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 13 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 the University of Utah Health Sciences Center and our national reference laboratory, ARUP, located in the foothills of the beautiful Wasatch mountain range. Research is encouraged and actively supported for all 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 fellowship training at the University of Utah.

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

General Information

The Department of Pathology at the University of Utah offers training in combined Anatomic Pathology and Clinical Pathology, Clinical Pathology only, and Anatomic Pathology only 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 in both Anatomic and Clinical Pathology.

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 90 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.

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 100-bed Huntsman Cancer Hospital.

Primary Children’s Medical Center 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.

Veterans Affairs Medical Center is one of nine regional referral centers for the Veterans Administration Health System, drawing patients from five 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.

Curriculum

The four-year AP/CP residency program includes 24 months of required anatomic pathology rotations and 17 months of required clinical pathology rotations, leaving 7 months for elective rotations and research.

Electives available in anatomic pathology include dermatopathology, renal pathology, surgical pathology, sarcoma pathology, frozen section pathology, and lymph node pathology. Electives in clinical pathology include molecular oncology, molecular genetics, H&I lab, and toxicology/pharmacogenomics. Rotations may be repeated for more graduated responsibility.

Research

Many research opportunities are available covering a wide range of areas from basic science to preclinical to clinical research. Though not required, all residents are encouraged to pursue research projects as part of their training. Trainees with an interest in research will find enthusiastic support from the faculty, including help in identifying research mentors. Residents may also choose to do research elective rotations, allowing them to have an extensive research experience in more diverse areas of research.
Away Rotations

The residency program allows residents to do away rotations with approval from the Program Director, to help them make informed decisions regarding subspecialty fellowship training and work preferences.

Residents who wish to do an away rotation may also apply to have their housing expenses paid provided they fulfill the requirements set forth by the Program Director. Also, residents who choose to do a rural pathology experience in Utah may apply for an elective rotation in a rural community hospital in Price, Utah.

Assistant Medical Directorships

Residents are encouraged to act as assistant medical directors in an ARUP lab of their interest as a moonlighting activity. Although available directorships vary from year to year, some examples are Transfusion Services, Automated Core Lab, Infectious Diseases Lab, Anatomic Pathology, Hematologic Flow Cytometry, Informatics, and Cellular and Innate Immunity Laboratory.

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

The residency program believes these activities give the residents invaluable experience in laboratory management.

Stipends/Benefits

Stipends vary between $53,617 for PGY-1 and $60,423 for PGY-4 for the 2015–16 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.
Morning Conference
The residents have morning conference every day from 8:00 to 9:00 am.

<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>ARUP Clinical Pathology. The pathology resident on the ARUP Clinical Chemistry rotation, along with the Clinical Chemistry Fellows, present Clinical Pathology conference on Mondays. Clinical pathology staff from ARUP Laboratories, University Hospital and Primary Children’s Medical Center attend.</td>
</tr>
<tr>
<td><strong>Tuesday</strong></td>
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<tr>
<td>1st Tuesday of the month—Pediatric Pathology.</td>
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<tr>
<td>2nd Tuesday of the month—Alternates between Infectious Disease and Hematopathology.</td>
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<tr>
<td>3rd Tuesday of the month—Alternates between Autopsy and Gross Specimen Review.</td>
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<tr>
<td>4th Tuesday of the month—Transfusion.</td>
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<tr>
<td><strong>Wednesday</strong></td>
</tr>
<tr>
<td>1st and 3rd Wednesday of the month—Surgical Pathology Unknown.</td>
</tr>
<tr>
<td>4th Wednesday of the month—Cytopathology.</td>
</tr>
<tr>
<td><strong>Thursday</strong></td>
</tr>
<tr>
<td>Rosai Slide Series. This conference is given by a pathologist who has a corresponding expertise in the topic being covered. This conference follows the Rosai reading schedule and it takes 2 years to complete the schedule.</td>
</tr>
<tr>
<td><strong>Friday</strong></td>
</tr>
<tr>
<td>RCW (Resident Cases of the Week) alternates with Surgical Specialty Unknown Conferences.</td>
</tr>
</tbody>
</table>

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 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 St. Luke’s, University of Washington, University of Chicago, University of Western Ontario and St. Jude Medical Center. Some former residents also work locally in the Salt Lake City area at the University of Utah and ARUP Laboratories, or in private practice.
Research

Many research opportunities are available covering a wide range of areas from basic science to preclinical to clinical research. Though not required, all residents are encouraged to pursue research projects as part of their training. Trainees with an interest in research will find enthusiastic support from the faculty, including help in identifying research mentors. Many 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 an extensive research experience in more diverse areas of research. Current CP-only and AP-only residents are incorporating intensive research training during extended elective rotations into their curriculum.

Residents specifically interested in an academic career in pathology focused on basic or translational research will find many opportunities for career development at the University of Utah. Abundant opportunities for pathology studies and development projects exist in all anatomic, clinical, and experimental areas of the department. In addition, residents are welcome to develop collaborations with faculty in any clinical or basic science department at the University of Utah. Pathology residents have developed collaborations 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.

With ARUP Laboratories, an established national reference laboratory affiliated with the Department of Pathology, the University of Utah is unique as a leader in translational pathology research. In addition to substantial departmental external grant funding, ARUP Laboratories and the ARUP Institute for Clinical and Experimental Pathology® spend over 8 million dollars annually on translational pathology research and development. This is an unparalleled resource for residents 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 resident research projects to spur implementation of new tests at ARUP, which can have an immediate clinical impact nationwide.

Lunch meetings are held each year with the residency research director to discuss specific research opportunities available in the department. Residents are urged to submit their research for presentation at national meetings and prepare projects for publication in peer reviewed medical journals. Residents are given travel support to present abstracts at national meetings. Supplies for research are usually provided by resident’s research mentor. Residents often apply for additional research funds for more extensive projects through the department chair and the ARUP Institute for Clinical and Experimental Pathology®.

The Pathology Department sponsors resident research pathology grand rounds once a year at the University of Utah School of Medicine, in which residents present their research projects. An award of $400 is given for first place and an award of $100 is given for second place at the graduation dinner to the best research presentation given by a pathology resident.
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 90 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 2,000 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 50-bed Huntsman Cancer Hospital.

Primary Children’s Medical Center is owned and operated by Intermountain Healthcare, a charitable, community-owned, nonprofit health care organization based in Salt Lake City. PCMC 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 $52,055 for PGY-1 and $64,417 for PGY-7 for the 2014–15 academic year, depending on level of training. All fellows are covered by professional liability insurance. Other benefits include three weeks paid vacation, a book/travel fund, and a choice of insurance plans.

With ARUP Laboratories, an established national reference laboratory affiliated with the Department of Pathology, the University of Utah is unique as a leader in translational pathology research. In addition to substantial departmental external grant funding, ARUP Laboratories and the ARUP Institute for Clinical and Experimental Pathology spend over 8 million dollars annually on translational pathology research and development. This is an
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<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>
</tr>
<tr>
<td>Cytopathology</td>
<td>M.D.</td>
<td>ACGME</td>
<td>ABP</td>
<td>2</td>
<td>1 yr</td>
<td>p9</td>
</tr>
<tr>
<td>GI Pathology</td>
<td>M.D.</td>
<td>—</td>
<td>—</td>
<td>1</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>1-2 yrs</td>
<td>p12</td>
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<tr>
<td>Clinical Immunology</td>
<td>Ph.D.</td>
<td>CPEP</td>
<td>ABMLI</td>
<td>2</td>
<td>2 yrs</td>
<td>p13</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>p14</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></td>
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<tr>
<td>Molecular Genetic Pathology</td>
<td>M.D.</td>
<td>ACGME</td>
<td>ABP/ABMG</td>
<td>2</td>
<td>1-2 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>
</tr>
<tr>
<td>Surgical Pathology</td>
<td>M.D.</td>
<td>—</td>
<td>—</td>
<td>2</td>
<td>1 yr</td>
<td>p17</td>
</tr>
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**GENETICS FELLOWSHIPS**

<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>Medical Genetics</td>
<td>M.D.</td>
<td>ACGME</td>
<td>ABMG</td>
<td>2</td>
<td>2-3 yrs</td>
<td>p18</td>
</tr>
<tr>
<td>Clinical Biochemical Genetics</td>
<td>Ph.D.</td>
<td>ABMG</td>
<td>ABMG</td>
<td>2</td>
<td>2-3 yrs</td>
<td>p19</td>
</tr>
<tr>
<td>Clinical Cytogenetics</td>
<td>Ph.D.</td>
<td>ABMG</td>
<td>ABMG</td>
<td>2</td>
<td>2 yrs</td>
<td>p20</td>
</tr>
<tr>
<td>Clinical Molecular Genetics</td>
<td>Ph.D.</td>
<td>ABMG</td>
<td>ABMG</td>
<td>2</td>
<td>2-3 yrs</td>
<td>p21</td>
</tr>
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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, the University of Utah Health Sciences Center, and Primary Children’s Medical Center. 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.

Provides broad experience in clinical chemistry to prepare individuals for a career in academic laboratory medicine, clinical practice, or industry.
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 Hospital and ARUP Laboratories.

Diagnostic material covers the spectrum of cytopathology practice and includes utilization of specialized, ancillary tests. 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.

Diagnostic and research facilities are available in molecular biology, immunohistochemistry, immunofluorescence (FISH), and flow cytometry. The Cytopathology Division has an active, clinical 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.

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.

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Diagnostic material covers the spectrum of cytopathology practice and includes utilization of specialized, ancillary tests.
GI Pathology

The Department of Pathology at the University of Utah School of Medicine offers a one-year fellowship program in GI, hepatic and pancreaticobiliary pathology. The program has one position.

This fellowship is designed to give the fellow experience at the junior faculty level, including progressive sign-out privileges for qualified fellows. Fellows have the opportunity to learn about the range of diseases within this subspecialty, including Barrett’s esophagus, idiopathic inflammatory bowel disease, cancer and precancerous conditions, mesenchymal and hematolymphoid lesions, motility disorders, and hepatic and pancreatic medical, neoplastic and transplantation pathology. Our program offers in-depth training in molecular diagnosis, an ever expanding and critical component of GI and all pathology.

Responsibilities include diagnostic sign-out, including histologic review and reporting of all consultation material, and in conjunction with residents, the in-house GI, hepatic and pancreaticobiliary biopsy and resection material. Gross room supervision of residents and pathology assistants, and conference presentations in this subspecialty area is a requirement and occurs in conjunction with attending supervision. A well-defined and supervised clinical, translational, or basic research project is also required.

The overall goal of the fellowship is to provide in-depth exposure to the full spectrum of GI, hepatic and pancreaticobiliary pathology with our faculty, Dr. Mary Bronner (Fellowship Director and Division Chief of Anatomic Pathology), Dr. Wade Samowitz (Director of GI Pathology and Molecular Oncology), Dr. Xinjian Chen (Faculty), and Dr. Erinn Downs-Kelly (Faculty).

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.

Provides in-depth exposure to the full spectrum of GI, hepatic and pancreaticobiliary pathology.
The Department of Pathology at the University of Utah School of Medicine offers an ACGME-accredited one- or two-year fellowship program in hematopathology. The program is approved for three positions.

This fellowship is designed to meet the needs of the successful candidate and offers broad experience in both diagnostic and experimental hematopathology.

Liquid hematology, bone marrow aspirate and biopsy examination, lymph node pathology, immunohistochemistry, flow cytometry and molecular pathology are all emphasized during the fellowship training.

Through an active consultation service, an affiliated national reference laboratory, and study cases from Children’s Cancer Group and Southwestern Oncology Group, the hematopathology section processes approximately 4,500 tissue cases per year.

Additional rotations are offered in coagulation, hemoglobin analysis, flow cytometric analysis, molecular hematopathology, and laboratory management. The fellow is encouraged to be involved with research projects and to participate in teaching.

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.

**Application**

Interested candidates should submit cover letter with personal statement, curriculum vitae, CAP Standardized Fellowship Application, and three letters of recommendation to Fellowship Director Mohamed E. Salama, M.D., or Fellowship Coordinator Leita Rogers.

Mohamed E. Salama, M.D.
ARUP Laboratories
Dept. of Medical Directors
500 Chipeta Way - MS 115-604
Salt Lake City, UT 84108
mohamed.salama@path.utah.edu
(801) 581-5854

Leita Rogers
Fellowship Coordinator
leita.rogers@aruplab.com
(801) 581-2034
fax (801) 585-3831

**Faculty**

Archana M. Agarwal, M.D.
David W. Bahler, M.D., Ph.D.
Jerry W. Hussong, M.D., D.D.S.
Todd W. Kelley, M.D.
David Li, M.D.
Rodney R. Miles, M.D., Ph.D.
Jay L. Patel, M.D.
Sherrie L. Perkins, M.D., Ph.D.
Josef T. Prchal, M.D.
George M. Rodgers, M.D., Ph.D.
Mohamed E. Salama, M.D.
Kristi J. Smock, M.D.
Ronald L. Weiss, M.D., M.B.A.

**Mohamed E. Salama, M.D.**
Fellowship Director

Offers broad experience in both diagnostic and experimental hematopathology.
Clinical Immunology

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

This fellowship covers the major areas of clinical and diagnostic immunology, including laboratory administration, teaching, and research.

Fellows rotate through clinical laboratories at ARUP Laboratories, the Histocompatibility and Immunogenetics Laboratory at the University of Utah Health Sciences Center, and the Public Health Laboratory at the Utah Department of Public Health (UDPH).

The Clinical Facilities of the Laboratory of Immunology at ARUP Laboratories include Protein, Allergy, Autoimmune Disease Serology, Microbial Serology, Cellular and Innate, Flow Cytometry, and Hepatitis and Retrovirus Serology sections.

Research facilities include the ARUP Institute for Clinical and Experimental Pathology and the University of Utah Laboratories of Drs. Marc R. Couturier, Julio Delgado, Nahla Heikal, Harry R. Hill, Attila Kumanovics, Patricia R. Slev, Anne E. Tebo, and Carl T. Wittwer.

Fellows completing the program are expected to take the certification examination in Medical Laboratory Immunology offered by the American Board of Medical Laboratory Immunology.

Requirements

Prerequisite for admission includes a Ph.D. in immunology or related degree with at least two years 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.

Individuals with an M.D. or Ph.D. earned outside of the United States or Canada must have their transcripts evaluated by an approved foreign educational evaluation agency prior to entering this training program.

Application

Interested candidates should submit cover letter with personal statement, curriculum vitae (including education, degrees, internships, residencies, etc.), completed application form, and three letters of recommendation sent directly to Fellowship Coordinator Mishka Foster. Foreign medical graduates must submit a copy of their valid ECFMG certificate.

Mishka Foster
Fellowship Coordinator
ARUP Laboratories
500 Chipeta Way - MS 115
Salt Lake City, UT 84108
mishka.foster@aruplab.com
(801) 583-2787 ext. 4505
fax (801) 584-5207

Fellows completing the program are expected to take the certification examination in Medical Laboratory Immunology offered by the American Board of Medical Laboratory Immunology.

Requirements

Prerequisite for admission includes a Ph.D. in immunology or related degree with at least two years 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.

Individuals with an M.D. or Ph.D. earned outside of the United States or Canada must have their transcripts evaluated by an approved foreign educational evaluation agency prior to entering this training program.
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 an earned doctoral degree (Ph.D., M.D., D.O., Sc.D., Dr.P.H.) with graduate education in microbiology or immunology to qualify for admission to the training program.

Trainees gain hands-on experience in bacteriology, mycobacteriology, mycology, parasitology, virology, molecular microbiology, and serology.
Molecular Genetic Pathology

The Department of Pathology at the University of Utah School of Medicine offers an ACGME-accredited one- or two-year fellowship program in molecular genetic pathology. 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 and histocompatibility.

Training includes didactic lectures in molecular pathology, rotations through a variety of active clinical laboratories performing molecular testing, active consultation on clinical problems related to these tests and clinical research. A large variety and volume of molecular assays are received from the University of Utah Health Sciences Center 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 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.

Provides comprehensive training in molecular testing for human genetics, infectious diseases, hematopathology, oncology, pharmacogenetics and molecular immunology and histocompatibility.

Application

Please complete the application form found online and send 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

Faculty

Pinar Bayrak-Toydemir, M.D., Ph.D.
Philip S. Bernard, M.D.
Julio Delgado, M.D., M.S.
Katherine B. Geiersbach, M.D.
Allie H. Grossmann, M.D., Ph.D.
David R. Hillyard, M.D.
Todd W. Kelley, M.D.
Attila Kumanovics, M.D.
Elaine Lyon, Ph.D.
Rong Mao, M.D.
Marzia Pasquali, Ph.D.
Mohamed E. Salama, M.D.
Wade S. Samowitz, M.D.
Sarah T. South, Ph.D.
Reha M. Toydemir, M.D., Ph.D.
Karl V. Voelkerding, M.D.

David R. Hillyard, M.D.
Fellowship Co-Director

Karl V. Voelkerding, M.D.
Fellowship Co-Director
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 Medical Center, ARUP Laboratories and the University of Utah Health Sciences Center.

Approximately 5,000 pediatric surgical pathology specimens, 150 perinatal and pediatric autopsy cases and fetal examinations, 400 placental examinations, and additional outside pediatric surgical pathology consultations are performed at the hospitals.

Exposure to both general and esoteric pediatric laboratory testing is available at Primary Children’s Medical Center 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.

Offers extensive experience in pediatric anatomic and clinical pathology. Approximately 5,000 pediatric surgical pathology specimens and 150 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.

Surgical Pathology

The Department of Pathology at the University of Utah School of Medicine offers a one-year fellowship program in surgical pathology. The program has two positions.

This fellowship is designed to give the fellow experience at the junior faculty level, including sign-out of surgical pathology cases. The fellowship is based at the Huntsman Cancer Hospital at the University of Utah. Training in general surgical pathology is emphasized.

We have a great variety of interesting and challenging cases on a daily basis, including breast, gynecologic, gastrointestinal, genitourinary, pulmonary, head and neck, skin, and soft tissue/bone pathology.

Electives are available in cytopathology, hemopathology, neuropathology, gastrointestinal, renal pathology, and dermatopathology.

Research activities are available and encouraged. The fellows will be expected to teach surgical pathology residents and medical students.

The overall goal of the fellowship is to provide comprehensive, broad-based training in surgical 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.

Faculty

Daniel J. Albertson, M.D.
Mary P. Bronner, M.D.
Barbara E. Chadwick, M.D.
Xinjian Chen, M.D., Ph.D.
Frederic C. Clayton, M.D.
Michael B. Cohen, M.D.
Erinn Downs-Kelly, D.O.
Lyska L. Emerson, M.D.
Rachel E. Factor, M.D.
H. Evin Gulbahce, M.D.
Edward H. Hart, M.D.
Julie A. Jackson, M.D.
Elke A. Jarboe, M.D.
Ting Liu, M.D.
Monica Patricia Revelo, M.D., Ph.D.
Wade S. Samowitz, M.D.
Jason M. Wells, M.D.
Benjamin L. Witt, M.D.

Application

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

Ting Liu, M.D.
Huntsman Cancer Hospital
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Sarah Barth
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Ting Liu, M.D.
Fellowship Co-Director
Daniel J. Albertson, M.D.
Fellowship Co-Director
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 program (with the possibility of an extra year of research and case review) in medical genetics. The program is approved for two positions.

Fellows spend 18 months in clinical rotations, working in the general outpatient genetics clinic at Primary Children’s Medical Center and at the Utah Department of Health. Fellows perform inpatient consultations at Primary Children’s and at the University of Utah Health Sciences Center. 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 disease, mitochondrial disorders, and X-linked mental retardation syndromes.

The experience of our program is enriched by the great diversity of presentations and the great pride our faculty take in mentoring those interested in learning this discipline.

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

Requirements

Applicants must hold an M.D. degree (or foreign equivalent with ECFMG certification), and be eligible for a Utah State medical license.

Fellows spend 18 months in clinical rotations performing inpatient consultations. 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. The program has two positions.

This fellowship provides training in laboratory testing for the diagnosis and follow-up of patients with inherited metabolic disorders.

Physicians and Ph.D. 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 assume progressive independence in conducting and interpreting biochemical laboratory tests and maintain a logbook of cases for certification.

This training program satisfies the requirements for the American Board of Medical Genetics 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 ABMG Credentials Committee prior to entering this training program.

Provides training in laboratory testing for the diagnosis and follow-up of patients with inherited metabolic disorders.
Clinical Cytogenetics

The Department of Pediatrics Division of Medical Genetics in collaboration with the Department of Pathology and ARUP Laboratories offers a two-year fellowship program in clinical cytogenetics. The program has two positions.

This fellowship involves the processing and analysis of the chromosomes of various types of samples with the express purpose of detecting and interpreting chromosomal abnormalities.

Fellows who train for certification in clinical cytogenetics will participate in all aspects of sample preparation, analysis and reporting, with more than enough opportunities to acquire cases for their logbook. Techniques include standard chromosome analysis, fluorescence in situ hybridization, and genomic microarray. Samples include prenatal, postnatal and oncologic specimens.

Fellows will be responsible for quarterly chromosome rounds held within the division to enhance their teaching skills and encourage publication of highly interesting cases. Fellows will also develop an individualized research project based on the ongoing research and development activities within the laboratory which will be primarily translational in scope and will likely involve collaborations within the Division of Medical Genetics and ARUP Laboratories.

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

Requirements

Applicants must hold an M.D. or Ph.D. (or equivalent); the Ph.D. degree must be in genetics 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 ABMG Credentials Committee prior to entering this training program.

This fellowship involves the processing and analysis of the chromosomes of various types of samples with the express purpose of detecting and interpreting chromosomal abnormalities.
Clinical Molecular 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 extra year of research and case review) in clinical molecular genetics. The program has two positions.

This fellowship provides training for physicians and Ph.D. scientists focusing on laboratory testing for genetic mutations that underlie disease. Training includes: didactic lectures in clinical molecular genetics, rotations through genetics laboratories and clinics, performing molecular genetics testing, and active consultation on clinical problems related to these tests.

Ongoing development of new assays and assay improvements incorporate a broad range of traditional and cutting-edge technologies; fellows participate in assay development and validation projects. Laboratory management and administrative responsibilities may also be assumed by the fellow, who is provided exposure to laboratory management.

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

Requirements

Laboratory postdoctoral fellowship training programs in this specialty are accredited by the American Board of Medical Genetics and require a minimum of 24 months of training, with a significant amount of clinical interaction as related to human genetic abnormalities.

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 ABMG Credentials Committee prior to entering this training program.

Provides training for physicians and scientists focusing on laboratory testing for genetic mutations that underlie disease.
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 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.