Residency and Fellowship Programs

medicine.utah.edu/pathology/residency | medicine.utah.edu/pathology/fellowships
Welcome from the Department Chair

The Department of Pathology at the University of Utah School of Medicine offers a range of subspecialty training opportunities, including 14 fellowship programs in anatomic, clinical, pediatric, and genetic pathology. The department and faculty make it a high priority to provide outstanding educational experiences to expand expertise and facilitate career development in pathology and laboratory medicine. Our postgraduate trainees have the advantage of access to an exceptional range of clinical material and state-of-the-art technology available at University of Utah Health and our national reference laboratory, ARUP, located in the foothills of the beautiful Wasatch mountain range. Research is encouraged and actively supported for all residents and fellows. Our goal is to prepare trainees for leadership roles as academic or community-based pathologists and laboratory directors. We invite you to join us for residency and fellowship training at the University of Utah.
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The University of Utah School of Medicine does not discriminate on the basis of gender, gender identity/expression, sexual orientation, race, age, religion, color, national origin, disability, genetic information, or veteran’s status.
RESIDENCY PROGRAM

General Information

The Department of Pathology at the University of Utah offers training in combined Anatomic Pathology and Clinical Pathology, Anatomic Pathology and Neuropathology, Clinical Pathology only, Anatomic Pathology only, and Physician Scientist tracks. The residency training program is approved by the Residency Review Committee of Pathology for 20 residents and is fully accredited by the Accreditation Council for Graduate Medical Education (ACGME). The residency program was established in 1960 and has a long, stable history of training outstanding residents.

Our mission is to train exceptional board-certified pathologists through flexible training individually tailored for careers in academia or private practice. While striving to provide residents solid training in all fields of pathology, the Department maintains flexibility in the training program to allow and encourage residents to pursue expertise in an area of particular interest. Active participation in research is encouraged and supported for all residents.

With a faculty of over 120 committed academic and clinical practitioners at multiple facilities, the residency provides exposure to and experience in a full complement of autopsy, surgical and clinical pathology cases and medical problems, as well as eminent basic science and clinical research.

Requirements

The residency training program looks for candidates with excellent academic performance and who are passionate about a future career in pathology. Candidates for the pathology residency are selected on the basis of their academic credentials, research, communication skills and personal qualities such as motivation and integrity.

Facilities

ARUP Laboratories was created in 1984 to support the academic mission of the University of Utah and is located in the 320-acre Research Park adjacent to campus. ARUP is a wholly owned private enterprise of the University of Utah and is recognized for excellence as a leading national reference laboratory, offering over 3000 tests and test combinations. The test menu includes a comprehensive offering ranging from routine tests to highly esoteric molecular and genetic assays.

University Hospital is the only academic hospital in the geographically vast intermountain area, resulting in a wide variety of sophisticated medical problems available for study.

Huntsman Cancer Institute is the only National Cancer Institute-designated cancer center in the Intermountain West. The Institute is a nonprofit research and treatment center that combines research, education, and patient care programs and facilities, including the Huntsman Cancer Hospital.

Primary Children's Hospital is owned by Intermountain Healthcare, a charitable, community-owned, nonprofit health care organization based in Salt Lake City. The hospital is equipped to treat children with complex illness and injury and is recognized as one of the top children's hospitals in the United States.

As the flagship hospital of Intermountain Health Care, Intermountain Medical Center is the largest tertiary care hospital in the Salt Lake area and sees the highest volume of surgical specimens.

The State Medical Examiner's Office provides training in forensic pathology and exposure to a variety of medical/legal cases.

Assistant Medical Directorships

Residents are encouraged to act as assistant medical directors in an ARUP lab of their interest as a moonlighting activity. This provides invaluable experience in laboratory management, quality improvement, and patient safety. Although available directorships vary from year to year, some examples are Transfusion Services, Automated Core Lab, Infectious Diseases Lab, Anatomic Pathology, Hematologic Flow Cytometry, Immunology, Endocrinology, and Informatics.

Duties include signing out leukemia and lymphoma flow cytometry studies, calling blood donors with positive tests or deferral questions, validating new laboratory assays and instruments, reviewing standard operating procedures, and reviewing QA/QC data.

Stipends/Benefits

Stipends vary between $61,061 for PGY-1 and $68,627 for PGY-4 for the 2020–21 academic year, depending on level of training. All residents are covered by professional liability insurance. Other benefits include three weeks paid vacation, a book/travel fund, and a choice of insurance plans.
Curriculum
The four-year AP/CP residency program includes 23½ months of required anatomic pathology rotations and 17½ months of required clinical pathology rotations, leaving 7 months for elective rotations and research. A wide variety of electives are available in both anatomic and clinical pathology including molecular oncology, molecular genetics, and toxicology/pharmacogenomics. Core rotations may be repeated to allow for additional graduated responsibility.

Recent Graduates
Recent graduates of our program have secured a variety of fellowships including Hematopathology, Cytopathology, Dermatopathology, GI Pathology, Immunopathology, Molecular Genetics, Medical Microbiology, Surgical Pathology, Forensic Pathology, Neuropathology, Pediatric Pathology, Transfusion Medicine and others. These fellowships have been at the University of Utah as well as in academic centers such as Washington University, Johns Hopkins University, Stanford University, and MD Anderson Cancer Center.

Our graduates are successful in obtaining positions in both academic and private practice settings. For example, graduates have gone on to work for hospitals and universities including University of Utah, St. Luke’s, Intermountain Healthcare, Veterans Administration, University of Washington, University of Chicago, University of Western Ontario and St. Jude Medical Center. Many former residents also work locally in the Salt Lake City area at the University of Utah and ARUP Laboratories, or in private practice.

<table>
<thead>
<tr>
<th>Year of Training</th>
<th>Typical AP/CP Schedule</th>
<th>Mos.</th>
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</thead>
<tbody>
<tr>
<td>PGY-1</td>
<td>Autopsy</td>
<td>2</td>
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<tr>
<td></td>
<td>Surgical Pathology</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>Transfusion &amp; Coagulation</td>
<td>3</td>
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<tr>
<td></td>
<td>Clinical Chemistry</td>
<td>1</td>
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<tr>
<td></td>
<td>Cytopathology</td>
<td>1</td>
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<tr>
<td></td>
<td>GI Pathology</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>Forensics</td>
<td>1</td>
</tr>
<tr>
<td>PGY-2</td>
<td>Autopsy</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>Surgical Pathology</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>Hematopathology</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>Clinical Chemistry</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>Other Elective/Required/Research rotations</td>
<td>2</td>
</tr>
<tr>
<td>PGY-3</td>
<td>Surgical Pathology</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>Other Elective/Required/Research rotations</td>
<td>9</td>
</tr>
<tr>
<td>PGY-4</td>
<td>Surgical Pathology</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>Other Elective/Required/Research rotations</td>
<td>10</td>
</tr>
</tbody>
</table>
Morning Conference
The pathology residents have required morning conference every day from 8:00 to 9:00 am. Morning conference presenters and attendees include residents, fellows, faculty, and staff, depending on the conference. A variety of learning modalities are used. Residents gain experience presenting to a group and receive feedback on their presentation skills.

<table>
<thead>
<tr>
<th>Morning Conference Schedule</th>
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<tbody>
<tr>
<td><strong>Monday</strong></td>
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<tr>
<td>Clinical Pathology</td>
</tr>
<tr>
<td>• Interesting CP cases*</td>
</tr>
<tr>
<td>• CP call review*</td>
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<tr>
<td>• Coagulatoin</td>
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<tr>
<td>• CP didactics</td>
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<tr>
<td>• Informatices and laboratory management</td>
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<tr>
<td><strong>Tuesday</strong></td>
</tr>
<tr>
<td>Rotating topics</td>
</tr>
<tr>
<td>• Pediatric pathology</td>
</tr>
<tr>
<td>• Infectious disease</td>
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<tr>
<td>• Hematopathology</td>
</tr>
<tr>
<td>• Gross/autopsy pathology</td>
</tr>
<tr>
<td>• Transfusion medicine*</td>
</tr>
<tr>
<td>• Journal club*</td>
</tr>
<tr>
<td><strong>Wednesday</strong></td>
</tr>
<tr>
<td>Rotating topics</td>
</tr>
<tr>
<td>• Surgical pathology unknowns</td>
</tr>
<tr>
<td>• Hematopathology unknowns</td>
</tr>
<tr>
<td>• Cytopathology</td>
</tr>
<tr>
<td>• Resident Case of the Month*</td>
</tr>
<tr>
<td><strong>Thursday</strong></td>
</tr>
<tr>
<td>Pathology Grand Rounds once per month</td>
</tr>
<tr>
<td>• Rosai textbook surgical pathology slide series. Follows an assigned reading schedule. The slide conference is given by a surgical pathologist with expertise in the topic being covered.</td>
</tr>
<tr>
<td><strong>Friday</strong></td>
</tr>
<tr>
<td>Rotating topics</td>
</tr>
<tr>
<td>• Surgical pathology unknowns</td>
</tr>
<tr>
<td>• AP call review*</td>
</tr>
<tr>
<td>• Frozen section conference*</td>
</tr>
<tr>
<td>• Wellness conference*</td>
</tr>
<tr>
<td>• Resident group meeting*</td>
</tr>
<tr>
<td>• Resident group meeting with Program Director</td>
</tr>
</tbody>
</table>

* indicates conferences where residents routinely present

Research
Many research opportunities are available to our residents covering a wide range of areas from basic science to clinical and translational research. Though not required, all residents are encouraged to pursue research projects as part of their training.

Trainees will find enthusiastic support from the faculty, including help in identifying research mentors. Although research costs are usually provided by the resident’s research mentor, residents may apply for departmental grant funding to assist with the costs of their research.

The residency program also provides funding for research-related travel for residents presenting research at national scientific meetings. Residents have the opportunity to present their research projects at the department’s annual Resident Research Grand Rounds, with awards given at the annual graduation dinner.

Most residents collaborate with pathologists and other clinicians on small research projects and case reports as an adjunct to their clinical rotations. Residents may also choose to do research elective rotations, allowing them to have a more extensive research experience. Current CP-only, AP-only, and Physician-Scientist Research Pathway residents incorporate intensive research training during extended elective rotations within their clinical curriculum.
Residents specifically interested in an academic career in pathology will find many opportunities for career development at the University of Utah. Abundant opportunities for pathology research exists in all anatomic, clinical, and experimental areas of the department.

ARUP Laboratories is unique as a leader in translational pathology research. ARUP Laboratories and the ARUP Institute for Clinical and Experimental Pathology® have developed and validated over 1500 new diagnostic tests and an even larger number of commercially available tests. Because ARUP is an enterprise of the University and Utah and its Department of Pathology, ARUP has a strong academic mission. The ARUP Institute’s researchers and Medical Directors publish an average of more than 120 peer-reviewed publications per year and average more than 180 annual presentations in national scientific meetings. This offers unparalleled opportunities for our residents to participate in pathology research.

Residents are welcome to develop collaborations with faculty in any clinical or basic science department at the University of Utah. Pathology residents have recently collaborated with researchers in departments as diverse as bioinformatics, molecular biology and genetics, internal medicine, cardiology, pulmonary critical care, hematology-oncology, anesthesiology, pediatric neurology, pediatric infectious disease, and dermatology.

**Physician-Scientist Track**

The Physician-Scientist Research Pathway is intended for M.D., Ph.D. applicants aspiring to a physician-scientist career. The track is recognized by the American Board of Pathology, offers flexible training in any of our residency tracks, and includes one dedicated funded year of research in addition to the clinical training, with additional research years if grant funding is obtained. The pathway offers flexibility and is tailored to meet the individual physician-scientist’s career goals and to enable them to apply for NIH funding.

The department has an active Pathology Research Interest Mentoring Program (PRIMP) that provides mentorship and career guidance. This group holds monthly meetings attended by faculty members from the clinical and experimental divisions, residents, post-doctoral fellows, student researchers, and others. Topics discussed include career pathways, research-in progress, and grant applications.
FELLOWSHIP PROGRAMS

General Information
The Department of Pathology at the University of Utah School of Medicine offers a wide range of fellowships in anatomic, clinical, pediatric, and genetic pathology for both M.D. and Ph.D. candidates.

With a faculty of over 120 committed academic and clinical practitioners at multiple facilities, our fellowships provide exposure to and experience in a full complement of pathology cases and medical problems, as well as eminent basic science and clinical research.

Requirements
Requirements and application for each fellowship vary. Please refer to the Summary of Fellowships at right as well as the specific page dedicated to that fellowship.

J-1 Visa
The J-1 visa is the required visa for international trainees. This policy is governed by the University of Utah Office of Graduate Medical Education and applies to all Department of Pathology fellowships, regardless of program accreditation or associated degree type.

Facilities
ARUP Laboratories was created in 1984 to support the academic mission of the University of Utah and is located in the 320-acre Research Park adjacent to campus. ARUP has one of the largest laboratory test menus in the United States, offering more than 3,000 tests and test combinations in clinical laboratory testing and anatomic pathology services. Fellows have the opportunity to perform research with faculty members at ARUP as well as through the ARUP Institute for Clinical and Experimental Pathology.

University Hospital is the only academic hospital in the geographically vast intermountain area, resulting in a wide variety of sophisticated medical problems available for study. The department provides pathology consultative services to many hospitals in the area.

Huntsman Cancer Institute is the only National Cancer Institute-designated cancer center in the Intermountain West. The Institute is a nonprofit research and treatment center that combines research, education, and patient care programs and facilities, including the Huntsman Cancer Hospital.

Primary Children’s Hospital is owned and operated by Intermountain Healthcare, a charitable, community-owned, nonprofit health care organization based in Salt Lake City. PCH serves the needs of children in the states of Utah, Idaho, Wyoming, Nevada and Montana. The hospital is equipped to treat children with complex illness and injury and is recognized as one of the top children’s hospitals in the United States.

Clinical Immunology and Medical Microbiology fellows may also rotate to the Utah Public Health Laboratories where the Bureau of Microbiology helps the state and local health departments investigate outbreaks, test for infectious diseases, and identify agents that could be used as biological weapons.

Stipends/Benefits
Stipends vary between $61,061 for PGY-1 and $77,209 for PGY-7 for the 2020–21 academic year, depending on level of training. Benefits include three weeks paid vacation, a book/travel fund, and a choice of insurance plans.
unparalleled resource for trainees who wish to develop academic careers. Over 300 novel diagnostic tests have been developed at ARUP including multiplexed immunoassays for antibodies to pneumococcal capsular polysaccharides; rapid pregnancy screening tests for Down's Syndrome and Fragile X syndrome; and high resolution melting amplicon analysis for c-Kit, PDGFR, and EGFR mutations in tumors. In addition, faculty at ARUP Laboratories have developed cutting edge technologies, such as the LightCycler® Systems for Real-Time PCR, and have been involved in identifying genes and developing assays for BRCA1, Friedreich ataxia, Chediak-Higashi syndrome, hereditary hemorrhagic telangiectasia, and other genetic traits. It is not unusual for trainees’ research projects to spur implementation of new tests at ARUP, which can have an immediate clinical impact nationwide.

<table>
<thead>
<tr>
<th>FELLOWSHIP</th>
<th>Degree</th>
<th>Accred.</th>
<th>Boards</th>
<th>Positions</th>
<th>Duration</th>
<th>See page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Clinical Chemistry</td>
<td>Ph.D.</td>
<td>ComACC</td>
<td>ABCC</td>
<td>4</td>
<td>2 yrs</td>
<td>p8</td>
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<tr>
<td>Clinical Immunology</td>
<td>Ph.D.</td>
<td>ComACC/CPEP</td>
<td>ABCC</td>
<td>2</td>
<td>3 yrs</td>
<td>p9</td>
</tr>
<tr>
<td>Cytopathology</td>
<td>M.D.</td>
<td>ACGME</td>
<td>ABP</td>
<td>2</td>
<td>1 yr</td>
<td>p10</td>
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<tr>
<td>Forensic Pathology</td>
<td>M.D.</td>
<td>ACGME</td>
<td>ABP</td>
<td>3</td>
<td>1 yr</td>
<td>inside back cover</td>
</tr>
<tr>
<td>GI Pathology</td>
<td>M.D.</td>
<td>—</td>
<td>—</td>
<td>2</td>
<td>1 yr</td>
<td>p11</td>
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<tr>
<td>Hematopathology</td>
<td>M.D.</td>
<td>ACGME</td>
<td>ABP</td>
<td>3</td>
<td>1 yr</td>
<td>p12</td>
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<tr>
<td>Medical Microbiology</td>
<td>M.D.</td>
<td>ACGME</td>
<td>ABP</td>
<td>2</td>
<td>1-2 yrs</td>
<td>p13</td>
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<tr>
<td></td>
<td>Ph.D.</td>
<td>CPEP</td>
<td>ABMM</td>
<td>2</td>
<td>1-2 yrs</td>
<td>p13</td>
</tr>
<tr>
<td>Molecular Genetic Pathology</td>
<td>M.D.</td>
<td>ACGME</td>
<td>ABP/ABMGG</td>
<td>2</td>
<td>1-2 yrs</td>
<td>p14</td>
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<tr>
<td>Neuropathology</td>
<td>M.D.</td>
<td>ACGME</td>
<td>ABP</td>
<td>2</td>
<td>2 yrs</td>
<td>p15</td>
</tr>
<tr>
<td>Pediatric Pathology</td>
<td>M.D.</td>
<td>ACGME</td>
<td>ABP</td>
<td>1</td>
<td>1 yr</td>
<td>p16</td>
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<tr>
<td>Surgical Pathology</td>
<td>M.D.</td>
<td>—</td>
<td>—</td>
<td>3</td>
<td>1 yr</td>
<td>p17</td>
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<table>
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<tr>
<th>GENETICS FELLOWSHIPS</th>
<th>Degree</th>
<th>Accred.</th>
<th>Boards</th>
<th>Positions</th>
<th>Duration</th>
<th>See page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Medical Genetics/Genomics</td>
<td>M.D.</td>
<td>ACGME</td>
<td>ABMGG</td>
<td>2</td>
<td>2-3 yrs</td>
<td>p18</td>
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<tr>
<td>Clinical Biochemical Genetics</td>
<td>Ph.D.</td>
<td>ABMG</td>
<td>ABMGG</td>
<td>2</td>
<td>2-3 yrs</td>
<td>p19</td>
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<tr>
<td>Laboratory Genetics/Genomics</td>
<td>Ph.D.</td>
<td>ABMG</td>
<td>ABMGG</td>
<td>4</td>
<td>3 yrs</td>
<td>p20</td>
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</table>
The Department of Pathology at the University of Utah School of Medicine offers a two-year fellowship program in clinical chemistry. The program has four positions. This fellowship provides broad experience in clinical chemistry for pathologists and scientists with appropriate prior training. The program encompasses preparation in clinical service, laboratory administration, research and teaching. Fellows rotate through clinical laboratories at ARUP Laboratories, University of Utah Health, and Primary Children’s Hospital. The goal of the program is to prepare individuals for a career in academic laboratory medicine, clinical practice, or industry.

The first year includes rotations through the various laboratories, didactic courses and lectures, participation in medical rounds, case conferences, seminars, administrative meetings, clinical skills training, and research. Fellows are expected to begin one or more research projects in the first year and to engage in research throughout their training. Fellows in their second year participate in elective laboratory rotations and may assume responsibility as an acting assistant medical director for a laboratory at ARUP Laboratories.

The program is accredited by the Commission on Accreditation in Clinical Chemistry (ComACC). This training program satisfies the requirements for the American Board of Clinical Chemistry examination in Clinical Chemistry.

Requirements

Applicants must hold an M.D. or Ph.D. or other doctoral degree in chemistry, biochemistry, medicine, or a closely related field from an accredited institution. Applicants must have satisfactorily completed a minimum of 30 semester hours in undergraduate and/or graduate level chemistry or biochemistry instruction prior to admission into the program.
Clinical Immunology

The Department of Pathology at the University of Utah School of Medicine offers clinical (medical laboratory) immunology training accredited by the American College of Microbiology Committee on Postgraduate Educational Programs (CPEP). The program has two positions.

Fellows in the program rotate through ARUP Laboratories, the Histocompatibility and Immunogenetics Laboratory at University of Utah Health, and the Public Health Laboratory at the Utah Department of Public Health (UDPH). The rotations at ARUP cover training in all areas of clinical diagnostic immunology as outlined in the CPEP essentials for immunology training. Fellows also participate in research activities with the faculty and staff in the Department of Pathology and the ARUP Institute for Clinical and Experimental Pathology.

This fellowship offers two tracks—a two-year fellowship in clinical immunology training, and a three-year fellowship in clinical immunology with an emphasis on histocompatibility and immunogenetics testing in the last two years of training. CPEP accreditation is limited to the two years of immunology training.

Requirements

Prerequisite for admission includes a Ph.D. in immunology or related degree with at least one year of postdoctoral training in immunology, or a medical degree (M.D.) or equivalent with residency in internal medicine, pediatrics, or at least two years of research experience in immunology. The histocompatibility and immunogenetics training will be performed according to the American Society for Histocompatibility and Immunogenetics (ASHI) Director Training Program guidelines with the possibility of taking the American Board of Histocompatibility and Immunogenetics (ABHI) examination and obtaining accreditation as an ASHI-approved laboratory director. Applicants for this track must fulfill all requirements defined by the Accreditation Review Board and the Directors Training Review and Credentialing Committee of ASHI.

Provides broad experience and comprehensive exposure to clinical and diagnostic immunology.
Cytopathology

The Department of Pathology at the University of Utah School of Medicine offers an ACGME-accredited one-year fellowship program in cytopathology. The program is approved for two positions.

Experience is provided at the University of Utah Hospital, Huntsman Cancer Institute, Primary Children’s Hospital, and ARUP Laboratories. Diagnostic material covers the spectrum of cytopathology practice and includes utilization of specialized, ancillary tests. We see cases from around the country due to our alliance with ARUP Laboratories. Over 40,000 cytology specimens are processed each year, approximately three-quarters Gyn, one-quarter Non-Gyn. A fellow can expect to perform at least 50 palpable FNA procedures over the course of the training year.

The fellow participates in all aspects of the service and is given progressive responsibilities. Emphasis is placed on the performance and interpretation of FNA biopsies. The fellow has the opportunity to work with an endocrinologist to gain experience performing ultrasound-guided thyroid FNAs. Diagnostic and research facilities are available in molecular biology, immunohistochemistry, immunofluorescence (FISH), and flow cytometry. The Cytopathology Division has an active clinical UroVision FISH testing laboratory. Training time is dedicated to specimen preparation, laboratory management, automated cytology, quality control, and regulatory issues. The fellow participates in a variety of educational activities including involvement in interdisciplinary clinical conferences and journal club.

This training program satisfies the requirements for the American Board of Pathology examination in Cytopathology.

Requirements

Applicants must hold an M.D. degree, D.O. degree (or foreign equivalent with ECFMG certification), be board eligible or board certified in anatomic pathology, and be eligible for a Utah state medical license.

Diagnostic material covers the spectrum of cytopathology practice and includes utilization of specialized, ancillary tests.
Provides in-depth exposure to the full spectrum of GI, hepatic and pancreaticobiliary pathology.
Hematopathology

The Department of Pathology at the University of Utah School of Medicine offers an ACGME-accredited one-year fellowship program in hematopathology. The program is approved for three positions.

This fellowship provides a breadth of training opportunities. Graduates of our program are well-prepared for a variety of practice settings. Trainees participate in several services including a busy national consultation service, lymph node and bone marrow services from our large academic medical center and renowned NCCN cancer center, and see a variety of pediatric cases from our affiliated children’s hospital.

Rotations include flow cytometry, coagulation, hemoglobinopathy and molecular pathology (NGS and non-NGS) in a large reference laboratory setting. Working in the ARUP reference laboratory provides exposure to new technologies as well as ample opportunities to hone laboratory management skills.

Fellows have close interaction with other departments in multidisciplinary conferences and other collaborations including a molecular tumor board.

This training program satisfies the requirements for the American Board of Pathology examination in Hematology.

**Requirements**

Applicants must hold an M.D. degree (or foreign equivalent with ECFMG certification), be board eligible or board certified in anatomic and clinical pathology, and be eligible for a Utah state medical license.

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**Provides a breadth of training opportunities. Graduates of our program are well-prepared for a variety of practice settings.**
Medical Microbiology

The Department of Pathology at the University of Utah School of Medicine offers two Medical Microbiology Fellowship training programs, an ACGME-accredited program (two positions), and a CPEP-accredited program (two positions).

During the one- to two-year program, the trainee gains hands-on experience in bacteriology, mycobacteriology, mycology, parasitology, virology, molecular microbiology, and serology through a series of structured bench rotations and independent research.

The trainee also acquires administrative experience through participation in laboratory management and hospital committee meetings. Fellows are selected for their potential as future directors of academic diagnostic microbiology laboratories and leaders in public health.

Fellows completing the program are expected to apply for subspecialty certification in Medical Microbiology by examinations by the American Board of Pathology (ABP) or the American Board of Medical Microbiology (ABMM).

Requirements

Applicants for the ACGME-accredited program must hold an M.D. degree (or foreign equivalent with ECFMG certification), be board eligible or board certified in anatomic and clinical pathology, or have completed one year of clinical infectious diseases training after board certification in internal medicine, pediatrics, or both. Applicants must be eligible for a Utah state medical license.

Applicants for the CPEP-accredited program must have earned a doctoral degree (Ph.D., M.D., D.O., Sc.D., Dr.P.H., D.V.M.) with graduate education in microbiology or molecular biology to qualify for admission to the training program.

Trainees gain hands-on experience in bacteriology, mycobacteriology, mycology, parasitology, virology, molecular microbiology, and serology.
The Department of Pathology at the University of Utah School of Medicine offers an ACGME-accredited, one-year fellowship program in molecular genetic pathology. A second-year option can be considered for individuals interested in pursuing a research-focused academic career. The program is approved for two positions.

This fellowship provides comprehensive training in molecular testing for human genetics, infectious diseases, hematopathology, oncology, pharmacogenetics, and molecular immunology.

Training includes didactic lectures in molecular pathology, rotations through a variety of active clinical laboratories performing molecular testing, and active consultation on clinical problems related to these tests and clinical research. A large variety and volume of molecular assays are received from University of Utah Health and the Associated Regional and University Pathologists (ARUP Laboratories) reference testing network. A broad range of types of molecular testing is performed ranging from traditional PCR-based assays to next generation sequencing based assays including multi-gene panels for inherited disorders and oncology diagnostics, and exome sequencing for inherited disorders.

Opportunities for gaining competence in clinical/pathological correlation for a variety of molecular assays are abundant. Active development of new molecular assays is ongoing, incorporating a broad range of traditional and cutting-edge technologies. Fellows are expected to participate in projects of basic assay development and validation. Exposure to laboratory management is provided.

This training program satisfies the requirements for the American Board of Pathology and American Board of Medical Genetics and Genomics examinations in Molecular Genetic Pathology.

**Requirements**

Applicants must hold an M.D. degree (or foreign equivalent with ECFMG certification), be board eligible or board certified in anatomic, clinical, or anatomic/clinical pathology, and be eligible for a Utah state medical license. Prior experience in molecular biology or genetics is preferred.

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**Application**

Please complete the application form found online and send with the required documents to:

Karl V. Voelkerding, M.D.
ARUP Laboratories
Dept. of Medical Directors
500 Chipeta Way - MS 115
Salt Lake City, UT 84108
voelkek@aruplab.com
(801) 583-2787 ext. 2190

Mishka Foster
Fellowship Coordinator
mishka.foster@aruplab.com
(801) 583-2787 ext. 4505
fax (801) 584-5207

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**Faculty**

Pinar Bayrak-Toydemir, M.D., Ph.D.
Philip S. Bernard, M.D.
Georgios Deftereos, M.D.
Allie H. Grossmann, M.D., Ph.D.
David R. Hillyard, M.D.
Rong Mao, M.D.
Anna P. Matynia, M.D.
Marzia Pasquali, Ph.D.
Reha M. Toydemir, M.D., Ph.D.
Karl V. Voelkerding, M.D.

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**Provides comprehensive training in molecular testing for human genetics, infectious diseases, hematopathology, oncology, pharmacogenetics and molecular immunology.**
The Department of Pathology at the University of Utah School of Medicine offers an ACGME-accredited two-year fellowship program in Neuropathology. The program is approved for two positions with one position available on an annual basis.

Experience is provided at the University of Utah Hospital, Huntsman Cancer Institute, Primary Children’s Hospital, and the Office of the Medical Examiner.

This fellowship is designed to give fellows a broad experience in diagnostic neuropathology with an emphasis on surgical neuropathology, but also with exposure to autopsy, forensic and neuromuscular neuropathology. A diverse patient population, as well as an active consultation service provides adequate volumes of material.

The overall goal of the fellowship is to provide in-depth exposure to neuropathology with our faculty, Dr. Christian Davidson (Fellowship Director), Dr. Cheryl Palmer (Director of Neuropathology), Dr. Nick Mamalis (Faculty in Ophthalmology), and Dr. Andrew Guajardo.

This training program satisfies the requirements for the American Board of Pathology examination in Neuropathology.

**Requirements**

Applicants must hold an M.D. degree, D.O. degree (or foreign equivalent with ECFMG certification), be board eligible or board certified in anatomic pathology, and be eligible for a Utah state medical license.

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**Application**

Interested candidates should submit cover letter with personal statement, curriculum vitae, CAP Standardized Fellowship Application, and three letters of recommendation (one of which should be from current/most recent program director) to Fellowship Coordinator Ashleigh Mckensie.

Christian J. Davidson, M.D.
Huntsman Cancer Institute
2000 Circle of Hope, Rm 3100
Salt Lake City, UT 84112
christian.davidson@path.utah.edu

Ashleigh Mckensie
Fellowship Coordinator
ashleigh.mckensie@path.utah.edu
(801) 587-4563
fax (801) 581-7035

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**Faculty**

Christian J. Davidson, M.D.
Andrew R. Guajardo, M.D.
Nick Mamalis, M.D.
Cheryl Ann Palmer, M.D.

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Provides broad experience in diagnostic neuropathology with an emphasis on surgical neuropathology, but also with exposure to autopsy, forensic and neuromuscular neuropathology.
Pediatric Pathology

The Department of Pathology at the University of Utah School of Medicine offers an ACGME-accredited one-year fellowship program in pediatric pathology. The program is approved for one position.

This fellowship offers extensive experience in pediatric anatomic and clinical pathology at Primary Children’s Hospital, ARUP Laboratories, and University of Utah Health.

Approximately 5,000 pediatric surgical pathology specimens, 120 perinatal and pediatric autopsy cases and fetal examinations, 400 placental examinations, and additional outside pediatric surgical and autopsy pathology consultations are performed at the hospitals. Exposure to both general and esoteric pediatric laboratory testing is available at Primary Children’s Hospital and ARUP Laboratories.

Active programs in pediatric hematopathology, molecular diagnostics, cytogenetics, immunopathology, pediatric clinical chemistry, pediatric transfusion medicine, and pediatric microbiology offer an additional opportunity for training. Research opportunities are available in both anatomic and clinical pathology.

This training program satisfies the requirements for the American Board of Pathology examination in Pediatric Pathology.

Requirements

Applicants must hold an M.D. degree (or foreign equivalent with ECFMG certification), be board eligible or board certified in anatomic or anatomic/clinical pathology, and be eligible for a Utah state medical license.

Application

Interested candidates should send (via email) cover letter, personal statement, curriculum vitae, CAP Standardized Fellowship Application, and three letters of recommendation (one from your current Program Director) directly from the author to Fellowship Coordinator Krista Spilker.

Hong Holly Zhou, M.D.
Division of Pediatric Pathology
Primary Children’s Hospital
100 North Mario Capecchi Drive
Salt Lake City, UT 84113
hongholly.zhou@imail2.org
(801) 662-2153
Krista Spilker
Fellowship Coordinator
krista.spilker@imail2.org
(801) 662-2155
fax (801) 662-2165

Offers extensive experience in pediatric anatomic and clinical pathology. Approximately 5,000 pediatric surgical pathology specimens and 120 perinatal and pediatric autopsy cases and fetal examinations are performed at the hospitals.
We have a great variety of interesting and challenging general surgical pathology cases on a daily basis, including breast, gynecologic, gastrointestinal, genitourinary, pulmonary, head and neck, skin, and soft tissue/bone pathology.
The Department of Pediatrics’ Division of Medical Genetics in collaboration with the Department of Pathology and ARUP Laboratories offers an ACGME-accredited two-year fellowship (with the possibility of an extra year of research) in medical genetics. The program is approved for two positions.

Fellows spend two years in clinical rotations, including training in the general outpatient genetics clinics, inpatient consultations, and subspecialty and laboratory rotations. Opportunities exist for exposure within a subspecialty practice including craniofacial, cardiology and neurology-based settings. Fellows will have significant experience with the evaluation and treatment of inborn errors of metabolism and biochemical laboratories.

Areas of expertise among the faculty include neurofibromatosis, hereditary hearing loss, cardiovascular malformation, skeletal dysplasia, birth defects, epidemiology, developmental biology, dysmorphology, lysosomal storage disorders and X-linked mental retardation syndromes. The experience of this program is enriched by the great diversity of presentations and conscientious efforts the faculty take in mentoring trainees in medical genetics.

This training program satisfies the requirements for the American Board of Medical Genetics and Genomics examination in Medical Genetics.

Requirements

Applicants must hold an M.D. or D.O. degree (or foreign equivalent with ECFMG certification) and be eligible for a Utah state medical license. International applicants must be eligible to obtain a J-1 visa. Applicants must have completed one year of an ACGME-accredited residency (or international equivalent) before entering this program.

Fellows spend two years in clinical rotations. Opportunities exist for exposure within a subspecialty practice including craniofacial, cardiology, and neurology-based settings.
Clinical Biochemical Genetics

The Department of Pediatrics’ Division of Medical Genetics in collaboration with the Department of Pathology and ARUP Laboratories offers a two-year fellowship program (with the possibility of an additional year of research) in clinical biochemical genetics. This fellowship provides training in laboratory testing for the diagnosis and follow-up of patients with inherited metabolic disorders. The program has two positions.

Physicians and Ph.D. scientist fellows participate in the testing conducted by the Biochemical Genetics and Newborn Screening laboratories of ARUP Laboratories, learning chromatographic and mass-spectrometry techniques. Fellows rotate in clinical and laboratory departments to become familiar with medical genetics and inborn errors of metabolism.

Research is directed toward the elucidation of the molecular bases/pathophysiology of inborn errors of metabolism and the development of new diagnostic tests for metabolic disorders. Fellows will be responsible for monthly presentations to enhance their teaching skills and encourage publication of highly interesting cases. Fellows assume progressive independence in conducting and interpreting biochemical laboratory tests in the course of training and need to maintain a logbook of cases for certification.

This training program satisfies the requirements for the American Board of Medical Genetics and Genomics examination in Clinical Biochemical Genetics.

Requirements

Applicants must hold an M.D. or Ph.D. or other doctoral degree in genetics, biochemistry, chemistry or closely related field from an accredited institution. Previous clinical laboratory experience or a postdoctoral fellowship in genetics or training in medical genetics (for physicians) is highly recommended. Individuals with an M.D. or Ph.D. earned outside of the United States or Canada must have their degree reviewed by the ABMGG Credentials Committee prior to entering this training program.

Application

Application should be made by September 15 for positions beginning in July. Address inquiries to:

Marzia Pasquali, Ph.D.
ARUP Laboratories
Dept. of Medical Directors
500 Chipeta Way - MS 115
Salt Lake City, UT 84108
pasquam@aruplab.com

Kelli Gard
Fellowship Coordinator
kelli.gard@aruplab.com
(801) 583-2787 ext. 2506
fax (801) 584-5207

Facility

D. Hunter Best, Ph.D.
Lorenzo D. Botto, M.D.
John C. Carey, M.D., M.P.H.
Irene De Biase, M.D., Ph.D.
Nicola Longo, M.D., Ph.D.
Rong Mao, M.D.
Marzia Pasquali, Ph.D.
Reha M. Toydemir, M.D., Ph.D.
David H. Viskochil, M.D., Ph.D.
Tatiana N. Yuzyuk, Ph.D.

Provides training in laboratory testing for the diagnosis and follow-up of patients with inherited metabolic disorders.
The Department of Pediatrics’ Division of Medical Genetics in collaboration with the Department of Pathology and ARUP Laboratories offers a three-year fellowship in laboratory genetics and genomics. The program has four positions.

Specialized training is provided in all aspects of sample preparation, analyses and reporting of various types of samples, with a focus on detection and interpretation of chromosomal abnormalities in the Clinical Cytogenetics laboratory, and testing for mutations in human disease in the Clinical Molecular Genetics laboratory.

Fellows participate in clinical test validations and also take part in the ongoing development of new assays and assay improvements, incorporating a broad range of traditional and cutting-edge technologies. Didactic lectures, rotations through other non-specialty laboratories, and participation in biochemical and medical genetics clinics are also included in this training.

Fellows have the opportunity to develop a research project based on the ongoing research and development activities within the laboratories, which are translational in scope and likely involve collaborations within the Divisions of Medical Genetics, Pathology and ARUP Laboratories.

This training program satisfies the requirements for the American Board of Medical Genetics and Genomics examination in Laboratory Genetics and Genomics.

Requirements

Applicants must hold an M.D. or Ph.D. (or equivalent); the Ph.D. degree must be in genetics, molecular biology, or a related field within the biological sciences. Individuals with an M.D. or Ph.D. earned outside of the United States or Canada must have their degree reviewed by the ABMGG Credentials Committee prior to entering this training program.

Integrates clinical cytogenetics and clinical molecular genetics to prepare those who wish to specialize in these areas as a laboratory director or co-director.
Application
Interested candidates should submit cover letter with personal statement, curriculum vitae, CAP Standardized Fellowship Application, and three letters of recommendation (one of which should be from current/most recent program director) to Fellowship Coordinator Anna Bond.
J. Brent Davis, M.D. Utah Office of the Medical Examiner 4451 South 2700 West Taylorsville, UT 84129 brentdavis@utah.gov Anna Bond Fellowship Coordinator abond@utah.gov (801) 816-3650 fax (801) 964-1240

Faculty
Michael Belenky, M.D.
Erik D. Christensen, M.D.
J. Brent Davis, M.D.
Andrew R. Guajardo, M.D.
Jamie E. Kallan, M.D.
Kacy Krezbiel, M.D.
Jason Lozano, M.D.
Zachary D. Michalicek, D.O.
Pamela S. Ulmer, D.O.

Forensic Pathology
The Department of Pathology at the University of Utah offers an ACGME-accredited, one-year fellowship program in forensic pathology. The program is approved for three positions.

Training will be at the Utah Office of the Medical Examiner with additional exposure to forensic toxicology at the Utah State Laboratory and criminology at the Utah State Crime Lab. All three facilities are located in adjacent buildings at the Utah public health campus.

The Utah Medical Examiner Office is a statewide office serving a population of over 3 million, providing exposure to a jurisdictional caseload of greater than 3,000 death investigations per year.

The fellow will be trained in all facets of death investigation including initial death scene response, written and photographic documentation, external and internal examination of the body, evidence collection, death certification, preparation of a forensic autopsy report and testimony in court on necessary cases. Interaction with law enforcement, attorneys, organ and tissue donor agencies, child fatality and domestic violence committees as well as families is integrated into the training.

The structured learning environment will include regular case reviews, lectures, and journal club as well as giving presentations to law enforcement, health professionals and the general public.

The fellow will assist in the education of medical students and pathology residents that do elective rotations through the office.

This training program satisfies the requirements for the American Board of Pathology examination in Forensic Pathology.

Requirements
Applicants must hold an M.D. degree (or foreign equivalent with ECFMG certification), be board eligible or board certified in anatomic or anatomic/clinical pathology, and be eligible for a Utah state medical license.

Fellows will be trained in all facets of death investigation.

J. Brent Davis, M.D
Fellowship Director
Welcome to Utah

The state of Utah is a diverse cultural setting, offering a dynamic blend of history and progress. Salt Lake City, bounded on the west by the Great Salt Lake and on the east by the sharply rising Wasatch Mountains, is one of North America’s most beautiful cities. Host to the 2002 Olympic games, this vigorous cosmopolitan center blends the virtues of a small town with the advantages of a large city.

Utah offers a variety of cultural opportunities and is home to the nationally recognized Utah Symphony, Utah Opera, and Ballet West. Annually, Utah offers the Sundance Film Festival in Park City and the Utah Shakespeare Festival in Cedar City.

Major sporting events are provided on both college and professional levels. The University of Utah Utes football team capped a spectacular season becoming the 2009 BCS Sugar Bowl Champions. The NBA’s Utah Jazz, Real Salt Lake soccer, Salt Lake Bees baseball, and Utah Grizzlies hockey teams provide sports entertainment year round.

Perhaps most famous for its spectacular scenery and outdoor recreation, Utah is home to five national parks. Northern Utah boasts “The Greatest Snow on Earth,” beckoning skiers to world-class ski resorts just minutes from downtown Salt Lake City. Activities such as kayaking, whitewater rafting, fishing, hiking and mountain biking are readily available. Salt Lake City sits at an elevation of 4,300 feet and enjoys four distinct seasons.

The University of Utah is a proud member of the Pac-12 Conference.

medicine.utah.edu/pathology/residency
medicine.utah.edu/pathology/fellowships