



Associated Regional and University Pathologists ARUP Research Internship

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Introduction

ARUP is a reference laboratory that is part of the University of Utah. When a physician wants to run a test on a patient's blood or other fluid for diagnostic purposes, there are a few options for where the test is run. Some hospitals are equipped to run many common tests. When a test exceeds what the hospital can do however, a patient's sample is then sent to a better equipped lab, such as ARUP. ARUP is one of the largest reference laboratories in the nation, and has hundreds of thousands of samples that are tested there every week. These samples are tested for everything from cancer markers in the blood to creatinine levels in the urine to even looking for genetic markers in blood serum. ARUP has many different laboratories that are all running very specific tests in order to help diagnose patients. Statistics show that information discovered from the tests at ARUP and other reference labs make up about 70% of a diagnosis of a patient. This is why these laboratories are so crucial for modern medicine.



Figure 1: Specimen transport track located in the Automated Core Lab. This picture was taken from online because I was unable to take pictures myself due to HIPPA and HITECH laws. Source: <https://www.aruplab.com/news/06-22-15>

Labs In ARUP Visited

While at ARUP I was able to visit many of the specimen testing and research labs in addition to the Core Lab where I was primarily assigned. They were:

- Automated Endocrinology
- Core Research and Development
- Newborn and Newborn Metabolic Screening
- Mass Spectrometry I + II
- Drugs Of Abuse
- Infectious Disease Screening
- Nuclear Magnetic Resonance (NMR)
- Spectroscopy
- Immunological Flow Cytometry
- Trace Metals Research
- Biochemical Genetics

What I Did

I was able to spend most of my time in ARUP's Core Laboratory. This lab receives a large quantity of tests that are sent to ARUP such as: testosterone tests, creatinine tests, cholesterol tests, vitreous tests, cancer marker tests, and many other commonly ordered physician tests. These tests are run through multimillion dollar machines that are programmed to be able to run and interpret thousands of different chemical tests. In the month of July, the core lab ran tests on over 245 thousand different patients. Much of my time was spent assisting the Medical Technologists on a set of machines known in the company as the "Roche Bench" which is named after the company that produces the machine. This set of machines is capable of running hundreds of different tests, that all share similarities in the chemistry they are tested with. While I was at ARUP I was allowed to do daily maintenance, prep and transport samples, and help in preparing results in order for them to be sent to the physician who ordered them.

Experience

My experience at ARUP was a life changing one. Before this internship when I thought of medicine I had never thought about the medical laboratory side, I simply thought of doctors and nurses. Now I understand how important this medical research is, and why cutting funding to these laboratories would be a terrible decision. These labs are crucial to making life changing diagnoses.

It was also amazing for me to see these different diagnostic chemistry techniques in the real world. In organic chemistry I was always wondering how NMR, and Mass Spec. were even applicable to the field of medicine. Now I know that these techniques can help to confirm diagnosis and to help push medical research forward.

This experience was one that I would suggest to anyone. It helped broaden my understanding of medicine, and the diagnostic process. It also helped me have a greater respect for the chemistry that I spent countless hours studying as I was able to see the ways it can be applied to real life situations.



Figure 2: Exterior of ARUP

Thank you to Ryan Greer for allowing me to be part of his laboratory. Also to all of the Medical Laboratory Technicians and Medical Technologists that helped me understand the implications of these incredible tests. It was a life changing experience I would recommend to anyone.