Division Details

Division Data Summary

<table>
<thead>
<tr>
<th>Research and Training Details</th>
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<tbody>
<tr>
<td>Number of Faculty</td>
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<td>Number of Joint Appointment Faculty</td>
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<td>Number of Research Fellows</td>
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<td>Number of Research Students</td>
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<tr>
<td>Number of Support Personnel</td>
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<td>Peer Reviewed Publications</td>
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<th>Clinical Activities and Training</th>
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<td>Number of Clinical Staff</td>
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<td>Inpatient Encounters</td>
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<td>Outpatient Encounters</td>
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Significant Accomplishments

**Gene therapy for SCID**

Children with severe combined immune deficiency (SCID) are born lacking an essential gene that allows the immune system to fight infections. Untreated, SCID is fatal, with the children typically dying of overwhelming infection in the first two years of life. Children with SCID can be successfully treated with a bone marrow transplant that replaces the defective immune system cells with new ones. Unfortunately, some children with SCID will not have a suitable donor, and some who do have a transplant will have serious complications. A multi-center international gene therapy study, using a viral vector manufactured at Cincinnati Children’s, takes the child’s own cells and inserts a normal copy of the defective gene into the child’s own cells. With this approach there is no need for a matched donor and no need for chemotherapy, which leads to fewer complications. Lisa Filipovich, MD, is leading the study at Cincinnati Children’s and the first child has been enrolled and treated. We anticipate that gene therapy will become an important treatment option for babies with SCID, and may allow cure for all the children with fewer complications.

**Participation in Clinical Trial Consortia Grows**

With the acceptance of our application to join the National Cancer Institute-funded Pediatric Brain Tumor Consortium (PBTC), Cincinnati Children’s became the only pediatric cancer program in the US participating in all four selective national early-phase clinical research consortia: the NCI Pediatric Phase I/Pilot Consortium, the NCI New Approaches to Neuroblastoma Consortium, the PBTC, and the Department of Defense-funded Neurofibromatosis Clinical Consortium.
The PBTC is the premiere national multidisciplinary cooperative research group developing new therapies for CNS tumors of childhood. It has a highly competitive application process, which makes Cincinnati Children’s one of only 11 participating centers. In addition, Maryam Fouladi, MD, MSc, Professor of Pediatrics and Medical Director of Neuro-Oncology, has been elected to serve as national chair of the PBTC.

**Experimental Hematology and Cancer Biology**

Humoral and paracrine signals from the bone marrow hematopoietic microenvironment control blood generating stem cell activity during regenerative hematopoiesis. A group led by Jose Cancelas, MD, PhD, reported in *Proceedings of the National Academy of Sciences, USA*, that Connexin-43, a molecule involved in cell-cell communications, exerts a protective role and regulates the blood producing progenitor cell reactive oxygen species content through ROS transfer to the bone marrow microenvironment. This effect results in blood stem cell protection during stress hematopoietic regeneration under chemo or radiation therapies.

Tissue damage induced by ionizing radiation in the hematopoietic and gastrointestinal systems is the major cause of lethality in radiological emergency scenarios and underlies some deleterious side effects in children undergoing radiation therapy. The identification of target-specific interventions that confer radiomitigating activity is an unmet challenge. Hartmut Geiger, PhD, in collaboration with several other researchers at Cincinnati Children’s, Wisconsin and Arkansas, identified the thrombomodulin (Thbd)-activated protein C (aPC) pathway as a new mechanism for the mitigation of total body irradiation-induced mortality. Reporting in the journal *Nature Medicine*, they show that pharmacologic augmentation of the activity of the Thbd-aPC pathway by recombinant Thbd or aPC might offer a rational approach to the mitigation of tissue injury and lethality caused by ionizing radiation.

Small molecule targeted therapy has been hindered by an issue of druggability of target molecules. In a study published in *Chemistry and Biology*, Yi Zheng, PhD, led a group of chemical biologists to devise a novel approach of rational design of chemical compounds that selectively bind to and inhibit RhoA GTPase, a critical cell signal transducer with a globular structure involved in cancer cell proliferation and neuronal disorders. Their discovery suggests that design and search for low affinity binding chemicals tethered by proper linkers may be useful for rational targeting of “undruggable” biological molecules.

**Hematology Division**

The Hematology Division offers state-of-the-art testing for a variety of complex hematological diagnoses. Over the last year, the Sickle Cell Center, in collaboration with Human Genetics, has launched a genetics-based hemoglobinopathy diagnostic service, making Cincinnati Children’s one of only a few centers in the US that offer comprehensive genetic testing for hemoglobinopathies. Our Special Hemostasis Laboratory has expanded our repertoire of diagnostic studies available for the diagnosis and management of children with bleeding and thrombotic disorders. We recently added several new tests for the detailed diagnosis and characterization of Von Willebrand disease, the most common bleeding disorder in children, making us the only facility in the region offering these assays. We have also added several new tests for the evaluation of platelet function abnormalities, making our laboratory one of the few laboratories nationally with the capability to diagnose children with platelet disorders.

**Division Publications**


Damez-Werno D, Dietz KC, Scobie KN, Ferguson D, Christoffel D, Ohnishi Y, Hodes GE, Zheng Y, Neve RL, 
Hahn KM, Russo SJ, Nestler EJ. Rac1 is essential in cocaine-induced structural plasticity of nucleus 
Severe allergic reactions to thiol-based cytoprotective agents mesna and amifostine in a child with a 
counters oxidative stress through selective protection of antioxidant defense gene promoters. 
23. Dvorak CC, Bollard CM, El-Bietar J, Filipovich A. Complications of transplant for nonmalignant disorders: 
autoimmune cytopenias, opportunistic infections, and PTLD. Biol Blood Marrow Transplant. 2012; 
18:S101-10.
Magnetic resonance imaging-guided microdialysis cannula implantation in a spontaneous high-grade 
survivorship practices, services, and delivery: a report from the Children's Oncology Group (COG) 
26. Fadell MF, 2nd, Jones BV, Adams DM. Prenatal diagnosis and postnatal follow-up of rapidly involving 
27. Fang J, Varney M, Starczynowski DT. Implication of microRNAs in the Pathogenesis of MDS. Curr Pharm 
28. Fernandes JF, Rocha V, Labopin M, Neven B, Moshous D, Gennery AR, Friedrich W, Porta F, Diaz de Heredia 
Transplantation in patients with SCID: mismatched related stem cells or unrelated cord blood?. Blood. 
outcomes in children with neurofibromatosis type 1-associated optic pathway glioma following 
Scharffetter-Kochanek K, Zheng Y, Geiger H. Cdc42 activity regulates hematopoietic stem cell aging and 
S, Gajjar A, Demuth T, Kun LE, Boyett JM, Gilbertson RJ. Phase I trial of MK-0752 in children with 
32. Franz DN, Weiss BD. Molecular therapies for tuberous sclerosis and neurofibromatosis. Curr Neurol 
J, Massey G, Perentesis J, Ravindranath Y, Taub J, Smith FO. Natural history of transient 
myeloproliferative disorder clinically diagnosed in Down syndrome neonates: a report from the


H3K4 at PU.1 regulatory regions is impaired by MDS/AML-associated RUNX1/AML1 mutations. Blood. 2011; 118:6544-52.


80. Meyers AB, Towbin AJ, Serai S, Geller JI, Podberesky DJ. *Characterization of pediatric liver lesions with*
94.


## Grant and Contract Awards

### DAVIES, S

**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  
$8,864

**Childhood Cancer Survivor Study**  
National Institutes of Health (St Jude's Children's Hospital)  
U24 CA 055727  
12/01/11-11/30/16  
$177,391

**Children's Oncology Chair Award**  
National Institutes of Health (Children's Oncology Group)  
U10 CA 098543  
03/01/11-02/28/14  
$12,831

**Multicenter Pilot Trial of HSCT Lacking a Genotype Identical Donor**  
Fanconi Anemia Research Fund  
05/01/10-04/30/13  
$1,160

**Molecular Epidemiology of Pediatric Germ Cell Tumors**  
National Institutes of Health (University of Minnesota)  
R01 CA151284  
08/10/11-05/31/16  
$21,219

### FILIPOVICH, A

**Gene Therapy for SCID-X1 Using Self-Inactivating (SIN) Gammaretroviral Vector**  
National Institutes of Health (Children's Hospital Boston)  
U01 AI 087628  
09/01/10-08/31/15  
$121,927

**Hypoxia and Potassium Channel Activity in T Lymphocytes**  
National Institutes of Health (University of Cincinnati)  
R01 CA 095286  
06/01/09-04/30/12  
$19,959

**Rare Diseases Clinical Consortia for the Rare Diseases - Per Patient**  
National Institutes of Health (The Regents of the Univ of California)  
U54 AI 082973  
09/12/09-08/31/14  
$60,333

### KUMAR, A

**Molecular Pathogenesis of MLL-Fusion Gene Leukemia**  
National Institutes of Health  
K08 CA 122191  
08/19/09-06/30/12  
$125,250

### MARSH, R

**Studies to Determine Why ZIAP Deficiency Leads to HLH**  
Clinical Immunology Society  
07/01/10-06/30/12  
$85,000

### MEHTA, P

**Quercetin in Patients with Fanconi Anemia, a Pilot Study**  
Aplastic Anemia & MDS International Fdn  
07/01/11-06/30/13  
$27,273

### SUMEGI, J

**Biomarkers in Primary and Secondary Hemophagocytic Lymphohistiocytosis**  
Histiocytosis Association of America  
01/01/12-12/31/12  
$50,000

**Identification of PAX3-NCOA1/NCOA2-Regulated Genes in Rhabdomyosarcoma**  
Joanna McAfee Childhood Cancer Fdn. Inc.  
01/01/12-12/31/12  
$8,000
Industry Contracts

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<td>HARRIS, R</td>
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Current Year Direct Receipts $88,225

Service Collaborations

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Funded Collaborative Efforts

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<tr>
<td>BLEESING, J</td>
<td>NIAMS Multidisciplinary Clinical Research Center</td>
<td>Nonadherence: Undermining Health Outcomes in Pediatric HSCT</td>
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Total $808,932

Experimental Hematology

Grant and Contract Awards

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<td>FANCD2 Monoubiquitination in DNA Damage Responses</td>
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<td>AZAM, M</td>
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<td>CANCELAS-PEREZ, J</td>
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<td>Improving Stem Cell Mobilization by the EGFR Inhibitor Erlotinib</td>
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<td>Rac GTPase Inhibition in Chronic Myelogenous Leukemia</td>
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<td>Regulation of Cellular Growth and Differentiation</td>
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<td>Analysis of Staphylococcus Aureus Host Interactions</td>
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<td>Thrombin-Mediated Proteolysis in Neuroinflammatory Disease</td>
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<td>Hemostatic Factors and Sickle Cell Disease</td>
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<td>Regulation of Hematopoietic Stem Cell Self Renewal</td>
<td>FILIPPI, M</td>
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<td>Regulation of Neutrophil Migration and Polarity</td>
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<td>Mechanisms Linking the Hemostatic Protease Thrombin to Arthritic Disease</td>
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<td>Digestive Health Center - Pilot &amp; Feasibility Study</td>
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<td>Activated Protein C for Treatment of Radiation Combined Injury</td>
<td>HUANG, G</td>
<td>Ohio Cancer Research Associates</td>
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<td>Molecular Mechanisms of Leukemogenesis Mediated by MLL-Partial Tandem Duplication (MLL-PTD)</td>
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<td>Targeting the &quot;Warburg Effect&quot; in Cancer</td>
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<td>Ameliorating Sickle Nephropathy and Pulmonary Hypertension</td>
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<td>Development of Safe and Efficient Gene Therapy Strategies</td>
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<td>PIGF-HIF 1a-miRNA Axis in Sickle Pulmonary Hypertension</td>
<td>National Institutes of Health(University of Southern California)</td>
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<td>Cincinnati Center for Clinical/Translational Sciences &amp; Training</td>
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<td>MULLOY, J</td>
<td>Next Generation DNMT-1 Depletion Therapy for Leukemia</td>
<td>Department of Defense Army(Cleveland Clin Lerner Col of Med of CWRU)</td>
<td>W81XWH-09-1-0671</td>
<td>09/01/09-09/01/12</td>
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<td>Novel Therapeutic Target in Leukemia Stem Cells</td>
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<td>Rac Signaling in MLL Leukemia</td>
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<td>NASSAR, N</td>
<td>Ras, Cycling and Inhibition</td>
<td>National Institutes of Health</td>
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<td>OLSHAVSKY, N</td>
<td>Regulation of Cellular Growth and Differentiation</td>
<td>National Institutes of Health(University of Cincinnati)</td>
<td>T32 CA59268</td>
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<td>PAN, D</td>
<td>Genetic Therapy for CNS Manifestations in MPS I via BBB-Targeted Protein Delivery</td>
<td>National Institutes of Health</td>
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<td>09/30/08-08/31/13</td>
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<td>PANG, Q</td>
<td>Role of FA Proteins in Hematopoiesis</td>
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<td>04/01/10-03/31/15</td>
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<td>Role of Tumor Necrosis Factor in Leukemogenesis</td>
<td>The Leukemia and Lymphoma Society</td>
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Targeted Improvement in Stem Cell Therapy for Leukemia and Bone Marrow Failure Syndromes
National Institutes of Health
R01 CA 157537 02/01/11-12/31/15 $207,500

PATEL, A
Identification and study of Novel Genes Critical to survival of MPNSTS
Department of Defense
W81XWH1110144 06/01/11-05/31/13 $50,000

RATNER, N
Cincinnati Center for Neurofibromatosis Research
National Institutes of Health
P50 NS 057531 09/15/08-06/30/13 $1,033,483
 Ratner, N Project A $48,069
 Cripe, T Project B $106,147
 Rizvi, T Project C $81,328
 Perentesis, J Project 1 $297,055
 Ratner, N Project 2 $224,070
 Ratner, N Project 3 $276,814

Mitogenic Activities in Neurofibromatosis
National Institutes of Health
R01 NS 028840 09/15/11-07/31/16 $231,250

Modelling Brain Defects in NF1
Department of Defense
W81XWH1010116 04/01/10-03/31/13 $251,091

STARCZYNOWSKI, D
Deregulation of TIFAB in Myelodysplastic Syndrome
American Society of Hematology

Regulation and Function of TIFAB in Myelodysplastic Syndrome
Department of Defense
W81XWH1110468 06/01/11-05/31/14 $132,295

Identification and Characterization of Genes in del(5q) Myelodysplastic Syndrome
National Institutes of Health
R01 HL111103 12/05/11-11/30/16 $250,000

VAN DER LOO, J
AKTA Ready Liquid Chromatography System
National Institutes of Health
S10 RR 031721 07/01/11-06/30/12 $175,119

VARNEY, M
Environmental Carcinogenesis and Mutagenesis
National Institutes of Health(University of Cincinnati)
T32 ES 007250 05/01/12-04/30/14 $49,198

WU, J
STAT3 in Neurofibroma Tumorigenesis and Therapy
Department of Defense Army
W81XWH1110259 07/01/11-06/30/14 $129,364

STAT3 in Neurofibroma Tumorigenesis and Therapy
Ohio State University
08/01/10-07/31/12 $49,205
Lineage Determination and Tissue HomeOstasis in the Aged Hematopoietic System
National Institutes of Health
R01 AG 040118 08/01/11-07/31/16 $225,000

Cincinnati Center for Excellence in Molecular Hematology
National Institutes of Health
P30 DK 090971 09/30/10-06/30/15 $482,569
Zheng, Y Admin Core $89,909
Grabowsky, G Genomics and Genetics Core $63,000
Cancelas, J Cell Analysis and Sorting Core $65,112
Malik, P Translational Core $165,412
Mulloy, J Xenotransplant and Transgenic Core $68,766
Zheng, Y Summer Students $30,370

Rac GTPase-Specific Small Molecular Inhibitors
National Institutes of Health
R01 CA 141341 03/24/09-01/31/14 $165,237

Training Program in Pediatric Hematologic and Oncologic Diseases
National Institutes of Health
T32 HL 091805 09/01/08-08/31/13 $164,652

Rac GTPases in the Mammalian Brain Development
National Institutes of Health (CCHMC (Developmental Biology-Dr. Kuan))
R01 NS 056435 07/01/08-06/30/12 $165,237

Targeting Cdc42 in Leukemia Stem Cells
National Institutes of Health
R01 CA 150547 03/10/10-01/31/15 $201,275

Industry Contracts

FLICK, M
Novo Nordisk Pharmaceuticals $53,159

MALIK, P
HemaQuest Pharmaceuticals, Inc $4,719

MULLOY, J
Celgene Cellular Therapeutics $63,229

Service Collaborations

GRASSMAN, E
Battelle $183,361
Neogenomic $11,593

Current Year Direct $194,954

Funded Collaborative Efforts

MALIK, P
Macrophage-based Human Gene Therapy for Hereditary PAP
National Institutes of Health
Trapnell, B 12/15/10-11/30/12 5%

Role of Anti-GM-CSF Antibodies in Myeloid Cell Function
National Institutes of Health
Trapnell, B 04/01/11-03/31/16 5%

ANDREASSEN, P
DNA Damage Response Pathways in Meiotic Sex Chromosome Inactivation
National Institutes of Health
Namekawa, F 08/01/11-07/31/16 7.5%

Total $8,454,484

Hematology

Grant and Contract Awards Annual Direct

GRUPPO, R

ATHNdata.Quality Counts
American Thrombosis & Hemostatis Network 01/15/11-01/01/14/13 $10,315

Hemophilia And Thrombosis Center
Cascade Hemophilia Consortium(Hemophilia Foundation of Michigan) 06/01/03-05/31/13 $90,000

Hemophilia Comprehensive Care
Maternal and Child Health Bureau(Hemophilia Foundation of Michigan) H30MC00215 06/01/04-05/31/12 $14,500

Public Health Surveillance for the Prevention of Complications of Bleeding and Clotting Disorders
Centers for Disease Control & Prevention(Hemophilia Foundation of Michigan) U27 DD 000862 09/30/11-09/29/14 $17,000

Hemophilia Patient Handbook
Hemophilia Alliance Foundation 05/01/2012-04/30/2013 $5,000

JOINER, C

Cincinnati Sickle Cell Project
Health Resources & Services Admin (Ohio Department of Health) 03130011SK0411 07/01/1998-06/30/2012 $123,469

KALFA, T

Rac1 and Rac2 Guanosine Triphosphatases in Erythroid Function and Differentiation
National Institutes of Health K08 HL 088126 02/11/08-11/30/12 $119,125

MULLINS, E

Mechanisms Linking Hemostatic Factors to Neuroinflammatory Disease
National Institutes of Health K08 HL 105672 08/22/11-07/31/16 $121,375

SHOOK, L

Cincinnati Sickle Cell Newborn Screening Network
Health Resources & Services Admin U38 MC 22218 06/01/11-05/31/15 $377,100

Sickle Cell Treatment Demonstration Program
Health Resources & Services Admin(University of Cincinnati)
Industry Contracts

GRUPPO, R
- Baxter Healthcare Corporation $25,987
- Bayer Healthcare Pharmaceuticals, Inc $15,828
- Novo Nordisk Pharmaceuticals $34,798
- PAREXEL International, LLC $11,758
- Wyeth Pharmaceuticals $2,434
- PTC Therapeutics, Inc $1,540

KALFA, T
- Baxter Healthcare Corporation $6,884

KALINYAK, K
- GlaxoSmithKline $6,545

QUINN, C
- GlycoMimetics, Inc. $26,488
- Lilly USA, LLC $25,327

PALUMBO, J
- Novo Nordisk Pharmaceuticals $86,375

Current Year Direct Receipts $243,964
Total $1,133,166

Oncology

Grant and Contract Awards

ADAMS, D
- Phase II Study of Rapamycin for Complicated Vascular Anomalies
  Food and Drug Administration
  R01 FD 003712 09/25/09-07/31/13 $248,540

CHOW, L
- Micro-RNA Expression in Pediatric High-Grade Glioma
  Bear Necessities Pediatric Cancer Fdn
  08/01/11-07/31/12 $40,000

- Micro-RNA Expression in Pediatric High-Grade Glioma
  Childhood Brain Tumor Foundation
  09/01/11-08/31/13 $22,727

- Molecular Targeting of High-Grade Astrocytoma
  The Sontag Foundation
  10/01/11-09/30/15 $130,435

- Molecular Targeting of Pediatric High-Grade Glioma
  St. Baldrick's Foundation
  07/01/11-06/30/14 $110,000

CRIPE, T
- Neurofibromatosis Preclinical Consortium Center Award
  The Children's Tumor Foundation
  2011-05-003 07/01/11-06/30/13 $136,364
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<tr>
<th>Project Title</th>
<th>Agency</th>
<th>Award Number</th>
<th>Start Date</th>
<th>End Date</th>
<th>Amount</th>
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<tr>
<td>Phase I Study of HSV1716 in Pediatric Non-CNS Solid Tumors</td>
<td>Food and Drug Administration</td>
<td>R01 FD 003717</td>
<td>09/01/10-08/31/13</td>
<td>$152,618</td>
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<td>Acidic Phospholipid-Selective Treatment for Neuroblastoma</td>
<td>National Institutes of Health</td>
<td>R01 CA 158372</td>
<td>09/27/11-07/31/13</td>
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<td>Molecular Epidemiology in Children's Environmental Health</td>
<td>National Institutes of Health</td>
<td>T32 ES010957</td>
<td>10/01/10-09/30/12</td>
<td>$52,293</td>
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<td>Biology Studies in the First Phase I Trial of a Telomerase Inhibitor in</td>
<td>Children's Cancer Research Fund</td>
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<td>08/01/11-07/31/12</td>
<td>$40,000</td>
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<td>Establishment of an International Diffuse Intrinsic Pontine Glioma (DIPG)</td>
<td>National Institutes of Health</td>
<td>U10 CA 097452</td>
<td>09/16/11-07/31/12</td>
<td>$25,662</td>
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<td>The Pediatric Brain Tumor Consortium</td>
<td>National Institutes of Health</td>
<td>U01 CA 081457</td>
<td>04/01/08-03/31/13</td>
<td>$93,908</td>
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<td>Children's Oncology Group Chair</td>
<td>National Institutes of Health</td>
<td>U01 CA 098543</td>
<td>03/01/11-02/29/12</td>
<td>$12,500</td>
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<tr>
<td>Ontogeny and Quantitative Multimodal Skin Imaging of Infantile Hemangiomas</td>
<td>The Society for Pediatric Dermatology</td>
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<td>07/01/11-06/30/12</td>
<td>$6,500</td>
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<td>Analysis of Antioxidant Polymorphisms in Patients with Down Syndrome and</td>
<td>St. Baldrick's Foundation</td>
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<tr>
<td>Cincinnati Children’s Hyundai Scholar in Cancer Survivorship</td>
<td>Hyundai Hope on Wheels</td>
<td>10/01/11-12/01/12</td>
<td>$100,000</td>
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<td>Cincinnati Children's Oncology Group Phase I / Pilot Consortium</td>
<td>National Institutes of Health</td>
<td>U01 CA 097452</td>
<td>09/01/06-07/31/12</td>
<td>$26,124</td>
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<td>Cincinnati Children's Oncology Group Chair - Per Patient</td>
<td>National Institutes of Health</td>
<td>U10 CA 098543</td>
<td>03/01/11-02/28/12</td>
<td>$57,840</td>
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POPE, J

Analysis of Antioxidant Polymorphisms in Patients with Down Syndrome and CML
St. Baldrick's Foundation
<table>
<thead>
<tr>
<th>Name</th>
<th>Grant Description</th>
<th>Organization</th>
<th>Start Date</th>
<th>End Date</th>
<th>Amount</th>
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<tbody>
<tr>
<td>WANG, P-Y</td>
<td>Virotherapy on Primary Neuroblastoma Cells</td>
<td>Alex's Lemonade Stand Foundation</td>
<td>07/01/10-06/30/12</td>
<td>$70,804</td>
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<td>WELL, S</td>
<td>Fanconi Anemia and HPV Transformation</td>
<td>National Institutes of Health</td>
<td>09/28/09-08/31/14</td>
<td>$191,834</td>
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<td>CHLA - NANT</td>
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### Industry Contracts

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<tr>
<td>FOULADI, M</td>
<td>Genentech, Inc</td>
<td>$30,800</td>
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<td>GELLER, J</td>
<td>Bayer HealthCare Pharmaceuticals, Inc.</td>
<td>$25,000</td>
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<td>WEISS, B</td>
<td>CHLA - NANT</td>
<td>$15,574</td>
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<td>ABSALON, M</td>
<td>Children's Healthcare of Atlanta</td>
<td>$3,332</td>
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<td>CRIPE, T</td>
<td>Jennerex Biotherapeutics</td>
<td>$88,250</td>
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<tr>
<td>WAGNER, L</td>
<td>Abraxis BioScience, LLC</td>
<td>$16,178</td>
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<td>Amgen, Inc</td>
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### Funded Collaborative Efforts

<table>
<thead>
<tr>
<th>Name</th>
<th>Grant Description</th>
<th>Organization</th>
<th>Amount</th>
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<tbody>
<tr>
<td>WELL, S</td>
<td>Fanconi Anemia as a Model for Susceptibility to Human Papillomavirus Infection</td>
<td>Butsch-Kovacic</td>
<td>07/01/11-06/30/16</td>
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**Total** $1,969,285