The Department of Pathology and Laboratory Medicine at Children’s Hospital Los Angeles is one of the most comprehensive pediatric pathology programs in the nation and is comprised of three divisions: Anatomic Pathology, Laboratory Medicine and Genomic Medicine (Center for Personalized Medicine). Our skilled, Board-certified pathologists and laboratorians are internationally recognized for their subspecialty expertise and maintain active professional consultation and outreach program services. The department offers some of the most sophisticated testing available for evaluating all types of patient specimens, including blood and body fluids, tissue biopsies, and formalin-fixed and paraffin-embedded surgical resections.

CHLA Laboratory Draw Stations in the Community

**CHLA – Arcadia**
468 E. Santa Clara St.
Arcadia, CA 91006
Phone: 877-543-9522
Fax: 626-357-4052

**CHLA – Encino**
5359 Balboa Blvd., Suite B,
Encino, CA 91316
Phone: 877-543-9522
Fax: 818-728-4932

**CHLA – Pasadena**
800 S. Fairmount Ave., Suite 115
Pasadena, CA 91105
Phone: 877-543-9522
Fax: 323-361-4904

**CHLA – South Bay**
3440 Torrance Blvd., Suite 100
Torrance, CA 90503
Phone: 877-543-9522
Fax: 310-303-3893

**CHLA – Valencia**
23838 Valencia Blvd., Suite 140
Valencia, CA 91355
Phone: 877-543-9522
Fax: 661-259-7783

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Division of Anatomic Pathology

The Division of Anatomic Pathology provides a full range of diagnostic services, including evaluations of surgical specimens, biopsies and autopsies. Consultative services for childhood diseases are offered to other hospitals and physicians.

Resources Include:

- **Autopsy and perinatal pathology.** We offer advanced autopsy and perinatal pathology services with dedicated expert faculty who are also available for consultation.
- **Histology laboratory.** Our laboratory prepares tissue for anatomic pathology studies and offers comprehensive histochemical and immunohistochemical stains for specialized pediatric diagnostics. We also offer technical services for other clinical laboratories.
- **Integrated molecular genomic diagnostics.** Our pathologists, in collaboration with colleagues in the Division of Genomic Medicine, offer state-of-the-art molecular genetic and next-generation sequencing-based testing for pediatric tumors, along with fully integrated pathology genomic reporting.
- **Electron microscopy laboratory.** We are one of the few remaining labs that can perform the full range of services to support ultrastructural analysis for clinical diagnosis. Our pathologists offer special expertise in pediatric renal disease, ciliopathies and other pediatric disorders.
- **Birepository.** We provide specialized collection, processing and storage of biospecimens for use by CHLA and outside researchers. Our current collection comprises over 22,000 patient samples with an emphasis on solid tumors and hematologic malignancies. We offer whole-slide scanning and image-analysis services for both clinical and research purposes.
- **Pathology core laboratory.** We offer a full line of histopathology, immunohistochemistry (IHC), tissue microarray (TMA) construction and imaging services designed for the unique needs of researchers. We perform histochemical stains from routine H&Es to complex Gallyas silver stains and offer a full range of IHC services, including new antibody workups, double markers, and immunofluorescence on both paraffin-embedded and frozen tissue.

The Anatomic Pathology Division is staffed with a full range of Board-certified pathology subspecialists, including faculty with training in pediatric pathology, hematopathology, GI pathology, neuropathology, molecular genetic pathology and forensic pathology. This allows us to offer a wide range of specialized expertise in addition to pediatric pathology, including:

- Autopsy and perinatal pathology
- Cytopathology
- Gastrointestinal pathology
- Nephropathology
- Neuromuscular pathology
- Ultrastructural pathology
- Hematopathology
- Neuroblastoma
- Brain tumors
- Bone and soft tissue tumors
- Molecular genetic pathology

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Providers and Faculty

Bruce Pawel, MD
Chief, Division of Anatomic Pathology, Department of Pathology and Laboratory Medicine, Children’s Hospital Los Angeles
Professor of Pathology, Keck School of Medicine of USC
Specialties: Pediatric pathology, anatomic and clinical pathology

Jennifer Cotter, MD
Director of Pediatric Biorepository and Neuropathologist, Division of Anatomic Pathology, Department of Pathology and Laboratory Medicine, Children’s Hospital Los Angeles
Assistant Professor of Clinical Pathology, Keck School of Medicine of USC
Specialties: Neuropathology, anatomic pathology

Linda Szymanski, DO
Director of Autopsy and Perinatal Pathology, Division of Anatomic Pathology, Department of Pathology and Laboratory Medicine, Children’s Hospital Los Angeles
Assistant Professor of Clinical Pathology, Keck School of Medicine of USC
Specialties: Pediatric pathology, neuropathology, forensic pathology and anatomic pathology

Debra Hawes, MD
Director of Pathology Core Lab and Neuropathologist, Division of Anatomic Pathology, Department of Pathology and Laboratory Medicine, Children’s Hospital Los Angeles
Associate Professor of Clinical Pathology, Keck School of Medicine of USC
Specialties: Neuropathology, anatomic pathology

Matthew Oberley, MD, PhD
Director, Bone Marrow Laboratory; Associate Director, Hematology Laboratory, Divisions of Anatomic Pathology and Laboratory Medicine, Department of Pathology and Laboratory Medicine, Children’s Hospital Los Angeles
Assistant Professor of Clinical Pathology, Keck School of Medicine of USC
Specialties: Hematopathology; anatomic and clinical pathology

David Parham, MD
Attending Physician, Division of Anatomic Pathology, Department of Pathology and Laboratory Medicine, Children’s Hospital Los Angeles
Professor of Pathology (Clinical Scholar), Keck School of Medicine of USC
Specialties: Pediatric pathology, anatomic and clinical pathology

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**Nick Shillingford, MD**
Pediatric Pathologist, Division of Anatomic Pathology, Department of Pathology and Laboratory Medicine, Children’s Hospital Los Angeles
Clinical Assistant Professor of Pathology (Clinician Educator), Keck School of Medicine of USC

**Specialties:** Pediatric pathology, anatomic pathology

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**Hiroyuki Shimada, MD, PhD**
Pathologist, Division of Anatomic Pathology, Department of Pathology and Laboratory Medicine, Children’s Hospital Los Angeles
Professor of Pathology (Clinical Scholar), Keck School of Medicine of USC

**Specialty:** Anatomic pathology

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**Larry Wang, MD, PhD**
Director, Surgical Pathology, Division of Anatomic Pathology, Department of Pathology and Laboratory Medicine, Children’s Hospital Los Angeles
Associate Professor of Clinical Pathology and Surgery, Keck School of Medicine of USC

**Specialties:** Pediatric pathology, anatomic pathology and clinical pathology

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**Mikako Warren, MD**
Director of Electron Microscopy and Pediatric Pathologist, Division of Anatomic Pathology, Department of Pathology and Laboratory Medicine, Children’s Hospital Los Angeles
Assistant Professor of Clinical Pathology, Keck School of Medicine of USC

**Specialties:** Pediatric pathology, molecular genetic pathology, anatomic pathology and clinical pathology

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**Shengmei Zhou, MD**
Pediatric Pathologist, Division of Anatomic Pathology, Department of Pathology and Laboratory Medicine, Children’s Hospital Los Angeles
Associate Professor of Clinical Pathology, Keck School of Medicine of USC

**Specialties:** Pediatric pathology, anatomic pathology and clinical pathology

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Division of Laboratory Medicine

The Division of Laboratory Medicine provides the full range of diagnostic laboratory services, including a 24/7 core laboratory (clinical chemistry, point-of-care testing, biochemical genetics and special chemistry); hematology/coagulation; a state-of-the-art microbiology laboratory that offers cutting-edge and rapid turnaround testing in bacteriology, virology, mycology and parasitology. We also offer specialized testing in immunology; flow cytometry, including COG-certified MRD testing; histocompatibility/HLA; and bone marrow evaluations. The Division also includes a full-service transfusion medicine program, including a donor center that provides greater than 95 percent of CHLA’s blood and blood products, a blood bank and a state-of-the-art therapeutic apheresis service.

CHLA’s clinical laboratories are led by internationally recognized faculty and highly skilled laboratory professionals. Faculty and staff actively participate in a wide range of educational programs, including postdoctoral clinical fellowships and CLS training. Working together with CHLA’s physicians we develop innovative clinical testing and are recognized nationally and internationally for our clinical services. We make our full range of laboratory testing and technical services available through our outreach program, which includes both draw station- and reference-based testing with integrated electronic physician ordering and a physician portal.

Clinical Laboratories:
- Biochemical Genetics and Special Chemistry
- Bone Marrow
- Clinical Chemistry
- Diagnostic Immunology and Flow Cytometry
- Hematology and Coagulation
- Histocompatibility (HLA) and Immunogenetics Laboratory
- Microbiology
- Point-of-Care
- Virology
- Outreach program supporting both reference and routine draw station-based testing

Providers and Faculty

Maurice O’Gorman, MSc, MBA, PhD, D(ABMLI)
Chief, Division of Laboratory Medicine; Director, Clinical Laboratory; Director, Diagnostic Immunology and Flow Cytometry Laboratory, Department of Pathology and Laboratory Medicine, Children’s Hospital Los Angeles
Professor of Pathology and Pediatrics (Clinical Scholar), Keck School of Medicine of USC

Specialties: Clinical immunology and diagnostic laboratory immunology, flow cytometry

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Providers and Faculty (continued)

Lee Ann Baxter-Lowe, PhD, dABHI
Director, HLA Laboratory, Division of Laboratory Medicine, Department of Pathology and Laboratory Medicine, Children’s Hospital Los Angeles
Adjunct Professor of Clinical Pathology, Keck School of Medicine of USC
Specialty: Histocompatibility

Jennifer Dien Bard, PhD
Director, Clinical Microbiology and Clinical Virology Laboratories, Division of Laboratory Medicine; Associate Chief, Research and Education, Department of Pathology and Laboratory Medicine, Children’s Hospital Los Angeles
Associate Professor of Pathology (Clinical Scholar), Keck School of Medicine of USC
Specialty: Clinical microbiology

Edward Leung, PhD, DABCC, FACB/FAACC
Director, Core Laboratory (Clinical Chemistry, Point-of-Care Testing, Biochemical Genetics and Special Chemistry), Division of Laboratory Medicine, Department of Pathology and Laboratory Medicine, Children’s Hospital Los Angeles
Assistant Professor of Clinical Pathology, Keck School of Medicine of USC
Specialty: Clinical chemistry

Paul Pattengale, MD
Chief, Research and Education, Division of Laboratory Medicine, Department of Pathology and Laboratory Medicine, Children’s Hospital Los Angeles
Professor of Pathology and Microbiology, Keck School of Medicine of USC
Specialty: Anatomic and clinical pathology

Ajay Perumbeti, MD
Director, Transfusion Medicine, Division of Laboratory Medicine; Co-Director, Infusion Center and Medical Director, FACT Collections and Apheresis, Department of Pathology and Laboratory Medicine, Children’s Hospital Los Angeles
Assistant Professor of Clinical Pathology, Keck School of Medicine of USC
Specialties: Transfusion medicine, pediatrics

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Division of Genomic Medicine

The Division of Genomic Medicine’s Center for Personalized Medicine (CPM) is committed to using genetic information to enable pediatric personalized medicine at CHLA. Our testing is designed to create new ways for our clinical colleagues to detect, diagnose, treat and prevent childhood disease. The Division includes physicians, laboratorians, scientists, genetic counselors and bioinformaticians internationally recognized for their expertise in genomics, clinical genetics, bioinformatics and molecular diagnostics. We are committed to discovering the human genome’s potential to guide preventive medicine, targeted therapies and personalized health care for the benefit of generations to come. The Center for Personalized Medicine works at the forefront of the genomic revolution by integrating state-of-the-art sequencing and other molecular technologies with cutting-edge bioinformatics and expert clinical and diagnostic professionals to develop innovative clinical testing for pediatric cancer, other complex conditions such as epilepsy, and inherited diseases.

Our Tests

Neonatal and pediatric patients with features of a recognizable or suspected genetic condition, or those who experience delays in development or intellectual disability, can benefit from our clinical genetic testing. The results of this testing can aid in diagnosis as well as support the development of specialized treatment plans. Our interdisciplinary team includes laboratory directors who are Board-certified in clinical cytogenetics and molecular genetics, bioinformaticians, clinical geneticists and genetic counselors to help guide physicians, patients and their families to better understand the testing process as well as the interpretation of test results. We are internationally recognized for our specialized expertise in pediatric oncology and offer a comprehensive range of tests for analysis of hematologic disorders, central nervous system tumors, and solid and soft tissue tumors. Our test menu includes:

- 22q11.2 Deletion/Duplication Analysis
- Chromosomal Microarray Analysis
- Clinical Exome Sequencing
- Epilepsy Gene Panel
- Ocular Disease Focused Exome
- Focused Exome (which can be customized for gene panels associated with specific diseases)

Working with our colleagues in the Division of Anatomic Pathology, many of whom are internationally recognized authorities in pathologic diagnosis, we are able to combine their analyses with our state-of-the-art molecular genetic and next-generation sequencing-based testing into fully integrated pathology genomic reporting. This combination of state-of-the-art genomic testing and integrated reporting enables clinicians to access all the information they need to create personalized treatment plans for pediatric cancer. In addition to this, our faculty members are internationally recognized for their experience in pediatric cancer predisposition and offer tests to detect genetic predisposition to known cancers, including rhabdoid tumor and retinoblastoma.

- BRAF Sanger Sequencing
- Chromosomal Microarray Analysis - Oncology
- OncoKids® Cancer Panel
- Retinoblastoma - RB1 Molecular Genetic Analysis
- SMARCB1 Molecular Genetic Analysis

Providers and Faculty

Jaclyn Biegel, PhD, FACMG
Chief, Division of Genomic Medicine; Director, Center for Personalized Medicine, Department of Pathology and Laboratory Medicine, Children’s Hospital Los Angeles
Professor of Pathology (Clinical Scholar), Keck School of Medicine of USC

Specialties: Clinical cytogenetics, cancer genetics

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Xiaowu Gai, PhD
Director of Bioinformatics, Center for Personalized Medicine; Division of Genomic Medicine, Department of Pathology and Laboratory Medicine, Children’s Hospital Los Angeles
Associate Professor of Clinical Pathology, Keck School of Medicine of USC

Specialty: Bioinformatics

Matthew Hiemenz, MD, MS, FCAP
Assistant Director, Clinical Genomics Laboratory, Center for Personalized Medicine, Division of Genomic Medicine, Department of Pathology and Laboratory Medicine, Children’s Hospital Los Angeles
Assistant Professor of Clinical Pathology, Keck School of Medicine of USC

Specialties: Molecular genetic pathology, anatomic pathology

Jianling (Jenny) Ji, MD, MS
Assistant Director, Clinical Genomics Laboratory, Center for Personalized Medicine, Division of Genomic Medicine, Department of Pathology and Laboratory Medicine, Children’s Hospital Los Angeles
Assistant Professor of Clinical Pathology, Keck School of Medicine of USC

Specialties: Clinical molecular genetics, clinical cytogenetics

Gordana Raca, MD, PhD, FACMG
Director, Clinical Cytogenomics Laboratory, Center for Personalized Medicine, Division of Genomic Medicine, Department of Pathology and Laboratory Medicine, Children’s Hospital Los Angeles
Associate Professor of Clinical Pathology, Keck School of Medicine of USC

Specialty: Clinical cytogenetics

Ryan Schmidt, MD, PhD
Assistant Director of Clinical Genomics Laboratory, Center for Personalized Medicine, Division of Genomic Medicine, Department of Pathology and Laboratory Medicine, Children’s Hospital Los Angeles
Assistant Professor of Clinical Pathology, Keck School of Medicine of USC

Specialties: Molecular genetic pathology, clinical pathology

Timothy Triche, MD, PhD
Co-Director, Center for Personalized Medicine, Division of Genomic Medicine, Department of Pathology and Laboratory Medicine, Children’s Hospital Los Angeles
Professor of Pathology and Pediatrics, Keck School of Medicine of USC

Specialties: Anatomic pathology, molecular oncology