PROGRAM REPORT

Update on programs for achieving Specialist in Blood Banking certification in the United States: 2023

G.M. Meny, M.A. Keller, and C. Flickinger

A person who has achieved the Specialist in Blood Banking (SBB) certification is a medical laboratory scientist who receives advanced training in blood banking and transfusion medicine and has passed an examination given by the American Society for Clinical Pathology. There are several pathways or "eligibility routes" to qualify for the examination to obtain SBB certification, with the most common route involving enrollment in a Commission on Accreditation of Allied Health Education Programs-accredited SBB program. The goal of this study was to compile information about the current accredited SBB programs in the United States and SBB exam statistics for purposes of assessing changes in the programs and detecting trends in SBB exam takers and pass rates. SBB program coordinators were surveyed about qualitative and quantitative aspects of their programs. Current data, changes over time, and nationally available data were tabulated for comparison. This information may be helpful for all medical laboratory scientists interested in considering further studies and certification in blood banking and transfusion medicine. ***Immunohematology*** **2023;39:101-133. DOI: 10.2478/immunohematology-2023-017.**

A Specialist in Blood Banking (SBB) frequently becomes an expert member of the clinical team in the hospital laboratory, donor center, immunohematology reference laboratory (IRL), or cellular therapy laboratory. SBBs are involved in all operations of hospital blood banks and donor centers. While they may perform laboratory testing, many are technical supervisors and laboratory managers who use their expertise in IRLs, cellular therapy laboratories, and/or regulatory agencies. SBBs are also educators and researchers.[1]

An individual becomes an SBB by successfully passing an examination given by the American Society for Clinical Pathology (ASCP).[2] There are seven pathways or "routes" to qualify for the examination (Table 1).[3] The first route requires a candidate to possess a baccalaureate degree in a science-based field and complete a Commission on Accreditation of Allied Health Education Programs (CAAHEP)-accredited SBB program. The remaining six routes do not require completion of a CAAHEP-accredited SBB program but consist of combinations of different academic degrees and either laboratory or education experience. The number of routes for examination qualification has increased over time as acceptable academic degrees and types of experience have changed.

Table 1. Eligibility routes for qualifying for the SBB certification examination

Route 1	Baccalaureate degree; includes biology and chemistry courses	Complete CAAHEP-accredited SBB program	
Route 2	Baccalaureate degree	MLS(ASCP) or BB(ASCP) certification	3 years FT BB laboratory experience
Route 3	Master's degree†		3 years FT BB laboratory experience
Route 4	Doctorate degree†		2 years post-doctural fellowship in BB OR 2 years FT BB laboratory experience
Route 5	Baccalaureate degree	MLS(ASCP) or BB(ASCP) certification	3 years as FT BB educator‡
Route 6	Master's degree†		3 years as FT BB educator‡
Route 7	Doctorate degree†	MLS(ASCP) or BB(ASCP) certification	1 year FT BB laboratory experience OR 1 year FT BB research experience

CAAHEP = Commission on Accreditation of Allied Health Education Programs; MLS = medical laboratory scientist; ASCP = American Society for Clinical Pathology; FT = full-time; BB = blood banking; SBB = Specialist in Blood Banking.

*Abbreviated information. Details available from https://www.ascp.org/content/board-of-certification/get-credentialed#. Accessed 31 August 2023.[3]

†Degree in chemistry, biology, immunology, immunohematology, microbiology, allied health, medical laboratory science, or related field.

‡Educator in college/university or acceptable laboratory.

Byrne et al.[4] published an overview of the organization and design of the 16 CAAHEP-accredited SBB programs in existence in the United States in 2010 (Fig. 1A). At that time, programs delivered instruction either face-to-face or online but not both, and only five programs offered part-time enrollment (Fig. 2A).[4] Since 2010, and more recently after the

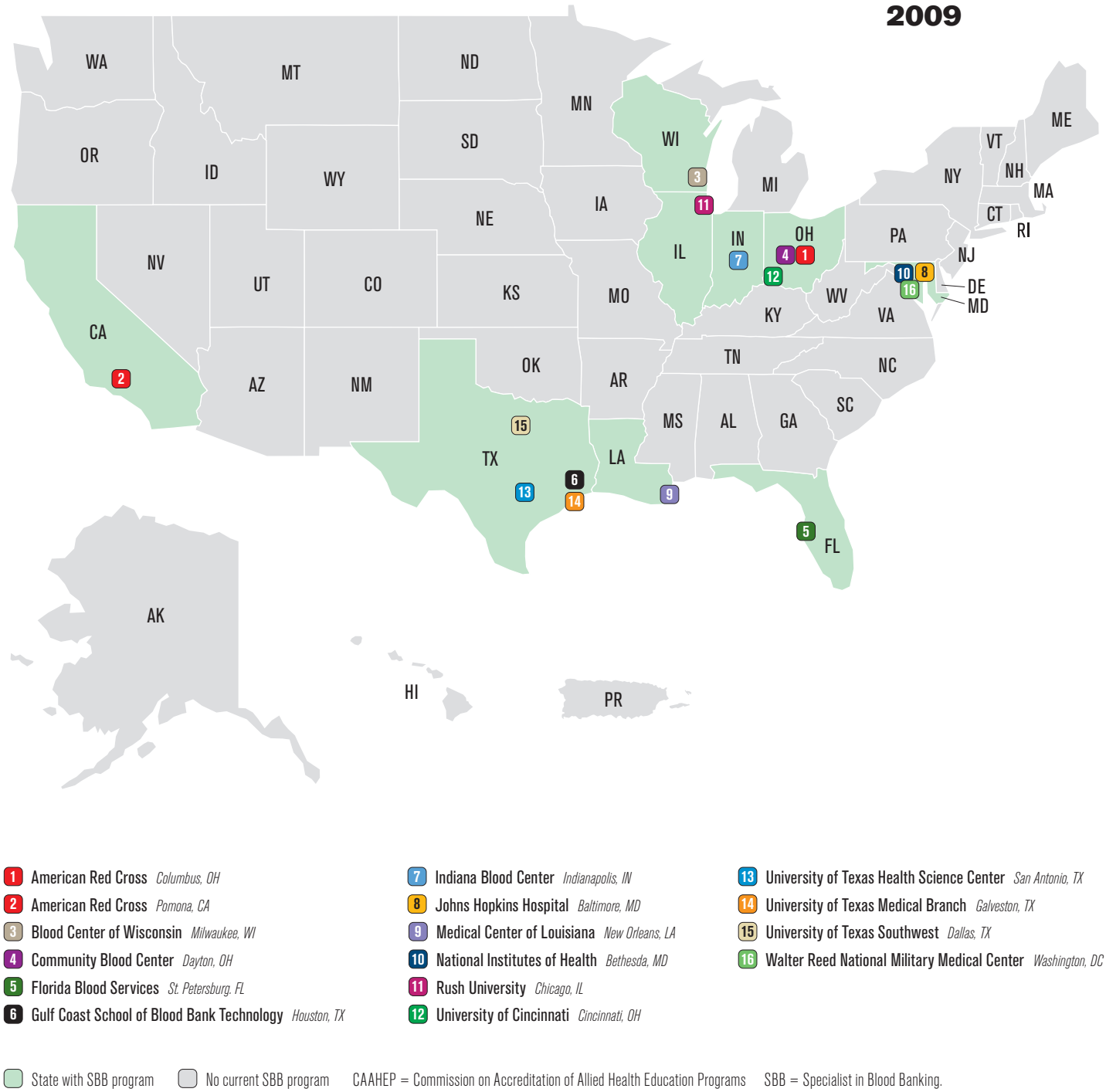


Fig. 1A Location of CAAHEP-accredited SBB programs in the United States in 2009.

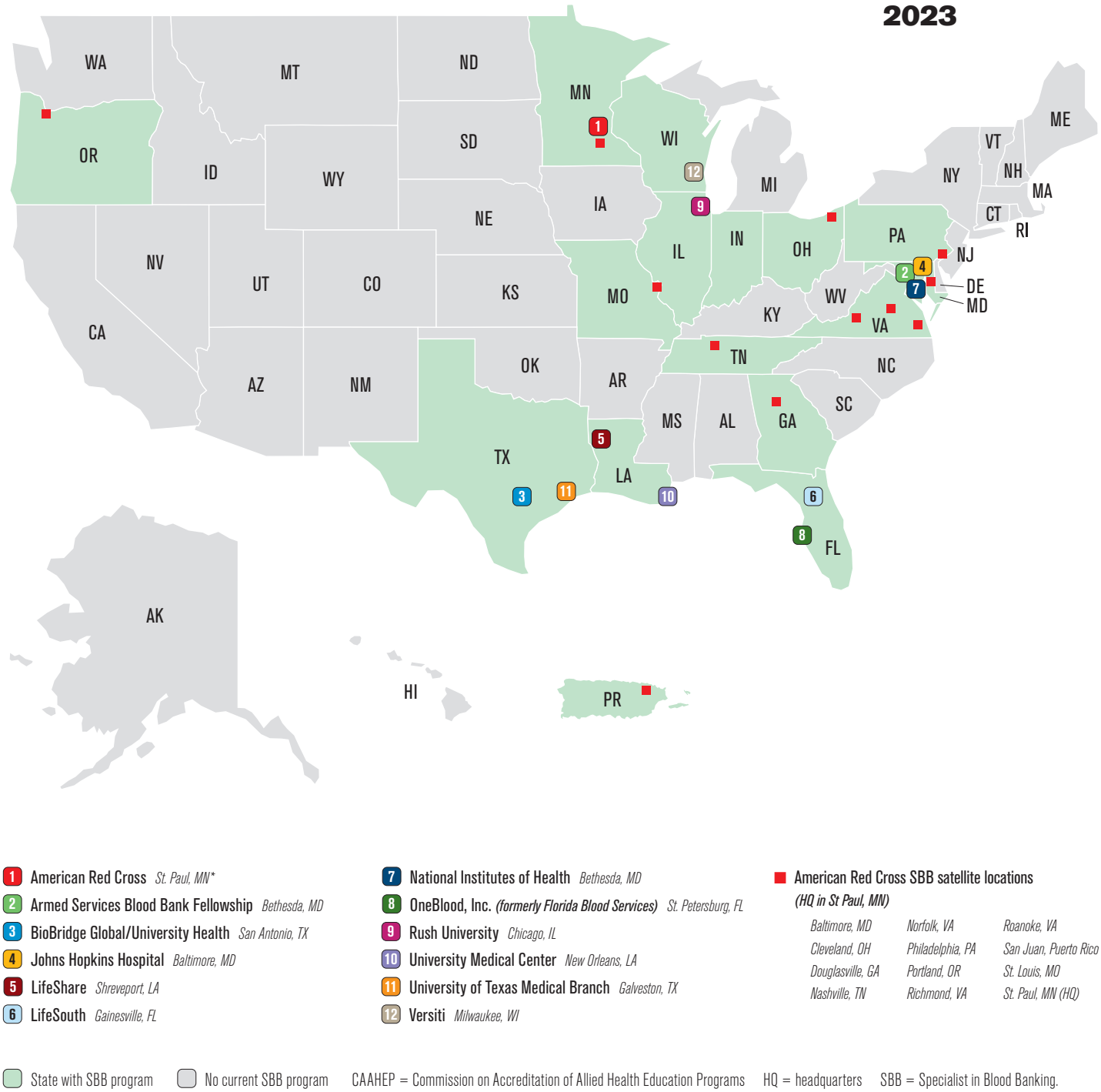


Fig. 1B Location of CAAHEP-accredited SBB programs in the United States in 2023.

SARS-CoV-2 pandemic in 2020, the majority of programs offer online-only instruction or online combined with face-to-face instruction (hybrid), and many offer enrollment for working professionals. Current SBB program locations and modes of education are presented in Figures 1B and 2B.

Staffing shortages in health care[5] and specifically among clinical laboratory staff[6] are well appreciated. Though an aging workforce and burnout are significant factors contributing to the high vacancy rate, another is the lack of knowledge about certification programs for medical laboratory scientists and the shrinking number of such programs. With regard to SBB programs, CAAHEP[7] and the Association for the Advancement of Blood & Biotherapies (AABB)[1] only provide directories with individual SBB program descriptions. Hence, a more up-to-date understanding and analysis of the current status of SBB programs in the United States is needed.

Methods

A survey of SBB programs in the United States was conducted in 2023. The survey questions were designed to query both qualitative and quantitative aspects of the programs, such as program location, length, design, and cost; instructional modality, contact information, available resources and clinical affiliates; admission and graduation requirements; and SBB certification pass rates. The survey was sent to SBB program coordinators, completed, and returned within 2 months. The data were tabulated for comparison of current program status as well as analyzed for changes over time. Data were queried from the ASCP for comparative purposes (Table 2).[8]

Results

The survey results are summarized within this report (Table 3) with complete information on each of the current programs provided in Exhibits 1–12. The number of CAAHEP-accredited SBB programs in the United States has declined from 16 in 2009 to 12 in 2023 (Fig. 1A and B). Six programs based in Ohio, Indiana, and California became inactive, and two programs in Florida and Louisiana became accredited. Besides gaining or losing accreditation, programs may have changed in approved number of students. Class sizes range from a single student to 25 students. The American Red Cross program has experienced the most growth, expanding from an annual class of 6 in 2010 to a class of 12 in 2022, with plans for future student increases.

CAAHEP-accredited SBB programs are currently concentrated in the midwestern, south central, and northeastern areas of the United States. (Fig. 1B). The locale is

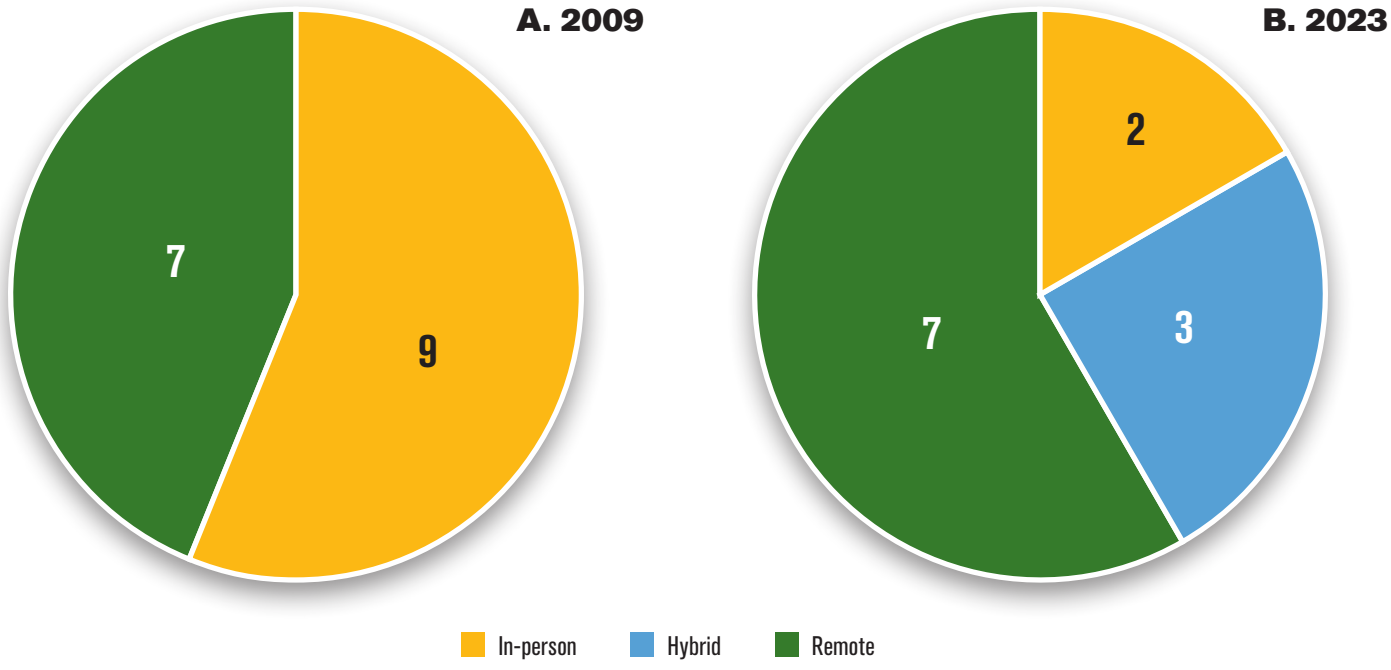


Fig. 2 Comparison of modes of education in CAAHEP-accredited SBB programs in the United States in 2009 and 2023. CAAHEP = Commission on Accreditation of Allied Health Education Programs; SBB = Specialist in Blood Banking.

Table 2. Pass rates for the ASCP SBB certification examination*

	First-time CAAHEP		First-time non-CAAHEP				
	Total pass (*N*)	Pass rate (%)	Total pass (*N*)	Pass rate (%)	Total examinations (*N*)	Total passes for year (*n*)	Total pass rate (%)
2013	62	84	NP	NP	173	94	54
2014	53	79	NP	NP	153	79	52
2015	47	63	NP	NP	164	77	47
2016	46	79	NP	NP	166	76	46
2017	32	68	NP	NP	170	70	41
2018	41	62	NP	NP	174	84	48
2019	52	68	NP	NP	174	92	53
2020	53	74	NP	NP	143	79	55
2021	58	73	NP	NP	179	99	55
2022	51	70	NP	NP	185	88	48

ASCP = American Society for Clinical Pathology; SBB = Specialist in Blood Banking; CAAHEP = Commission on Accreditation of Allied Health Education Programs; NP = not published.

*Data available from https://www.ascp.org/content/board-of-certification/about-boc/#exam_stats. Accessed 8 May 2023.[9]

no longer as relevant as it once was, with only one program fully in-person and most programs fully remote (Fig. 2B). Five (41.6%) programs are linked to employment, with either institutional employees eligible to apply to the program, such as the American Red Cross and Armed Services (40%), or enrollment in the program is linked to employment, such as National Institutes of Health (NIH) and Johns Hopkins Hospital (JHH) (40%), or enrollees commit to working for the institution for a period of time after completing the program and becoming certified, such as LifeSouth (20%).

All CAAHEP-accredited SBB programs require full-time participation in the program; however, scheduling varies. Students either already work part- or full-time in their institution and are enrolled in their onsite SBB program, such as Armed Services, JHH, NIH, and Versiti, or students may be working in a transfusion service or IRL and are enrolled in an online SBB program, such as BioBridge Global/University Health; LifeSouth; OneBlood, Inc.; University Medical Center, New Orleans Louisiana Children's Medical Center (LCMC) Health; or the University of Texas Medical Branch (UTMB). LifeShare and Rush have combination programs whereby the students work at the site while participating in the online SBB program. The American Red Cross program differs by being a hybrid program which offers guided self-study, online lectures, and 12 clinical rotations (6 in-person and 6 virtual) to American Red Cross students and to students at affiliated academic partners. For the six in-person clinical rotations, American Red Cross employees either already work at or travel to one of the 11 satellite locations, and students at an affiliated partner may complete the rotation at their hospital or travel to a satellite location. Rush and Versiti programs offer part-time participation requiring a longer enrollment period.

Eight (75%) programs charge tuition, ranging from $5000 to $18,500, while four (25%) programs are offered at no cost, based on students being hired and paid as employees, students who are already full-time employees of the institution sponsoring the program, or students who commit to working at the institution sponsoring the program for at least 1 year after graduation.

Many CAAHEP-accredited SBB programs partner with other facilities. Blood center-based programs partner with hospitals, and hospital-based programs partner with blood centers to ensure students have exposure to all aspects of transfusion medicine. UTMB, a university-based program, also partners with other facilities to provide students with their clinical experience. One program (Armed Services) does not partner with other sites/centers.

Discussion

Annual reports are provided by accredited SBB programs. These reports provide an update on program design, as well as include metrics such as graduation rate, SBB certification examination pass rate, job placement, and SBB student/graduate publications/awards. A potential student or employer may seek answers to the following questions:

- Which program is the best "fit" to prepare an individual for the SBB examination?

Table 3. Summary of demographics and statistics of Specialist in Blood Banking programs in the United States*

	1 American Red Cross	2 Armed Services Blood Bank Fellowship	3 BioBridge Global/ University Health (BBG/UH)	4 Johns Hopkins Hospital (JHH)	5 LifeShare
Location	St. Paul, MN†	Bethesda, MD	San Antonio, TX	Baltimore, MD	Shreveport, LA
Certificate/degree	Certificate	Certificate/MS	Certificate	Certificate	Certificate
Instructional modality	Hybrid	In-person	Remote	In-person	Remote (on-site orientation)
Schedule	Full-time§ Working professional¶	Full-time§	Working professional¶	Full-time§	Full-time§ Working professional¶
Program accreditation	CAAHEP	CAAHEP	CAAHEP	CAAHEP	CAAHEP
Number of faculty	4	2	5	3–5	6
Length of program	12 months	12–18 months	12 months	12 months	12 months
Start month	September	July	May	September	May
Application period	March 1–June 1	May of the previous year	December–January	Deadline November 30	July 1–December 15
Class size	10–20	Average 6	Maximum 5	Maximum 3	No maximum
Tuition (as reported in 2023)	Offered to select American Red Cross and academic partner employees throughout the United States at no cost, if employer post-graduation employment commitments are met	No tuition for the SBB certificate Tuition for George Washington University MS courses	$5000/year Discount for BBG and UH employees	No tuition	$6000 Students are responsible for travel expenses
Stipend	None	Regular military service pay	None	Students are paid as employees	None
ASCP SBB certification exam pass rate	89% (25/28 graduates)	97%	92% (11/12 graduates)	89% (8/9 graduates)	74%
Contributor	Marvin (Marty) Moore, MHA, MLS^{CM}(ASCP) SBB^{CM}	William L. Turcan, MLS(ASCP)SBB	Ronny Fryar, MS, MT(ASCP)SBB	Lorraine Blagg, MA, MLS(ASCP)^{CM}SBB	Katrina Billingsley, MSTM, MLS(ASCP) SBB

6 LifeSouth	7 National Institutes of Health (NIH)	8 OneBlood, Inc.	9 Rush University	10 University Medical Center New Orleans LCMC Health	11 University of Texas Medical Branch (UTMB)	12 Versiti
Gainesville, FL	Bethesda, MD	St. Petersburg, FL	Chicago, IL	New Orleans, LA	Galveston, TX	Milwaukee, WI
Certificate	Certificate	Certificate	Certificate/MS	Certificate	Certificate	Certificate/MSTM‡
Remote	Hybrid	Remote	Remote	Remote	Remote (on-site orientation)	Hybrid
Working professional¶	Full-time§	Working professional¶	Full-time§ Part-time§ Working professional¶	Working professional¶	Working professional¶	Full-time§ Part-time§
CAAHEP	CAAHEP	CAAHEP	CAAHEP	CAAHEP	CAAHEP	CAAHEP
3	>10	2	5	10	4	3
12 months	12 months	12 months	12 or 24 months	12 months	12 months	18–28 months
June	July	May	September	October	May	August
Anytime, mid-April application deadline	Applications are welcome throughout the year	January–February	October–July	Deadline February 28; will accept applications until July 31 if class size has not reached capacity	July 1–March 1	January 1–April 1
Up to 5	1–3	6	18–24	4–12	Maximum 25	4
$6000; students responsible for travel expenses; no charge to employees with a 1-year commitment to work for LifeSouth as an SBB	No charge to employees	$50 application fee $6000 tuition	Approximately $16,000 for all students.	$6000 tuition Employees of LCMC Health facilities receive exemption of $3000 after successful completion of the program	Texas residents: approximately $9600 Non-residents: approximately $18,500	Installments over five semesters, minimum of $1232/semester Fees reviewed annually; subject to change
None	Students work part-time in transfusion services laboratory	None	None	None	None	None
71% (5/7 graduates)	90% (9/10 graduates)	77%	70%	88%	94%	89% (8/9 graduates)
Guillermo (Bill) Martinez, MS, MT(ASCP)SBB, LSSBB (ASQ)	Karen M. Byrne, MDE, MLS(ASCP) SBB	Julie Laureano, MLS(ASCP)CM SBBCM	Laurie Gillard, MS, MLS(ASCP)SBB	Leslie Granier, MT(ASCP)SBB	LeeAnn Walker, MEd, MLS(ASCP) SBB	Natasha (Tasha) Leon, MLS(ASCP) SBBCM

LCMC = Louisiana Children's Medical Center; MS = Master of Science; MSTM = Master of Science in Transfusion Medicine; CAAHEP = Commission on Accreditation of Allied Health Education Programs; SBB = Specialist in Blood Banking; UH = University Health; ASCP = American Society for Clinical Pathology.

*Data compiled February 2023.

†St. Paul, MN, is headquarters; there are 11 satelite locations in the United States and Puerto Rico.

‡Through Marquette University.

§Full-time/part-time = student works in his or her transfusion service department, either part-time or full-time, and is enrolled in the on-site SBB program.

¶Working professional = student works in any transfusion service department/immunohematology reference laboratory and is enrolled in an online SBB program.

- What are the chances that an individual passes the SBB exam without attending a CAAHEP-accredited program?
- What benefit is there in taking the SBB certification exam?

The survey succeeded in providing detailed comparison of accredited programs. The majority of programs have adapted to hold lectures remote or hybrid. Meeting requirements for wet-bench training is more difficult to accomplish remotely. Programs and national organizations should investigate the use of virtual reality to augment or replace face-to-face training. Various metrics, such as graduation or exam pass rates are collected. However, individual program numbers are small and may be difficult to compare.

Certain data are published on a national collective. The first-time SBB examination pass rate for individuals completing a CAAHEP-accredited program ranged from 62 to 70 percent between 2018 and 2022 (Table 2).[8] Unfortunately, there are no published data available to compare pass rates for first-time exam takers from examinees who completed a CAAHEP-accredited program versus pass rates from those who took the non–CAAHEP-accredited program route. These data may be helpful in program design and student decision-making when assessing the questions previously stated.

The pathways for meeting examination eligibility requirements have changed over the years. For example, only four approved pathways existed in 2009.[4] Byrne et al.[4] noted that individuals who completed a CAAHEP-accredited program (route 1) had a pass rate of 86 percent, while those who completed the non–CAAHEP-accredited program routes (routes 2–4) had a pass rate of 53 percent. However, the data from the CAAHEP-accredited program included only first-time examinees, while the data from non–CAAHEP-accredited program routes included first-time and repeat examinees.

Today, eligibility via a CAAHEP-accredited program (route 1) is still an option. However, six non–CAAHEP-accredited program routes (routes 2–7) are alternatively available to apply for the examination based on education, laboratory experience, and type of advanced degree.[3] There are no published data distinguishing pass rates for first-time examinees between CAAHEP-accredited and non–CAAHEP-accredited program routes.

Garcia et al.[9] noted in 2022 that the overall percentage of blood bank employees anticipated to retire in the next 5 years is 14.2 percent (20.4% highest reported) with a 13 percent staff retirement rate and a 24.3 percent supervisor retirement rate. While this rate is at its lowest level in 6 years, the number of SBB students enrolling in accredited programs will likely not be able to replace individuals retiring, particularly the retiring supervisors.

The lack of published data from national organizations and the anticipated inability to replace retiring SBB personnel does not bode well. National trade organizations, such as the ASCP and AABB, must be transparent while engaging and educating prospective job seekers, especially young people, about careers in laboratory medicine. And organizations such as hospitals and blood centers must provide a compelling argument that will inspire a young person to enter the field of laboratory medicine.

An employment or salary assessment was not performed as part of this survey. The only category of clinical medical laboratory scientist available in the *Occupational Outlook Handbook* published by the Bureau of Labor Statistics (BLS), is "Clinical Laboratory Technologists and Technicians."[10] The median annual wage for clinical laboratory technologists and technicians in May 2021 was $57,800, and employment was projected to grow 7 percent from 2021 to 2031, which is average for all occupations. "Blood bank technologists" are identified as a "specialized clinical laboratory technologist." However, per this publication, their roles are clearly limited and out-of-date in that they state these specialists "collect blood, classify it by type, and prepare blood and its components for transfusions." In addition, this publication does not provide annual wage or employment growth projection data specifically for SBBs or blood bank technologists. A recent salary update for an "ASCP certified Specialist in Blood Bank" published on Payscale.com lists an average U.S. salary of $85,368.[11]

Conclusion

In conclusion, medical laboratory scientists and, in particular, SBBs are critical in their role as health care workers by providing test results, blood components, and other laboratory information that aid physicians in managing the transfusion needs of their patients. Patients are treated based on hospital testing, and laboratory testing is based on the knowledge of the laboratory staff who determine sample suitability, perform simple and complex testing, assess and interpret test results for accuracy and completeness before their release, and may manage an accredited hospital blood bank, IRL, or blood donor center.

Maintaining trained, knowledgeable medical laboratory scientists in our world of a decreasing workforce and an increasingly aging population adds additional layers of

resistance to fulfilling these important roles. Knowledge of the available SBB programs and their suitability to each individual's needs is paramount in moving this initiative forward.

Exhibits 1–12 providing details of the 2023 Specialist in Blood Banking programs in the United States follow on pages 110–133.

Acknowledgments

The authors extend a special acknowledgment to all of the SBB program directors and coordinators who responded to the survey, providing the information comprising this report. In addition, they express deep appreciation to Alexandra Harris for managing the survey, compiling the data, and generating tables and figures, and they acknowledge Susan Johnson for assisting with ASCP data.

References

1. Association for the Advancement of Blood & Biotherapies. Certificate programs. Available from https://www.aabb.org/education/certificate-programs/specialist-in-blood-bank-technology-and-other-certifications. Accessed 8 May 2023.
2. American Society for Clinical Pathology. Available from https://www.ascp.org/content. Accessed 8 May 2023.
3. American Society for Clinical Pathology. Board of certification. Available from https://www.ascp.org/content/board-of-certification/get-credentialed#. Accessed 31 August 2023.
4. Byrne KM, Sheldon SL, Flegel WA. Organization and management of an accredited specialist in blood bank (SBB) technology program. Transfusion 2012;50:1612–7. doi: 10.1111/j.1537-2995.2010.02737.x.
5. Glatter G, Papadakos P, Shah Y. American health care faces a staffing crisis and it's affecting care. Time Magazine 06/30/23.
6. Stone J. We're facing a critical shortage of medical laboratory professionals. Forbes. 04/28/2022.
7. Commission on Accreditation of Allied Health Education Programs. Find an accredited program. Available from https://www.caahep.org/students/find-an-accredited-program. Accessed 8 May 2023.
8. American Society for Clinical Pathology. Board of certification. Available from https://www.ascp.org/content/board-of-certification/about-boc/#exam_stats. Accessed 8 May 2023.
9. Garcia E, Kundu I, Kelly M, Soles R. The American Society for Clinical pathology 2020 vacancy survey of medical laboratorians in the United States. Am J Clin Pathol. 2022; 157:874–89.
10. Bureau of Labor Statistics, U.S. Department of Labor, Occupational Outlook Handbook, Clinical Laboratory Technologists and Technicians. Available from https://www.bls.gov/ooh/healthcare/clinical-laboratory-technologists-and-technicians.htm. Accessed 8 May 2023.
11. Payscale. Salary for certification: ASCP certified Specialist in Blood Banking (SBB). Available from https://www.payscale.com/research/US/Certification=ASCP_Certified_Specialist_in_Blood_Banking_(SBB)/Salary. Accessed 8 September 2023.

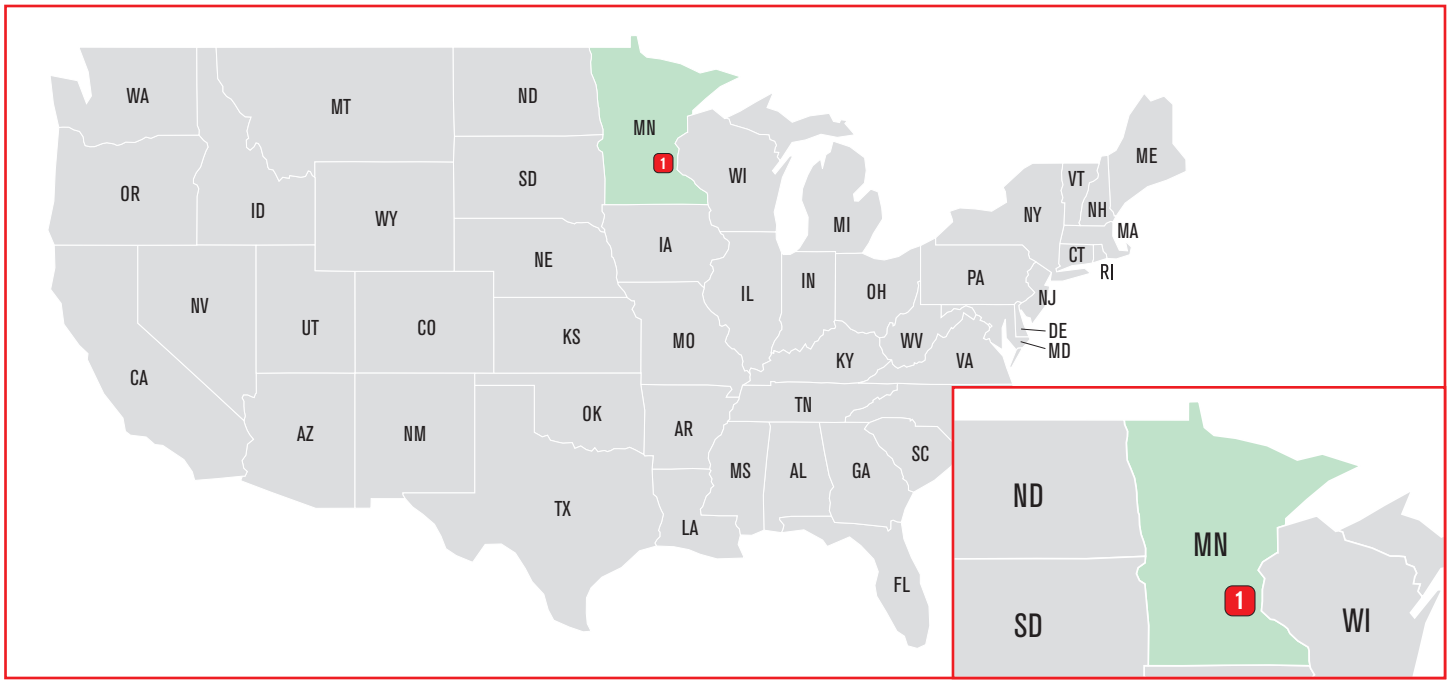
Geralyn M. Meny, MD, MS (corresponding author), Dallas, TX, gmmeny@gmail.com; Margaret A. Keller, PhD, Executive, National Laboratories; Senior Director, American Rare Donor Program, American Red Cross, Philadelphia, PA; and Cynthia Flickinger, MT(ASCP)SBB, Clinical Research Professional, Siemens Healthcare Diagnostics, Newark, DE; Managing Editor, Immunohematology, *American Red Cross, Philadelphia, PA.*

EXHIBIT

1 American Red Cross Specialist in Blood Banking and Transfusion Medicine Program	
Location	Headquarters: St. Paul, MN Satellite locations: Baltimore, MD; Cleveland, OH; Douglassville, GA; Nashville, TN; Norfolk, VA; Philadelphia, PA; Portland, OR; Richmond, VA; Roanoke, VA; San Juan, Puerto Rico; St. Louis, MO
Sponsoring institution	American Red Cross Blood Services
Year program started	In-person program existed from 2006–2018 which was then transformed to a hybrid program in 2019
Certificate/degree	Certificate
Instructional modality	Hybrid
Schedule	Full-time, working professional
Program accreditation	CAAHEP
Number of faculty	4
Length of program	12 months
Start month	September
Application period	March 1–June 1
Class size	10–20
Tuition (as reported in 2023)	The program is offered to select American Red Cross and academic partner employees throughout the United States at no cost, if employer post-graduation employment commitments are met.
Stipend	None
ASCP SBB certification exam pass rate	89% (25/28 graduates)
Minimum admission requirements	▪ Current employee of the American Red Cross or one of its academic partners in select locations ▪ A baccalaureate degree from an accredited college or university in clinical laboratory, biological, or related science ▪ MT, MLS, or BB certification ▪ ≥2 years of full-time blood banking experience (preferred) ▪ U.S. citizen
Minimum curriculum requirements	▪ Learner guides ▪ Clinical rotations ▪ Research project ▪ Professional development activities ▪ Hybrid program that includes 22 directed and self-study learner guides, on-line lectures, 12 clinical rotations (6 in-person and 6 virtual), a required research project (proposal, submission/approval by IRB, execution, written paper, and presentation), and monthly professional development activities ▪ Students supported by their selected mentors and local leadership and by program staff in the form of weekly office hours and monthly group meetings ▪ Attendance and participation at scheduled learning events is mandatory; however, program staff take every opportunity to be flexible with working professional students when scheduling learning events.
Resources available	▪ SUCCESS® library of recorded lectures ▪ Live learning events every 2 weeks ▪ Access to PubMed literature by article/by request
Clinical affiliates	▪ Currently available at 10 ARCBS regional facilities located throughout the United States ▪ Each ARCBS program facility partners with an academic medical center in their region to provide a comprehensive educational experience for the students. ▪ Additional locations may be onboarded in the future.
Publications/awards	Yearout S, Smith A, Keller J, Keller MA. Novel KEL allele associated with loss of Kp^b antigen identified in a white blood donor. Immunohematology 2022;38:51–4. DOI: 10.21307/immunohematology-2022-041.
Noteworthy program changes since COVID-19	Development and incorporation of virtual rotations and creative solutions to such
Additional notes from the program	Applications only accepted from participating American Red Cross sites and their respective hospital partners

Medical Director	David Mair, MD
Program Director	Marvin (Marty) Moore, MHA, MLS^{CM}(ASCP)SBB^{CM}
Education Coordinator	Michelle Lodermeier, MBA, MLS^{CM}(ASCP)SBB^{CM}
Email	Marty.Moore@redcross.org Michelle.Lodermeier@redcross.org Debra.Bailey@redcross.org Tiffany.Walters@redcross.org
Phone	404-234-5199
Web site	https://www.redcrossblood.org/biomedical-services/specialist-in-blood-bank-technology-and-transfusion-medicine-pro.html
Contributor	Marvin (Marty) Moore, MHA, MLS^{CM}(ASCP)SBB^{CM}

CAAHEP = Commission on Accreditation of Allied Health Education Programs; ASCP = American Society for Clinical Pathology; SBB = Specialist in Blood Banking; MT = medical technologist; MLS = medical laboratory scientist; BB = Technologist in Blood Banking; ARCBS = American Red Cross Blood Services; IRB = institutional review board; COVID-19 = coronavirus disease 2019.

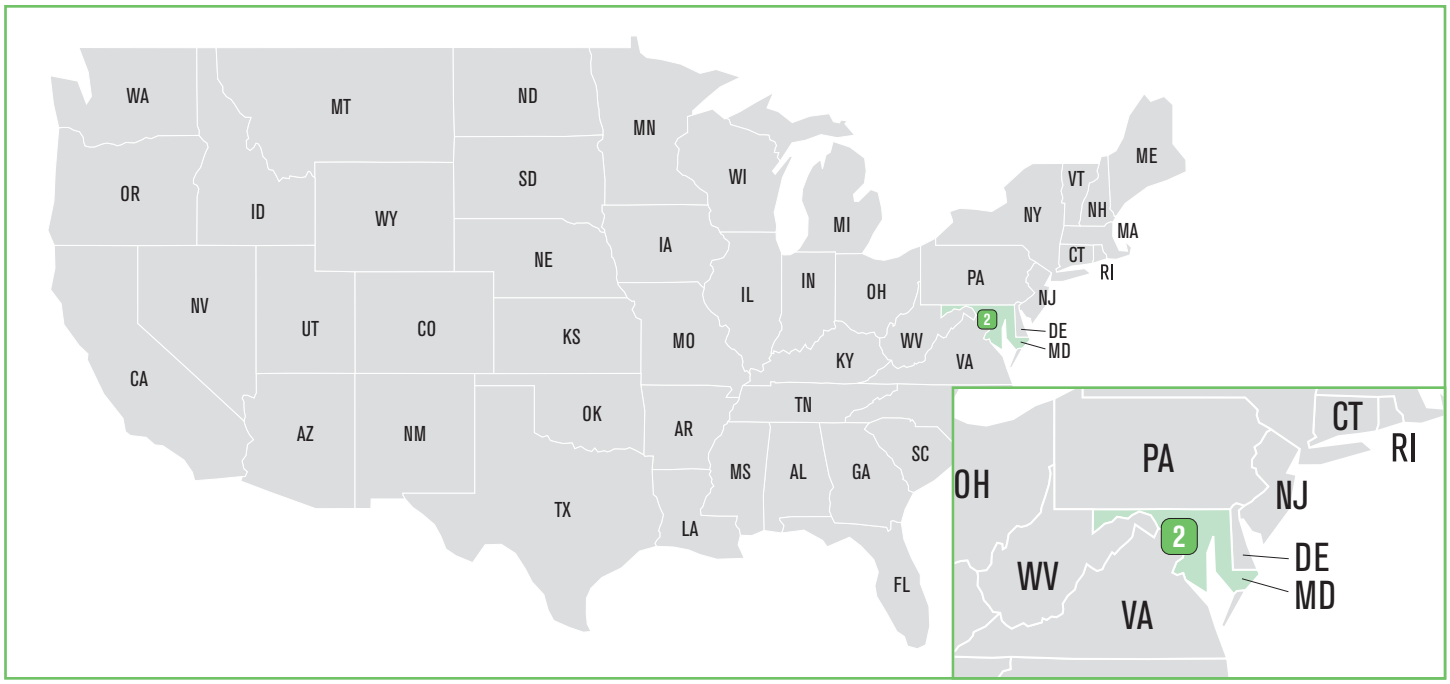


2 Armed Services Blood Bank Fellowship	
Location	Bethesda, MD
Sponsoring institution	Walter Reed National Military Medical Center
Year program started	1958
Certificate/degree	Certificate/MS
Instructional modality	In-person
Schedule	Full-time
Program accreditation	CAAHEP
Number of faculty	2
Length of program	12–18 months
Start month	July
Application period	May of the previous year
Class size	Average 6
Tuition (as reported in 2023)	▪ No tuition for the SBB certificate ▪ Tuition for George Washington University MS courses
Stipend	Regular military service pay
ASCP SBB certification exam pass rate	97%
Minimum admission requirements	▪ BS degree ▪ MLS certification ▪ Active-duty U.S. military member
Minimum curriculum requirements	▪ Lectures ▪ Clinical rotations ▪ Research project ▪ Military-specific training
Resources available	Walter Reed Bethesda and George Washington University libraries
Clinical affiliates	None
Publications/awards	N/A
Noteworthy program changes since COVID-19	None
Additional notes from the program	Open only to active-duty U.S. military members

EXHIBIT

Medical Director	Dr. James O. Long
Program Director	William L. Turcan, MLS(ASCP)SBB
Education Coordinator	William L. Turcan, MLS(ASCP)SBB
Email	William.L.Turcan.civ@health.mil
Phone	301-295-8605
Web site	https://www.health.mil/Military-Health-Topics/Health-Readiness/ASBP/About
Contributor	William L. Turcan, MLS(ASCP)SBB

MS = Master of Science; CAAHEP = Commission on Accreditation of Allied Health Education Programs; SBB = Specialist in Blood Banking; ASCP = American Society for Clinical Pathology; BS = Bachelor of Science; MLS = medical laboratory scientist; N/A = not applicable; COVID-19 = coronavirus disease 2019.

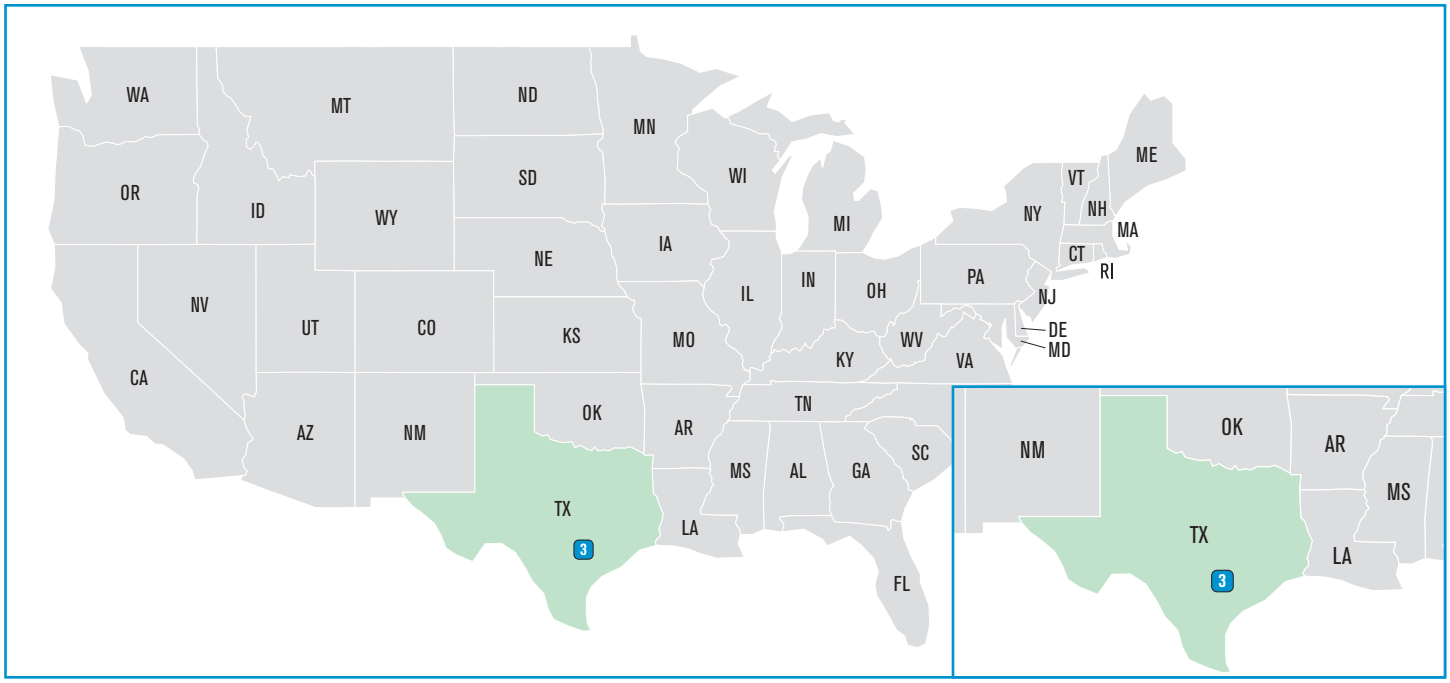


EXHIBIT

3 BioBridge Global Specialist in Blood Banking Technology/Transfusion Medicine Program	
Location	San Antonio, TX
Sponsoring institution	BioBridge Global and University Health
Year program started	2018
Certificate/degree	Certificate
Instructional modality	Remote
Schedule	Working professional
Program accreditation	CAAHEP
Number of faculty	5
Length of program	12 months
Start month	May
Application period	December–January
Class size	Maximum 5
Tuition (as reported in 2023)	$5000/year, discount for BBG and UH employees
Stipend	None
ASCP SBB certification exam pass rate	92% (11/12 graduates)
Minimum admission requirements	▪ BS in clinical laboratory sciences, biology, chemistry, or related field ▪ Minimum of 2 years post-baccalaureate full-time experience in transfusion services, blood donor services, or an IRL
Minimum curriculum requirements	▪ Lectures ▪ Rotations ▪ Projects ▪ Professional development ▪ Participation ▪ Courses include homework, quizzes, and examinations; a student must maintain ≥80% grade for each course and is required to have ≥80% score on the comprehensive final exam. ▪ Clinical rotations, a student research project, and a journal presentation are required.
Resources available	Excellent location for clinical rotations (level 1 trauma center, IRL, HLA laboratory, blood donor centers) and several board-certified TM pathologists
Clinical affiliates	None provided
Publications/awards	None provided
Noteworthy program changes since COVID-19	N/A
Additional notes from the program	N/A

Medical Director	Samantha Gomez Ngamsuntikul, MD
Program Director	Ronny Fryar, MS, MT(ASCP)SBB
Education Coordinator	Jose Quesada, MS, MT(ASCP)SBB
Email	samantha.ngamsuntikul@southtexasblood.org ronny.fryar@uhtx.com jose.quesada@southtexasblood.org
Phone	Ronny Fryar, MS, MT(ASCP)SBB: 210-358-2812 Jose Quesada, MS, MT(ASCP)SBB: 210-731-5561, ext. 1516
Web site	https://biobridgeglobal.org/careers/professional-development/
Contributor	Ronny Fryar, MS, MT(ASCP)SBB

CAAHEP = Commission on Accreditation of Allied Health Education Programs; BBG = BioBridge Global; UH = University Health; ASCP = American Society for Clinical Pathology; SBB = Specialist in Blood Banking; BS = Bachelor of Science; IRL = immunohematology reference laboratory; HLA = human leukocyte antigen; TM = transfusion medicine; COVID-19 = coronavirus disease 2019; N/A = not applicable.

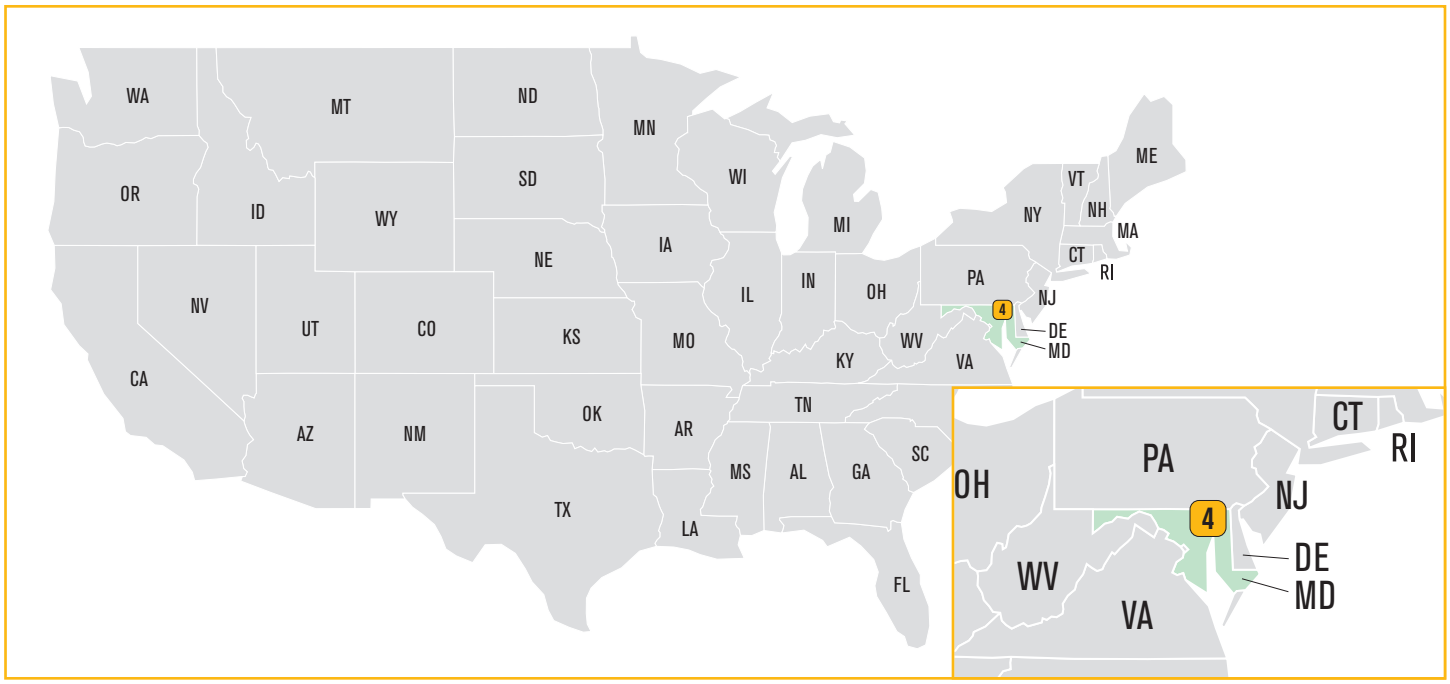


EXHIBIT

4 The Johns Hopkins Hospital (JHH) Specialist in Blood Banking Technology/Transfusion Medicine Program	
Location	Baltimore, MD
Sponsoring institution	Johns Hopkins Medicine
Year program started	1971
Certificate/degree	Certificate
Instructional modality	In-person
Schedule	Full-time
Program accreditation	CAAHEP
Number of faculty	3–5
Length of program	12 months
Start month	September
Application period	Deadline November 30
Class size	Maximum 3
Tuition (as reported in 2023)	No tuition
Stipend	Students paid as employees
ASCP SBB certification exam pass rate	89% (8/9 graduates)
Minimum admission requirements	▪ BS degree with a minimum of: – 16 credit hours of biology – 16 credit hours of chemistry – 3 credit hours of math ▪ MLS, MT, or BB certified ▪ Minimum GPA: 2.5 (3.0 preferred) ▪ 2 years full-time blood bank experience preferred by program start date; candidates with ≥1 year full-time experience in a tertiary medical center transfusion service or blood bank with greater than 400 inpatient beds who have performed specialized immunohematology serologic testing will be considered. ▪ Students must work 40 hours per week during the program; students are to start employment at least 90 days before the program start date; 120 days is preferred.
Minimum curriculum requirements	▪ Students participate in didactics, discussions, and clinical rotations ▪ Students to complete exams with scores ≥80%, present journal articles and patient cases, and prepare a research project
Resources available	▪ Laboratory resources ▪ Textbooks ▪ Learning management system
Clinical affiliates	Johns Hopkins Health System and the American Red Cross
Graduate publications last 5 years	▪ Buban KR, Lawrence CE, Zhu XJ, et al. Algorithm-based selection of automated red blood cell exchange procedure goals reduces blood utilization in chronically transfused adults with sickle cell disease. J Clin Apher 2022;37:1–8. doi: 10.1002/jca.22004. ▪ Blagg LN, Hruban RH, Gehrie EA. A department-sponsored, hospital-based pathology education symposium is a cost-effective method to provide laboratory staff with highly rated continuing education experiences. Arch Pathol Lab Med 2021;145:231–39. doi:10.5858/arpa.2019-0694-EP. ▪ Haddaway K, Bloch EM, Tobian AA, et al. Hemostatic properties of cold-stored whole blood leukoreduced using a platelet-sparing versus a non–platelet-sparing filter. Transfusion 2019;59:1809–17. doi: 10.1111/trf.15159. ▪ Erony SM, Marshall CE, Gehrie EA, et al. The epidemiology of bacterial culture–positive and septic transfusion reactions at a large tertiary academic center: 2009 to 2016. Transfusion 2018;58:1933–39. doi: 10.1111/trf.14789. ▪ Lokhandwala PM, O'Neal A, Patel EU, et al. Hemostatic profile and safety of pooled cryoprecipitate up to 120 hours after thawing. Transfusion 2018;58:1126–31. doi: 10.1111/trf.14550.
Noteworthy program changes since COVID-19	N/A
Additional notes from the program	Applications accepted from all qualified individuals; eligibility for employment required

Medical Director	Elizabeth Crowe, MD, PhD
Program Director	Lorraine Blagg, MA, MLS(ASCP)^{CM}SBB
Education Coordinator	Kathy Haddaway, MLS(ASCP)^{CM}SBB
Email	lblagg1@jhmi.edu
Web site	https://pathology.jhu.edu/transfusion/sbb-program
Contributor	Lorraine Blagg, MA, MLS(ASCP)^{CM}SBB

CAAHEP = Commission on Accreditation of Allied Health Education Programs; ASCP = American Society for Clinical Pathology; SBB = Specialist in Blood Banking; BS = Bachelor of Science; MLS = medical laboratory scientist; MT = medical technologist; BB = Technologist in Blood Banking; GPA = grade point average; COVID-19 = coronavirus disease 2019; N/A = not applicable.

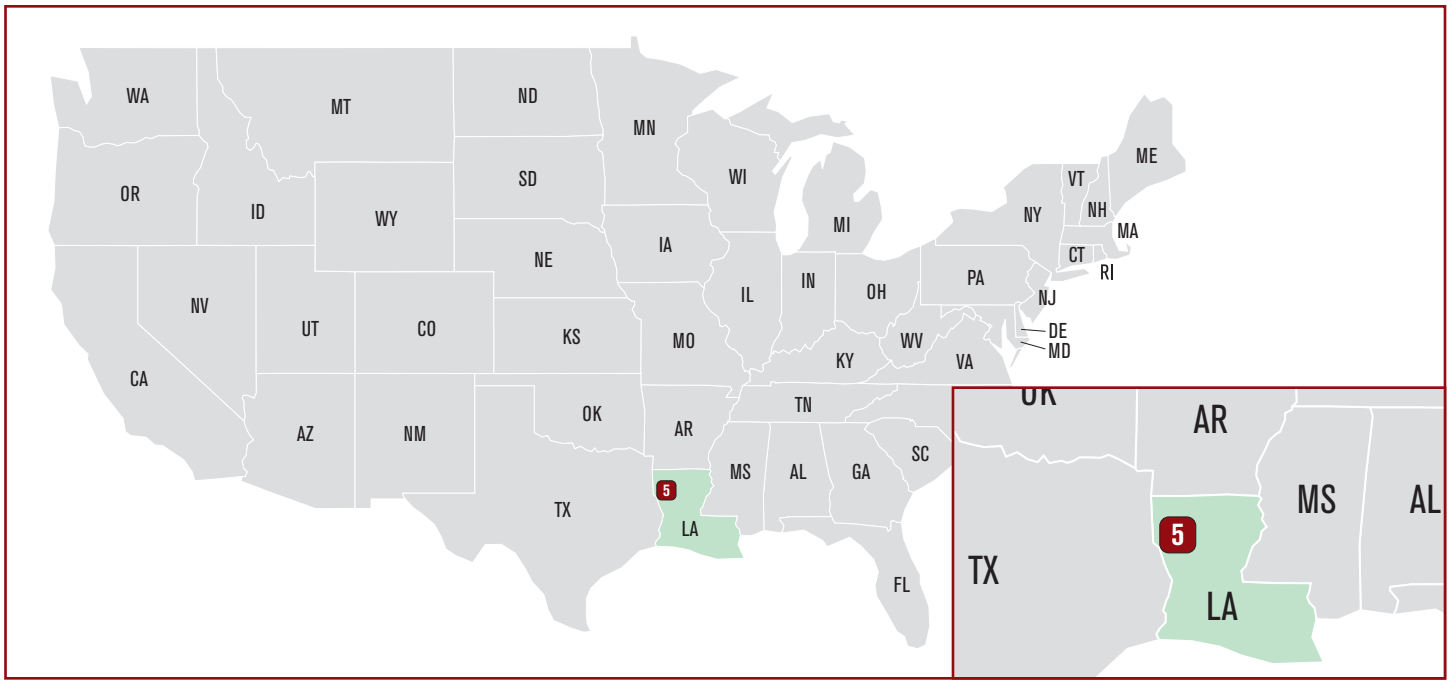


EXHIBIT

5 LifeShare Blood Center Specialist in Blood Banking Program	
Location	Shreveport, LA
Sponsoring institution	LifeShare Blood Center
Year program started	2016
Certificate/degree	Certificate
Instructional modality	Remote (on-site orientation)
Schedule	Full-time, working professional
Program accreditation	CAAHEP
Number of faculty	6
Length of program	12 months
Start month	May
Application period	July 1–December 15
Class size	No maximum
Tuition (as reported in 2023)	$6000; students responsible for travel expenses
Stipend	None
ASCP SBB certification exam pass rate	74%
Minimum admission requirements	▪ Degree: BA/BS with required science/math ▪ Experience: 2 years ▪ GPA/exam scores: GPA >3.0 preferred; lower GPA may be considered ▪ Residency/employer requirements: none
Minimum curriculum requirements	▪ Lectures ▪ Rotations ▪ Professional development tasks ▪ Research project ▪ Education project
Resources available	UTMB Moody Medical Library
Clinical affiliates	UTMB
Publications/awards	▪ 11 graduates reported publication of abstracts or papers ▪ 3 graduates have presented nationally ▪ 4 graduates are serving on industry committees at the national level ▪ 4 graduates have become AABB assessors or MLS educators ▪ Graduates awarded the SCABB Sol Haberman Scholarship Award in 2017, 2018, 2020, 2021, 2022, and 2023
Noteworthy program changes since COVID-19	Addition of multiple virtual practicums to replace or augment in-person rotations
Additional notes from the program	None

Medical Director	Tim G. Peterson, MD, FCAP
Program Director	Katrina Billingsley, MSTM, MLS(ASCP)SBB
Education Coordinator	Kaitlyn Taylor, SBB(ASCP)
Email	SBB@lifeshare.org or Katrina.Billingsley@lifeshare.org
Phone	318-673-1463
Web site	https://www.lifeshare.org/sbb-program/
Contributor	Katrina Billingsley, MSTM, MLS(ASCP)SBB

CAAHEP = Commission on Accreditation of Allied Health Education Programs; ASCP = American Society for Clinical Pathology; SBB = Specialist in Blood Banking; BA = Bachelor of Arts; BS = Bachelor of Science; GPA = grade point average; UTMB = University of Texas Medical Branch; AABB = Association for the Advancement of Blood & Biotherapies; MLS = medical laboratory scientist; SCABB = South Carolina Association of Blood Banks; COVID-19 = coronavirus disease 2019.

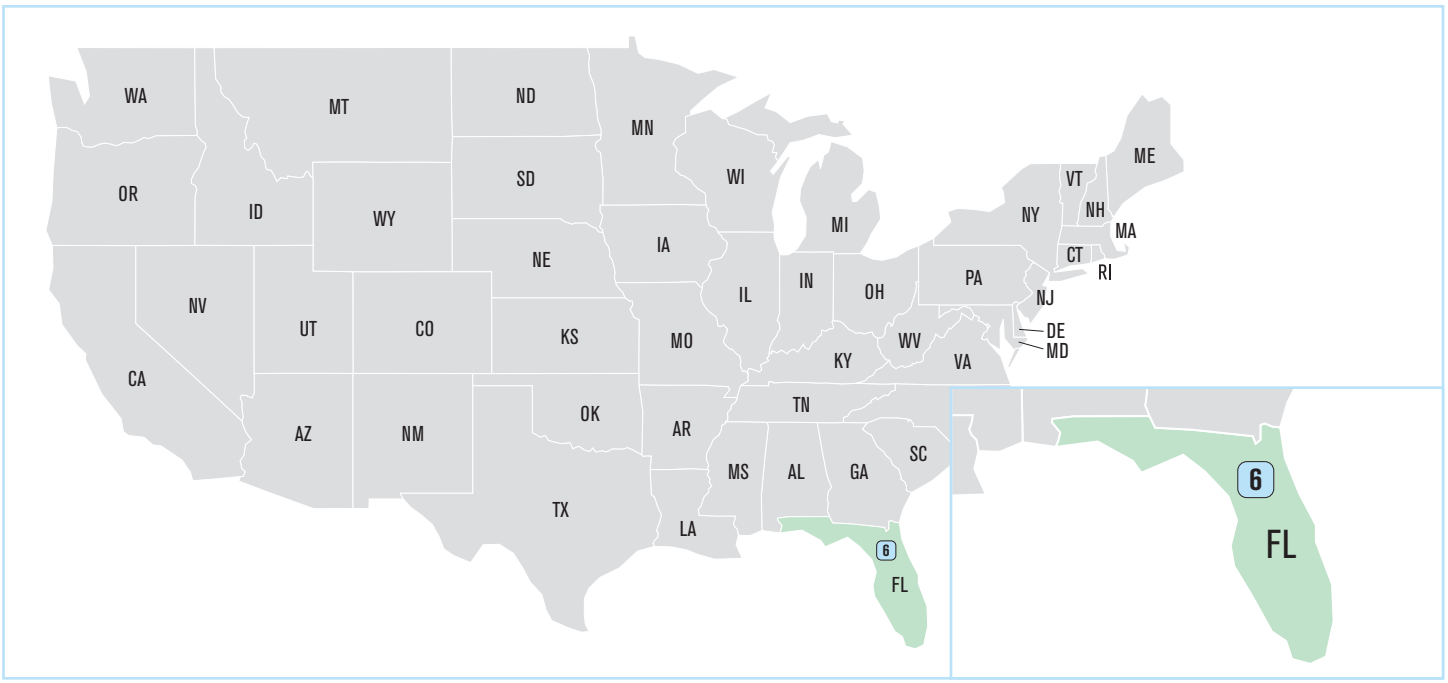


EXHIBIT

6 LifeSouth Specialist in Blood Banking Certificate Program	
Location	Gainesville, FL
Sponsoring institution	LifeSouth Community Blood Centers, Inc.
Year program started	2020
Certificate/degree	Certificate
Instructional modality	Remote
Schedule	Working professional
Program accreditation	CAAHEP
Number of faculty	3
Length of program	12 months
Start month	June
Application period	Anytime, mid-April application deadline
Class size	Up to 5
Tuition (as reported in 2023)	$6000; students responsible for travel expenses; no charge to employees with a 1-year commitment to work for LifeSouth as an SBB
Stipend	None
ASCP SBB certification exam pass rate	71% (5/7 graduates)
Minimum admission requirements	▪ National accreditation as an MT in immunohematology ▪ At least 3 years of full-time clinical experience in a blood bank in an accredited laboratory within the last 5 years; 3 years of experience acquired after completion of a baccalaureate degree
Minimum curriculum requirements	▪ Maintain an average of ≥75% for exams of the six courses in the program and achieve an average of ≥75% for the midterm and final exams. ▪ Complete clinical, technical, and administrative rotations as assigned.
Resources available	▪ Access to content and medical library resources via Blackboard ▪ Access to three IRLs (two accredited IRLs), and HLA, molecular, QC, and stem cell–processing laboratories – Laboratories directed by three board-certified, blood banking/transfusion medicine pathologists – Laboratories staffed by 10 SBBs and 40 MTs ▪ Group and individual communication via Slack ▪ Review/discussion meetings via ZOOM (at least monthly)
Clinical affiliates	UF Health Shands Hospital, Blood Bank/Transfusion Services
Publications/awards	None provided
Noteworthy program changes since COVID-19	Increased the number of virtual content options
Additional notes from the program	Faculty members with current working experience as medical director, technical director, and QA coordinator as well as experience teaching blood banking.

Medical Director	Christopher M. Lough, MD
Program Director	Christopher M. Lough, MD
Education Coordinator	Guillermo (Bill) Martinez, MS, MT(ASCP)SBB, LSSBB (ASQ)
Email	gamartinez@lifesouth.org
Web site	https://www.lifesouth.org/specialist-in-blood-banking-certificate-program/
Contributor	Guillermo (Bill) Martinez, MS, MT(ASCP)SBB, LSSBB (ASQ)

CAAHEP = Commission on Accreditation of Allied Health Education Program; SBB = Specialist in Blood Banking; ASCP = American Society for Clinical Pathology; MT = medical technologist; IRLs = immunohematology reference laboratories; HLA = human leukocyte antigen; QC = quality control; UF = University of Florida; COVID-19 = coronavirus disease 2019; QA = quality assurance.

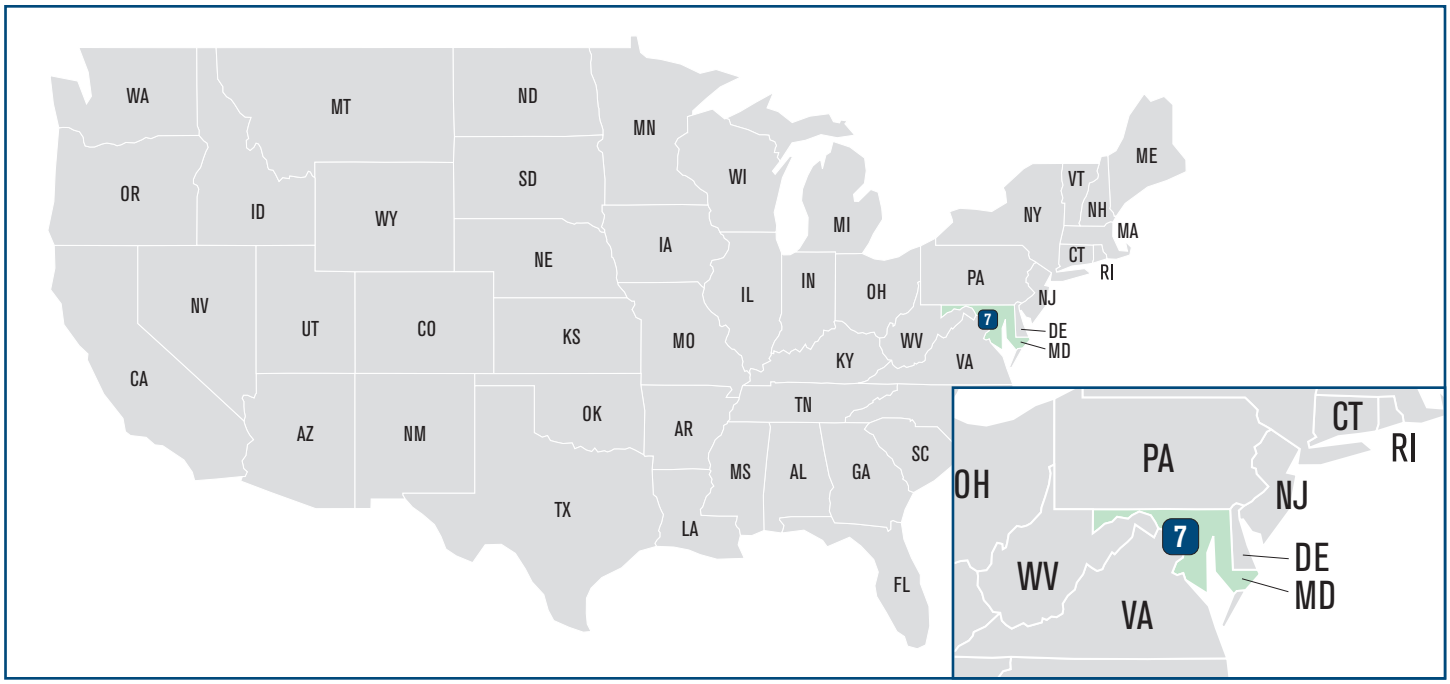


EXHIBIT

7 NIH CC DTM Specialist in Blood Banking Program	
Location	Bethesda, MD
Sponsoring institution	National Institutes of Health, Clinical Center, Department of Transfusion Medicine
Year program started	Instituted in 1966; program appeared as accredited in the AMA directory in 1973
Certificate/degree	Certificate
Instructional modality	Hybrid
Schedule	Full-time
Program accreditation	CAAHEP
Number of faculty	>10
Length of program	12 months
Start month	July
Application period	Applications welcome throughout the year
Class size	1–3
Tuition (as reported in 2023)	No charge to employees
Stipend	Students work part-time in transfusion services laboratory
ASCP SBB certification exam pass rate	90% (9/10 graduates)
Minimum admission requirements	▪ U.S. citizenship required ▪ Education: baccalaureate degree from an accredited college/university including biological science, chemistry, and mathematics courses ▪ Experience: ≥2 years full-time blood banking experience
Minimum curriculum requirements	▪ Attendance: required (three excused) ▪ Didactics: >75% on examinations, complete homework, participate in Journal Club ▪ Clinical rotations: attendance required, completion of post-rotation questions, and satisfactory instructor evaluation ▪ Student project: choose, conduct, report progress, write, and present
Resources available	▪ NIH Library ▪ Government-issued laptop ▪ AABB Technical Manual and Standards ▪ AABB eCasts
Clinical affiliates	▪ ARCBS, Philadelphia, PA ▪ Inova Fairfax Medical Campus, Fairfax, VA
Publications/awards	▪ Remley VA, Collins A, Underwood S, et al. Optimizing a fully automated and closed-system process for red blood cell reduction of human bone marrow products. Cytotherapy 2023;25:442–50. ▪ Byrne KM, Collins AA, Seifu R, Paige TD, Flegel WA. Using social media to recruit for a face-to-face Specialist in Blood Bank (SBB) Technology program. Immunohematology 2022;38:62–3. ▪ Byrne KM, Paige TD, Flegel WA. An outcome-based review of an accredited Specialist in Blood Banking (SBB) program: 25 years and counting. Immunohematology 2020;36:7–13. ▪ Tynuv M, Flegel WA. Quality improvement with platelet additive solution for safer out-of-group platelet transfusions. Immunohematology 2019;35:108–15. ▪ Byrne KM, Mercado CMC, Nnabue TN, Paige TD, Flegel WA. Inhibition of blood group antibodies by soluble substances. Immunohematology 2019;35:19–22. ▪ Lodermeier MA, Byrne KM, Flegel WA. Red blood cell sedimentation of apheresis granulocytes. Transfusion 2017;57:2551–2.
Noteworthy program changes since COVID-19	Lecturers may opt to present lectures via WebEx: student and presenter not in same location (hybrid/synchronous)
Additional notes from the program	▪ No cost is associated with this 1-year certificate program. ▪ Students are employees of the transfusion service laboratory. ▪ Affordable housing may be available from https://faes.org/housing.

Medical Director	Willy (Bill) A. Flegel, MD; since 2009
Program Director	Traci D. Paige, MLS(ASCP)SBB; since 2017
Education Coordinator	Karen M. Byrne, MDE, MLS(ASCP)SBB; since 1995
Email	CC-DTMSBBApplication@mail.nih.gov
Phone	301-496-8335
Web site	https://www.cc.nih.gov/dtm/research/sbb.html
Contriibutor	Karen M. Byrne, MDE, MLS(ASCP)SBB

NIH = National Institutes of Health; CC = Clinical Center; DTM = Department of Transfusion Medicine; AMA = American Medical Association; CAAHEP = Commission on Accreditation of Allied Health Education Programs; ASCP = American Society for Clinical Pathology; SBB = Specialist in Blood Banking; AABB = Association for the Advancement of Blood & Biotherapies; ARCBS = American Red Cross Biomedical Services; COVID-19 = coronavirus disease 2019.

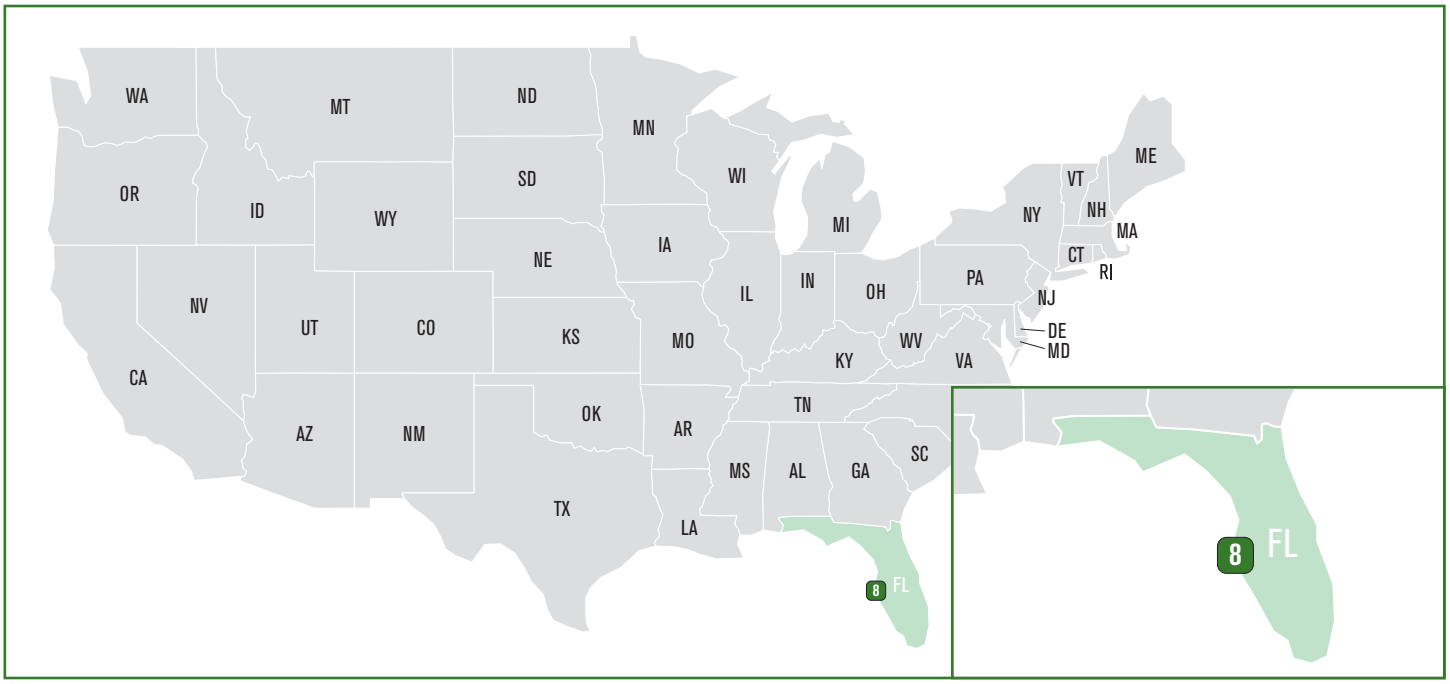


8 OneBlood, Inc. Specialist in Blood Banking Technology/Transfusion Medicine Program	
Location	St. Petersburg, FL
Sponsoring institution	OneBlood, Inc.
Year program started	2020
Certificate/degree	Certificate
Instructional modality	Remote
Schedule	Working professional
Program accreditation	CAAHEP
Number of faculty	2
Length of program	12 months
Start month	May
Application period	January–February
Class size	6
Tuition (as reported in 2023)	$50 application fee, $6000 tuition
Stipend	None
ASCP SBB certification exam pass rate	77%
Minimum admission requirements	▪ Baccalaureate degree from accredited college/university including 24 semester hours of biological sciences and chemistry ▪ MT(ASCP), MLS(ASCP), or BB(ASCP) certification ▪ ≥2 years of full-time hospital transfusion service, reference laboratory, or blood bank experience ▪ Undergraduate GPA 3.0 (preferred) ▪ U.S. citizenship or eligible to work in the United States
Minimum curriculum requirements	▪ 7 courses, maintaining ≥70% average ▪ 12 clinical practicums ▪ 7 professional development tasks ▪ Research abstract
Resources available	University of Texas Medical Branch library
Clinical affiliates	None
Publications/awards	Three abstracts accepted at SCABB and AABB annual meetings: ▪ J Laureano – Ultrasensitive ELISA for the detection of immunoglobulin A-deficient blood donors ▪ K Stein – Reducing STAT turnaround time and potential cost savings using lean six sigma methods ▪ M Prieto – An enzyme-linked antiglobulin test for D antigen screening using microplate and an automated process
Noteworthy program changes since COVID-19	None
Additional notes from the program	None

EXHIBIT

Medical Director	Richard Gammon, MD
Program Director	Wyenona "Nonie" Hicks, MS, MT(ASCP)SBB
Education Coordinator	Julie Laureano, MLS(ASCP)^{CM}SBB^{CM}
Email	MTEducation@oneblood.org
Web site	https://www.oneblood.org/BBTSBB/sbbprogram.stml
Contributor	Julie Laureano, MLS(ASCP)^{CM}SBB^{CM}

CAAHEP = Commission on Accreditation of Allied Health Education Programs; ASCP = American Society for Clinical Pathology; SBB = Specialist in Blood Banking; MT = medical technologist; MLS = medical laboratory scientist; BB = Technologist in Blood Banking; GPA = grade point average; SCABB = South Carolina Association of Blood Banks; AABB = Association for the Advancement of Blood & Biotherapies; COVID-19 = coronavirus disease 2019.

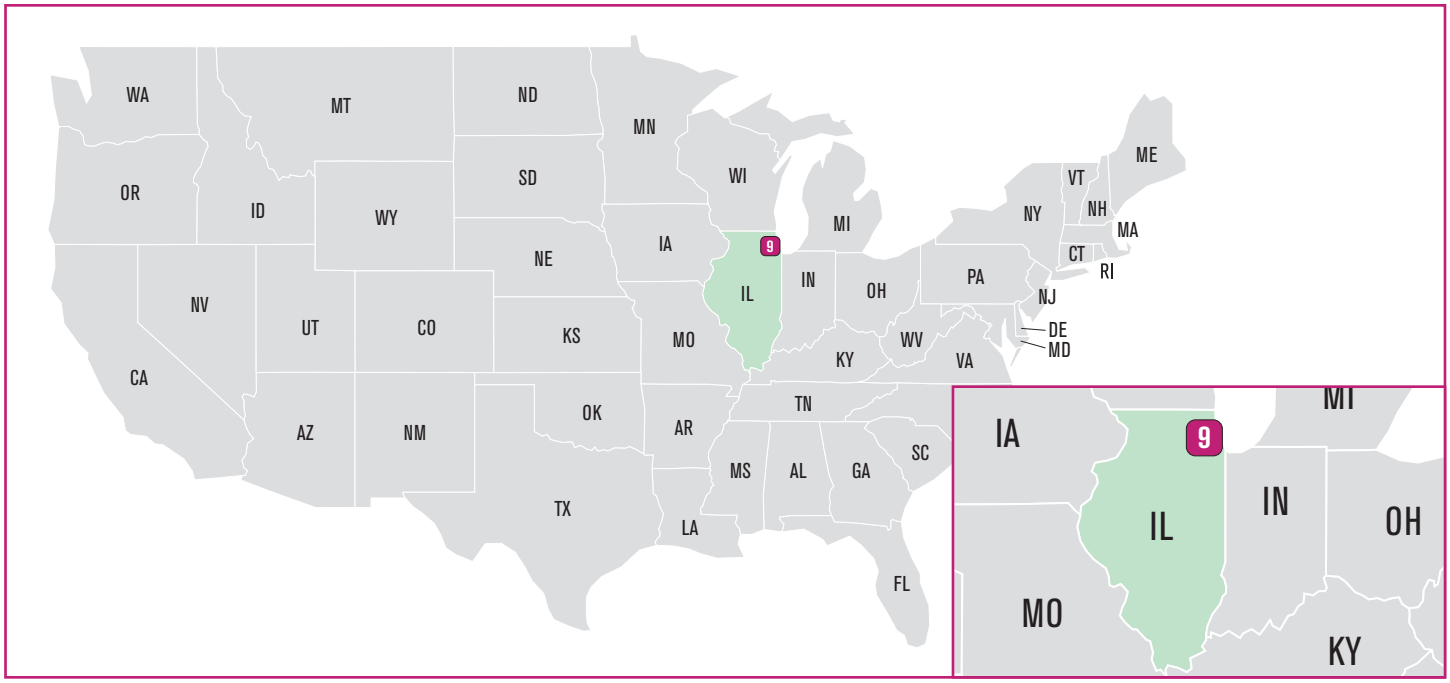


EXHIBIT

9 Rush University Specialist in Blood Banking Program	
Location	Chicago, IL
Sponsoring institution	Rush University Medical Center
Year program started	2007
Certificate/degree	Certificate/MS
Instructional modality	Remote
Schedule	Full-time/part-time, working professional
Program accreditation	CAAHEP
Number of faculty	5
Length of program	12 or 24 months
Start month	September
Application period	October–July
Class size	18–24
Tuition (as reported in 2023)	Approximately $16,000 for all students
Stipend	None
ASCP SBB certification exam pass rate	70%
Minimum admission requirements	▪ Baccalaureate degree or U.S. equivalent (after transcript evaluation by WES or ECE) ▪ GPA 3.0 preferred but not required ▪ 2 years full-time blood bank/transfusion service experience preferred; 1 year full-time experience required ▪ Employer verification of clinical experience in the blood bank or transfusion service
Minimum curriculum requirements	▪ All curriculum mapped to the CAAHEP SBBT/TM Standards and Guidelines as well as the ASCP SBB Exam Content Outline Guideline ▪ Students attend the program asynchronously. ▪ No specific required time for lectures, projects, attendance, and participation ▪ Required participation; weekly due dates for all assignments, quizzes, case studies, and discussion boards ▪ Recorded lectures for students; faculty contact with students through frequent announcements and feedback on assignments, case studies, exams, and quizzes
Resources available	▪ Rush University Library and Archives: comprehensive collection of printed materials with access to over 9200 full-text electronic journals, 115 databases, and 8200 electronic books ▪ Center for Clinical Wellness: network of on-site and virtual tools and provides free counseling, coaching, and other services to Rush students ▪ Center for Academic Excellence: holistic, targeted learning support for Rush University students; provided services range from support in science, statistics, and writing to academic coaching ▪ Center for Innovative and Lifelong Learning: innovative, cutting-edge, research-based, and expert-driven continuing education; all Rush students have access to these courses; many are free to Rush students
Clinical affiliates	Many; contact program director for specific locations
Publications/awards	▪ Hukill M. An adjusted process to improve efficiency and efficacy of adsorption procedures to resolve warm autoantibody cases. Lab Med 2022;54:e85–90. ▪ Gillard L, Royeen C. Promoting global health through improved blood collections and transfusion practices: a pilot project between Rush University and University of Global Health Equity in Rwanda; November 2021. ▪ Caudill J, Gillard L. HDFN resulting from anti-U: alternatives to allogeneic intrauterine transfusion. Lab Med 2022;53:79–82. ▪ Matthew Hukill, a recent graduate, was the recipient of the 2021 AABB Future Leader, Specialty in Blood Banking Scholarship Award.
Noteworthy program changes since COVID-19	Beginning in 2021, as a global health initiative, the Rush University SBB program began a collaboration with the UGHE, Rwanda, Africa, to provide education to their selected candidates for 3 years. In 2023, the Rush faculty will assist UGHE in the creation of a distance blood banking program to benefit sub-Saharan countries, ultimately impacting donor and patient transfusion safety throughout Africa.
Additional notes from the program	▪ The mission of the Rush SBB program is to provide advanced blood banking and transfusion education to all qualified applicants. ▪ The applicants must have the required degree and experience; GPA is not a deciding factor. ▪ All interested individuals are encouraged to contact the program director with any questions regarding admissions.

Medical Director	Mark Pool, MD
Program Director	Laurie Gillard, MS, MLS(ASCP)SBB
Education Coordinator	Laurie Gillard, MS, MLS(ASCP)SBB
Email	Laurie_Gillard@rush.edu
Web site	https://www.rushu.rush.edu/college-health-sciences/academic-programs/specialist-blood-bank-technology-certificate/
Contributor	Laurie Gillard, MS, MLS(ASCP)SBB(ASCP)

MS = Master of Science; CAAHEP = Commission on Accreditation of Allied Health Education Programs; ASCP = American Society for Clinical Pathology; SBB = Specialist in Blood Banking; WES = World Education Services; ECE = Educational Credential Evaluators; GPA = grade point average; SBBT = Specialist in Blood Banking technology; TM = transfusion medicine; COVID-19 = coronavirus disease 2019; UGHE = University of Global Health Equity.

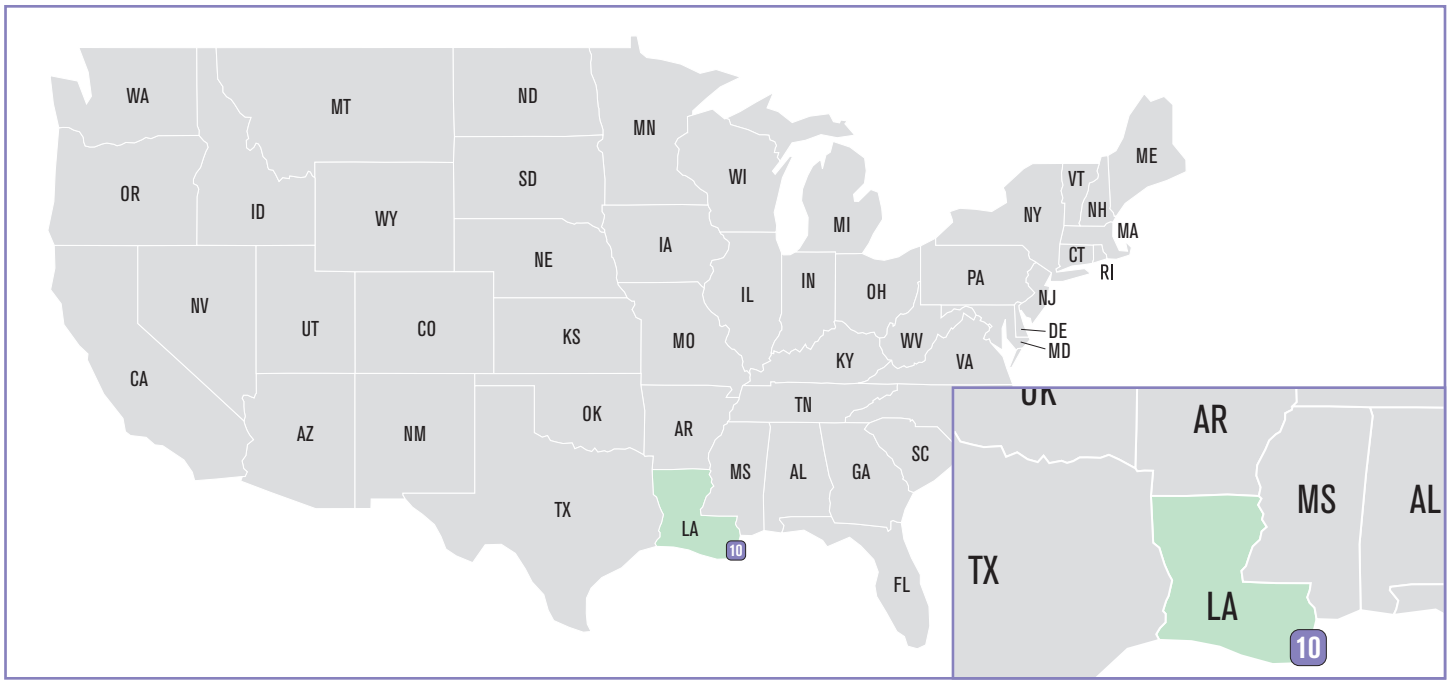


10 University Medical Center New Orleans Specialist in Blood Banking Program	
Location	New Orleans, LA
Sponsoring institution	University Medical Center New Orleans
Year program started	2016 (distance); previously on-site began in 1974
Certificate/degree	Certificate
Instructional modality	Remote
Schedule	Working professional
Program accreditation	CAAHEP
Number of faculty	10
Length of program	12 months
Start month	October
Application period	Deadline February 28; accept applications until July 31 if class size has not reached capacity
Class size	4–12
Tuition (as reported in 2023)	$6000 tuition; exemption of $3000 to LCMC Health employees after successful completion of the program
Stipend	None
ASCP SBB certification exam pass rate	88%
Minimum admission requirements	▪ MT/MLS(ASCP)/BB(ASCP) certification or equivalent ▪ A minimum GPA of 3.0 out of 4.0 for math and sciences ▪ ≥2 years full-time equivalence experience in a hospital transfusion service or donor center ▪ Citizenship or legal residency in the United States ▪ Other students considered on a case-by-case basis
Minimum curriculum requirements	▪ Lectures ▪ Rotations ▪ Projects ▪ Professional development ▪ Attendance ▪ Participation ▪ Passing all written exams and quizzes with a minimum composite score of 80% per course as well as passing all practical exams, completing rotation checklists, presenting at a journal club, and completing a research project with accompanying paper suitable for publication in a peer-reviewed journal
Resources available	Availability of textbooks for student use
Clinical affiliates	Locations chosen by student near his or her geographic location
Publications/awards	Completion of a scientific paper with the expectation it will be publishable
Noteworthy program changes since COVID-19	▪ Since COVID-19, some clinical rotations conducted virtually ▪ Online orientation in 2021; now on site
Additional notes from the program	Students of any race, color, creed, sex, age, disabling conditions (handicaps), and national origin welcomed

EXHIBIT

Medical Director	Shaun Lawicki, MBBS
Program Director	Sharon Stradley, MT(ASCP)SBB
Education Coordinator	Leslie Granier, MT(ASCP)SBB
Email	BBEducation@lcmchealth.org or Leslie.granier@lcmchealth.org
Phone	504-702-3482
Web site	https://www.lcmchealth.org/university-medical-center-new-orleans/academic-medical-center/specialist-in-blood-bank-technology-program/
Contributor	Leslie Granier, MT(ASCP)SBB

CAAHEP = Commission on Accreditation of Allied Health Education Programs; LCMC = Louisiana Children's Medical Center; ASCP = American Society for Clinical Pathology; SBB = Specialist in Blood Banking; MT = medical technologist; MLS = medical laboratory scientist; BB = Technologist in Blood Banking; GPA = grade point average; COVID-19 = coronavirus disease 2019.

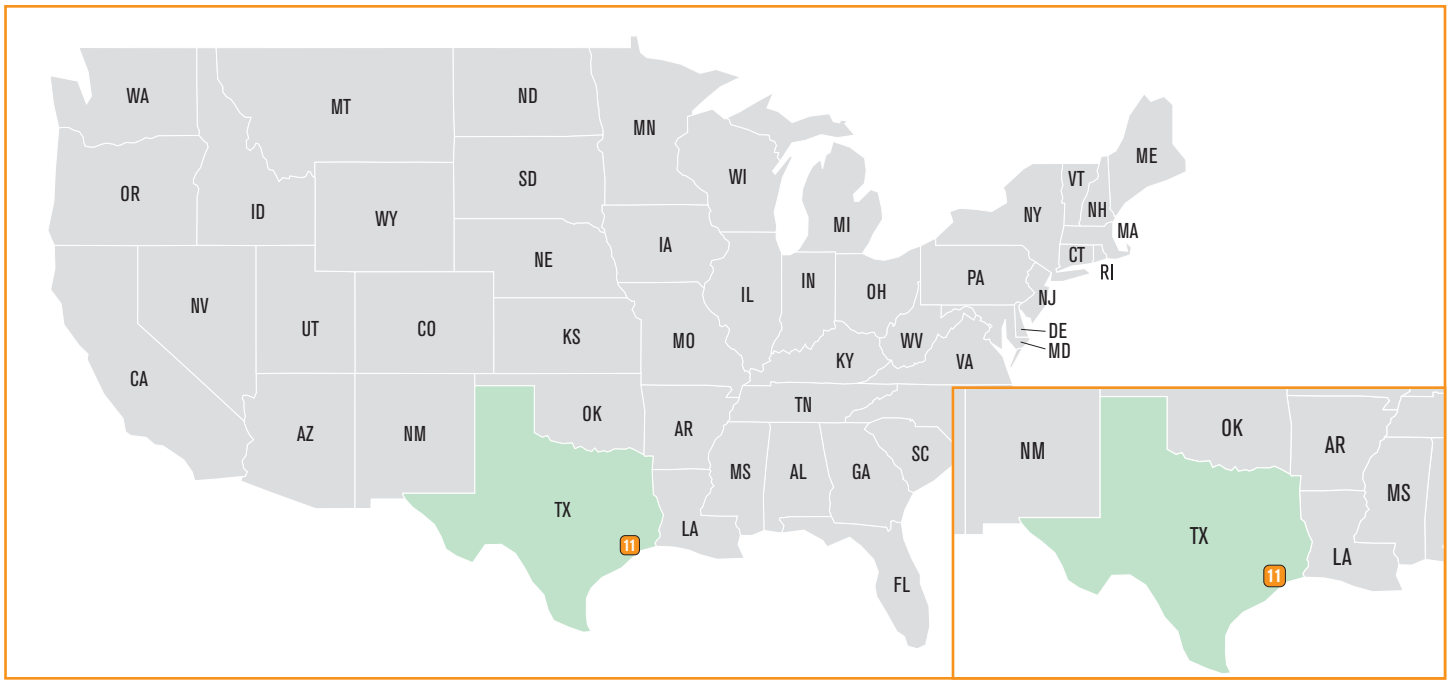


EXHIBIT

11 UTMB Specialist in Blood Banking Technology Program	
Location	Galveston, TX
Sponsoring institution	University of Texas Medical Branch
Year program started	1955
Certificate/degree	Certificate
Instructional modality	Remote (on-site orientation)
Schedule	Working professional
Program accreditation	CAAHEP
Number of faculty	4
Length of program	12 months
Start month	May
Application period	July 1–March 1
Class size	Maximum 25
Tuition (as reported in 2023)	Texas residents: approximately $9600; non-residents: approximately $18,500
Stipend	None
ASCP SBB certification exam--pass rate	94%
Minimum admission requirements	▪ BS degree in appropriate science field ▪ Minimum 2.75 GPA ▪ Current employment in some aspect of blood banking ▪ ≥2 years full-time post-baccalaureate experience relevant to immunohematology in an accredited facility ▪ Ability to be on-campus in Galveston for orientation week in late April
Minimum curriculum requirements	▪ Lectures ▪ Practicums ▪ Projects ▪ Professional development ▪ Participation in synchronous sessions ▪ Attendance at orientation week in late April
Resources available	Library, Student Success Center
Clinical affiliates	American Red Cross facilities
Publications/awards	▪ Blake DE, Crews WS, Wortman S, Walker L, Burnett-Greenup S. Implementation of a molecular genotyping protocol for patients with warm autoantibodies. Transfusion 2023; in press. ▪ Munyikwa R, Walker L, Rajendran R. Improvement in platelet product wastage and reduction of costs through implementation of the Pan Genera Detection Test. Lab Med 2023;54:287–90; https://doi.org/10.1093/labmed/lmac111. ▪ Wafford TR, Walker LP. Prevalence of Rh, Kell, Kidd, Duffy and MNS antigens in the Hispanic donor population of South Texas. Immunohematology 2022;38:43–50. ▪ SBB and MSTM graduates have presented 26 abstracts at national and regional meetings since 2016. ▪ Sydney Klausing, MSTM, MLS(ASCP)SBB: AABB Future Leader's Award (2023); Erin Westby, MLS(ASCP)SBB: AABB Future Leader's Award (2020); SCABB Sol Haberman Scholarship Award (2019) ▪ The UTMB SBB Program received the ASCP Program Director Education Grant in 2016 and 2023.
Noteworthy program changes since COVID-19	Addition of several virtual clinical practicums and interactive educational activities
Additional notes from the program	▪ Grants 19 graduate credits for the SBB courses ▪ Can be combined with the MSTM degree program ▪ Fully on-line, distance education program; students are required to be on campus for the 1-week orientation at the beginning of the program ▪ Since the program grants graduate credits, students are eligible for tuition reimbursement from many employers. Students can also apply for UTMB scholarships, with many students receiving funds each year.

Medical Director	Christopher Lough, MD
Program Director	LeeAnn Walker, MEd, MLS(ASCP)SBB
Education Coordinator	N/A
Email	clsadmin@utmb.edu
Phone	409-772-3055
Web site	https://www.utmb.edu/shp/clls/sbb/home
Contributor	LeeAnn Walker, MEd, MLS(ASCP)SBB

UTMB = University of Texas Medical Branch; CAAHEP = Commission on Accreditation of Allied Health Education Programs; ASCP = American Society for Clinical Pathology; SBB = Specialist in Blood Banking; BS = Technologist in Blood Banking; GPA = grade point average; MSTM = Master of Science in Transfusion Medicine; AABB = Association for the Advancement of Blood & Biotherapies; SCABB = South Carolina Association of Blood Banks; COVID-19 = coronavirus disease 2019; N/A = not applicable.



EXHIBIT

12. Versiti Specialist in Blood Banking Program

Location	Milwaukee, WI
Sponsoring institution	Versiti
Year program started	1965
Certificate/degree	Certificate/MSTM
Instructional modality	Hybrid
Schedule	Full-time, part-time
Program accreditation	CAAHEP
Number of faculty	3
Length of program	18–28 months
Start month	August
Application period	January 1–April 1
Class size	4
Tuition (as reported in 2023)	Installments over five semesters, minimum of $1232/semester; fees reviewed annually and subject to change
Stipend	None
ASCP SBB certification exam pass rate	89% (8/9 graduates)
Minimum admission requirements	Applicants must meet the following ASCP BOC requirements for SBB certification: ▪ 1 year of full-time clinical laboratory experience with an emphasis/interest in blood banking preferred ▪ One of the following two options: 1) MLS or BB (ASCP) certification and a baccalaureate degree from an accredited college/university 2) Baccalaureate degree from an accelerated college/university with a major in a biological or physical science
Minimum curriculum requirements	▪ Lectures ▪ Professional development ▪ Wet workshop ▪ Host/coordinate a Versiti blood drive ▪ Rotations ▪ Attendance ▪ Journal Club ▪ Projects in Progress (PIP) ▪ Projects ▪ Participation ▪ Abstract development and presentation at a state blood bank meeting ▪ Minimum acceptable grade average for courses is 80%; minimum passing score for virtual practicals is 85%; minimum passing score for the final written exam is 80%.
Resources available	▪ Recognized researchers, lecturers, and educators ▪ In-person mentors ▪ Flexible clinical scheduling at Versiti Blood Centers in Wisconsin, Illinois, Indiana, and Michigan ▪ Guaranteed clinical placement ▪ Structured, yet self-paced program with virtual and in-person learning over the course of five semesters ▪ Research practicum under the guidance of a mentor ▪ Create, develop, prepare samples, and deliver hands-on workshops for working medical laboratory scientists
Clinical affiliates	▪ Advocate Aurora Health: St. Luke's ▪ Froedtert Hospital ▪ Northwestern Medical Center: Chicago ▪ Children's Wisconsin ▪ Marshfield Clinic Health System: Marshfield
Publications/awards	▪ Karafin MS, Schumacher C, Zhang J, Simpson P, Johnson ST, Pierce KL. Human leukocyte antigen (HLA)-incompatible mean fluorescence intensity-selected platelet products have corrected count increments similar to HLA antigen-matched platelets. Transfusion 2021;61:2307–16. doi: 10.1111/trf.16430. Epub 2021 June 1. PMID: 34075590. ▪ 2022 Poster Presentation: Crystal Theiler, MLS(ASCP)^{CM}SBB^{CM}, Weak and partial D phenotyping: a comparison study between molecular and serologic results. Transfusion 2002;62(S2):I–IV, 1A–291A. ▪ 2020 AABB Future Leaders Award: Connie Schumacher, MLS(ASCP)SBB^{CM}, Corrected count increments associated with the transfusion of partially matched platelets transfused in the presence of donor specific antibodies are comparable to HLA-matched platelets. ▪ 2021 AABB Future Leaders Award: Jennifer Herring, BS, SBB(ASCP)^{CM}, CHT(ABHI), Laboratory developed lectins using kodecyte technology Tn control cells. ▪ 2022 AABB Future Leaders Award: Teri D. Kopish, MLS(ASCP)^{CM}SBB^{CM}, Comparing warm autoantibody reactivity to number of adsorptions.
Noteworthy program changes since COVID-19	Program changes minimal; some non-laboratory rotations moved to/have a virtual option

Additional notes from the program	Versiti's SBB program is not an online program; weekly lectures can be attended remotely. ▪ Weekly lecture series during the student's first year (September–August) ▪ Lectures generally not recorded; must be attended live (online via Zoom or in person at a Versiti blood center) 9:00 AM–noon CST each Friday ▪ Lasts five semesters, beginning in the fall; students register for "fall" and "spring" courses, curriculum; exams and rotations conducted year-round ▪ Select clinical experiences at any of the Versiti Blood Centers (WI, IL, IN, MI)
Program Director	Sue Johnson, MSTM, MLS(ASCP)SBB^{CM}
Education Coordinator	Natasha Leon, MLS(ASCP)SBB^{CM}
Email	nmleon@versiti.org
Phone	414-937-6412
Web site	https://versiti.org/education/specialist-in-blood-banking-program
Contrbutor	Natasha Leon, MLS(ASCP)SBB^{CM}

MSTM = Master of Science in Transfusion Medicine; CAAHEP = Commission on Accreditation of Allied Health Education Programs; ASCP = American Society for Clinical Pathology; SBB = Specialist in Blood Banking; BOC = Board of Certification; MLS = medical laboratory scientist; BB = Technologist in Blood Banking; AABB = Association for the Advancement of Blood & Biotherapies; COVID-19 = coronavirus disease 2019.