Division Data Summary

Research and Training Details

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Clinical Activities and Training

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Faculty Members

Franklin O. Smith, MD, Professor; Marjory J. Johnson Endowed Chair; Director, Hematology/Oncology

Research Interests: Acute myeloid leukemia
Michael Absalon, MD, PhD, Assistant Professor Clinical
  Research Interests: New therapeutics; ataxia telangiectasia; DNA damage response mechanisms

Denise M. Adams, MD, Associate Professor Clinical; Inpatient Clinical Director; Medical Director of Comprehensive Hemangiomas and Vascular Malformation Clinic;
  Research Interests: Research in angiogenesis, endothelial cell proliferation, vascular anomalies.

Vinod Balasa, MBBS, Assistant Professor Clinical
  Research Interests: Research activities related to sickle cell disease and Thrombophilia

Jacob Bleesing, MD, PhD, Assistant Professor Clinical
  Research Interests: Clinical Investigation of Primary Immunodeficiency Disorders, with emphasis on disorders of immunodysregulation and B-cell disorders

Karen Burns, MD, Assistant Professor Clinical
  Research Interests: Outcomes following cancer therapy and outcomes following bone sarcomas

Timothy Cripe, MD, PhD, Associate Professor; Director, Musculoskeletal Tumor Comprehensive Clinic; Director, Translational Research Trials Office
  Research Interests: Transcriptional regulation; genetic perturbations in cancer; gene therapy of cancer; gene transfer; transcriptional targeting; antiangiogenesis; viral oncolysis; viral oncogenesis

Stella M. Davies, MBBS, PhD, MRCP, Professor; Jacob G. Schmidlapp Endowed Chair; Director, Blood and Marrow Transplant Program
  Research Interests: Developing novel drugs for the treatment of children with recurrent or poor prognosis brain tumors

Rachid Drissi, PhD, Assistant Professor
  Research Interests: Examine telomere disruption signaling to DNA damage pathway

Alexandra Filipovich, MD, Professor; Ralph J. Stolle Chair in Clinical Immunology; Director, Immunodeficiency and Histiocytosis Program; Medical Director, Diagnostic Laboratory
  Research Interests: Immunoreconstitution Following Pediatric Stem Cell Transplantation

Maryam Fouladi, MD, FRCP, Associate Professor
  Research Interests: Developing novel drugs for the treatment of children with recurrent or poor prognosis brain tumors

James I. Geller, MD, Assistant Professor Clinical
  Research Interests: Solid and brain tumors, with a specific interest in new drug development. Leads renal, liver and retinoblastoma initiative

Ralph A Gruppo, MD, Professor Clinical; Director, Hemophilia Thrombosis Center
  Research Interests: Coagulation; hemophilia; thrombosis

Matthew Hansen, MD, Assistant Professor Clinical
  Research Interests: Studying outcomes in Hurler’s syndrome patients receiving hematopoietic stem cell transplants.

Richard E. Harris, MD, Adjunct Professor Clinical
  Research Interests: Transplantation for children with bone marrow failure syndromes and aplastic anemia

Sonata Jodele, MD, Assistant Professor Clinical
  Research Interests: Phase I clinical trials; new anticancer drug development; stem cell transplantation; high risk pediatric malignancies; childhood neuroblastoma

Clinton H. Joiner, MD, PhD, Professor; Director, Comprehensive Sickle Cell Center
  Research Interests: Sickle cell disease and other hemoglobinopathies

Theodosia Kalfa, MD, PhD, Assistant Professor
  Research Interests: study of erythropoiesis and red blood cell structural membrane biology

Karen Ann Kalinyak, MD, Professor Clinical; Hematology Clinical Director
  Research Interests: Hematology; bone marrow failure; sickle cell anemia; hemoglobinopathy

Beatrice Lampkin, MD, Professor Emerita

Parinda Mehta, MD, Assistant Professor
  Research Interests: Blood and Marrow Transplant, Fanconi anemia, Pharmacogenetics and Pharmacokinetics

Rajaram Nagarajan, MD, Assistant Professor Clinical
  Research Interests: Outcomes following cancer therapy and outcomes following bone sarcomas

Joseph S. Palumbo, MD, Research Assistant Professor
  Research Interests: Interactions between the hemostatic system and innate immunity effecting tumor progression

John Perentesis, MD, Professor; Director, Oncology Program
  Research Interests: Recombinant cancer therapeutics and molecular mechanisms for drug action
Janos Sumegi, MD, PhD,  Professor  
**Research Interests:** Lymphoproliferative disease, Hemophagocytic Lymphohistioscytosis, Usher syndrome

Lars Wagner, MD,  Associate Professor Clinical  
**Research Interests:** Treatment of neuroblastoma, sarcomas, and brain tumors

Brian D. Weiss, MD,  Assistant Professor Clinical  
**Research Interests:** Targeted Agents for Neurofibromatosis Type 1-Related Malignancies (including plexiform neurofibromas, optic pathway gliomas, and Juvenile Myelomonocytic Leukemia)

Susanne Wells, PhD,  Associate Professor  
**Research Interests:** Papillomavirus biology, molecular mechanisms of cellular growth and senescence

**Joint Appointment Faculty Members**

Michael Jordan, MD,  Assistant Professor  
Immunobiology  
Regulation of the immune response; immunotherapy of cancer

Mi-Ok Kim, PhD,  Assistant Professor  
Center for Epidemiology and Biostatistics

Punam Malik, MD,  Associate Professor  
Experimental Hematology and Cancer Biology

Laura Stadler, ME, MD, MS,  Assistant Professor  
Infectious Disease  
Epidemiology of infectious diseases; cytomegalovirus (CMV); infections in immunocompromised hosts; international adoption; medical education

Sualius Sumanas, PhD,  Assistant Professor  
Developmental Biology

Mary Sutton, MD,  Assistant Professor  
Neurology

David Williams, MD,  Professor  
Experimental Hematology  
Translational Research

**Clinical Staff Members**

- Sarita Joshi, MBBS, MD
- Teresa Finke, MD
- Grant Mussman, MD
- Gregory Wallace, DO

**Trainees**

- Trent Hummel, MD,  PL-VII,  Children's Hospital Medical Center - Akron
- Eric Mullins, MD,  PL-VII,  Vanderbilt University
- Francis Eshun, MD,  PL-VI,  Lincoln Medical Center
- Sabine Mellor-Heineke, MD,  PL-VI,  Staatliches Klinikum Braunschweig
- Ajay Perumbeti, MD,  PL-VI,  Upstate Medical University
- Philip Roehrs, MD,  PL-VI,  Medical University of South Carolina
- Lars Mueller, MD,  PL-V,  Cincinnati Children's Hospital
- Christine Phillips, MD,  PL-V,  Children's Memorial Hospital Chicago
- Melissa Rayburg, MD,  PL-V,  University of Texas Health Science Center
- Adrienne Hammill, MD, PhD,  PL-IV,  Cincinnati Children's Hospital
- Theodore Johnson, MD, PhD,  PL-IV,  Medical College of Georgia
- Kasiani Myers, MD,  PL-IV,  Cincinnati Children's Hospital
- Benjamin Mizukawa, MD,  PL-IV,  Cincinnati Children's Hospital
Significant Accomplishments in FY08

Oncology Program Summary: Leukemia/Lymphoma Programs

A key focus of the Oncology Program is the translational development of new anti-cancer therapies built upon a foundation of research into the basic mechanisms of oncogenesis in childhood cancers. Fundamental cancer research is based in the Divisions of Hematology/Oncology and Experimental Hematology, along with integrated collaborations including other CCHMC Divisions, the University of Cincinnati, and the Ohio State University Comprehensive Cancer Center.

Leukemia and lymphoma are the most common pediatric malignancies and account for approximately 40% to 45% of all childhood cancer. In coordinated efforts, CCHMC faculty members from the Divisions of Hematology/Oncology and Experimental Hematology lead an impressive array of research initiatives in the biology and therapy of leukemias and lymphomas which have been benchmarked by ability to gain competitive National Institutes of Health funding. Dr. Yi Zheng’s NIH-funded laboratory is developing novel small molecular inhibitors of pathological signaling in leukemia cells. His group studies the function and mechanism of regulation of the Rho family small GTP-binding proteins of Ras superfamily. The Rho GTPases are a class of intracellular signal transducers that play important roles in the regulation of diverse cellular activities including action cytoskeleton reorganization, transcription activation, and DNA synthesis. The NIH-funded research group of Dr. Lee Grimes is studying the regulation of expression of cancer causing genes in leukemias through multiple NIH funded awards and is using this work to develop an understanding of the molecular bases of acute myeloid leukemia. He is also actively identifying and refining new drug targets for clinical intervention in leukemias. Dr. Hartmut Geiger is identifying the role of tumor suppressor genes in leukemias and therapeutic opportunities to exploit this pathway. Dr. John Perentesis’ NIH-funded laboratory program is identifying molecular targets in leukemias in high-risk pediatric populations such as children with Down syndrome, as well a molecular predictors of outcome in leukemia and Hodgkin’s lymphoma. His lab has also been active in the development of targeted therapies for leukemia. Dr. Andreassen is NIH funded to analyze and dissect the role of cancer gene checkpoint dysregulation in leukemias. Dr. Filippi is NIH-funded to understand some of the role of similar small molecules affecting normal and malignant hematopoietic stem cells as well as how these molecules impact the function of normal cells. Dr. Meetei is also funded through the NIH to study the function and regulation of DNA repair genes in blood cell precursors. Dr. James Mulloy's NIH-funded group is studying the role of specific core binding factor and other fusion target genes in the regulation of normal and leukemia cells. Dr. Stella Davies leads an extensive NIH-funded program to identify genetic risk factors for the development of leukemia as well as a parallel extensive effort in pharmacogenetics to provide a foundation for the optimization of personalized cancer therapies as well as new targeted agents. Her NIH funded laboratory is the center for national pharmacogenetic studies on the children treated on leukemia regimens through the National Children's Oncology Group, and 20,000 survivors of pediatric cancer through the Childhood Cancer Survivor Study. This work is a key element for the future development of personalized and predictive medicine efforts in pediatric and adult cancers. Translational clinical activities in the Oncology and Blood/Marrow Transplantation Programs are investigating the use of new targeted anti-cancer therapies and antibodies in the treatment of high-risk and relapsed pediatric leukemias and lymphomas.

Blood and Marrow Transplantation Program Summary: Reducing the Side Effects of Bone Marrow Transplantation

Bone marrow transplantation is the only available cure for children with a variety of genetic diseases that cause metabolic abnormalities or bone marrow failure. The availability of better matched donors has improved the results of bone marrow transplantation have improved markedly in recent years. However, the short and long term side effects of transplant can still be severe, or even fatal. Faculty members of the stem cell transplant program at Cincinnati Children’s Hospital have investigated the use of a less intense pre-transplant chemotherapy regimen and have shown that the results are excellent, with successful engraftment and reduced side-effects of treatment. The new reduced-intensity regimen has been used successfully to treat children with Schwachman-Diamond syndrome and Seckel syndrome, two bone marrow failure syndromes in which genetic instability commonly leads to severe side effects, or even death after treatment with conventional regimens. All the children treated with the new regimen had successful engraftment of their stem cells and survived their transplant. Outcomes were similarly in children with Hurler syndrome, a progressive and fatal metabolic disease. The investigators are hopeful that the new approach will allow preservation of fertility for at least a proportion of children, but long term follow-up is needed to confirm this.

Hematology Program Summary: Comprehensive Sickle Cell Center

Sickle cell disease is one of the most common “single gene” disorders in the US, seriously affecting the health and well-being of almost 100,000 children and adults, and significantly shortening their life expectancy. The past two decades of basic and clinical research have generated a new opportunities for treating this disease of red blood cells. The Comprehensive Sickle Cell Center, led by Dr. Clinton Joiner, is fully engaged across a full spectrum of basic, translational, clinical and outcomes/adherence research. Over the past decade, the Sickle Cell Center has received over
$22 M in extramural research funding. In 2008 the Sickle Cell Center was awarded a new $6.4 M four-year grant from NHLBI to conduct three major projects: 1. Basic science research into ways to improve the hydration state of sickle red blood cells via gene transfer to hematopoietic stem cells (Dr. Clinton Joiner, PI). 2. Translational research to develop methodologies to alter hemoglobin expression via gene transfer to hematopoietic stem cells (Dr. Punam Malik, PI, Division of Experimental Hematology). 3. A project aimed at improving adherence to hydroxyurea therapy for sickle cell disease via individualized psychosocial interventions (Dr. Monica Mitchell, PI, Division of Psychology and Behavioral Medicine). The grant also funds a career development program for research faculty in hematology and a summer program to introduce high school students to laboratory research. Other NIH-funded, collaborative clinical research projects focus on therapies to prevent strokes in sickle cell disease; on pharmacological treatments for Hemoglobin SC disease; on the correlation between genetic polymorphisms and phenotypic diversity in sickle cell disease (Dr. Karen Kalinyak, PI). Another NHLBI-funded translational research project, in collaboration with the Divisions of Experimental Hematology and Pulmonary Medicine, investigates the relationships among sickle cell disease, inflammation, and lung disease (Dr. Malik).

### Significant Publications in FY08

**Leukemia** 22(2): 265-72  

This study demonstrated that patients with acute myeloid leukemia who were heterogeneous for the XRCC3 Thr241 Met allele has improved post-induction disease-free survival compared to children homozygous for the major or minor allele.

**Mol Ther** 16(5): 879-85  

This study suggest that the oncolytic herpes simplex virus, rRP450/CPA, is safe and should be studied further in children with recurrent solid tumors.

**Cancer** 110(11): 2535-41  

This phase II study of the farnesyl transferase inhibitor, tipifarnib, was not found to be effective in children with recurrent central nervous system malignancies.

**Blood** 110(1): 133-41  

This study showed that tumor-associated tissue factor is linked to metastasis through a fibrinogen-dependent and platelet-dependent restriction in natural killer cell mediated clearance of micro-metastases.

**Clin Cancer Res** 13(18 Pt 1): 5418-25  

This study showed that methylguanine-DNA methyltransferase is widely expressed in primary neuroblastoma tumors and may be a relevant therapeutic target.

### Division Highlights

New viral and gene therapies for high-risk brain and other pediatric solid tumors
Brain tumors and other pediatric solid tumors including neuroblastoma and rhabdomyosarcoma that cannot be completely resected are often fatal, and desperately need new approaches to therapy. CCHMC researchers are developing genetically engineered viruses, called “oncolytic viruses,” that show potent effects in killing cancer cells. In leading edge discoveries published in Molecular Therapy, Cancer Research, and Cancer Gene Therapy, CCHMC investigators have shown that oncolytic herpes simplex viruses can specifically target malignant sarcomas, inhibiting tumor growth and angiogenesis. In parallel clinical trials, patients at CCHMC with highly malignant brain tumors called glioblastoma multiforme are being treated with gene therapy that allows normal healthy blood cells to become resistant to the chemotherapies needed to treat these tumors. In these studies, a patient’s normal healthy blood stem cells are genetically modified to carry genes conferring resistance for the brain tumor chemotherapy drug temozolomide, allowing the patients to safely receive higher doses of the drug. Patients receive the genetically modified blood cells as well as high-dose temozolomide therapy and radiation for treatment of the glioblastoma multiforme. In related studies, our investigators have discovered the molecular mechanisms involved in events leading to the development of gene therapy-related complications, including leukemia. This work provides background for the development of safer gene therapy technologies.

References


Leading-edge advances in leukemia research

CCHMC leukemia researchers are among the first to successfully transform normal human blood stem cells into leukemia stem cells. This work is providing a new understanding of what causes pediatric leukemia, the most common cancer affecting children. When researchers programmed normal benign human umbilical cord blood cells to express a fusion of two genes important in childhood mixed-lineage leukemia (MLL), they were able to create leukemia stem cells able to transform into either acute myeloid leukemia (AML) or acute lymphoid leukemia (ALL) cells depending on the growth factor proteins present in the cell culture. By manipulating these growth factor proteins in the cells, they were also able to transform ALL cells into AML cells and vice versa. In order to facilitate research into new therapies, this same team of researchers used the human leukemia stem cells they developed to create new and more useful mouse models of MLL-associated ALL and mixed myeloid/lymphoid disease. This work has highlighted the critical importance of leukemia cells’ environment to the progression and form of the disease and has suggested exciting new targets for future drug development. Published in the prestigious journal Cancer Cell, this research has garnered significant national attention. In integrated parallel investigations, CCHMC scientists have developed novel drugs for targeting signaling pathways in these leukemias as well as other cancers. Importantly, these new drugs work to kill leukemia cells by targeting the core processes that make them malignant and spare normal cells. These new drugs also kill leukemia cells that have become otherwise resistant to traditional chemotherapy and are currently being refined for clinical trials.

References


Wei J. Wunderlich M. Fox C. Alvarez S. Cigudosa JC. Wilhelm JS. Zheng Y. Cancelas JA. Gu Y. Jansen M. Dimartino
Division Collaboration

Collaboration with Experimental Hematology & Cancer Biology; Pediatric & Thoracic Surgery; Developmental Biology-Students
Collaborating Faculty: J. Cancelas; T. Crombleholme; W. Baird
Tissue inhibitor of metalloproteinase-3 via oncolytic herpesvirus inhibits tumor growth and vascular progenitors.
Cancer Res 68:1170-1179, 2008  (T. Cripe; Y. Mahller)

Collaboration with Translational Research Trials Office; Infectious Diseases; Immunobiology
Collaborating Faculty: R. Gillespie; N. Sawtell; D. Hildeman
Efficacy and safety of the oncolytic herpes simplex virus rRp450 alone and combined with cyclophosphamide. Mol Ther 16:879-885, 2008  (T. Cripe; M. Currier; Y. Mahller)

Collaboration with Biomedical Informatics; Developmental Biology-Students
Collaborating Faculty: B. Sakthivel; B. Aronow; W. Baird

Collaboration with Experimental Hematology & Cancer Biology; Pathology; Biostatistics & Epidemiology; Experimental Hematology & Cancer Biology
Collaborating Faculty: G. Johansson; M. Collins; K. Mi-Ok; N. Ratner
Effective in vivo targeting of the mTOR pathway in malignant peripheral nerve sheath tumors. Mol Cancer Ther 7:1237-1245, 2008.  (T. Cripe; Y. Mahller; J. Perentesis)

Collaboration with Endocrinology; Behavioral Medicine & Clinical Psychology
Collaborating Faculty: S. Rose; Doug Ris
A pilot study of oxandrolone in children with Fanconi Anemia and severe bone marrow failure  (F. Smith)

Collaboration with Surgical Services
Collaborating Faculty: R. Azizkhan
COG, Surgery services for Oncology patients

Collaboration with UC Radiation Oncology
Collaborating Faculty: J. Breneman
Radiation Oncology clinical services for Hem/Onc patients; COG

Collaboration with Human Genetics
Collaborating Faculty: Liming Bao; T Smolarek
COG; Genetic services for HemOnc Patients

Collaboration with Pathology
Collaborating Faculty: M. Collins
COG; Pathology services

Collaboration with Behavioral Medicine and Clinical Psychology
Collaborating Faculty: D. Drotar
COG; Adherence Research

Collaboration with Behavioral Medicine & Clinical Psychology
Collaborating Faculty: D. Ris
COG; NeuroPsych services, Neuropsychology research, Fanconi Anemia research

Collaboration with Radiology
Collaborating Faculty: M. Gelfand
COG; Cancer Nuclear Medicine services
Collaboration with Orthopaedics
**Collaborating Faculty: CT Mehlman**
COG; Brain Tumor research and clinical services

Collaboration with Experimental Hematology
**Collaborating Faculty: J. Mulloy**
Leukemia Research; COG

Collaboration with Endocrinology
**Collaborating Faculty: S. Rose**
COG; FA research, NeurOncology Research, Endocrinology services as part of clinic

Collaboration with University of Cincinnati
**Collaborating Faculty: George Thomas**
COG; Drug Development

Collaboration with Pediatric & Thoracic Surgery
**Collaborating Faculty: G. Tiao**
COG; Cancer Surgery

Collaboration with Clinical Pharmacology
**Collaborating Faculty: A. Vinks**
COG; Developmental Therapeutics research

Collaboration with Anesthesia
**Collaborating Faculty: N. Weidner**
COG; Palliative care and pain

Collaboration with PM&R
**Collaborating Faculty: D. Pruit**
NeuroOncology Clinic

Collaboration with University of Cincinnati - Oncology
**Collaborating Faculty: M Gerena-Lewis**
Medical Oncology and NeuroOncology services

Mentions in Consumer Media
- America's Best Children's Hospitals U.S. News & World Report, Magazine
- Viral Therapy Slows Pediatric Tumors in Mice Forbes, Magazine

Division Publications
7. Currier MA, Gillespie RA, Sawtell NM, Mahller YY, Stroup G, Collins MH, Kambara H, Chiocca EA, Cripe TP. **Efficacy and safety of the oncolytic herpes simplex virus rRp450 alone and combined with cyclophosphamide.** Mol


adapted craniospinal and conformal primary-site irradiation and high-dose chemotherapy with stem-cell rescue on the SJMB-96 trial. *J Clin Oncol.* 2008; 26: 1112-8.


32. Harris RE. *Management of the hematologic abnormalities of Shwachman Diamond Syndrome.* Kernersville, NC: Shwachman Diamond America


40. Mehta PA, Davies SM. *Allogeneic transplantation for childhood ALL.* *Bone Marrow Transplant.* 2008; 41: 133-9.


Grants, Contracts, and Industry Agreements

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<td><strong>Predictors Of Adult Leukemia</strong></td>
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Genetic Epidemiology of Basal Cell Carcinoma in Childhood Cancer Survivors
University of Cincinnati Center for Environmental Genetics
04/01/08 - 03/31/09
$25,000 / $25,000

Novel Molecular and Cellular Therapies in Fanconi Anemia
National Institutes of Health (Children's Hospital Boston)
R01 HL 081499
04/01/08 - 03/31/09
$166,839 / $333,678

Childhood Cancer Survivor Study
National Institutes of Health (St. Jude's Children's Hospital)
U54 CA 055727
12/01/05 - 11/30/10
$50,000 / $643,729

Antileukemic Effect of NK Cells in HCT for Pediatric AML
National Institutes of Health (St. Jude's Children's Hospital)
R01 CA 120583
08/01/07 - 06/30/12
$8,716 / $43,580

Fouladi, M

Children's Oncology Group Phase I/Pilot Consortium
National Institutes of Health (National Childhood Cancer Foundation)
U01 CA 097452
08/01/07 - 07/31/12
$21,877 / $21,877

The Pediatric Brain Tumor Consortium
National Institutes of Health (St. Jude's Children's Hospital)
U01 CA 081457
04/01/08 - 03/31/09
$11,127 / $11,127

Glass, D.

Fascanto II Flow Cytometer and SVC Fascanto II Violet
Health Resources and Services Administration
C76 HF 09978
06/01/08 - 05/31/09
$473,707 / $473,707

Gruppo, R

Hemophilia Comprehensive Care & Prevention Core Center for Bleeding Disorders
Maternal and Child Health Bureau (Hemophilia Foundation of Michigan)
5H30MC0015-11
10/01/97 - 05/31/09
$14,760 / $124,190

Hemophilia Prevention Network
Centers for Disease Control and Prevention (Hemophilia Foundation of Michigan)
U27 CCU 51382
10/01/97 - 09/29/08
$22,295 / $134,458

Hemophilia and Thrombosis Center
Cascade Hemophilia Consortium (Hemophilia Foundation of Michigan)
06/01/03 - 05/31/09
$58,200 / $239,458

Joiner, C

Cincinnati Sickle Cell Project
Ohio Department of Health
31-6-006-1-CC-08
07/01/07 - 06/30/08
$117,368 / $117,368

Cincinnati Comprehensive Sickle Cell Center
National Institutes of Health
U54 HL 070871
06/15/08 - 03/31/12
$1,005,115 / $4,067,809

Joiner, C

Project 3
108,644

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298,056

Project 5
389,734

Admin Core
103,681

Scholar
105,000

Cincinnati Comprehensive Sickle Cell Center
National Institutes of Health
U54 HL070871-05S
06/15/08 - 03/31/09
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<td>Marsh, R</td>
<td>Investigation into the Clinical and Molecular Pathogenesis of XIAP Deficiency</td>
<td>Histiocytosis Association of America</td>
<td>11/01/07</td>
<td>10/31/08</td>
<td>$48,500 / $48,500</td>
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<td>Muller, L</td>
<td>Optimization of Gene Therapy Technology for FA, an Inherited Cancer Predisposition and Bone Marrow Failure Syndrome</td>
<td>St. Baldrick's Foundation</td>
<td>07/01/07</td>
<td>06/30/08</td>
<td>$61,875 / $61,875</td>
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<td>Nagarajan, R</td>
<td>Genetic Epidemiology of Osteosarcoma</td>
<td>National Institutes of Health (University of Minnesota)</td>
<td>05/01/07</td>
<td>04/30/11</td>
<td>$9,013 / $36,607</td>
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<td>Palumbo, J</td>
<td>Hemostatic Factors and Tumor Biology</td>
<td>National Institutes of Health</td>
<td>07/15/03</td>
<td>06/30/08</td>
<td>$120,750 / $603,750</td>
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<td>Mechanisms Linking Metastasis to Tumor Procoagulant and Innate Immunity</td>
<td>National Institutes of Health</td>
<td>07/20/06</td>
<td>06/30/11</td>
<td>$242,750 / $1,221,000</td>
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<td>Partin-Welch, P</td>
<td>Oncology Education and Support Group/Family Specials Needs Program</td>
<td>Bear Necessities Pediatric Cancer Foundation</td>
<td>07/01/07</td>
<td>06/30/08</td>
<td>$5,000 / $5,000</td>
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<td>Perentesis, J</td>
<td>Children's Oncology Group Phase I Consortium</td>
<td>National Institutes of Health (National Childhood Cancer Foundation)</td>
<td>08/01/07</td>
<td>07/31/12</td>
<td>$21,250 / $106,250</td>
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<td>Children's Oncology Group Phase I Consortium (Per Patient)</td>
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<td>07/31/12</td>
<td>$23,354 / $116,772</td>
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<td>Children's Oncology Group - Committee</td>
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<td>$11,441 / $57,205</td>
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<td>Molecular Studies of Down Syndrome Leukemia</td>
<td>National Institutes of Health</td>
<td>01/01/05</td>
<td>12/31/08</td>
<td>$178,395 / $652,146</td>
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<td>Personalized Neuroblastoma Cancer Signatures and Targeted Therapy</td>
<td>Cancer Free Kids</td>
<td>05/01/08</td>
<td>04/30/09</td>
<td>$40,000 / $40,000</td>
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Chairman's Award Children's Oncology Group
National Institutes of Health (National Childhood Cancer Foundation)
U10 CA 098543 03/01/08 - 02/28/13 $23,325 / $116,625

Chairman's Award Children's Oncology Group (Per Patient)
National Institutes of Health (National Childhood Cancer Foundation)
U10 CA 098543 03/01/03 - 02/28/13 $97,909 / $418,715

Shook, L
Cincinnati Sickle Cell Newborn Screening Network
Health Resources and Services Administration
H46 MC 09233 06/01/08 - 05/31/11 $185,000 / $555,000

Smith, F.
The Children's Oncology Group Chairs Grant
National Institutes of Health (National Childhood Cancer Foundation)
U10 CA 098543 03/01/08 - 02/28/13 $108,925 / $544,628

Sumegi, J
Molecular Characterization of Novel Variant Translocation in Sarcomas of Children
American Cancer Society - Ohio
09/01/07 - 08/31/08 $25,000 / $25,000

Search for Growth Inhibitory Genes in Ewing's Sarcoma by Epigenetic Profiling
La Fondation des Gouverneurs de l'espoir for Ewing Family Tumors (University of Nebraska)
01/01/08 - 12/31/08 $46,262 / $92,524

Wagner, L.
Children's Oncology Group Phase I ADVL0414 Study Chair
National Institutes of Health (National Childhood Cancer Foundation)
U01 CA 097452 08/01/07 - 07/31/12 $20,251 / $101,255

Identification of Response Markers in Children Receiving Combination Therapy with Chemotherapy and Bevacizumab
Cancer Free Kids
05/01/08 - 04/30/09 $20,000 / $20,000

Wells, S.
Fanconi Anemia and HPV Associated Disease
Fanconi Anemia Research Foundation
01/01/07 - 12/31/08 $75,000 / $150,000

Role and Regulation of the Human DEK Proto-Oncogene
National Institutes of Health
R01 CA 116313 04/01/06 - 02/28/11 $172,353 / $916,579

Current Year Direct $4,397,168

Industry Contracts
Balasa, V
Novartis Pharmaceuticals $ 36,599

Cripe, T
Crusade Laboratories Limited $ 38,078

Gruppo, R
Baxter Healthcare Corp. $ 11,562
Wyeth Pharmaceuticals $ 12,570

Harris, R
Alexion Pharmaceuticals, Inc. $ 2,118
NANT $ 6,622
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<td>Joiner, C</td>
<td>Icagen Inc.</td>
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<td>Smith, F</td>
<td>Clinical Trials Office</td>
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<td>Current Year Direct Receipts</td>
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<tr>
<td>Current Year Direct</td>
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<td>Total</td>
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<td>$4,540,818</td>
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