Clinical Laboratory Science (CLS) Advising

Profession Overview

What's the difference?

Clinical Laboratory Scientist (CLS) ● Medical Laboratory Scientist (MLS) ● Medical Technologist (MT Clinical Laboratory Technician (CLT) ● Medical Laboratory Technician (MLT)

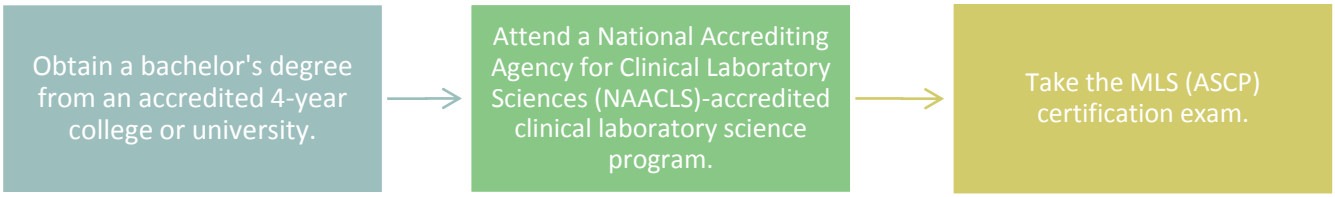
- CLS, MT, and MLS are all interchangeable.
- In 2009, the National Credentialing Agency (NCA) and American Society for Clinical Pathology (ASCP) merged to form a single certification agency for medical laboratory professionals, the ASCP Board of Certification (BOC). Under the new agency, the certifications for MT's (NCA) and CLS's (ASCP) were also merged to form the new MLS title and certification.
- Clinical laboratory technicians (CLT) and medical laboratory technicians (MLT), which are equivalent to one another, differ from clinical laboratory scientists in that technicians carry out more routine testing duties, while scientists carry out more exacting tasks (e.g., high-tech molecular and genetic testing and unusual diagnostic challenges). Various differences include those described below.

	Clinical Laboratory Scientist	Clinical Laboratory Technician
Responsibilities	Clinical lab scientists might: • Examine biological samples for chemical content. • Analyze findings and verify lab results. • Provide information about results to other health professionals (e.g., physicians and researchers) • Oversee clinical lab technicians. • Train others.	Clinical lab technicians might: • Analyze bodily fields (e.g., tissue samples, blood, and urine). • Examine blood samples for use in transfusions to look at blood type and compatibility. • Calibrate and sterilize medical lab equipment. • Enter information about a patient's results into their medical history.
Tools and Equipment Used	Along with those used by technicians, tools may include: • Laboratory diluters • Photometers • Urinalysis analyzers • Vacuum blood collection	Tools may include: • Automated platelet analyzers • Chemistry analyzers • Coagulation analyzers • Phlebotomy trays

	tubes	• Medical software
Opportunities for Specialization & Advancement	MLSs can advance to managerial or training positions. Areas of specialization include clinical chemistry, histotechnology, immunology, toxicology, etc.	MLTs can advance to a MLS career with more education and training. Areas of specialization include phlebotomy, histotechnician, and donor phlebotomy.
Degree Requirement	Bachelor's Degree	Postsecondary Certificate or Associate Degree
Number of Programs	227 accredited programs, as of October 2015	246 accredited programs, as of October 2015
Certifying Exam	ASCP, AMT	ASCP, AMT, AAB
Licensing	Not all states require licensing, but in states that do, some requirements include: • Completion of a bachelor's degree • Graduation from an accredited school • Passing a certification exam	Not all states require licensing.

- Work locations include hospital clinical laboratories, commercial or reference laboratories, public health laboratories, pharmaceutical or chemical industries, biotechnology companies, veterinary clinics, research and teaching institutions, etc.

Routes to Certification/Licensure



While the above process is the most quick and efficient route to becoming MLS (ASCP)-certified, there are other options of obtaining eligibility via other routes. For those who choose not to complete an NAACLS-accredited medical laboratory science program, other routes to certification include:

- Complete a bachelor's degree from an accredited 4-year college or university with a sufficient course load in biology, chemistry and math; AND
- Earn a medical laboratory technician MLT (ASCP) certification, and gain 2 years of full-time acceptable clinical laboratory experience; OR
- Gain 5 years of full-time acceptable clinical laboratory experience; OR
- For those with a valid CLA certification, gain 4 years of full-time acceptable clinical laboratory experience.

As long as the student meets one of the sets of requirements, he/she is eligible to sit for the ASCP certification exam. However, if a student is missing one or more of the eligibility requirements, he/she must first achieve that before sitting for the certification exam.

Also, before beginning a training program, students must have a CLS trainee license. It permits students only to train as a licensed CLS, as well as train in all specialty areas of the clinical laboratory only in Department-approved training programs. Academic requirements for a license include:

- A bachelor's degree with specific course requirements:
    - 16 semester or equivalent quarter units of chemistry, which must include clinical chemistry or analytical and biochemistry.
    - 18 semester or equivalent quarter units of biology, which must include hematology, immunology, and medical microbiology.
    - 3 semester or equivalent quarter units of physics (light and electricity).

Academic Prep

While some programs do prefer students majoring in the biological sciences or chemistry, as long as the s prerequisites are met, any major is acceptable.
Prerequisite course differ by program, but generally include those listed below. Please note that some courses must be completed within the last five years at the time of application.

Required Prerequisites:

- Analytical Chemistry (Quantitative Analysis)
- Physics (Recommended: include electronics, instruments, computer science)
- Biochemistry (BIS 102 & 103 OR 105)
- Immunology (MMI 188 or PMI 126)
- Hematology (Not Offered at UCD)
- Medical Microbiology (PMI 127)

Recommended (in general):

- Physiology
- Genetics
- Human Anatomy
- Math

Other recommendations for some programs:

- Mycology (MMI 130 or PLB 148), Virology (MIC 162), Parasitology

Students should aim for a B average in the core biology and chemistry courses, and although some programs only require a minimum 2.7-2.8 GPA, students should maintain a minimum science and overall 3.0 GPA. Note that this is a minimum and programs are highly selective, accepting about only 8-14 students.

Essential Functions & Attributes

Some example essential functions student should possess, or be able to request reasonable accommodations to execute, prior to beginning the program include the following:

- Eye-hand coordination and manual dexterity skills
- Ability to stand and/or walk for hours at a time
- Effective communication skills
- Visual acuity to perform macroscopic and microscopic analyses, or read procedures, graphs, etc.
- Professional skills such as the ability to work independently, manage time efficiently, and to comprehend, analyze and synthesize various materials.
- Independently prepare papers and laboratory reports and take paper, computer, and laboratory practical examinations.
- Use phlebotomy and culture acquisition equipment safely.
- Utilize laboratory equipment and adjust instruments to perform laboratory procedures.
- Characterize the color, odor, clarity and viscosity of biological, reagents or chemical reaction products.
- Employ a clinical grade binocular microscope to discriminate among fine structural and color differences of microscopic specimens.

- Good physical and mental health. Disabilities are evaluated on a case-by-case basis by some programs.

See the Essential Functions required by Eisenhower Medical Center for an example of other essential functions required by various programs.

Letters of Recommendation

Students should have three letters of recommendations from either professors or employers; many programs require two to be from instructors. Some school also require letter writers to complete a form in which they should be able to address familiarity, the applicant's strengths and weaknesses, the applicant's ability to do independent work, and the applicant's profile (e.g., reliability, emotional control, laboratory skills, etc.). Example of applicant profile section:

FACTORS	1	2	3	4	5
1. **Technical Knowledge/Skills**: To what extent does the applicant maintain a satisfactory level of knowledge and/or technical skill?					
2. **Quality of Work**: To what extent does the applicant meet the required standards regarding accuracy, neatness, and thoroughness?					
3. **Productivity**: To what extent does the applicant accomplish the quantity of work expected of the assignment?					
4. **Communication/Writing Skills**: To what extent does the applicant adequately prepare and maintain written reports and assignments?					
5. **Dependability**: To what extent does the applicant demonstrate consistency and maturity and work without close supervision or assistance?					
6. **Adaptability**: To what extent does the applicant adapt to new situations and changes in routine, workload, and/or work assignments?					
7. **Initiative**: To what extent does the applicant present new ideas or otherwise demonstrate an awareness of need for change?					
8. **Attendance**: To what extent does the applicant maintain satisfactory attendance in regard to tardiness, early departures, and/or absences?					
9. **Interpersonal Relations**: To what extent does the applicant establish effective working relationships when dealing with supervisors, instructors, peers, and/or the public?					
10. **Perseverance**: To what extent does the applicant see a task to completion?					
11. **Self-Confidence**: To what extent does the applicant demonstrate assuredness and a capacity to achieve?					
12. **Intellectual Ability**: To what extent does the applicant demonstrate the ability to evaluate situations, demonstrate good judgment, and problem solve?					

Applying

There are thirteen MSL programs in CA, ten of which are nationally approved as listed in the chart below. CA-only approved programs include those at CSY Los Angeles, Physician's Automated Lab, and Children's Hospital Central California.

Program	Director	Phone
CSU, Dominguez Hills	Cheryl Jackson-Harris	(310) 243-3899
Arrowhead Regional Medical Center	Ramona Fox	(909) 580-0069
Santa Barbara Cottage Hospital	Lynette Hansen	(805) 879-8184
Loma Linda University	Katherine Davis	(909) 558-4966
UC Irvine Medical Center	Laura Ogata	(714) 456-6305
Eisenhower Medical Center	Joan Steiner-Adler	(760) 773-4525
UC Davis Health System	Sharon Wahl	(916) 734-0231
San Diego CLS Training Consortium	Janice Dowd	(858) 657-5688
SF State University	Susan Kazarian, Geraldine Albee	(415) 338-2332
San Jose State University	Suzanne Gayrard	(408) 924-4898

Programs typically have two application cycles (Fall & Spring); deadlines vary by school. Also, please note that some programs also require a supplemental application for a clinical internship component.