

2014 Research Annual Report

Cancer and Blood Diseases Institute



Institute Summary

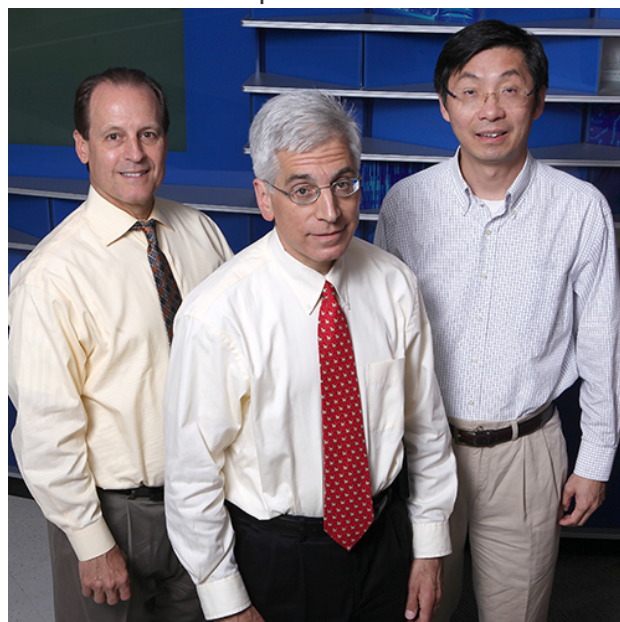
RESEARCH AND TRAINING DETAILS

Number of Faculty	78
Number of Joint Appointment Faculty	24
Number of Research Fellows	47
Number of Research Students	18
Number of Support Personnel	330
Direct Annual Grant Support	\$17,216,928
Direct Annual Industry Support	\$1,080,971
Peer Reviewed Publications	161

CLINICAL ACTIVITIES AND TRAINING

Number of Clinical Staff	13
Number of Staff Physicians	11
Number of Clinical Fellows	16
Number of Other Students	13
Inpatient Encounters	22,794
Outpatient Encounters	19,111

Institute Leadership



L to R: R Ware, J Perentesis, Y Zheng

Significant Accomplishments

Oncology

Exome Sequencing Accelerates Personalized Cancer Therapy

In a landmark investigation, **Brian Turpin, DO**, presented the Cincinnati Children's experience in targeted exome sequencing for more than 100 cases of high risk and relapsed childhood cancers and leukemias at the International Society of Pediatric Oncology annual meeting in Hong Kong in 2013. This work represents the first and largest pediatric experience in tumor signatures. The research project has four key implications:

- It identified mutations in more than 70 percent of patient tumors, where previous estimates had asserted that only a minority of patients would have alterations.
- Most of the mutations identified are targetable by new small-molecule anticancer drugs available or in development.
- Tumor mutations did not track with tumor histology, which suggests a new approach for treating patients by genetic signature.
- Drug-resistant pediatric tumors shared targetable genomic alterations common with aggressive adult cancers – a previously unappreciated observation.

This work forms a foundation for personalized precision therapy of high-risk and relapsed pediatric cancers,

augmenting our role as the nation's largest center for new anticancer drug development in children.

Experimental Hematology and Cancer Biology

A Major Step Forward in Rejuvenating Hematopoietic Stem Cells

Many tissues in the human body require continuous replenishment from stem cells, but as people age their stem cells begin to decline in function. Now a study led by a Cincinnati Children's scientist has revealed a critical mechanism involved in this aspect of aging. The regeneration of haematopoietic stem cells (HSCs), which produce all types of blood cells, appears to be controlled by a shift from canonical to non-canonical Wnt signaling due to elevated expression of Wnt5a. The altered signaling triggers a cascade of events that erodes the regenerative capacity of HSCs. Controlling this signaling circuit could help refresh aged or diseased blood stem cells, which in turn could have significant impact on a variety of diseases. The study, published in *Nature*, was led by [Hartmut Geiger, PhD](#), and included a team of scientists from Cincinnati Children's and the University of Ulm in Germany.

Novel Therapy for Myelodysplastic Syndrome

The lab of [Daniel Starczynowski, PhD](#), has identified a potential new approach to treating a collection of bone marrow disorders known as myelodysplastic syndromes (MDSs). These disorders arise from defective hematopoietic stem cells or progenitor cells that produce MDS-initiating clone cells. In a paper published in *Cancer Cell*, Starczynowski and colleagues report that the immune-modulating kinase, IRAK1, is overexpressed and hyperactivated in MDSs. Treating MDS clones in the lab with an IRAK1 inhibitor increased cell death among the MDS cells without affecting normal stem cells. They also found that a combined treatment to inhibit IRAK1 and BCL2 was even more effective at eliminating MDS clones. These findings support further investigation of treatments that target IRAK1.

Hematology

Hematology Division Rated 'Excellent' for Hemoglobinopathy Research

The Division of Hematology has received a five-year, \$8.9 million "Excellence in Hemoglobinopathy Research Award" from the National Heart, Lung, and Blood Institute. Led by [Punam Malik, MD](#), the grant will focus on mechanisms that lead to cardiac and kidney damage among patients with sickle cell disease. Co-investigators from Hematology include [Theodosia Kalfa, MD, PhD](#), and [Charles Quinn, MD, MS](#). Other scientists in the Heart Institute also are collaborating.

Sickle Cell Research Expands in Africa

The recent recruitment of [Russell Ware, MD, PhD](#), Director of Hematology, and [Patrick McGann, MD, MS](#), is rapidly expanding the role of Cincinnati Children's in sickle cell research in sub-Saharan Africa. Ware and McGann recently led a highly successful newborn screening initiative in the Republic of Angola. They have since launched several more projects, including a hydroxyurea safety and dosing trial known as Realizing Effectiveness Across Continents with Hydroxyurea (REACH) and the Uganda Sickle Surveillance Study (US3).

Bone Marrow Transplantation and Immune Deficiency

Study Shows Safety in Radiation-Free Transplants

Our division completed a multi-center study showing that it is safe to perform bone marrow transplants in children with Fanconi Anemia without using radiation. We also established a comprehensive biological sample repository for transplant recipients, storing more than 30,000 samples annually. Our team also has identified

genetic changes that increase the risk of post-transplant thrombotic microangiopathy.

Division Publications

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4. Alvarez O, Yovetich NA, Scott JP, Owen W, Miller ST, Schultz W, Lockhart A, Aygun B, Flanagan J, Bonner M, Mueller BU, Ware RE, Investigators of the Stroke With Transfusions Changing to Hydroxyurea Clinical T. **Pain and other non-neurological adverse events in children with sickle cell anemia and previous stroke who received hydroxyurea and phlebotomy or chronic transfusions and chelation: results from the SWITCH clinical trial**. *Am J Hematol*. 2013; 88:932-8.
5. Araten DJ, Krejci O, Ditata K, Wunderlich M, Sanders KJ, Zamechek L, Mulloy JC. **The rate of spontaneous mutations in human myeloid cells**. *Mutat Res*. 2013; 749:49-57.
6. Beverly LJ, Starczynowski DT. **IRAK1: oncotarget in MDS and AML**. *Oncotarget*. 2014; 5:1699-700.
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 25. Dai M, Han J, El-Amouri SS, Brady RO, Pan D. **Platelets are efficient and protective depots for storage, distribution, and delivery of lysosomal enzyme in mice with Hurler syndrome.** *Proc Natl Acad Sci U S A*. 2014; 111:2680-5.
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Grants, Contracts, and Industry Agreements

Bone Marrow Transplantation and Immune Deficiency

Grant and Contract Awards

Annual Direct

DAVIES, S

Childhood Cancer Survivor Study

National Institutes of Health(St Jude's Children's Hospital)

U24 CA 055727

12/01/11-11/30/16

\$178,628

COG Group Chair Award - Scientific Leadership		
National Institutes of Health(Children's Hospital of Philadelphia)		
U10 CA 098543	03/01/12-02/28/17	\$11,546
Molecular Epidemiology of Pediatric Germ Cell Tumors		
National Institutes of Health(University of Minnesota)		
R01 CA 151284	08/10/11-05/31/16	\$11,370
Children's Oncology Group Chair - WorkLoad Intensity		
National Institutes of Health(Children's Hospital of Philadelphia)		
U10 CA 098543	04/13/12-02/28/15	\$5,775
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	\$54,140
Rare Diseases Clinical Consortia for the Rare Diseases		
National Institutes of Health(The Regents of the University of California)		
U54 AI 082973	09/12/09-08/31/14	\$1,000
KUMAR, A		
The Role of MEIS1 in Hematopoiesis and Hematopoietic Transformation		
National Institutes of Health		
R01 HL 111192	05/01/13-04/30/17	\$271,032
MEHTA, P		
Phase I Study of Quercetin for the Treatment of Fanconi Anemia		
U.S Food and Drug Administration		
R01 FD 004383	09/16/13-07/31/16	\$130,719
MYERS, K		
Chemoprevention of Leukemia in a Genetically Susceptible Population		
Conquer Cancer Foundation		
	07/01/12-06/30/15	\$62,466
Current Year Direct		\$726,676
Industry Contracts		
GRIMLEY, M		
Baxter Healthcare Corporation		\$1,143
Chimerix Inc		\$58,769
HARRIS, R		
Alexion Pharmaceuticals, Inc		\$1,155

JODELE, S

Alexion Pharmaceuticals, Inc.	\$30,800
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MEHTA, P

Astellas Scientific and Medical Affairs, Inc	\$14,427
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Current Year Direct Receipts	\$106,294
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Total	\$832,970
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Experimental Hematology

Grant and Contract Awards	Annual Direct
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AKUNURU, S**Training Programs in Cancer Therapeutics**

National Institutes of Health(University of Cincinnati)

T32 CA 117846	09/14/12-08/31/14	\$42,862
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CANCELAS-PEREZ, J**Rational Design of a Vav/Rac Inhibitor as a New Therapy for High-Risk B-ALL**

The Leukemia and Lymphoma Society

10/01/12-09/30/15	\$180,018
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Validation of a Rationally Designed Guanine Nucleotide Exchange Factor Inhibitor in Lymphoblastic Leukemia

William Lawrence & Blanche Hughes Foundation

01/01/14-12/31/16	\$70,000
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DEGEN, J**Analysis of Staphylococcus Aureus Host Interactions**

National Institutes of Health(Texas A&M University Health Science Center)

R01 AI 020624	09/01/12-08/31/15	\$46,736
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DEGEN, J / MALIK P**Hemostatic Factors and Sickle Cell Disease**

National Institutes of Health

R01 HL 112603	01/01/12-11/30/16	\$245,000
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FILIPPI, M**Regulation of Neutrophil Migration and Polarity**

National Institutes of Health

R01 HL 090676	03/01/10-02/28/15	\$242,550
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FLICK, M

Mechanisms Linking the Hemostatic Protease Thrombin to Arthritic Disease

National Institutes of Health

R01 AR 056990	08/10/09-07/31/14	\$162,518
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Cincinnati Rheumatic Disease Core Center (Core 2)

National Institutes of Health

P30 AR 047363	08/25/11-06/30/16	\$45,687
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GEIGER, H**Molecular Mechanisms and Therapies for Radiation-Induced Myelodysplastic Syndrome**

Edward P Evans Foundation(University of Kentucky)

04/01/12-03/31/17	\$181,818
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GUO, F**Novel Signaling Function of Cdc42 GTPase in vivo**

National Institutes of Health

R01 GM 108661	05/01/14-02/28/18	\$175,000
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HENNIGAN, R**Regulation of Intracellular Trafficking in NF2**

Department of Defense

W81XWH1310136	06/01/13-05/31/16	\$133,290
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KOMUROV, K**Modeling and Targeting the Hexosamine Pathway in Drug Resistance**

Susan G Komen for the Cure

08/01/13-07/31/16	\$120,000
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LU, Q**A Novel Model of Medulloblastoma to Define Cancer Pathways and Molecular Targets**

National Institutes of Health

R01 NS 078092	10/01/13-03/31/17	\$349,062
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Chromatin Remodeling Control of CNS Myelination and Remyelination

National Institutes of Health

R01 NS 075243	10/01/13-03/31/17	\$399,554
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Chromatin Remodeling in Oligodendrocyte Myelination and Remyelination

National Multiple Sclerosis Society

RG4568A5T	10/01/13-03/31/14	\$31,122
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microRNA Control of Myelination and Remyelination in the Central Nervous System

National Multiple Sclerosis Society

RG4727A6T	10/01/13-06/30/15	\$148,046
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Molecular Mechanisms of Oligodendrocyte Differentiation and Myelination

National Institutes of Health

R01 NS 072427	10/01/13-08/31/15	\$138,615
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Identification of Novel Small Molecules for CNS Myelin Repair

National Institutes of Health(Texas A&M)			
R21 NS 077215	11/01/13-06/30/15		\$67,644
MALIK, P			
Ameliorating Sickle Nephropathy and Pulmonary Hypertension			
National Institutes of Health			
R34 HL 108752	08/18/11-06/30/14		\$142,800
Cincinnati Cell Characterization Core			
National Institutes of Health(University of Maryland)			
U01 HL 099997	09/01/10-04/30/15		\$50,862
Cincinnati Cell Characterization Core (per case reimbursement)			
National Institutes of Health(University of Maryland)			
U01 HL 099997	05/01/11-04/30/14		\$109,291
Cincinnati Center of Excellence in Hemoglobinopathies Research			
National Institutes of Health			
U01 HL 117709	08/15/13-05/31/18		\$1,169,344
Quinn, C	Translational Research Skills Development Core		\$258,435
Kalfa, T	Research Project 1		\$123,169
Malik, P	Research Project 2		\$548,319
Quinn, C	Research Project 3		\$222,743
Kalfa, T	Summer Students		\$40,542
Gene Therapy for Sickle Cell Anemia			
Doris Duke Charitable Foundation			
	09/01/13-08/31/16		\$150,000
PLGF-H1F1a-miRNA Axis in Sickle Pulmonary Hypertension			
National Institutes of Health(University of Southern California)			
R01 HL 111372	01/01/12-12/31/16		\$143,001
MULLOY, J			
Genotype and Phenotype of Chemoresistant AML			
National Institutes of Health			
R21 CA 168369	03/01/13-02/28/15		\$105,488
Rac Signaling in MLL Leukemia			
The Leukemia and Lymphoma Society			
	07/01/10-06/30/15		\$104,762
LSC Mobilization and Differentiation Therapy			
Hyundai Hope on Wheels			
	09/01/13-12/31/15		\$250,000
Conferring In Vivo Metabolic Resistance to a Highly Selective Anti-AML Agent			

National Institutes of Health(University of Cincinnati)		
R21 CA185370	05/01/14-02/28/16	\$29,928
NASSAR, N		
Novel Rationally Designed Ras Inhibitors for B-ALL Multi-Target Therapy		
The Leukemia and Lymphoma Society		
	10/01/13-09/30/16	\$180,018
PAN, D		
Gaucher Disease: Treatment of Neurodegenerative Disease		
National Institutes of Health		
R01 NS 086134	09/01/13-05/31/18	\$270,887
PANG, Q		
Role of FA Proteins in Hematopoiesis		
National Institutes of Health		
R01 HL 076712	04/01/10-03/31/15	\$242,550
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	\$186,750
PATEL, A		
Identification and Study of Novel Genes Critical to Survival of MPNST Cells		
Ohio State University		
	06/01/13-05/31/15	\$46,092
RATNER, N		
Identification of Molecular and Cellular Contributors to Neurofibroma Formation and Growth		
Department of Defense		
W81XWH1210133	07/01/12-06/30/15	\$225,000
Identification of Neurofibroma Growth and Drug Resistance Pathways		
Johns Hopkins University(Neurofibromatosis Therapeutic Acceleration Program)		
	02/01/14-01/31/16	\$65,902
Mitogenic Activities in Neurofibromatosis		
National Institutes of Health		
R01 NS 028840	09/15/11-07/31/16	\$223,156
Neurofibroma Preclinical Therapeutics		
The Children's Tumor Foundation		
	07/15/13-07/14/16	\$287,661
Ras Proteins in Nerve Tumorigenesis		
National Institutes of Health		
R01 NS 083580	04/01/14-03/31/19	\$218,750
Regulation of GCPII for the Diagnosis and Treatment of Neurofibromas		

John Hopkins University (Neurofibromatosis Therapeutic Acceleration Program)

05/01/14-04/30/15

\$33,085

SAMPSON, L

mTOR Signaling in Murine Intestinal Stem Cell and Progenitor Homeostasis

National Institutes of Health

F32 DK 097879

12/01/12-11/30/14

\$55,094

SPRINGER, M

Training Programs in Cancer Therapeutics

National Institutes of Health(University of Cincinnati)

T32 CA 11786

08/01/13-07/31/15

\$39,265

STARCZYNOWSKI, D

Defining the Role and Therapeutic Potential of TNF Receptor-Associated Factor 6 in Myelodysplastic Syndromes

Gabrielle's Angel Foundation for Cancer Research

06/01/13-05/31/16

\$68,182

Deregulation of TIFAB in Myelodysplastic Syndrome

American Society of Hematology

07/01/11-06/30/14

\$50,000

Identification and Characterization of Genes in del(5q) Myelodysplastic Syndrome

National Institutes of Health

R01 HL 111103

12/15/11-11/30/16

\$245,000

TANDON, P

Characterizing the Role of Specific Ras Proteins in Neurofibroma and MPNST Formation

National Institutes of Health

F32 NS 083249

09/01/13-08/31/15

\$49,214

VARNEY, M

Environmental Carcinogenesis and Mutagenesis

National Institutes of Health(University of Cincinnati)

T32 ES007250

05/01/12-04/30/15

\$46,092

WU, L

Functional Study of Transcriptional Regulator Sip1 in CNS Myelination and Remyelination

National Multiple Sclerosis Society

10/01/13-09/30/16

\$51,642

WU, J

STAT3 in Neurofibroma Tumorigenesis and Therapy

Department of Defense Army

W81XWH1110259

07/01/11-06/30/14

\$137,415

ZHENG, Y**Cincinnati Center for Excellence in Molecular Hematology**

National Institutes of Health

P30 DK 090971	09/01/11-06/30/15	\$456,330
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A Non-Myeloablative Conditioning Regimen for Hematopoietic Stem Cell Transplant

National Institutes of Health(P2D Bioscience)

R34 HL117576	02/17/14-02/16/15	\$86,732
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Therapeutic Targeting of LARG-RhoA-ROCK Signaling Axis in Childhood Leukemia

Alex's Lemonade Stand Foundation

07/01/13-06/30/15	\$125,000
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ZHENG, Y/ GEIGER, H**Lineage Determination and Tissue Homeostasis in the Aged Hematopoietic System**

National Institutes of Health

R01 AG 040118	08/01/11-07/31/16	\$212,625
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ZHENG, Y / MULLOY J**Targeting Cdc42 in Leukemia Stem Cells**

National Institutes of Health

R01 CA 150547	03/10/10-01/31/15	\$195,237
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Current Year Direct	\$8,832,677
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Industry Contracts**FLICK, M**

Novo Nordisk	\$115,747
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GRASSMAN, E

Battelle Memorial Institute	\$34,010
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MULLOY, J

Amgen, Inc.	\$7,261
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STARCZYNOWSKI, D

Celgene Cellular Therapeutics	\$33,433
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Current Year Direct Receipts	\$190,451
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Total	\$9,023,128
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Hematology

ADAMS, G**Thrombin Promotes Prostate Cancer Progression**

The Ohio State University Research Foundation

07/01/13-06/30/15

\$41,634

GRUPPO, R**Hemophilia And Thrombosis Center**

Cascade Hemophilia Consortium(Hemophilia Foundation of Michigan)

06/01/13-05/31/15

\$114,250

Hemophilia Comprehensive Care

Maternal and Child Health Bureau(Hemophilia Foundation of Michigan)

H30 MC 00015

10/01/97-05/31/14

\$22,000

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

10/01/97-09/29/14

\$18,900

My Life, Our Future: A Hemophilia Genotyping Initiative

American Thrombosis & Hemostasis Network

02/01/14-01/31/15

\$3,500

Hemophilia Inhibitor Pup Study (per capita)

The University of Texas Health Science Center at Houston

04/29/13-04/28/147

\$8,540

KALFA, T**Rho GTPases in Terminal Erythroid Maturation**

National Institutes of Health

R01 HL 116352

09/26/12-06/30/16

\$238,000

Cincinnati Center of Excellence in Hemoglobinopathies Research - Research Project 1: Signaling Pathways that Regulate ROS Production in Sick RBCs and Contribution to Hemolysis, SN and Cardiac Pathology

National Institutes of Health

U01 HL 117709

08/15/13-05/31/18

\$123,169

Cincinnati Center of Excellence in Hemoglobinopathies Research - Summer Students

National Institutes of Health

U01 HL 117709

08/15/13-05/31/18

\$40,542

MULLINS, E**Mechanisms Linking Hemostatic Factors to Neuroinflammatory Disease**

National Institutes of Health

K08 HL 105672

08/22/11-07/31/16

\$121,375

QUINN, C**A Controlled Clinical Trial of Regadenoson in Sickle Cell Anemia**

National Institutes of Health(Dana Farber Cancer Institute)

P50 HL 110790	07/01/13-06/30/17	\$78,470
PFAST: Patent Foramen Ovale and Stroke in Sick Cell Disease (per capita)		
Doris Duke Charitable Foundation(The University of Texas Southwestern Medical Center)		
DDCF #2009091	02/15/11 -04/30/14	\$10,449
Cincinnati Center of Excellence in Hemoglobinopathies Research - Translational Research Skills Development Core		
National Institutes of Health		
U01 HL 117709	08/15/13-05/31/18	\$258,435
Cincinnati Center of Excellence in Hemoglobinopathies Research - Research Project 3 -Novel Cardiac Magnetic Resonance Imaging to Define a Unique Restrictive Cardiomyopathy in Sick Cell Disease		
National Institutes of Health		
U01 HL 117709	08/15/13-05/31/18	\$222,743
SHOOK, L		
Cincinnati Sick Cell Newborn Screening Network		
Health Resources & Services Administration		
U38 MC 22218	06/01/11-05/31/15	\$319,804
Cincinnati Sick Cell Project		
Ohio Department of Health		
	07/01/98-06/30/14	\$123,469
WARE, R		
Accurate and Inexpensive Point-of-Care Diagnosis of Sick Cell Anemia		
Doris Duke Charitable Foundation(Rice University)		
	09/01/13-08/31/16	\$45,305
Baby Hug Follow-up Study II Core Laboratory		
National Institutes of Health(Clinical Trials & Surveys Corp)		
HHSN268201200023C	07/01/13-12/31/16	\$2,101
Genetic Predictors of Cerebrovascular Disease in Sick Cell Anemia		
Doris Duke Charitable Foundation		
	08/01/13-07/31/14	\$178,722
RH Genotyping of Patient with Sick Cell Anemia from a Multi-Center Study (SWITCH Trial) and Correlation with Alloimmunization Following Blood Transfusion		
Doris Duke Charitable Foundation(New York University School of Medicine)		
	01/01/14-12/31/14	\$9,259
Sparing Conversion to Abnormal TCD Elevation		
National Institutes of Health		
R01 HL 098239	12/01/13-11/30/14	\$533,037
TCD with Transfusions Changing to Hydroxyurea		
National Institutes of Health		
R01 HL 095647	08/01/13-07/31/14	\$3,033,934
Endothelialized Microfluidics for Sick Cell Disease Research & Drug Discovery		
National Institutes of Health(Emory University)		
R01 HL 121264	01/01/14-12/31/18	\$11,593

Current Year Direct \$5,559,231

Industry Contracts

GRUPPO, R

Alexion Pharmaceuticals, Inc	\$10,128
Baxter Healthcare Corporate	\$98,792
Bayer HealthCare Pharmaceuticals, Inc	\$36,723
Biogen Idec MA Inc.	\$42,450
Boehringer Ingelheim Pharmaceuticals	\$14,650
Grifols, Inc	\$1,000
Novo Nordisk Pharmaceuticals	\$38,836
Pfizer, Inc	\$97,576
Rho, Inc.	\$500

KALFA, T

Baxter	\$750
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KALINYAK, K

Novartis Pharmaceuticals	\$4,505
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PALUMBO, J

Novo Nordisk Pharmaceuticals	\$43,187
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QUINN, C

Amgen, Inc.	\$51,770
Eli Lilly and Company	\$9,500
GlycoMimetics, Inc	\$5,197
Mast Therapeutics, Inc.	\$15,015

WARE, R

Bristol-Myers Squibb	\$20,000
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Current Year Direct Receipts \$490,579

Total \$6,049,810

Oncology

Grant and Contract Awards Annual Direct

CHLON, T

Pelotonia Fellowship Program		
Ohio State University Comprehensive Cancer Center		
	03/01/13-02/28/15	\$39,264
CHOW, L		
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
DASGUPTA, B		
Regulation of Forebrain Neurogenesis by the Energy Sensor AMP Kinase		
National Institutes of Health		
R01 NS 072591	07/01/12-06/30/17	\$222,372
FOULADI, M		
NIH COG Study Chair		
National Institutes of Health(Children's Hospital of Philadelphia)		
U10 CA 098543	04/13/13-02/28/15	\$11,550
Establishment of an International Diffuse Intrinsic Pontine Glioma (DIPG) Registry		
The Cure Starts Now Foundation		
	01/01/12-12/31/14	\$205,000
The Pediatric Brain Tumor Consortium - Per Patient		
National Institutes of Health(St. Jude Children's Hospital)		
U01 CA 08155	04/01/11-03/31/15	\$23,195
The Pediatric Brain Tumor Consortium		
National Institutes of Health(St. Jude Children's Hospital)		
UM1 CA 081457	04/01/11-03/31/19	\$121,496
GELLER, J		
NIH COG Phase 1 Study Chair		
National Institutes of Health(Children's Hospital of Philadelphia)		
UM1 CA 097452	08/01/12-07/31/17	\$11,550
Epigenetic and Clinical Impact of SMARCB1 Loss in Cancer		
National Institutes of Health(Children's Memorial Hospital)		
	07/01/12-06/30/14	\$6,954
LEE, J		
Proliferation Control of DIPG Cells by AMP Linase Inhibition		
Joshua's Wish		
	06/01/14-05/31/15	\$5,000

MIZUKAWA, B**Targeted Inhibition of Cdc42 GTPase in the Acute Myeloid Leukemia Stem Cell**

St. Baldrick's Foundation

07/01/13-06/30/16

\$110,000

PERENTESIS, J**Children's Oncology Group Chair - Workload Intensity**

National Institutes of Health(Children's Hospital of Philadelphia)

U10 CA 098543

03/01/12-02/28/17

\$27,797

Children's Oncology Group Chair - per patient

National Institutes of Health(Children's Hospital of Philadelphia)

U10 CA 098543

03/01/12-02/28/17

\$144,883

CHOP/COG ADVL0921

Millennium Pharmaceuticals(Children's Hospital of Philadelphia)

01/01/14-12/31/16

\$3,080

COG Supplemental Reimbursement

St. Baldrick's Foundation(Children's Hospital of Philadelphia)

03/01/12-02/18/17

\$46,970

CHOP/COG AALL0932

National Institutes of Health(Children's Hospital of Philadelphia)

HHSN261200800001E

03/30/12-06/30/15

\$4,620

Pediatric Phase I - Pilot Consortium (per case)

National Institutes of Health(Children's Hospital of Philadelphia)

UM1 CA 097452

07/24/12-05/31/15

\$12,320

Pediatric Phase I Scientific Leadership

National Institutes of Health(Children's Hospital of Philadelphia)

UM1 CA 097452

09/26/12-07/31/15

\$11,501

COG ADVL1213

Morphotek(Children's Hospital of Philadelphia)

01/01/14-12/31/16

\$8,778

COG Community Clinical Oncology Program

National Institutes of Health(Children's Hospital of Philadelphia)

U10 CA 095861

08/01/13-07/31/16

\$808

COG Cancer Trial Support Unit

National Institutes of Health(Children's Hospital of Philadelphia)

03/01/14-02/28/17

\$9,240

COG AALL1131

National Institutes of Health(Children's Hospital of Philadelphia)

01/01/14-12/31/16

\$3,080

COG AALL1121

Amgen(Children's Hospital of Philadelphia)

05/01/12-04/30/15

\$9,269

PHILLIPS, C

Genetic Model of Cytarabine Sensitivity in Children with AML

American Association for Cancer Research

07/01/12-06/30/14

\$50,000

PRIVETTE, L**Cincinnati Interdisciplinary Women's Health Research Career Training Grant**

National Institutes of Health(University of Cincinnati)

K12 HD 051953

07/01/12-06/30/14

\$82,385

Defining the Role of the DEK Oncogene in Breast Cancer Stem Cell Tumorigenicity And Pre-Clinical Testing of Therapeutic DEK Targeting Strategies

Ride Cincinnati Foundation

06/01/14-05/31/15

\$40,000

RAYES, A**Mobilization with CASIN as a Preparative Regimen in Bone Marrow Transplant Therapy**

Cancer Free Kids

06/01/14-05/31/15

\$30,000

ROMICK-ROSENDALE, L**Environmental Carcinogenesis and Mutagenesis**

National Institutes of Health(University of Cincinnati)

T32 ES 007250

09/01/12-06/30/14

\$41,364

WEISS, B**Children's Oncology Group Chair**

National Institutes of Health(Children's Hospital of Philadelphia)

U10 CA 098543

04/13/13-02/28/15

\$11,550

Phase I Study of MEK Inhibitor AZD6244 in NF1 with Plexiforms

Children's Tumor Foundation(Children's Hospital of Philadelphia)

02/01/12-04/30/15

\$22,952

WELLS, S**Fanconi Anemia and HPV Transformation**

National Institutes of Health

R01 CA 102357

09/28/09-08/31/14

\$180,324

Role and Regulation of the Human DEK Proto-Oncogene

National Institutes of Health

R01 CA 116316

09/05/12-06/30/17

\$163,859

Targeting the Ron-DEK Signaling Axis in Breast Cancer

Department of Defense

W81XWH-12-1-0194

09/01/12-08/31/14

\$125,000

WILLIAMS, J

ETV2 Role in Tumor-Induced Lymphangiogenesis, A Putative Therapeutic Target

St. Baldrick's Foundation

07/01/12-06/30/14

\$71,748

Current Year Direct \$2,098,344**Industry Contracts****ADAMS, D**

Pfizer, Inc.	\$120,000
Pierre Fabre Pharmaceuticals	\$5,100

FOULADI, M

Genentech, Inc	\$11,550
Novartis Pharmaceuticals	\$18,750

GELLER, J

Bayer HealthCare Pharmaceuticals, Inc.	\$31,138
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HUMMEL, T

Lilly USA, LLC	\$13,650
Glaxo Smith Kline	\$13,500

O'BRIEN, M

Seattle Genetics, Inc.	\$39,397
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TURPIN, B

Sarcoma Alliance for Research through Collaboration	\$8,500
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WAGNER, L

Sarcoma Alliance for Research through Collaboration	\$5,236
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WEISS, B

Bacterial Robotics, LLC	\$4,004
Novartis Pharmaceuticals	\$17,000
NANT	\$5,822

Current Year Direct Receipts \$293,647**Total \$2,391,991**