

***Online Information Session
UCF Medical Laboratory Program***



UCF



Hello
Dr. Maridaliz Rodriguez Rosado
UCF Medical Laboratory Science Program Director

Ask me anything!!!!

What is the Medical Laboratory?

- Medical laboratory technologist or scientists are health professional who perform laboratory test analyzes **blood, urine, and bodily fluids** to detect **chemical or cellular abnormalities**, and **pathogens**
- Produces **70-80%** of the information used by physicians to diagnose, monitor, and treat disease
- Not really a research field but still has **research aspects**



Examples of Careers in Laboratory Medicine

- Pathologist (M.D)
- Doctor of Clinical Laboratory Science (DCLS)
- Medical Laboratory Scientist
- Medical Laboratory Technician
- Cytotechnologist
- Histotechnologist
- Phlebotomist
- Laboratory Assistants



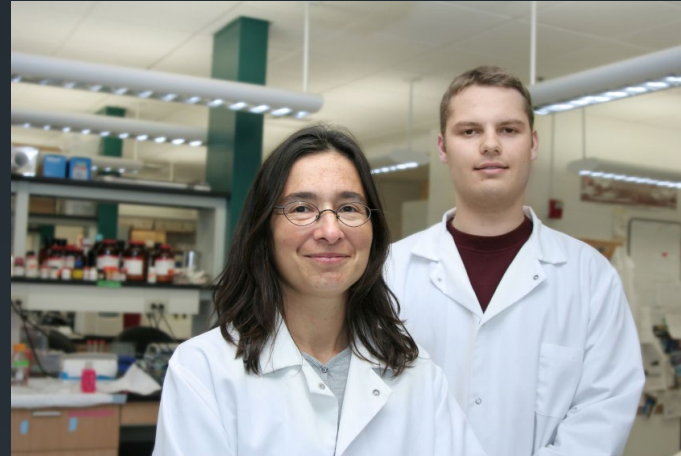
Entry Level Competencies of the Medical Laboratory Scientist/Working in the Laboratory

- Perform the full range of clinical laboratory tests in areas such as:
 - **Clinical Chemistry**
 - **Hematology/Hemostasis**
 - **Immunology**
 - **Immunochemistry/Transfusion medicine**
 - **Microbiology**
 - **Urine and Body Fluid Analysis**
- **Laboratory Operations/Management**
- **Emerging diagnostics-Public Health/Infection Prevention**
 - **COVID-19**
 - **Monkey Pox**
- Development and evaluation of test systems and interpretive **algorithms/LIS System/IT**
 - **Epic Systems/Patient Portal**
- Analysis and clinical decision-making
- **Regulatory compliance with applicable regulations**
- **Education, and quality assurance/performance improvement** wherever laboratory testing is researched, developed or performed



Who works in the Medical Laboratory?

- Variety of entry-level roles exist within the medical laboratory:
 - **Medical Laboratory Technician (A.S. Degree)**
 - **Medical Laboratory Scientist (B.S. Degree)**
- In Florida you must pass a **national board exam** and obtain a **Florida License to Practice**



What skills must they possess?

- Laboratory Professionals must:
 - *Enjoy science*
 - *Critically think*
 - *Pay attention to details*
 - Act Compassionately
 - Work independently
 - Work in a team
 - Follow directions
 - Remain calm during stressful situations
 - Communicate clearly to a variety of audiences

Where can you work?

- You can work in a variety of fields, including:
 - Hospitals
 - Clinics
 - Doctor's Offices
 - Academic Research Labs
 - Veterinary Offices/Clinics
 - Pharmaceutical Companies



- Armed Services Laboratories
- Food Safety Laboratories
- Public Health Laboratories
- Forensic Laboratories
- Colleges/Universities
- Private Laboratories

General medical and surgical hospitals; private	36%
Medical and diagnostic laboratories	21
Offices of physicians	9
Educational services; state, local, and private	5
Other ambulatory healthcare services	4

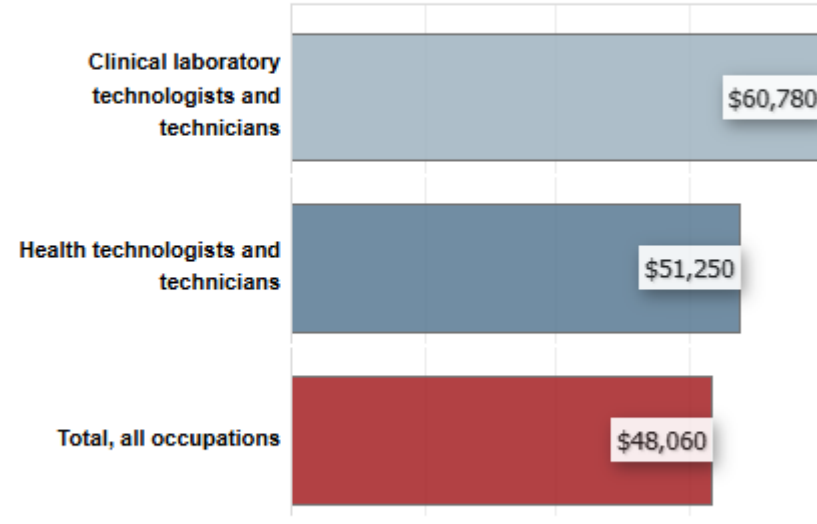


Job Outlook

- Fast Facts:
 - The field is growing
 - Educational programs are only **graduating 1/3 of the number of graduates that the field will need**
 - >50% of laboratories report difficulty in hiring**
 - Median age of current workforce is >50 years**
 - Average starting salary is ~\$28-34/hour (base)**
 - Salaries can be higher if working second or third shift with differentials averaging an additional \$3-5/hour

Clinical Laboratory Technologists and Technicians

Median annual wages, May 2023

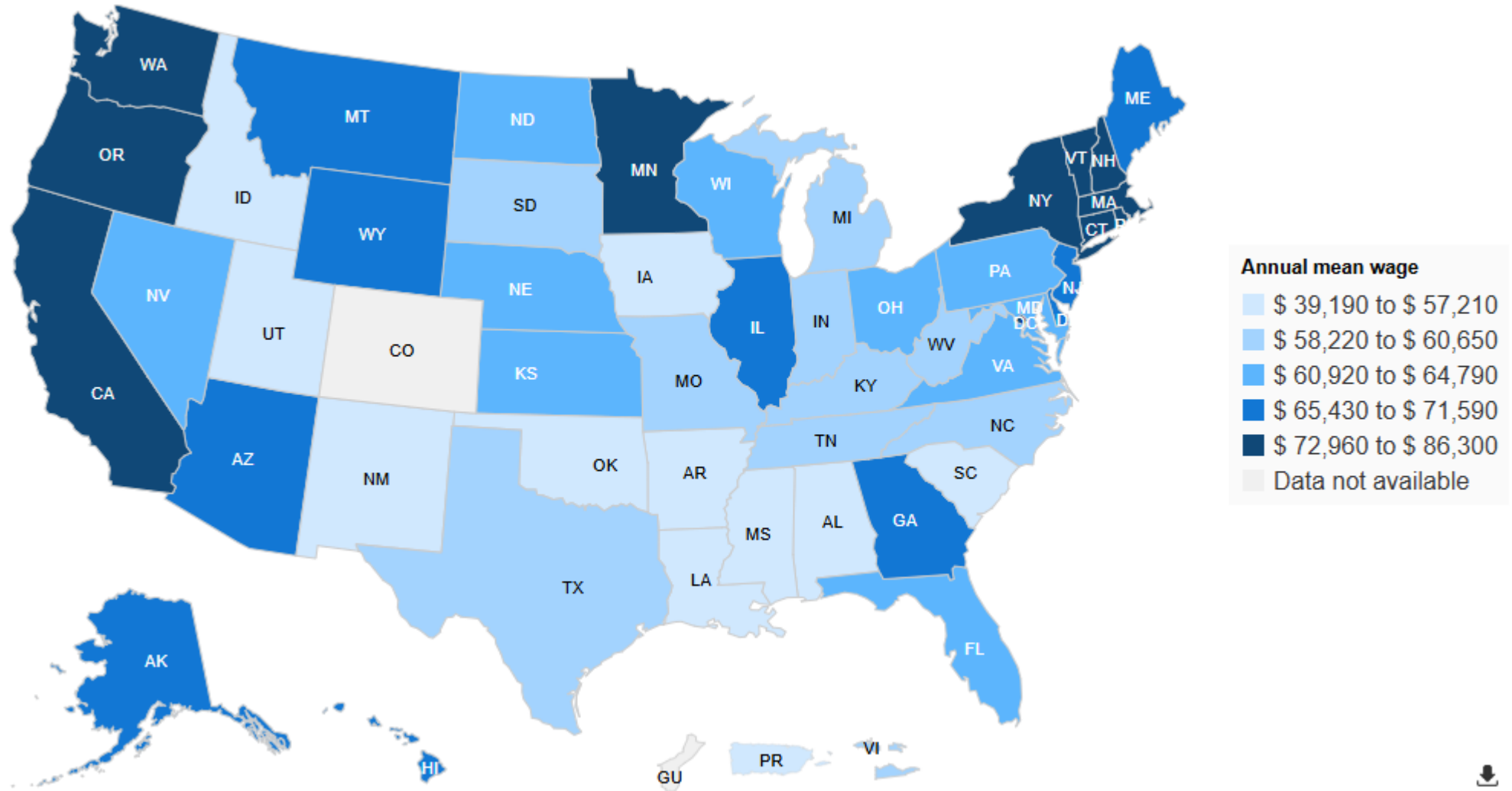


Note: All Occupations includes all occupations in the U.S. Economy.

Source: U.S. Bureau of Labor Statistics, Occupational Employment and Wage Statistics

The Bureau of Labor Statistics projects a 7% growth rate for Clinical Laboratory Scientist positions from now until 2029.

Annual mean wage of clinical laboratory technologists and technicians, by state, May 2024



Source: U.S. Bureau of Labor Statistics (www.bls.gov)

How to become a Medical Laboratory Scientist

- 1. Bachelor's degree in Medical Laboratory Science
- 2. Apply for a Trainee License withing your professional phase at UCF
- 3. Graduate from the certified MLS program
- 4. Certification Exam (ASCP or AMT)
- 5. Apply for Florida Medical Laboratory Scientist License

Academic Training

- Typical **Academic Training Programs** have the following courses:
 - Introductory Sciences (Gen. Bio, A&P, and Chem.)
 - Liberal Arts Classes
 - Clinical Chemistry
 - Medical Microbiology
 - Hematology
 - Immunology
 - Immunohematology
 - Statistics
 - Medical Ethics
 - Clinical Practicum

- MLS programs will also include:
 - Pathophysiology
 - Organic Chemistry and Biochemistry
 - Genetics
 - Management
 - Education

Starting a Career in the Medical Laboratory

- You must obtain appropriate educational credentials:
 - Associate's Degree to be a MLT
 - Bachelor's Degree to be MLS
- You want to obtain these credentials from a **NAACLS-accredited program** (<http://www.naacls.org>)
- If you already have a Bachelor's Degree in a scientific-discipline, accelerated programs exist
- Upon graduation, pass the ASCP-BOC Certification Exam or American Medical Technologist Exam
- Must also obtain a Florida CLP License to practice



Licensure vs. Certification: Mechanisms to ensure competency

- Licensure: **granted by state governments, mandatory**. If state requires it, you cannot legally work without it. Must meet certain education and training requirements and pass a competency-based test. States that require it sometimes also require certification.
- Certification: also called **registration, granted by professional agency, optional**. Proof of attainment of a certain level of education and knowledge. Must meet certain education and training requirements and pass a competency-based test. Some employers require it. **Florida State requires proof of certification.**

Credentialing

- Most states/territories do not require licensure of laboratory personnel. 11 do (and 1 territory):
- California, Hawaii, **Florida**, New York, North Dakota, Tennessee, Louisiana, Nevada, West Virginia, Montana, Rhode Island/Georgia, Puerto Rico
- Most recognize national certification in lieu of state exams
- Having a license in one state does not automatically qualify you for a license in another state
- Agencies that offer certification exams
- **American Society of Clinical Pathologists (oldest and most recognized)**
- **American Medical Technologists**
- **American Association of Bioanalysts**

Things to consider before Applying the UCF MLS Program

- Tuition and stipends for clinical training
- Considered a 2+2 program
 - Two years of pre-requisite study
 - Two years of professional study which includes a clinical externship in one of our affiliated hospitals
- Limited Access/Specialized Admission
- Format for coursework and clinical training (separated lecture and lab)
- Application requirements
- NAACLS accredited program (10 years of accreditation)
- Outcomes

Graduating Class of:	2022		2023		2024*		2021	
Total Graduates	25		26		25		29	
Prof Phase Graduation Rate:	100%		100%		100%		97%	
Job Placement Rate*	100%		100%		100%		100%	
	UCF	National	UCF	National	UCF	National	UCF	National
ASCP-BOC Pass Rate**	95%	80%	92%	79%	92%	79%	86%	76%

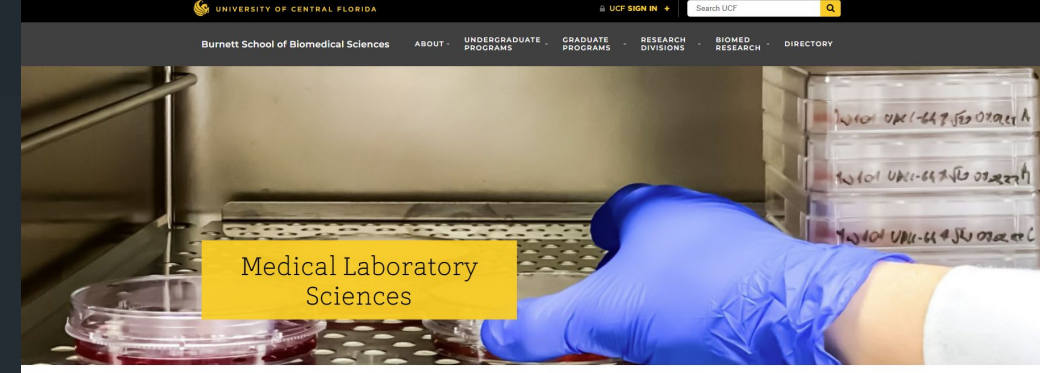
Recent Program Inputs

	Class of 2023	Class of 2024	Class of 2025*	Class of 2026	Average
Total Apps	66	62	52	38	55
Interviewed	34	40	47	37	40
Accepted	31	31	31	29	31
Matriculated	28	26	30	29	28
Currently	N/A	N/A	29	29	29

Your action Plan

- Research the career opportunities for Medical Laboratory Scientists
- Identify specific interests such as specialties, laboratory types, career paths
- Understand the admission requirements
- Contact the Medical Laboratory Sciences leadership team for information on the application process.
- Submit Reference Information
 - A total of three (3) references are required. A minimum of two (2) references must be from science professors; one (1) employer or non-science professor reference is acceptable.
- Make your application competitive

UCF MLS Program Curriculum



- **Must complete GEP and pre-requisites BEFORE starting the professional phase of study.**
- **Common Program Prerequisites include:**

- Biology I with Lab
- Chemistry Fundamentals I and II
- Chemistry Fundamentals Lab
- Organic Chemistry I
- Organic Laboratory Techniques I
- General Microbiology with Lab
- Human Anatomy with Lab
- Human Physiology with Lab
- College Algebra
- Statistical Methods I

- **All pre-reqs must be completed with a C or better and student must have a 3.0 GPA minimum**

What You'll Learn

UCF MLS Program Curriculum

Professional Phase Curriculum

FALL—JUNIOR/start of professional phase of MLS

MLS 3220C 3 CLINICAL MICROSCOPY
 MLS 4625 3 CLINICAL CHEMISTRY I
 MLS 4625L 1 CLINICAL CHEMISTRY LAB
 MLS 4430C 4 CLINICAL MICROBIOLOGY I/LAB
 PCB 3233 3 IMMUNOLOGY
 PCB 3233L 1 IMMUNO LAB

TOTAL 15

SUMMER-JUNIOR

MLS 4334 3 HEMOSTASIS
 MLS 4550C 5 CLINICAL IMMUNOHEM/lab

TOTAL 8

FALL--SENIOR

MLS 4830L 3 Interpretative and practical clinical chemistry
 MLS 4831L 3 Intrepretive and practical Imunohematology
 MLS 4832L 4 HEMATOLOGY LABORATORY PRACTICUM
 MLS 4833L 3 DIAGNOSTIC MICROBIOLOGY

TOTAL 13

SPRING JUNIOR

MLS 3305 3 HEMATOLOGY
 MLS 3305L 2 HEMATOLOGY LAB
 MLS 4630 3 CLINICAL CHEMISTRY II
 MLS 4075L 1 CLINICAL AUTOMATION LAB
 MLS 4460C 5 CLINICAL MICROBIOLOGY II

TOTAL 14

SPRING—SENIOR

MLS4505 3 IMMUNODIAGNOSTIC
 MLS 4910 1 INTRO TO CLIN RESEARCH
 MLS 3705 3 EDUCATION/MANAGEMENT
 MLS 4933 1 SENIOR SEMINAR
 BSC 3403C 4 QUANT BIO METHODS

TOTAL 13

Program Application

- Application opens early Spring Semester.
 - Link is found on MLS Advising Page [Medical Laboratory Sciences - Burnett School of Biomedical Sciences](#)
- For priority review students must be:
 - Accepted to UCF
 - Completed the application by **March 3**
- Following criteria are assessed:
 - **Does student meet grade requirements?**
 - **Does student have reasonable plan to get references and Pre-reqs completed by Fall?**
- If those criteria are met, you are scheduled for an interview with the selection committee

Program Application Cont.

- Common Program Prerequisites:
- The following prerequisite courses MUST be completed prior to entering the professional phase of this upper-division limited-access program. A minimum grade of “C” MUST be achieved in prerequisite courses. A GPA of 3.0 in prerequisites and the major courses is also required.
- Biology I with Lab
- Chemistry Fundamentals I and II
- Chemistry Fundamentals Lab
- Organic Chemistry I
- Organic Laboratory Techniques I
- General Microbiology with Lab
- Human Anatomy with Lab
- Human Physiology with Lab
- College Algebra
- Statistical Methods I

Program Application

- Interviews typically happen in late April and take 15-20 minutes
- Main emphasis is on:
 - Interest in profession
 - Ability to succeed in program
 - Ethics
 - Critical Thinking
 - Team work potential
- Four statuses occur by Mid-May to Early June:
 - Accepted
 - Conditional Acceptance
 - Waitlisted
 - Not Accepted

Programmatic Progression

- Passing grades are C or better
- Students must maintain a 3.0 GPA to remain in the program.
- Student will undergo the professional attributes assessment prior to clinicals to assure affective domain objectives are met

Other Factors

- Florida Trainee License
 - Must have SSN and positive background can create issues
 - This must be obtained for clinical courses
- Drug Screens
 - Students are required to complete a Drug Screen
 - A positive drug screen may inhibit program progression
- Background Check/Fingerprinting Level II
 - Students are required to have completed a Background check
 - A positive background check may inhibit program progression
- Health History
 - Typically vaccine records and some others depending upon site
 - Failure to have these records may inhibit program progression

Graduating

- The graduate:
 - **Students must pass all classes with a C or better**
 - **Complete the comprehensive exam in MLS 4933 with a 60% or higher (assures you pass the class)**
- You are NOT required to take the board exam to graduate

Who You'll Learn From

- M. Rodriguez-Rosado,
 - Ph.D.; MLS (ASCP), MB (ASCP)
- Jo Ellen Russell,
 - MBA, MLS(ASCP), RMA, RHIT
- Greg Weigel,
 - M.S
- Robert Borgon,
 - Ph.D.
- Adjunct Faculty



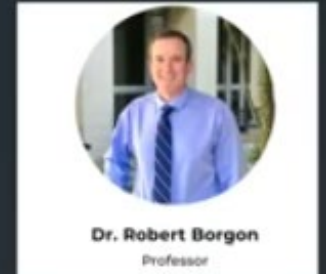
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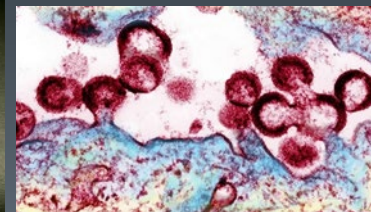
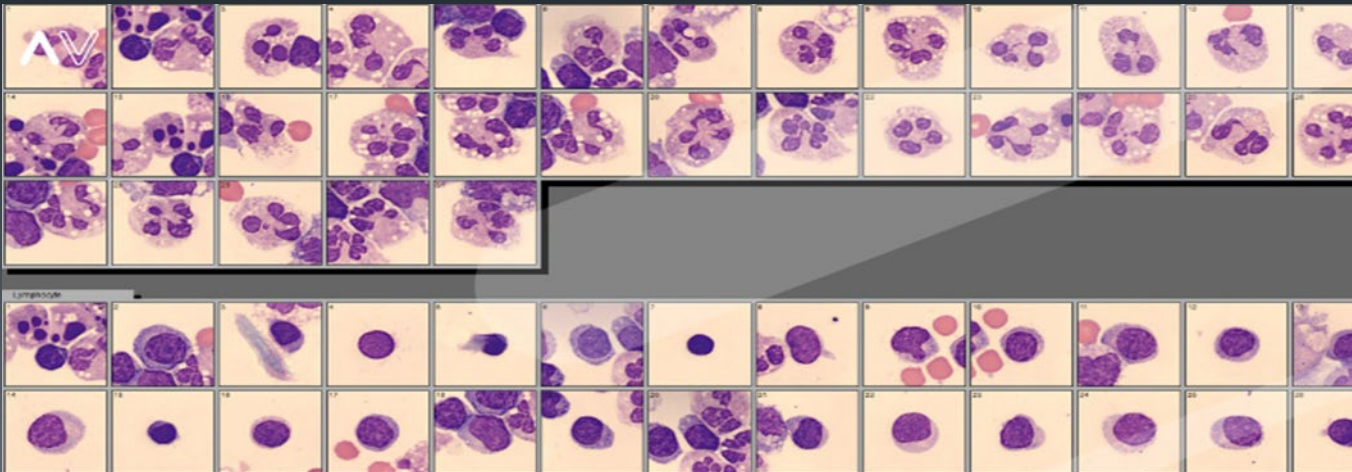
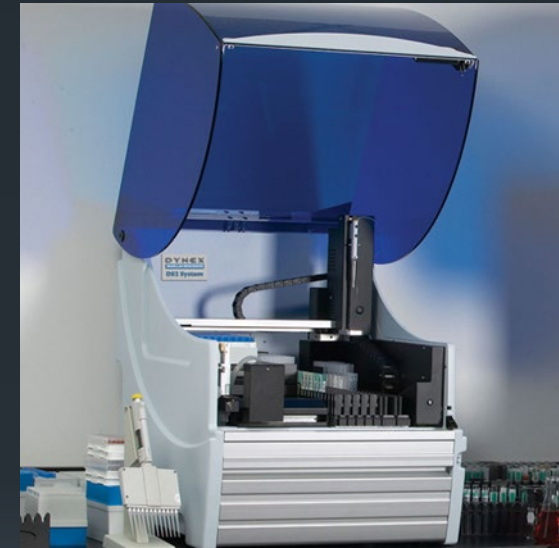
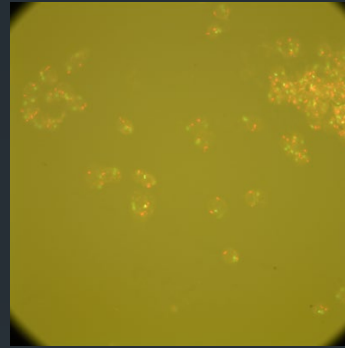
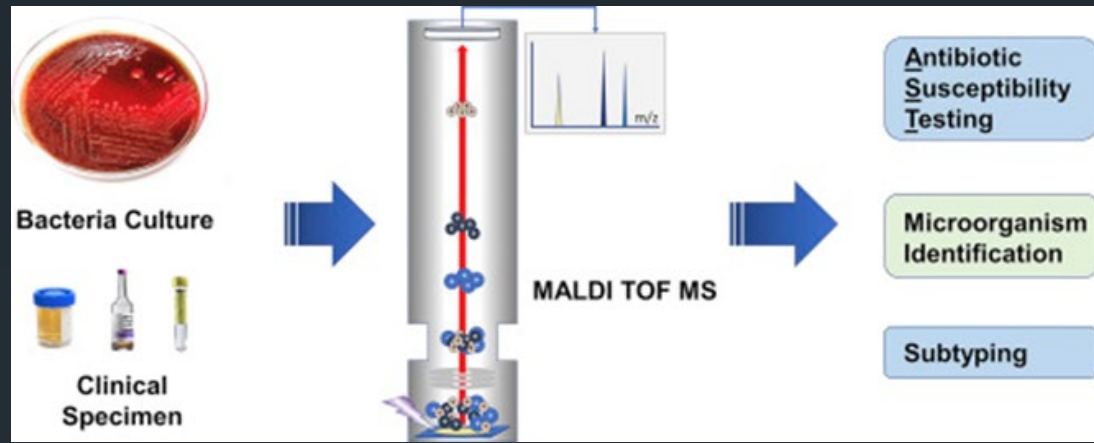
Greg Weigel,
M.S



Robert Borgon,
Ph.D.

Virtual Lab Tour

<https://orlandohealth.wistia.com/medias/ql5s33pst3>



Where our graduates end up:

- Emily Woten B.S., MLS, (ASP)CM Senior Medical Laboratory Scientist at Orlando Health





Questions?

- Dr. Maridaliz Rodriguez Rosado
- Assistant Professor of Medicine/Medical Laboratory Science Program Director
- Maridaliz.rodriquezrosado@ucf.edu
- HSII, Room 312