ARUP LABORATORIES

As a nonprofit, academic institution of the University of Utah and its Department of Pathology, ARUP believes in collaborating, sharing knowledge, and contributing to laboratory science in ways that benefit our clients and their patients.

Our test menu is one of the broadest in the industry, encompassing more than 3,000 tests, including highly specialized and esoteric assays. We offer comprehensive testing in the areas of genetics, molecular oncology, pediatrics, and pain management, among others.

ARUP’s clients include many of the nation’s university teaching hospitals and children’s hospitals, as well as multihospital groups, major commercial laboratories, and group purchasing organizations. We do not compete with our clients for physician office business, choosing instead to support clients’ existing test menus by offering highly complex assays and accompanying consultative support so clients can provide exceptional patient care in their local communities.

Offering analytics, consulting, and decision support services, ARUP provides clients with the utilization management tools necessary to prosper in this time of value-based care. Our UM+ program helps clients control utilization, reduce costs, and improve patient care. In addition, ARUP is a worldwide leader in innovative laboratory research and development, led by the efforts of the ARUP Institute for Clinical and Experimental Pathology®.

ARUP’s reputation for quality is supported by our ability to meet or exceed the requirements of multiple regulatory and accrediting agencies and organizations. ARUP participates in the CAP laboratory accreditation program and has CLIA certification through the Centers of Medicare and Medicaid Services. In December 2016, ARUP earned accreditation to the ISO 15189:2012 standard under CAP.

We believe in collaborating, sharing knowledge, and contributing to laboratory science in ways that provide the best value for the patient. Together, ARUP and its clients will improve patient care today and in the future.

patients. answers. results.

A laboratory test is more than a number; it is a person, an answer, a diagnosis.
TRUSTED PATHOLOGISTS
ARUP’s Anatomic Pathology and Oncology Division consists of more than 30 expert pathologists, all of whom are faculty members in the Department of Pathology at the University of Utah School of Medicine. These dedicated professionals publish in peer-reviewed literature, and many serve as authors of respected pathology textbooks. These pathologists provide a full range of consultative and diagnostic services, ranging from flow cytometry and molecular diagnostics to surgical pathology.

BUILDING PROFESSIONAL RELATIONSHIPS
ARUP strives to continually improve patient care by building professional relationships through excellence in pathology testing, service, education, and research. ARUP supports clients by providing services that cannot be performed at the local level due to low volume, equipment expense, or new technology. State-of-the-art technology and active research programs ensure that the most sophisticated diagnostic modalities are available.

Due to ARUP’s dual role as both a national reference laboratory and a hospital laboratory, ARUP’s technical staff is intimately aware of the struggles faced by the community pathologist. ARUP is committed to working as a partner with community pathologists and offers services that expand their ability to serve patients.

TRUSTED PATHOLOGIST.
REPUTATION TO BE TRUSTED
ARUP’s reputation for high quality is supported by its ability to meet or exceed the requirements of multiple regulatory and accrediting agencies and organizations. ARUP maintains current CLIA numbers with the U.S. Department of Health and Human Services Centers for Medicare & Medicaid Services (CMS) and is accredited by the College of American Pathologists (CAP).

INVALUABLE ANSWERS
Working together with our clients expands ARUP’s ability to provide the invaluable answers needed by the medical community to make critical decisions and continually improve patient care.

RESEARCH
Precise diagnoses are necessary to select the optimal form of treatment and provide prognostic information. With the advent of new technologies, the scope of research has increased considerably, allowing study of chromosomal, DNA, and protein expression abnormalities. These abnormalities are used to delineate the prognostic and therapeutic aspects of disease. ARUP’s Anatomic Pathology and Oncology Division continues to update its state-of-the-art service by bringing on new technologies and techniques focused on improving the accuracy of diagnosis as well as understanding disease pathophysiology. Research in anatomic pathology and oncology improves ARUP’s ability to diagnose disease and advances fundamental understanding of disease mechanisms.
For a complete list of available tests in the various subspecialties, refer to the ARUP Anatomic Pathology website:

WWW.ARUPLAB.COM/AP

BONE AND SOFT TISSUE PATHOLOGY
BREAST PATHOLOGY
CARDIOVASCULAR PATHOLOGY
CYTOPATHOLOGY
DERMATOPATHOLOGY
FISH
GASTROINTESTINAL PATHOLOGY
GENITOURINARY PATHOLOGY
GYNECOLOGICAL PATHOLOGY

HEAD AND NECK PATHOLOGY
HEMATOPATHOLOGY
HISTOCHEMICAL STAINS
IMMUNOHISTOCHEMISTRY
MOLECULAR ONCOLOGY
NEUROPATHOLOGY
PULMONARY PATHOLOGY
RENAL PATHOLOGY (including light microscopy, electron microscopy, and immunofluorescence studies)

ARUP’s pathologists provide a full range of consultative and diagnostic services, ranging from flow cytometry and molecular diagnostics to surgical pathology.
GENETICS

ERICA ANDERSEN, PHD
Medical Director, Cytogenetics and Genomic Microarray
Dr. Andersen is an assistant professor of pathology at the University of Utah School of Medicine. She received her PhD in genetics from the University of Wisconsin–Madison and completed a clinical cytogenetics fellowship at the University of Utah. She is board certified by the American Board of Medical Genetics and Genomics and is a fellow of the American College of Medical Genetics and Genomics. Dr. Andersen’s interests include both constitutional and oncology cytogenetics. She is an active member of the Clinical Genome Resource (ClinGen) group’s efforts to improve constitutional structural variant interpretation, and her oncology research projects include improving the diagnosis and monitoring for myelodysplastic syndromes and understanding the genetic etiology of rare histiocytic and dendritic cell neoplasms.

PINAR BAYRAK-TOYDEMIR, MD, PhD, FACMG
Medical Director, Molecular Genetics and Genomics
Dr. Bayrak-Toydemir is a professor of pathology at the University of Utah, School of Medicine. She received her MD from the Ankara University School of Medicine in Ankara, Turkey, where she also received her PhD in human genetics. Subsequently, she completed her fellowship in clinical molecular genetics at the University of Utah. Dr. Bayrak-Toydemir is board certified in medical genetics, and her research interests include inherited vascular disorders, specifically hereditary hemorrhagic telangiectasia; capillary malformation-artériovenous malformation syndrome, lymphatic dysplasia, and aortopathies; and implementation of new technologies, such as next-generation sequencing, in clinical settings.

HUNTER BEST, PHD, FACMG
Medical Director, Molecular Genetics and Genomics
Co-Scientific Director, NGS and Biocomputing Director, High Complexity Platforms—NGS
Dr. Best is an associate professor of clinical pathology at the University of Utah School of Medicine. He received his PhD in molecular and cellular pathology at the University of North Carolina at Chapel Hill and completed a fellowship in clinical molecular genetics at the Vanderbilt University in Nashville. His research focuses on the genetics of pulmonary arterial hypertension.

YUAN JI, PHD, DABCP, FACMG
Medical Director, Molecular Genetics and Genomics
Medical Director, Pharmacogenomics
Dr. Yuan Ji is an assistant professor of pathology at the University of Utah School of Medicine. She received her MD in molecular pharmacology and experimental therapeutics at the Mayo Clinic in Rochester, Minnesota, where she further completed her postdoctoral research fellowship in pharmacogenomics. Dr. Ji is board certified in both clinical pharmacology and medical genetics and genomics. Dr. Ji’s major clinical and research focus is in pharmacogenomics, i.e., identifying novel pharmacogenomics markers and accurately testing, interpreting, and reporting pharmacogenomic variants.

ALLEN N. LAMB, PHD, FACMG
Section Chief, Cytogenetics and Genomic Microarray
Dr. Lamb is a professor of clinical pathology at the University of Utah School of Medicine. He received his PhD from Wesleyan University in molecular biology and biochemistry. He completed fellowships in clinical cytogenetics in the Department of Pediatrics at the University of North Carolina and in clinical molecular genetics at Harvard Medical School. Dr. Lamb is a founding fellow of the American College of Medical Genetics and Genomics and is certified by the American Board of Medical Genetics and Genomics in clinical cytogenetics. His primary areas of interest are in prenatal and postnatal chromosome diagnosis and the characterization of the phenotypic features (neurodevelopmental and physical development) associated with copy number changes.

RONG MAO, MD, FACMG
Section Chief, Molecular Genetics and Genomics
Dr. Mao is an associate professor of pathology and co-director of the Clinical Medical Genetics Fellowship Program at the University of Utah School of Medicine. She received her MD from Capital University of Medicine in Beijing and her MS in molecular pathology from Beijing Union Medical College. Her research interests include the genotype-phenotype correlations in inborn errors of metabolism and genetic diseases in the RAS/MAPK pathway; she is also involved with implementing next-generation sequencing techniques into molecular diagnostics.
GENETICS

GWENDOLYN A. MCMILLIN, PHD
Medical Director, Toxicology
Co-Medical Director, Pharmacogenetics
Dr. McMillin is a professor of pathology at the University of Utah School of Medicine. She received her PhD in pharmacology and toxicology from the University of Utah and is certified by the American Board of Clinical Chemistry in clinical chemistry and toxicological chemistry. She is a member of ARUP’s R&D Executive Committee, and is actively involved in professional associations such as the International Association of Therapeutic Drug Monitoring and Clinical Chemistry (IATDMMC), the American Association for Clinical Chemistry (AACC), and the College of American Pathologists (CAP). Her primary interests include detection of neonatal drug exposures, pain management, and clinical applications and implementation of pharmacogenomics.

GENETICS

DENISE QUIGLEY, PHD, FACMG
Medical Director, Cytogenetics
Dr. Quigley received her PhD in molecular and medical genetics at Oregon Health Sciences University and completed post-doctoral fellowships in clinical cytogenetics and clinical molecular genetics at the University of North Carolina, Chapel Hill. She is board certified in clinical cytogenetics and clinical molecular genetics by the American Board of Medical Genetics and Genomics. Dr. Quigley is a member of the CAP Cytogenetics Resource Committee and past-president of the American CytoGenetics Conference. Her research interests include integrated cytogenetic and molecular genetic testing algorithms in hematological disease for accurate diagnosis, prognosis, and guided therapy.

GENETICS

REHA TOYDEMIR, MD, PHD, FACMG
Medical Director, Cytogenetics and Genomic Microarray
Dr. Toydemir is an assistant professor of pathology at the University of Utah, School of Medicine. He was a fellow in cytogenetics at ARUP Laboratories and a previous postdoctoral associate in the Human Genetics Department at the University of Utah. He completed his PhD in genetics at the University of Utah and his MD at the University of Ankara, School of Medicine in Turkey. Dr. Toydemir was the recipient of the 2007 James W. Prahl Award for Outstanding Contributions by a Graduate Student in the biological or biomedical science at the University of Utah, and is a member of the American Society of Human Genetics and Turkish Society of Medical Genetics.

GENETICS

XINJIE XU, PHD, FACMG
Medical Director, Cytogenetics and Genomic Microarray
Assistant Medical Director, Molecular Hematopathology/Oncology
Dr. Xu is an assistant professor of pathology at the University of Utah, School of Medicine. She received her PhD in genetics from the University of Wisconsin-Madison and completed a clinical cytogenetics fellowship at the University of Wisconsin-Madison and a clinical molecular genetics fellowship at Boston University. Dr. Xu is a fellow of the American College of Medical Genetics and Genomics and a member of several professional societies, including the American Society of Human Genetics and the American Society of Clinical Pathology. Her research interests include the identification of novel molecular markers in cancer and the development of novel diagnostic tools for genetic testing.

HEMATOPATHOLOGY

ARCHANA MISHRA AGARWAL, MD
Medical Director, Hematopathology and Special Genetics
Dr. Agarwal is an associate professor of pathology at the University of Utah School of Medicine. She received her MD at Delhi University in India and was a postdoctoral research scholar at the University of Iowa. She served as a pathology resident, a hematopathology fellow, and a molecular genetics pathology fellow at the University of Utah School of Medicine. Dr. Agarwal is board certified in hematopathology, anatomic pathology, and clinical pathology. She is also a member of several professional societies, including the College of American Pathologists and the American Society for Clinical Pathology. Dr. Agarwal’s research interests include red-cell enzymopathies, hemoglobinopathies, and molecular hematopathology.

HEMATOPATHOLOGY

DAVID W. BAHLER, MD, PHD
Medical Director, Hematopathology
Dr. Bahler is an associate professor of pathology at the University of Utah School of Medicine. He is certified by the American Board of Pathology in clinical pathology, with an added qualification in hematology. Dr. Bahler received his PhD in immunology and his MD from the University of Rochester. His research interests include the role of antigen receptor stimulation in the development of lymphoid malignancies.
HEMATOPATHOLOGY

TRACY I. GEORGE, MD
Executive Director, Clinical Trials and PharmaDx
Medical Director, Hematopathology
Dr. George is a professor of pathology at the University of Utah School of Medicine. She completed her MD and residency training in anatomic pathology and laboratory medicine at the University of California San Francisco, with fellowships in hematopathology and surgical pathology at Stanford University. Dr. George is board certified in anatomic pathology, clinical pathology, and hematology by the American Board of Pathology. Her research interests include mast cell disease and laboratory hematology. Dr. George has authored more than 100 publications, is Vice President of Scientific Communications for the International Society for Laboratory Hematology, and Co-Editor-in-Chief of the International Journal of Laboratory Hematology. She received the College of American Pathologists Lifetime Achievement Award in 2014.

HEMATOPATHOLOGY

KRISTIN HUNT KARNER, MD
Medical Director, Hematopathology
Medical Director, Molecular Oncology
Director, Hematopathology Fellowship Program
Dr. Karner is an assistant professor of pathology at the University of Utah School of Medicine. She received her MD from the University of Nebraska and completed her anatomic and clinical pathology residency at the University of New Mexico. She also completed hematopathology and molecular genetic pathology fellowships at the University of New Mexico and is board certified by the American Board of Pathology in anatomic and clinical pathology (AP/CP), as well as hematopathology and molecular genetic pathology. Dr. Karner’s areas of focus include both lymphoid and myeloid malignancies, and her current research interests include genetic aspects of myelodysplastic syndrome and other myeloid malignancies.

HEMATOPATHOLOGY

K. DAVID LI, MD
Medical Director, Hematopathology
Assistant Medical Director, Hematologic Flow Cytometry
Dr. Li is an assistant professor of pathology at the University of Utah School of Medicine. He received his MD from New York Medical College and completed a residency in anatomic and clinical pathology at the University of California, San Diego. Dr. Li also completed a fellowship in hematopathology at the University of Utah, and is board certified by the American Board of Pathology in anatomic and clinical pathology, with subspecialty boards in hematology.

HEMATOPATHOLOGY

ANTON RETS
Medical Director, Hematopathology
Dr. Rets is an assistant professor of pathology at the University of Utah School of Medicine. He completed his MD from Perm State Academy of Medicine in Russia. He served as a hematopathology fellow at Stanford University. He is certified by the American Board of Pathology in anatomic and clinical pathology, with subspecialty boards in hematology, and is a member of the CAP Hematology & Clinical Microscopy Resource Committee. Dr. Patel’s clinical and research interests are broad and include all aspects of hematopathology. He is keen on application of next-generation sequencing technologies in the diagnosis and prognostication of hematolymphoid malignancies and benign hematologic disorders.

HEMATOPATHOLOGY

RODNEY R. MILES, MD, PHD
Section Chief, Hematopathology
Dr. Miles is an associate professor of pathology at the University of Utah School of Medicine. He received his MD and a PhD in cell biology from the University of Nebraska and is certified by the American Board of Pathology in anatomic and clinical pathology, with subspecialty certification in hematology. His research interests include biological subtypes of adult and pediatric non-Hodgkin lymphomas. Dr. Miles is a member of the American Society of Hematology, the Society for Hematopathology, and the United States and Canadian Academy of Pathology.

HEMATOPATHOLOGY

SHERRIE L. PERKINS, MD, PHD
CEO, ARUP Laboratories
Dr. Perkins, CEO of ARUP Laboratories and a professor of pathology at the University of Utah School of Medicine, has been with ARUP and the University of Utah for over 25 years and has served in numerous leadership roles. She is board certified in anatomic pathology and holds a special qualification in hematology. She has authored over 200 peer-reviewed journal articles and 70 book chapters in hematology pathology.

HEMATOPATHOLOGY

JAY L. PATEL, MD
Medical Director, Molecular Oncology
Medical Director, Genomics
Medical Director, Hematopathology
Dr. Patel is an associate professor of pathology at the University of Utah School of Medicine. He received his MD from the University of Arizona and completed a residency in anatomic and clinical pathology at the University of Utah. Dr. Patel then served as a hematopathology fellow at Stanford University. He is certified by the American Board of Pathology in anatomic and clinical pathology, with subspecialty boards in hematology, and is a member of the CAP Hematology & Clinical Microscopy Resource Committee. Dr. Patel’s clinical and research interests are broad and include all aspects of hematopathology. He is keen on application of next-generation sequencing technologies in the diagnosis and prognostication of hematolymphoid malignancies and benign hematologic disorders.

HEMATOPATHOLOGY

KAREN MOSER
Medical Director, Hemostasis/Thrombosis
Dr. Moser is an assistant professor of pathology at the University of Utah School of Medicine. She received her M.D. from Saint Louis University and subsequently served as a pathology resident and hemopathology fellow at the University of Utah School of Medicine. She is certified by the American Board of Pathology in anatomic and clinical pathology, with subspecialty certification in hematology. Dr. Moser is a member of several professional societies, including the College of American Pathologists (for which she serves as a member of the Standards and Coagulation Resource Committees), American Society for Clinical Pathology, and International Society on Thrombosis and Haemostasis. Her primary research interest is in laboratory hemostasis and thrombosis testing.

HEMATOPATHOLOGY

JAY L. PATEL, MD
Medical Director, Molecular Oncology
Medical Director, Genomics
Medical Director, Hematopathology
Dr. Patel is an associate professor of pathology at the University of Utah School of Medicine. He received his MD from the University of Arizona and completed a residency in anatomic and clinical pathology at the University of Utah. Dr. Patel then served as a hematopathology fellow at Stanford University. He is certified by the American Board of Pathology in anatomic and clinical pathology, with subspecialty boards in hematology, and is a member of the CAP Hematology & Clinical Microscopy Resource Committee. Dr. Patel’s clinical and research interests are broad and include all aspects of hematopathology. He is keen on application of next-generation sequencing technologies in the diagnosis and prognostication of hematolymphoid malignancies and benign hematologic disorders.

HEMATOPATHOLOGY

KAREN MOSER
Medical Director, Hemostasis/Thrombosis
Dr. Moser is an assistant professor of pathology at the University of Utah School of Medicine. She received her M.D. from Saint Louis University and subsequently served as a pathology resident and hemopathology fellow at the University of Utah School of Medicine. She is certified by the American Board of Pathology in anatomic and clinical pathology, with subspecialty certification in hematology. Dr. Moser is a member of several professional societies, including the College of American Pathologists (for which she serves as a member of the Standards and Coagulation Resource Committees), American Society for Clinical Pathology, and International Society on Thrombosis and Haemostasis. Her primary research interest is in laboratory hemostasis and thrombosis testing.
HEMATOPATHOLOGY

GEORGE M. RODGERS III, MD, PHD
Medical Director, Hemostasis/Thrombosis
Dr. Rodgers is a professor of medicine and pathology at the University of Utah School of Medicine. He received his PhD in pharmacology and his MD from the Tulane University School of Medicine and is certified in internal medicine by the American Board of Internal Medicine and in hematology by the American Board of Pathology. Dr. Rodgers is the co-editor of Wintrobe’s Clinical Hematology.

KRISTI J. SMOCK, MD
Medical Director, Hemostasis/Thrombosis
Dr. Smock is an associate professor of pathology and associate program director of the Pathology Residency Program at the University of Utah School of Medicine. She completed her medical degree, residency, and fellowship training at the University of Utah. She is currently vice president of the North American Specialized Coagulation Laboratory Association (NASCOLA) and an editorial board member for Research and Practice in Thrombosis and Haemostasis. Dr. Smock’s primary research interest is laboratory coagulation medicine.

KAJSA AFFOLTER, MD
Medical Director, Anatomic Pathology
Dr. Affolter is an associate professor of pathology at the University of Utah School of Medicine. She received her MD from the University of Kansas School of Medicine while completing her residency in anatomic and clinical pathology and fellowship in gastrointestinal, hepatic, and pancreatic biliary pathology at the University of Utah School of Medicine. She is certified by the American Board of Pathology in anatomic and clinical pathology and is a member of the United States and Canadian Academy of Pathology, American Society for Clinical Pathology, College of American Pathologists, and the Gastrointestinal Pathology Society, among other professional organizations. Dr. Affolter has research interests that include the serrated pathway of colorectal carcinogenesis and predictive markers in inflammatory bowel disease.

MOUIED ALASHARI, MD
Pediatric Pathologist
Dr. Alashari is an associate professor of pathology at the University of Utah School of Medicine. He received his MD from Baghdad University College of Medicine, and completed residencies in anatomic pathology and general surgery at New York Medical College, a clinical pathology residency at Yale University, and a pediatric pathology fellowship at the Children’s Hospital of Pittsburgh. He is board certified by the American Board of Pathology in anatomic and clinical pathology and pediatric pathology. Dr. Alashari is a member of several professional societies, including the Society for Pediatric Pathology, the American Society of Clinical Pathologists, and the College of American Pathologists.

SURGICAL PATHOLOGY/SOLID TUMOR

DANIEL ALBERTSON, MD
Medical Director, Surgical Pathology and Oncology
Section Head, Surgical Pathology
Director, Genitourinary Pathology
Dr. Albertson is an assistant professor of pathology at the University of Utah School of Medicine. He received his MD from the University of Nebraska and completed his residency in anatomic and clinical pathology at Creighton University, followed by a surgical pathology fellowship at the University of Utah. While at Creighton, Dr. Albertson served as the chief resident for two years and received the Hal Lankford Pathology Resident Award. He is a member of United States and Canadian Academy of Pathology and the College of American Pathologists. Dr. Albertson’s special research interests include oncologic genitourinary pathology.

PHILIP S. BERNARD, MD
Medical Director, Molecular Oncology
Dr. Bernard is a professor of pathology at the University of Utah School of Medicine. He received his MD from and completed his postdoctoral training at the University of Utah and is certified in clinical pathology by the American Board of Pathology. Dr. Bernard’s laboratory at the Huntsman Cancer Center utilizes comprehensive genomic analyses to identify and translate biomarkers into clinical care for cancer patients. His work in gene expression classification of breast cancer led to the development of PAM50 (Prosigna), an FDA-approved diagnostic offered worldwide. His current research are in the development of liquid biopsies using ctDNA, CTCs, and exosomes for monitoring and early detection of cancer.

MARY BRONNER, MD
Co-Division Chief, Anatomic and Molecular Oncologic Pathology
Medical Director, Biocomputing
Dr. Bronner is a Carl R. Kjeldsberg presidential endowed professor of pathology at the University of Utah School of Medicine. She received her MD from the University of Pennsylvania and completed her pathology residency training and chief residency at the Hospital of the University of Pennsylvania. Dr. Bronner’s honors include her election as president of the GI Pathology Society and the award of the Arthur Purdy Stout Prize, recognizing her work as a surgical pathologist under the age of 45.

BARBARA E. CHADWICK, MD
Medical Director, Cytology
Dr. Chadwick is an associate professor of anatomic pathology, the University of Utah School of Medicine. She received her MD at Loma Linda University in California where she also served as a pathology fellow. Dr. Chadwick completed her residency in anatomic and clinical pathology at the University of Utah School of Medicine and was a cytopathology fellow at the University of Washington in Seattle. She is a member of the United States and Canadian Academy of Pathology, American Society of Cytopathology, and College of American Pathologists. Dr. Chadwick’s research interests include the use of molecular markers in cytopathology, pancreatic and biliary cancer, and cervical cancer screening.
SURGICAL PATHOLOGY/SOLID TUMOR

FREDERIC CLAYTON, MD
Medical Director, Autopsy Service
Dr. Clayton is a professor of pathology and director of the autopsy service at the University of Utah School of Medicine. He received his MD at Case Western Reserve University School of Medicine in 2007. Dr. Clayton subsequently completed his residency in anatomic and clinical pathology at the Cleveland Clinic (2011), followed by fellowships in hematopathology and molecular genetic pathology. He is board certified in molecular genetic pathology, hematopathology, and anatomic and clinical pathology, practicing most recently at the Ohio State University (2013–16). Immediately prior to joining the University of Utah, Dr. Coleman served as the vice president of medical affairs with GenomOncology, LLC, in Cleveland, Ohio.

SURGICAL PATHOLOGY/SOLID TUMOR

JOSHUA F. COLEMAN, MD
Medical Director, Molecular Oncology
Dr. Coleman is an assistant professor of pathology at the University of Utah School of Medicine. He earned his MD at Washington University in St. Louis, and completed postgraduate training in anatomic pathology at Stanford and clinical pathology at the University of Utah. He has interests in inflammatory diseases of the alimentary tract, other eosinophilic disorders, and medical student teaching.

SURGICAL PATHOLOGY/SOLID TUMOR

LARISSA V. FURTADO, MD
Medical Director, Molecular Oncology
Dr. Furtado co-founded the Division of Genomic and Molecular Diagnostics Laboratories. Dr. Furtado's research interests include molecular characterization of the initiating mutations in lung cancer.

SURGICAL PATHOLOGY/SOLID TUMOR

JESSICA COMSTOCK, MD
Pediatric Pathologist
Dr. Comstock is the director of autopsy at Primary Children’s Hospital and an associate professor of pathology at the University of Utah School of Medicine. She received her MD from the University of Iowa and completed both a pathology residency and a pediatric pathology fellowship at the University of Utah. She is board certified in anatomic and clinical pathology with a sub-certification in pediatric pathology. Dr. Comstock is a member of several professional societies, including the Society of Pediatric Pathology, College of American Pathologists, and the American Society of Clinical Pathologists.

SURGICAL PATHOLOGY/SOLID TUMOR

RACHEL E. FACTOR, MD, MHS
Medical Director, Anatomic Pathology and Cytology
Dr. Factor is an associate professor of pathology, director of breast pathology, and co-director of the Cytopathology Fellowship Program at the University of Utah School of Medicine. She received her master of health science from Johns Hopkins School of Public Health and her MD from the Albert Einstein College of Medicine in Bronx, New York, followed by residency and fellowships at Brigham and Women’s Hospital in Boston. Dr. Factor is board certified in anatomic pathology and cytopathology, and is a member of the College of American Pathology, the United States and Canadian Academy of Pathology, and the American Society for Clinical Pathology. Her research interests include the biology and prevention of breast cancer.

SURGICAL PATHOLOGY/SOLID TUMOR

KIMBERLEY J. EVASON, MD, PHD
Medical Director, Anatomic Pathology
Dr. Evason is an assistant professor at the University of Utah. Her research interests include the biology and prevention of breast cancer.

SURGICAL PATHOLOGY/SOLID TUMOR

LYSKA L. EMERSON, MD
Medical Director, Gross Dissection Lab, Huntsman Hospital; Staff Pathologist, Anatomic Pathology
Dr. Emerson is an associate professor of pathology at the University of Utah School of Medicine. She received her MD from the University of Texas Health Sciences Center at Houston and served a residency in pathology at the University of New Mexico Health Sciences Center and the University of Texas Health Sciences Center. Dr. Emerson completed her fellowship in general surgical pathology at the University of Utah Hospitals and Clinics and is certified by the American Board of Pathology in anatomic pathology. She is a member of the United States and Canadian Academy of Pathology, American Society for Clinical Pathology (fellow), and the Huntsman-Intermountain Cancer Care Program. Dr. Emerson’s current research interests include molecular characterization of the initiating mutations in lung cancer.

SURGICAL PATHOLOGY/SOLID TUMOR

GEORGIOS DEFTEREOS, MD
Medical Director, Molecular Oncology
Section Head, Molecular Oncology
Dr. Deftereos is an assistant professor of pathology at the University of Utah School of Medicine. He received his MD from the University of Bari Aldo Moro in Italy. Prior to his pathology training, Dr. Deftereos completed a research fellowship focusing on HPV and gynecological malignancies at the University of Washington. His residency was in anatomic and clinical pathology. Dr. Deftereos is board certified in anatomic pathology, clinical pathology, cytopathology, and molecular genetic pathology, and provides service in the areas of molecular oncology and cytopathology. His research interests include epigenetics of solid tumors and minimally invasive precision diagnostics, with emphasis on the use of molecular testing in cytopathology of solid tumors.

SURGICAL PATHOLOGY/SOLID TUMOR

KIMBERLEY J. EVASON, MD, PHD
Medical Director, Anatomic Pathology
Dr. Evason is an assistant professor at the University of Utah. Her research interests include the biology and prevention of breast cancer.

SURGICAL PATHOLOGY/SOLID TUMOR

RACHEL E. FACTOR, MD, MHS
Medical Director, Anatomic Pathology and Cytology
Dr. Factor is an associate professor of pathology, director of breast pathology, and co-director of the Cytopathology Fellowship Program at the University of Utah School of Medicine. She received her master of health science from Johns Hopkins School of Public Health and her MD from the Albert Einstein College of Medicine in Bronx, New York, followed by residency and fellowships at Brigham and Women’s Hospital in Boston. Dr. Factor is board certified in anatomic pathology and cytopathology, and is a member of the College of American Pathology, the United States and Canadian Academy of Pathology, and the American Society for Clinical Pathology. Her research interests include the biology and prevention of breast cancer.

SURGICAL PATHOLOGY/SOLID TUMOR

LYSKA L. EMERSON, MD
Medical Director, Gross Dissection Lab, Huntsman Hospital; Staff Pathologist, Anatomic Pathology
Dr. Emerson is an associate professor of pathology at the University of Utah School of Medicine. She received her MD from the University of Texas Health Sciences Center at Houston and served a residency in pathology at the University of New Mexico Health Sciences Center and the University of Texas Health Sciences Center. Dr. Emerson completed her fellowship in general surgical pathology at the University of Utah Hospitals and Clinics and is certified by the American Board of Pathology in anatomic pathology. She is a member of the United States and Canadian Academy of Pathology, American Society for Clinical Pathology (fellow), and the Huntsman-Intermountain Cancer Care Program. Dr. Emerson’s current research interests include molecular characterization of the initiating mutations in lung cancer.
EVELYN V. GOPEZ, MD
Medical Director, Cytology
Dr. Gopez is a professor of pathology and associate dean in the Office of Inclusion and Outreach at the University of Utah School of Medicine. She received her MD at the University of Santo Tomas in Manila, Philippines, and completed her residency in anatomic and clinical pathology at the Berkshire Medical Center in Pittsfield, Massachusetts. She also completed a fellowship in cytopathology and surgical pathology at the University of Pennsylvania and is board certified in cytopathology, as well as anatomic and clinical pathology. For seven years, Dr. Gopez served as residency program director at the University of Utah Department of Pathology. She assists ARUP’s clients by signing out specimen cases while also teaching residents and fellows in training.

ALLIE GROSSMANN, MD, PHD
Medical Director, Surgical Pathology and Molecular Oncology
Dr. Grossmann received a BS in zoology at the College of Idaho and a PhD and MD from the Oregon Health Sciences University, where she studied tyrosine kinase substrate specificity with Brian J. Druker, MD. Dr. Grossmann completed both a residency in anatomic pathology and a research fellowship in molecular medicine at the University of Utah. Her postdoctoral work in the laboratory of Dean Y. Li, MD, PhD, focused on the role of small GTPases in melanoma invasion and metastasis. Most recently, Dr. Grossmann completed a fellowship in molecular genetic pathology at ARUP Laboratories. Her primary subspecialty interests are sarcoma pathology and molecular oncology. Her research interests include mechanisms of tumorigenesis, metastasis, and the development of targeted therapies for cancer treatment.

H. EVIN GULBAHCE, MD
Medical Director, Surgical Pathology and Oncology
Dr. Gulbahce is a professor of pathology at the University of Utah School of Medicine. She received her MD from Hacettepe University in Ankara, Turkey, and completed a residency in anatomic and clinical pathology and a surgical pathology fellowship at the University of Minnesota. Her research interests include pulmonary complications of solid organs, hematopoietic stem cell transplantation, and breast cancer risk factors, specifically risk factor for basal-like and triple negative cancers.

ELKE JARBOE, MD
Medical Director, Surgical Pathology and Cytopathology
Dr. Jarboe is an associate professor of pathology at the University of Utah School of Medicine. She received her MD from and completed her anatomic pathology residency training at the University of Colorado School of Medicine. Subsequently, she completed fellowships in women’s and perinatal pathology and cytopathology at Brigham and Women’s Hospital in Boston. Her primary subspecialty and research interest is in gynecologic pathology. Dr. Jarboe is a member of the editorial board for the International Journal of Gynecological Pathology and the cytopathology section editor for the American Journal of Clinical Pathology.

JOLANTA JEDRZKIEWICZ, MD
Medical Director, Anatomic Pathology
Dr. Jedrzkiewicz is an assistant professor of pathology at the University of Utah School of Medicine. She obtained her MD from Poznan University of Medical Sciences in Poland. She completed her anatomic and clinical pathology residency at the University of Utah, followed by an oncologic surgical pathology fellowship at the MD Anderson Cancer Center in Houston and a gastrointestinal fellowship at the Mount Sinai Hospital in Toronto. She is certified by the American Board of Pathology in anatomic and clinical pathology and is a member of United States and Canadian Academy of Pathology, as well as the College of American Pathologists. Dr. Jedrzkiewicz has research interests in oncologic gastrointestinal pathology and appendiceal neoplasms.

NEELIMA KANDULA, MD
Medical Director, Surgical Pathology
Dr. Kandula is an assistant professor of pathology at the University of Utah School of Medicine. She received her MD from the NTR University of Health Sciences, Guntur Medical College in Guntur, India. She completed her residency in anatomic and clinical pathology at the Creighton University, followed by a cytopathology fellowship at the University of Utah. While at Creighton, Dr. Kandula served as the chief resident. She is certified by the American Board of Pathology in anatomic and clinical pathology and cytopathology. She is a member of the United States and Canadian Academy of Pathology, College of American Pathologists, American Society of Cytopathology, and International Society of Urological Pathology. Dr. Kandula has subspecialty interests in cytopathology, genitourinary pathology, and their related research.

TING LIU, MD
Director, Surgical Pathology
Dr. Liu is an associate professor of surgical pathology at the University of Utah School of Medicine and Surgical Pathology director at the University of Utah Department of Pathology. Dr. Liu received her MD from Beijing University of Chinese Medicine and her MS in pathophysiology from Peking Union Medical College. She completed AP/CP residency training at Drexel University College of Medicine, a fellowship in hematology at Drexel University College of Medicine, and an oncologic/surgical fellowship at Memorial Sloan-Kettering Cancer Center. Dr. Liu is an AP/CP and hematopathology-boarded pathologist. Her current research interests include oncologic clinical research.

AMY LOWICHIK, MD, PHD
Staff Pathologist, Pediatric Pathology
Dr. Lowichik is clinical professor of pediatric pathology at the University of Utah School of Medicine. She is also the director of Autopsy Service and Anatomic Pathology at Primary Children’s Medical Center and the associate chief of the Division of Pediatric Pathology at the University of Utah School of Medicine. Dr. Lowichik received her PhD in zoology and microbiology at Tulane University and her MD at the University of Michigan in Ann Arbor. She served as a pediatrics resident at the Children’s Medical Center of Dallas and a pediatric pathology fellow at the University of Texas Southwestern Medical School. Dr. Lowichik is board certified in pediatric pathology, clinical pathology, and anatomic pathology, and is a member of the Society for Pediatric Pathology. Dr. Lowichik’s research interests include pediatric gastrointestinal pathology and medical education.
Dr. Palmer’s research interests include neuropathological parameters of epilepsy, relationships between histologic and molecular genetic findings in brain tumors, and pediatric neuropathology, with special emphasis on epileptogenic disorders and brain tumors.

Dr. Pysher is an adjunct professor of pathology at the University of Iowa Carver College of Medicine and completed a residency in anatomic and clinical pathology, as well as a fellowship in gastrointestinal pathology at Johns Hopkins Hospital. Dr. Savage is an assistant professor of pathology at the University of Utah School of Medicine. Dr. Samowitz is certified by the American Board of Pathology in anatomic and clinical pathology, with subspecialty certification in hematology and molecular genetic pathology. Her academic interests include molecular diagnostics of hematolymphoid and solid tumor malignancies.

Dr. Matynia is an assistant professor of pathology at the University of Utah School of Medicine. She completed her residency in pathology, as well as fellowships in hematopathology and molecular genetic pathology, at the University of Utah and ARUP Laboratories. Dr. Matynia is certified by the American Board of Pathology in anatomic and clinical pathology, with subspecialty certification in hematology and molecular genetic pathology. Her academic interests include molecular diagnostics of hematolymphoid and solid tumor malignancies.

Dr. Revelo is an associate professor of pathology at the University of Utah School of Medicine. She received her MD from the Central University of Ecuador School of Medicine and her PhD in pathology from the Federal University of Minas Gerais in Brazil. Dr. Revelo completed a fellowship in renal pathology at Vanderbilt University Medical Center and is certified by the American Board of Pathology. Her research interests include mechanisms of chronic allograft and antibody mediated-rejection in kidney, heart, and pancreas transplants, mechanisms of glomerular diseases and molecular mechanisms of prostate carcinoma development and progression.

Dr. Sirohi is a fellow of the American Board of Pathology and is a fellow of the College of American Pathologists and the American Society of Clinical Pathology.

Dr. Samowitz is a professor of pathology at the University of Utah School of Medicine. Her research interests include genomic alterations in urologic malignancies, viral oncogenesis and application of next generation sequencing to solid tumors.
SURGICAL PATHOLOGY/SOLID TUMOR

JOSEPH A. SONNEN, MD
Medical Director, Anatomic Pathology, Oncology, and Neuropathology
Dr. Sonnen is an associate professor of pathology at the University of Utah School of Medicine. He received his MD from the Keck School of Medicine, University of Southern California, completing his residency at the University of Arizona, Tucson, and his neuropathology fellowship at the University of Washington, Seattle. He is a member of the College of American Pathologists and American Association of Neuropathologists. Dr. Sonnen’s research interests include dementia, Alzheimer disease, chronic traumatic encephalopathy, and other neurodegenerative diseases.

SURGICAL PATHOLOGY/SOLID TUMOR

BRYAN TRUMP, DDS, MS
Medical Director, Anatomic Pathology
Dr. Trump is an assistant professor at the University of Utah School of Dentistry, as well as an adjunct professor of anatomic pathology at the University of Utah School of Medicine. He received his DDS from Virginia Commonwealth University School of Dentistry, and completed his oral and maxillofacial pathology residency as well as a master’s in biomedical sciences at Texas A&M University Baylor College of Dentistry. He is board certified in oral and maxillofacial pathology. His research interests include head and neck pathology, with a focus on Sjögren’s syndrome, salivary gland neoplasms, and oral squamous cell carcinoma. Dr. Trump is a member of the American Academy of Oral & Maxillofacial Pathology, North American Society of Pathology, American Dental Association, American Dental Education Association, Utah Dental Association, and Salt Lake County Dental Society.

SURGICAL PATHOLOGY/SOLID TUMOR

BENJAMIN L. WITT, MD
Medical Director, Cytopathology
Dr. Witt is an assistant professor of anatomic pathology at the University of Utah School of Medicine, where he serves as the residency rotation director for cytopathology. Dr. Witt received his MD at the University of Colorado Denver, School of Medicine and completed his AP/CP pathology residency at the University of Chicago (NorthShore) where he served as the chief resident during his last two years. He also completed a cytopathology fellowship at the University of Utah/ARUP Laboratories, and is board certified in anatomic and clinical pathology, with subspecialty boards in cytopathology. Dr. Witt is a member of the College of American Pathologists Cytopathology Committee, the American Society for Clinical Pathology, and the American Society of Cytopathologists. His research interests include studies related to fine-needle aspiration and head and neck pathology.

SURGICAL PATHOLOGY/SOLID TUMOR

HOLLY ZHOU, MD, MS
Pediatric Pathologist
Dr. Zhou is an associate professor of pathology at the University of Utah School of Medicine. She received her medical degree from Fujian Medical College of China, where she also completed an MS in endocrinology. Subsequently, Dr. Zhou completed a research fellowship in endocrinology at the University of Maine, and both an AP/CP residency and a pediatric pathology fellowship at New York University. She is board certified by the American Board of Pathology in both anatomic and clinical pathology and pediatric pathology. Dr. Zhou is a member of the United States and Canadian Academy of Pathology and the Society for Pediatric Pathology. Her research interests include pediatric bone and soft tissue tumors.
**CYTOPATHOLOGY**

The ARUP Cytopathology Laboratory is a full-service laboratory providing screening and diagnostic testing on gynecological, non-gynecological, and fine-needle aspiration specimens. Consultation for difficult gynecologic, non-gynecologic, and fine-needle aspiration biopsy specimens is available from ARUP’s board-certified cytopathologists. By offering molecular testing, such as UroVysion FISH testing for urine and pancreatobiliary specimens, the Cytopathology Laboratory can assist clients in broadening their scope of services.

**HEMATOLOGIC FLOW CYTOMETRY**

The ARUP Hematologic Flow Cytometry Laboratory performs leukemia and lymphoma phenotyping with interpretations based on five-color analysis of multiple antigens. Using fluorescently labeled antibodies, surface markers in leukemia and lymphoma aid in identifying the tumor lineage, which provides diagnostic and prognostic information. This laboratory also performs circulating tumor cell analysis for prostate, breast, and colon tumor monitoring.

**HEMATOPATHOLOGY**

The Hematopathology Laboratory and the Division of Hematopathology offer diagnostic consultative services and a comprehensive testing menu for the evaluation of hematologic disorders. The Division of Hematopathology consists of nationally and internationally known experts whose expertise spans many different subspecialties of hematopathology, including flow cytometry, immunohistochemistry, cytogenetics, coagulation, and molecular diagnostics. An integrated approach is utilized to provide clients with services ranging from test interpretation and selection to a comprehensive histomorphologic diagnosis.

**IMMUNOHISTOCHEMISTRY**

The ARUP Immunohistochemistry Laboratory performs more than 175 stains on formalin-fixed, paraffin-embedded tissues/cellblocks. These stains are used to detect the presence, abundance, and localization of specific proteins to aid in determining the direction of differentiation in neoplasms with similar morphology, as well as to provide prognostic or therapeutic information, among other applications.

This lab is pathologist oriented, providing a stain and return service only, without interpretation, to our client pathologists to assist in their diagnostic studies. Most stains are returned the next day.
MOLECULAR ONCOLOGY
The ARUP Molecular Oncology Laboratory offers a broad hematologic and soft/solid tumor menu, as well as consultative services in oncology. Testing is designed to aid the physician in answering important clinical questions in the areas of screening, prognosis, treatment, and monitoring. An active research program in the ARUP Institute for Clinical and Experimental Pathology is committed to developing molecular technologies that will ensure continued quality of clinical testing in the rapidly progressing field of molecular pathology.

SURGICAL PATHOLOGY
Surgical Pathology is staffed by full-time University of Utah School of Medicine faculty. The faculty’s expertise in a wide variety of specialties enables the department to support ARUP’s clients throughout the United States and to aid the University of Utah Health Sciences Center and the Huntsman Cancer Hospital in their role as premier healthcare providers and teaching facilities for the region.

The department’s specialties include, but are not limited to: bone and soft tissue pathology, breast pathology, genitourinary pathology, gastrointestinal pathology, head and neck pathology, renal pathology, and neuropathology. Consultative and diagnostic services are available. Department services include gross dissection, frozen-section techniques, routine histology, rapid tissue processing, special stains and immunohistochemical staining, and patient reporting, with access to a wide variety of ancillary techniques, including electron microscopy and molecular diagnostics.