deadlines and procedures. UMBC will work in conjunction with MC to ensure building availability and access to meet the needed schedule.
 - d. USG will provide room scheduling (classrooms, labs, teaching areas, etc.) for TLST classes held on the USG campus. USG assigns space (office, education, student or instructional research) upon request and UMBC will follow existing USG procedures for requesting space.
 - i. USG will work with UMBC on scheduling of rooms at USG to support the UMBC TLST program. It is expected that no students will be required to commute between MC and USG on any given day.
 - ii. USG will provide IT support to UMBC TLST students and faculty when they are on the USG campus through in-office or in-call communications per the IT help desk schedule available online at <http://www.shadygrove.umd.edu/campus-services/oit>.
 - e. MC will provide room scheduling (classrooms, labs, teaching areas, etc.) for UMBC TLST classes held on the MC campus. MC assigns space (office, education, student or instructional research) upon request and UMBC will follow existing procedures for requesting space.
 - f. UMBC students, faculty, and staff are subject to the policies and procedures of the University System of Maryland and UMBC in the conduct of UMBC courses at MC and USG.
 - g. Regarding other areas beyond academics and coursework, UMBC students, faculty and staff will also follow the regulations, policies, and procedures of MC or USG, as appropriate when they are on each campus. This includes campus closures. The specific campuses are responsible for

ensuring that notification and information is provided to the people subject to the campus regulations, policies and procedures.

3. Facilities - Specific

a. MC will provide

- i. Two laboratory classrooms in the Bioscience Education Center on the Germantown Campus
- ii. Two laboratory prep rooms in the Bioscience Education Center (BE)
- iii. One recitation room in BE
- iv. Four adjacent offices in BE
- v. Use of all laboratory equipment that exists in the Bioscience Education Center laboratories at the time the BTEC courses begin being offered at MC. The equipment will be maintained in working order by MC.
- vi. Laboratory consumable supplies for courses offered at MC during Academic Years 2017-2018 and 2018-2019.
- vii. Laboratory and office support staff during Academic Years 2017-2018 and 2018-2019 at the levels that are standard for lab support at MC.
- viii. Neither UMBC, nor its faculty and students as individuals, will be charged for parking or facility access for students taking a UMBC TLST course(s) on the MC-Germantown campus.

b. USG will provide:

- i. Classrooms requested at USG free of charge until UMBC completely transfers the program to USG, at which time the charges will be in accordance with the standard classroom charges.
- ii. The cost for use by UMBC of all other space requests (technology, computer classrooms, labs, offices) will be charged by USG to UMBC based on usage in accordance with standard existing procedures at USG for all home institutions.

E. Student Services

1. UMBC will provide administrative services and support for all UMBC TLST students, regardless of instructional location, at USG. These services will include
 - a. Orientation for newly-admitted students
 - b. Career and academic advising
 - c. Disability accommodation services
 - d. Basic financial aid and billing support
 - e. Transfer course processing

- f. UMBC Campus Cards
 - g. Commencement preparations
 - h. Student conduct proceedings
 - i. Study Abroad offerings
 - j. Service learning opportunities
- 2. UMBC will offer other necessary services and support via phone and email as currently offered to UMBC students in existing programs at the Shady Grove location.
- 3. UMBC will work with USG on other student services and support per an existing agreement. This agreement specifically addresses support for student organizations, after-hours resources, career and internship services, academic success, recruitment efforts, veteran services, additional scholarship opportunities, etc.
- 4. USG will issue student identification cards to UMBC TLST students so they can access the services provided for all undergraduate UMBC students at USG and to comply with existing security procedures at the USG campus.
- 5. MC will provide UMBC TLST students taking courses at MC-Germantown access to the following resources:
 - a. student tutoring centers
 - b. library resources and access both on and off-campus
 - c. recreational facilities
 - d. emergency counseling services
 - e. internship and career services/resources coordinated with existing UMBC agreements with USG
 - f. emergency notification of MC closings due to weather conditions and other notifications

F. Communications, Marketing, and Recruitment

- 1. UMBC will actively recruit students to the UMBC TLST Program working in close collaboration with MC and USG
 - a. UMBC will employ a Program Coordinator at USG to lead recruitment efforts. UMBC's efforts will include, but are not limited to: visits to Montgomery College, information sessions, large scale events, open houses, Program Director visits, and transfer access programs.
 - b. MC will include UMBC TLST program information materials during activities such as: visits to high schools by its college recruiters, faculty and program coordinators, information provided by its faculty to students in Biology classes at MC, and events at MC.
 - c. UMBC will work with USG on recruitment efforts and support per the existing student services agreement. This agreement addresses activities

that include but are not limited to: visits to USG-feeder high schools; facilitation at USG recruiting events such as Open House events; management of online content for USG prospective student webpages hosted by USG; conducting campus tours as requested; and collaboration on recruitment and marketing of programs.

2. All three parties agree that marketing materials and other communications must accurately represent the program and the roles of each of the partners. This includes press releases, brochures, public presentations, etc. UMBC will have the overall coordination responsibility for these activities through its Marketing department in the Division of Professional Studies. MC and USG will each designate representatives from its institution to collaborate with the designated TLST marketing lead at UMBC.

G. Other

1. UMBC, USG, and MC intend to conduct research on the educational outcomes of the TLST Program, publish papers and present at conferences about the TLST Program and expect to pursue grant funding opportunities as they may arise to enhance the TLST Program,
2. UMBC and MC agree that representatives of each institution shall credit the other institution as a partner in the development of the UMBC and MC TLST program in all publications and presentations about the TLST program.
3. UMBC and MC agree to ongoing collaborations to ensure that the integrity of the TLST program as articulated between the two institutions shall continue to meet industry standards and specifications. Any proposed changes in the curriculum shall be handled according to the separate articulation agreement.
4. Nothing in this agreement shall be construed to hinder or prevent either MC or UMBC from developing agreements with other institutions related to the TLST program, so long as the integrity of the UMBC and MC TLST program is not significantly impacted.
5. All parties to this agreement agree to work together to resolve any program issues through joint input, collaboration, and negotiation.

IV. ADMISSIONS CRITERIA AND PROCEDURES

Transfer applicants will be evaluated by the UMBC Admissions Committee on the basis of their academic record at their previous institution(s). Cumulative grade point average, strength of curriculum, and performance on courses related to the applicant's intended area of study will be considered. Applicants must be in good standing at the institution from which they seek to transfer.

For prospective transfer students, application for admission to UMBC consists of the following:

1. Completion of the UMBC Undergraduate Application (currently the Common Application) in its entirety (including the application essay),
2. A non-refundable application fee (currently \$50), and
3. Official college transcript(s) from each college or university previously attended. Transcripts should be sent by the registrar of each institution to the UMBC Office of Undergraduate Admissions and Orientation. (A final transcript also should be sent upon the completion of any course work in progress).

All admitted students who submitted a full application by the priority deadline are considered for transfer scholarships. A separate application is not required.

For applicants with fewer than 30 college credits, an official high school transcript and SAT or ACT test score report will be required.

UMBC reserves the right to deny admission to any applicant for any legitimate and non-discriminatory reason.

V. FINANCIAL ARRANGEMENTS

It is expected that the UMBC TLST program will be funded by a combination of tuition revenue and USM support. The new program proposals prepared by UMBC detail the funding request for the program.

A. UMBC and USG Arrangements

1. USG will work with UMBC, as needed and outlined under separate agreement, to initiate and implement the financial arrangements with USM to establish the UMBC TLST program in Montgomery County and at USG.
2. USG will provide the classrooms requested at USG free of charge until UMBC has completely transferred the program to USG. The program will have been completely transferred to USG when all upper division BTEC courses are offered at USG's BSE building.
3. USG will charge UMBC for all other space requests (technology, computer classrooms, labs, and offices) based on usage in accordance with standard existing procedures at USG for all home institutions.
4. UMBC will continue to pay USG for student services provided for TLST students, per the existing agreement.

B. UMBC and MC Arrangements

1. MC will provide the specified laboratory and office space at no cost to UMBC until the expiration date of this MOU.
2. MC will provide laboratory and office staff support as identified in Section III.D.3.a.vii. of this MOU.

3. MC will provide consumable laboratory supplies as identified in Section III.D.3.a.vi. of this MOU.
4. MC will provide use of laboratory equipment to UMBC as identified in Section III.D.3.a.v. of this MOU.

VI. ADMINISTRATION OF PROGRAM

UMBC Administrators:

1. Dr. William LaCourse, Dean, College of Natural and Mathematical Sciences, UMBC
2. Dr. Christopher Steele, Interim Vice Provost, Division of Professional Studies, UMBC

USG Administrators:

1. Dr. Stewart Edelstein, Executive Director, USG & Associate Vice Chancellor for Academic Affairs, USM

MC Administrators:

1. Margaret Latimer, Vice President and Provost, Collegewide STEM Unit and Germantown Campus, Montgomery College

VII. HOUSING

TLST students will not be resident students. UMBC does not offer campus housing at USG.

VIII. INDEMNIFICATION AND LIMITATION OF LIABILITY

All parties understand and agree that each party's liability for any claims, losses or liabilities of any kind related to or arising out of the negligent performance of this Agreement shall be governed and limited by Maryland Code, State Government Article, Title 12 Sections 12-101 through 12-110, as to UMBC and USG, and Maryland Code, Courts and Judicial Proceedings, Title 5, Sections 5-301 through 5-304 as to MC (the "Acts"). Subject to the limitations contained in this paragraph and to the extent allowed by Maryland law, including the Acts and opinions of the Maryland Attorney General, the indemnifying party agrees to defend, indemnify, and hold harmless the indemnified party from and against any and all damages, claims, and reasonable out-of-pocket costs and expenses relating thereto and arising out of the negligent acts or omissions of the indemnifying party under this Agreement or the indemnifying party's breach of this Agreement; provided, however, that this indemnification shall be contingent upon an appropriation by the Maryland General Assembly to the indemnifying party specifically

for the purposes contemplated in this paragraph at the time an event which may give rise to the indemnifying party's obligation to indemnify or save harmless occurs, and to the extent that a tortious claim is involved, the indemnifying party's obligations shall not be greater than the liability that might be determined under the Acts, if the claim had been asserted against the indemnifying party directly pursuant to those Acts.

IX. FORCE MAJEURE

If either party's performance(s) hereunder is rendered impossible, hazardous, or is otherwise prevented or impaired due to sickness, inability to perform, accident, interruption or failure of means of transportation, Act(s) of God, riots, strikes, labor difficulties, war (including civil war), embargoes, epidemics, fires, floods, explosions, earthquakes, quarantine restrictions, any act or order of any civil or military authority, acts of any government, and/or any other cause or event, similar or dissimilar, beyond that party's control, then each party's obligations with respect to the affected performance(s) shall be excused and neither party will have any liability in connection therewith.

X. GOVERNING LAW AND FORUM

The terms of this Agreement shall be governed by the Laws of the State of Maryland of the United States, not including the law on conflicts of law. Any dispute arising from this Agreement that is not resolved by agreement of the parties shall be resolved exclusively in the Courts and regulatory agencies of the State of Maryland of the United States.

XI. TERM RENEWAL AND TERMINATION OF AGREEMENT

This agreement becomes effective upon signature by authorized representatives of UMBC, MC and USG. It remains in effect until June 30, 2020. The parties will discuss and negotiate during AY 2018-19 the renewal, extension, or modification of the MOU in order to achieve the best path forward for the TLST program.

This MOU may be modified only by mutual written agreement of all parties.

XII. CORRESPONDENCE

In the interest of implementing this MOU in a systematic manner, UMBC, MC and USG will each designate a contact person assigned the responsibility of coordinating MOU activities in general terms.

UMBC:

1. Dr. Christopher Steele, Interim Vice Provost, Division of Professional Studies, UMBC
[copy to: Dr. Antonio Moreira, Vice Provost for Academic Affairs]

USG:

1. Robyn Dinicola-Wagle, Chief Student Affairs Officer, USG
2. Mary Lang, Chief Strategy Officer, USG

MC:

1. Margaret Latimer, Vice President and Provost, Collegewide STEM Unit and Germantown Campus, Montgomery College

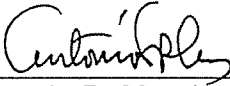
XIII. DATE OF AGREEMENT/SIGNATURES ON AGREEMENT/AUTHORITY TO EXECUTE

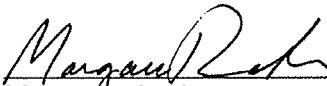
This Agreement is dated as of May 24th, 2016 and will become effective upon signature by the authorized representatives of the parties. The undersigned individuals represent and warrant that they are expressly and duly authorized by their respective institutions to execute the Agreement.


XIV. REQUIRED SIGNATURE

The parties identified below agree to the provisions and terms of this MOU.

APPROVED:

 5/24/2016
Antonio R. Moreira, Ph.D. Date
Vice Provost for Academic Affairs
University of Maryland, Baltimore County

 5/24/16
Margaret Latimer Date
Vice President and Provost
Collegewide STEM Unit
Germantown Campus, Montgomer
College

 5/24/16
Stewart Edelstein, Ph.D. Date
Executive Director
The Universities at Shady Grove
Associate Vice Chancellor for Academic Affairs
University System of Maryland

Appendix C

TLST program: Faculty Positions (to be hired after program approval as per budget)		
Program Director	Montgomery County	Full-time: Ph.D. or other terminal degree; expertise in Applied Biotechnology and Program Administration – will provide TLST Instruction
Assistant Program Director	Montgomery County	Full-time: Ph.D. or other terminal degree; expertise in Applied Biotechnology, Program Administration or Curricular Management or Student Advising – will provide TLST Instruction
Assistant Professor	UMBC Biological Sciences	Full-time: Ph.D.; researcher in Applied Biotechnology or other TLST area – will provide TLST Instruction
Lecturer	Montgomery County	Full-time: Ph.D. expertise in TLST areas
Lecturer	Montgomery County	Full-time: Ph.D. expertise in TLST areas
<p>TLST Faculty Advisory Committee Members (Charged to supervise or provide TLST Course Delivery and Assessment)</p>		
Dr. Charles M. Bieberich	Professor, Biological Sciences	
Dr. Mauricio Bustos	Associate Professor, Biological Sciences	
Dr. Mariajosé Castellanos	Lecturer, Department of Chemical, Biochemical, and Environmental Engineering	
Dr. William R. LaCourse	Dean, College of Natural and Mathematical Sciences Professor Chemistry and Biochemistry	
Dr. Antonio Moreira	Vice Provost for Academic Affairs, Professor, Department of Chemical, Biochemical and Environmental Engineering, Director of the Biochemical Regulatory Engineering Program	