

Duke Central Automated Laboratory DCAL



DESIGN BY: MEGHAN REID

Leadership and Team

Director(s):

- Dr. Ruhan Wei, PhD, Director
- Dr. Tom Ortel MD PhD (Coagulation Laboratory Services)
- Dr. Eric Carlsen MD, PhD (Hematology Laboratory Services)

Manager:

 Menalisa "Mely" Ranosa, BS, MLS (ASCP)CM

Supervisor(s):

- Rexel Ybanez, BS, MLS (AMT) First Shift Supervisor
- Fatima Ahmed, SC ASCPCM Evening Shift Supervisor

Admin:

• Shelley Sands -Administrative Assistant

Number of lab team members: 81

Location and Hours

Rm 1520 Hudson Bldg. Duke Eye Center 2351 Erwin Rd, Durham, NC 27710

24/7 365 days a year

Focus and Volume

Lab Focus

- Chemistry
- Special Chemistry
- Hematology
- Coagulation
- UrinalysisMass Spectrometry

Average yearly volume:

- Non-waived: 3,428,085
- Waived: 2,063



Beckman Coulter Automation Line Centrifuges

Overview

DCAL constantly run tests 24 hours a day, 7 days a week, 365 days a year. It is also the home of the Specimen Management Department, where courier drop-off specimens and specimens are processed. Providing excellent patient care is always a priority within the Duke Healthcare System, and the Duke Clinical Laboratories are no exception!

DCAL is also the central processing hub for all testing performed by our Duke Hospital Laboratories. Caring for our Duke Hospital inpatients and clinic patients, this laboratory operates 24/7 to process thousands of samples each day while maintaining turnaround times in the high 90% for the great majority of testing performed.





Xevo G3 Mass Spectrometry System

New in the Lab

Liquid Chromatography Mass Spectrometry

Duke Central Automated Laboratory employs Liquid **Chromatography Mass** Spectrometry methods to determine drug concentrations in patient samples. The Liquid Chromatography component of the analyzers ionizes the solubilized compounds of interest, separates them from extraneous compounds in the samples, and passes them on to the Mass Spectrometer, which then vaporizes, identifies, and quantifies the compounds according to the mass charge ratio (m/z) of their ionized forms. This is accomplished by the precise application of electrical and radio frequency fields to control the trajectory of the gas phase ions as they are accelerated toward the detector. Since the degree of deflection achieved for a given applied force is relative to the mass and charge of each ion, with the judicial application of force, specific ions can be preferentially directed into the detector and counted. The mass spectrometer can differentiate compounds varying by as little as 1 AMU (Atomic Mass Unit: a unit of measure approximately equivalent to the mass of a single proton), so needless to say, the method is highly sensitive and specific.



The Waters Quattro Micro Tandem and Xevo TQD Mass Spectrometry System

New Equipment

- Since opening in January 2017, we have added one more storage unit, so now we have four **Beckman Coulter storage units**
- We have added the **TOSOH G8** to our automation line
- DiaSorin Liaison XL was added to the automation line on August 8, 2022. DCAL went live with the DiaSorin Liaison XL, a discrete continuous-loading Chemiluminescence analyzer for in vitro diagnostic analysis. We initially went live with the HSV-1 IgG ab, HSV-2 IgG ab, and the QuantiFERON TB Gold plus test. These tests were originally done at the Immunology laboratory, and 8 more assays are set to be moved to DCAL soon. Currently performed only on dayshift Monday-Friday.
- New **urinalysis DXU** we have 2 of these analyzers



DiaSorin Liaison XL

Fun Facts

Duke Central Automated Laboratory (DCAL) opened its doors on Monday, January 16, 2017. Two of the biggest laboratories in our health system laboratories merged, and several laboratory sections are working together in this state-of-the-art facility. The Core Laboratory on Ben Franklin Blvd and the Rapid Response Laboratory (RRL) in the CARL building merged into this one laboratory to provide Chemistry, Special Chemistry, Hematology, Urinalysis, Coagulation, and Immunoassay testing to all our hospital patients and many of the Duke inpatient and outpatient clinics. DCAL is also the new home for the Specimen Management Department and the Coagulation Laboratory.

Two models of Waters Liquid Chromatography Tandem Mass Spectrometry Systems are employed by DCAL:

- Our most recently acquired instruments are the two Acquity-LC / Xevo TQD systems which we apply to the measurement of immunosuppressive drugs (Cyclosporine & Tacrolimus), the anti-fungal drug (Voriconazole), and the antineoplastic agent Busulfan, which is commonly employed in Bone Marrow Transplant procedures. The Xevo TQD systems are approximately 10 times more sensitive and 30% faster than the older instruments they recently replaced.
- Our Acquity-LC / Xevo TQ-S micro systems are utilized for Pain Management Drug-Monitoring, wherein patient urine samples are tested to confirm compliance with prescribed medications as well as to detect possible use of non-prescribed or illicit drugs. The Xevo TQ-S micro systems are approximately 10 times more sensitive than the Xevo TQD systems, thus allowing for the detection of drug concentrations in urine samples as low as only a few parts per billion.