2013 Research Annual Report

Oncology



Division Details

Division Data Summary

RESEARCH AND TRAINING DETAILS Number of Faculty 21 Number of Joint Appointment Faculty 4 Number of Research Fellows Number of Support Personnel 56 **Direct Annual Grant Support** \$2,610,576 Direct Annual Industry Support \$108,642 Peer Reviewed Publications 35 **CLINICAL ACTIVITIES AND TRAINING** Number of Clinical Staff 3 Number of Clinical Fellows 7 Number of Other Students 3 Inpatient Encounters 9,577 **Outpatient Encounters** 9,430

Division Photo



Row 1: M Absalon, R Nagarajan, B Mizukawa, L Privette-Vinnedge, B Lampkin Row 2: A Hammill, M O'Brien, S Wells, R Drissi, B Turpin, J Mangino, M DeWire, J Perentesis, B Weiss

Row 3: D Adams, L Chow, B Dasgupta, J Geller, T Hummel, C Phillips. S Laupola

Significant Publications

Freyer, D. R., Felgenhauer, J., Perentesis, J., Adolescent, C. O. G., & Young Adult Oncology Discipline, C. Children's Oncology Group's 2013 blueprint for research: adolescent and young adult oncology. *Pediatr Blood Cancer*, 2013 June; 60(6), 1055-1058.

The discipline of Adolescent and Young Adult (AYA) Oncology addresses compelling medical and psychosocial needs of AYA patients across the spectrum of cancer survivorship. To be successful, extraordinary collaboration involving multiple scientific disciplines and specialties is required. While AYA Oncology is international in scope, recent AYA-focused studies conducted in the Children's Oncology Group (COG) have documented survival disparities, toxicity differences, and biological insights that provide the basis for new COG trials and initiatives for this population. This experience will be useful in leveraging the new United States National Cancer Institute Clinical Trials Network to transform AYA Oncology research.

Dasgupta, B., Ju, J. S., Sasaki, Y., Liu, X., Jung, S. R., Higashida, K., Milbrandt, J. The AMPK beta2 subunit is required for energy homeostasis during metabolic stress. *Mol Cell Biol.* 2012 July; *32*(14), 2837-2848.

AMP activated protein kinase (AMPK) plays a key role in the regulatory network responsible for maintaining systemic energy homeostasis during exercise or nutrient deprivation. To understand the function of the regulatory $\beta 2$ subunit of AMPK in systemic energy metabolism, we characterized $\beta 2$ subunit-deficient mice. Using these mutant mice, we demonstrated that the $\beta 2$ subunit plays an important role in regulating glucose, glycogen, and lipid metabolism during metabolic stress. The $\beta 2$ mutant animals failed to maintain euglycemia and muscle ATP levels during fasting. In addition, $\beta 2$ -deficient animals showed classic symptoms of metabolic syndrome, including hyperglycemia, glucose intolerance, and insulin resistance when maintained on a high-fat

diet (HFD), and were unable to maintain muscle ATP levels during exercise. Cell surface-associated glucose transporter levels were reduced in skeletal muscle from $\beta 2$ mutant animals on an HFD. In addition, they displayed poor exercise performance and impaired muscle glycogen metabolism. These mutant mice had decreased activation of AMPK and deficits in PGC1 α -mediated transcription in skeletal muscle. Our results highlight specific roles of AMPK complexes containing the $\beta 2$ subunit and suggest the potential utility of AMPK isoform-specific pharmacological modulators for treatment of metabolic, cardiac, and neurological disorders.

Phillips, C. L., Davies, S. M., McMasters, R., Absalon, M., O'Brien, M., Mo, J., Perentesis, J. P. Low dose decitabine in very high risk relapsed or refractory acute myeloid leukaemia in children and young adults. *Br J Haematol*, 2013 May;161(3), 406-410.

Low-dose decitabine has encouraging activity and tolerability in adults with acute myeloid leukaemia (AML), but paediatric experience is lacking. We report our retrospective experience with decitabine in eight children and young adults (median age 4 years) with refractory/relapsed AML, who had failed multiple regimens or were not candidates for standard retrieval regimens due to prior toxicities. Three of eight patients (38%) had complete response (CR; 1 each of CR, CR with incomplete platelet recovery and CR with incomplete count recovery). Best responses were observed after a median of 2.5 cycles (range 1-4 cycles). Four patients received subsequent allogeneic stem cell transplant, and two remain in long-term CR.

Sturm, D., Witt, H., Hovestadt, V., Khuong-Quang, D. A., **Drissi, R., Fouladi, M.,** Pfister, S. M. **Hotspot mutations in H3F3A and IDH1 define distinct epigenetic and biological subgroups of glioblastoma**. *Cancer Cell.* 2012 October;22(4), 425-437.

Glioblastoma (GBM) is a brain tumor that carries a dismal prognosis and displays considerable heterogeneity. We have recently identified recurrent H3F3A mutations affecting two critical amino acids (K27 and G34) of histone H3.3 in one-third of pediatric GBM. Here, we show that each H3F3A mutation defines an epigenetic subgroup of GBM with a distinct global methylation pattern, and that they are mutually exclusive with IDH1 mutations, which characterize a third mutation-defined subgroup. Three further epigenetic subgroups were enriched for hallmark genetic events of adult GBM and/or established transcriptomic signatures. We also demonstrate that the two H3F3A mutations give rise to GBMs in separate anatomic compartments, with differential regulation of transcription factors OLIG1, OLIG2, and FOXG1, possibly reflecting different cellular origins.

Wunderlich, M., Mizukawa, B., Chou, F. S., Sexton, C., Shrestha, M., Saunthararajah, Y., & Mulloy, J. C. AML cells are differentially sensitive to chemotherapy treatment in a human xenograft model. *Blood.* 2013 March; 121(12), e90-97.

As acute myeloid leukemia (AML) xenograft models improve, the potential for using them to evaluate novel therapeutic strategies becomes more appealing. Currently, there is little information on using standard chemotherapy regimens in AML xenografts. Here we have characterized the immunodeficient mouse response to combined Ara-C (cytarabine) and doxorubicin treatment. We observed significant toxicity associated with doxorubicin that required optimization of the route of injection as well as the maximum-tolerated dose for immunodeficient strains. Mice treated with an optimized 5-day induction protocol showed transient weight loss, short-term reduction of peripheral blood cell and platelet counts, and slight anemia. Considerable cytotoxicity was observed in the bone marrow (BM), with primitive LSK cells having a significant survival advantage relative to more mature cells, consistent with the idea of chemotherapy targeting actively growing cells. Treated leukemic mice demonstrated reduced disease burden and increased survival, demonstrating efficacy. AML cells showed significantly increased sensitivity to doxorubicin-containing therapy compared with murine BM cells. Although early treatment could result in some cures, mice with significant leukemia grafts were not cured by using induction therapy alone. Overall, the data show that this model system is useful for the evaluation of novel

Division Publications

- 1. Abruzzo T, Patino M, Leach J, Rahme R, Geller J. Cerebral vasoconstriction triggered by sympathomimetic drugs during intra-atrerial chemotherapy. *Pediatr Neurol.* 2013; 48:139-42.
- 2. Busaidy NL, Farooki A, Dowlati A, Perentesis JP, Dancey JE, Doyle LA, Brell JM, Siu LL. **Management of metabolic effects associated with anticancer agents targeting the PI3K-Akt-mTOR pathway**. *J Clin Oncol*. 2012; 30:2919-28.
- 3. Chang KH, Sanchez-Aguilera A, Shen S, Sengupta A, Madhu MN, Ficker AM, Dunn SK, Kuenzi AM, Arnett JL, Santho RA, Agirre X, Perentesis JP, Deininger MW, Zheng Y, Bustelo XR, Williams DA, Cancelas JA. Vav3 collaborates with p190-BCR-ABL in lymphoid progenitor leukemogenesis, proliferation, and survival. *Blood*. 2012; 120:800-11.
- 4. Chen W, Adams D, Patel M, Gupta A, Dasgupta R. Generalized lymphatic malformation with chylothorax: long-term management of a highly morbid condition in a pediatric patient. *J Pediatr Surg.* 2013; 48:e9-12.
- 5. Cost CR, Stegner MM, Leonard D, Leavey P. IL-8 predicts pediatric oncology patients with febrile neutropenia at low risk for bacteremia. *J Pediatr Hematol Oncol.* 2013; 35:206-11.
- 6. Cost NG, Geller JI, DeFoor WR, Jr., Wagner LM, Noh PH. A robotic-assisted laparoscopic approach for pediatric renal cell carcinoma allows for both nephron-sparing surgery and extended lymph node dissection. *J Pediatr Surg.* 2012; 47:1946-50.
- 7. Dasgupta B, Ju JS, Sasaki Y, Liu X, Jung SR, Higashida K, Lindquist D, Milbrandt J. **The AMPK beta2** subunit is required for energy homeostasis during metabolic stress. *Mol Cell Biol*. 2012; 32:2837-48.
- Dome JS, Fernandez CV, Mullen EA, Kalapurakal JA, Geller JI, Huff V, Gratias EJ, Dix DB, Ehrlich PF, Khanna G, Malogolowkin MH, Anderson JR, Naranjo A, Perlman EJ, Committee COGRT. Children's Oncology Group's 2013 blueprint for research: renal tumors. Pediatr Blood Cancer. 2013; 60:994-1000.
- 9. Freyer DR, Felgenhauer J, Perentesis J, Adolescent COG, Young Adult Oncology Discipline C. Children's Oncology Group's 2013 blueprint for research: adolescent and young adult oncology. *Pediatr Blood Cancer.* 2013; 60:1055-8.
- 10. Gamis AS, Alonzo TA, Perentesis JP, Meshinchi S, Committee COGAML. Children's Oncology Group's 2013 blueprint for research: acute myeloid leukemia. *Pediatr Blood Cancer.* 2013; 60:964-71.
- 11. Gow KW, Barnhart DC, Hamilton TE, Kandel JJ, Chen MK, Ferrer FA, Price MR, Mullen EA, Geller JI, Gratias EJ, Rosen N, Khanna G, Naranjo A, Ritchey ML, Grundy PE, Dome JS, Ehrlich PF. Primary nephrectomy and intraoperative tumor spill: report from the Children's Oncology Group (COG) renal tumors committee. *J Pediatr Surg.* 2013; 48:34-8.
- 12. Hoskins EE, Morreale RJ, Werner SP, Higginbotham JM, Laimins LA, Lambert PF, Brown DR, Gillison ML, Nuovo GJ, Witte DP, Kim MO, Davies SM, Mehta PA, Butsch Kovacic M, Wikenheiser-Brokamp KA, Wells SI. The fanconi anemia pathway limits human papillomavirus replication. *J Virol*. 2012; 86:8131-8.
- 13. Hummel TR, Chow LM, Fouladi M, Franz D. **Pharmacotherapeutic management of pediatric gliomas** : current and upcoming strategies. *Paediatr Drugs*. 2013; 15:29-42.
- Hummel TR, Miles L, Mangano FT, Jones BV, Geller JI. Clinical heterogeneity of desmoplastic infantile ganglioglioma: a case series and literature review. J Pediatr Hematol Oncol. 2012; 34:e232-6.
- 15. Joshi K, Banasavadi-Siddegowda Y, Mo X, Kim SH, Mao P, Kig C, Nardini D, Sobol RW, Chow LM,

- Kornblum HI, Waclaw R, Beullens M, Nakano I. **MELK-Dependent FOXM1 Phosphorylation is Essential for Proliferation of Glioma Stem Cells**. *Stem Cells*. 2013; 31:1051-63.
- 16. Merchant MS, Geller JI, Baird K, Chou AJ, Galli S, Charles A, Amaoko M, Rhee EH, Price A, Wexler LH, Meyers PA, Widemann BC, Tsokos M, Mackall CL. **Phase I trial and pharmacokinetic study of lexatumumab in pediatric patients with solid tumors**. *J Clin Oncol*. 2012; 30:4141-7.
- 17. Meyers AB, Towbin AJ, Geller JI, Podberesky DJ. Hepatoblastoma imaging with gadoxetate disodium-enhanced MRI--typical, atypical, pre- and post-treatment evaluation. *Pediatr Radiol.* 2012; 42:859-66.
- 18. Musselman JR, Bergemann TL, Ross JA, Sklar C, Silverstein KA, Langer EK, Savage SA, Nagarajan R, Krailo M, Malkin D, Spector LG. Case-parent analysis of variation in pubertal hormone genes and pediatric osteosarcoma: a Children's Oncology Group (COG) study. Int J Mol Epidemiol Genet. 2012; 3:286-93.
- 19. Northcott PA, Shih DJ, Peacock J, Garzia L, Morrissy AS, Zichner T, Stütz AM, Korshunov A, Reimand J, Schumacher SE, Beroukhim R, Ellison DW, Marshall CR, Lionel AC, Mack S, Dubuc A, Yao Y, Ramaswamy V, Luu B, Rolider A, Cavalli FM, Wang X, Remke M, Wu X, Chiu RY, Chu A, Chuah E, Corbett RD, Hoad GR, Jackman SD, Li Y, Lo A, Mungall KL, Nip KM, Qian JQ, Raymond AG, Thiessen NT, Varhol RJ, Birol I, Moore RA, Mungall AJ, Holt R, Kawauchi D, Roussel MF, Kool M, Jones DT, Witt H, Fernandez LA, Kenney AM, Wechsler-Reya RJ, Dirks P, Aviv T, Grajkowska WA, Perek-Polnik M, Haberler CC, Delattre O, Reynaud SS, Doz FF, Pernet-Fattet SS, Cho BK, Kim SK, Wang KC, Scheurlen W, Eberhart CG, Fèvre-Montange M, Jouvet A, Pollack IF, Fan X, Muraszko KM, Gillespie GY, Di Rocco C, Massimi L, Michiels EM, Kloosterhof NK, French PJ, Kros JM, Olson JM, Ellenbogen RG, Zitterbart K, Kren L, Thompson RC, Cooper MK, Lach B, McLendon RE, Bigner DD, Fontebasso A, Albrecht S, Jabado N, Lindsey JC, Bailey S, Gupta N, Weiss WA, Bognár L, Klekner A, Van Meter TE, Kumabe T, Tominaga T, Elbabaa SK, Leonard JR, Rubin JB, Liau LM, Van Meir EG, Fouladi M, Nakamura H, Cinalli G, Garami M, Hauser P, Saad AG, Iolascon A, Jung S, Carlotti CG, Vibhakar R, Ra YS, Robinson S, Zollo M, Faria CC, Chan JA, Levy ML, Sorensen PH, Meyerson M, Pomeroy SL, Cho YJ, Bader GD, Tabori U, Hawkins CE, Bouffet E, Scherer SW, Rutka JT, Malkin D, Clifford SC, Jones SJ, Korbel JO, Pfister SM, Marra MA, Taylor MD. Subgroup-specific structural variation across 1,000 medulloblastoma genomes. Nature. 2012; 488:49-56.
- 20. O'Brien MM, Cao X, Pounds S, Dahl GV, Raimondi SC, Lacayo NJ, Taub J, Chang M, Weinstein HJ, Ravindranath Y, Inaba H, Campana D, Pui CH, Rubnitz JE. Prognostic features in acute megakaryoblastic leukemia in children without Down syndrome: a report from the AML02 multicenter trial and the Children's Oncology Group Study POG 9421. Leukemia. 2013; 27:731-4.
- 21. Patel AV, Eaves D, Jessen WJ, Rizvi TA, Ecsedy JA, Qian MG, Aronow BJ, Perentesis JP, Serra E, Cripe TP, Miller SJ, Ratner N. Ras-driven transcriptome analysis identifies aurora kinase A as a potential malignant peripheral nerve sheath tumor therapeutic target. *Clin Cancer Res.* 2012; 18:5020-30.
- 22. Phillips CL, Davies SM, McMasters R, Absalon M, O'Brien M, Mo J, Broun R, Moscow JA, Smolarek T, Garzon R, Blum W, Schwind S, Marcucci G, Perentesis JP. Low dose decitabine in very high risk relapsed or refractory acute myeloid leukaemia in children and young adults. *Br J Haematol*. 2013; 161:406-10.
- 23. Privette Vinnedge LM, Ho SM, Wikenheiser-Brokamp KA, Wells SI. **The DEK oncogene is a target of steroid hormone receptor signaling in breast cancer**. *PLoS One*. 2012; 7:e46985.
- 24. Privette Vinnedge LM, Kappes F, Nassar N, Wells SI. Stacking the DEK: from chromatin topology to cancer stem cells. *Cell Cycle*. 2013; 12:51-66.
- 25. Quarmyne MO, Gupta A, Adams DM. Lymphangiosarcoma of the thorax and thoracic vertebrae in a

- 16-year-old girl. J Clin Oncol. 2012; 30:e294-8.
- 26. Rafalski VA, Ho PP, Brett JO, Ucar D, Dugas JC, Pollina EA, Chow LM, Ibrahim A, Baker SJ, Barres BA, Steinman L, Brunet A. Expansion of oligodendrocyte progenitor cells following SIRT1 inactivation in the adult brain. *Nat Cell Biol.* 2013; 15:614-24.
- 27. Romick-Rosendale LE, Lui VW, Grandis JR, Wells SI. The Fanconi anemia pathway: Repairing the link between DNA damage and squamous cell carcinoma. *Mutat Res.* 2013; 743-744:78-88.
- 28. Scott JR, Courter JD, Saldaña SN, Widemann BC, Fisher M, Weiss B, Perentesis J, Vinks AA.

 Population pharmacokinetics of sirolimus in pediatric patients with neurofibromatosis type 1. Ther

 Drug Monit. 2013; 35:332-7.
- 29. Sturm D, Witt H, Hovestadt V, Khuong-Quang DA, Jones DT, Konermann C, Pfaff E, Tönjes M, Sill M, Bender S, Kool M, Zapatka M, Becker N, Zucknick M, Hielscher T, Liu XY, Fontebasso AM, Ryzhova M, Albrecht S, Jacob K, Wolter M, Ebinger M, Schuhmann MU, van Meter T, Fruhwald MC, Hauch H, Pekrun A, Radlwimmer B, Niehues T, von Komorowski G, Durken M, Kulozik AE, Madden J, Donson A, Foreman NK, Drissi R, Fouladi M, Scheurlen W, von Deimling A, Monoranu C, Roggendorf W, Herold-Mende C, Unterberg A, Kramm CM, Felsberg J, Hartmann C, Wiestler B, Wick W, Milde T, Witt O, Lindroth AM, Schwartzentruber J, Faury D, Fleming A, Zakrzewska M, Liberski PP, Zakrzewski K, Hauser P, Garami M, Klekner A, Bognár L, Morrissy S, Cavalli F, Taylor MD, van Sluis P, Koster J, Versteeg R, Volckmann R, Mikkelsen T, Aldape K, Reifenberger G, Collins VP, Majewski J, Korshunov A, Lichter P, Plass C, Jabado N, Pfister SM. Hotspot mutations in H3F3A and IDH1 define distinct epigenetic and biological subgroups of glioblastoma. Cancer Cell. 2012; 22:425-37.
- 30. Turpin BK, Morris VR, Lemen L, Weiss BD, Gelfand MJ. **Minimizing nuclear medicine technologist radiation exposure during 131I-MIBG therapy**. *Health Phys*. 2013; 104:S43-6.
- 31. Wagner AJ, Goldberg JM, Dubois SG, Choy E, Rosen L, Pappo A, Geller J, Judson I, Hogg D, Senzer N, Davis IJ, Chai F, Waghorne C, Schwartz B, Demetri GD. Tivantinib (ARQ 197), a selective inhibitor of MET, in patients with microphthalmia transcription factor-associated tumors: results of a multicenter phase 2 trial. Cancer. 2012; 118:5894-902.
- 32. Wise-Draper TM, Draper DJ, Gutkind JS, Molinolo AA, Wikenheiser-Brokamp KA, Wells SI. Future directions and treatment strategies for head and neck squamous cell carcinomas. *Transl Res.* 2012; 160:167-77.
- 33. Wunderlich M, Mizukawa B, Chou FS, Sexton C, Shrestha M, Saunthararajah Y, Mulloy JC. **AML cells** are differentially sensitive to chemotherapy treatment in a human xenograft model. *Blood*. 2013; 121:e90-7.
- 34. Zhong Y, Wan YW, Pang K, Chow LM, Liu Z. Digital sorting of complex tissues for cell type-specific gene expression profiles. *BMC Bioinformatics*. 2013; 14:89.
- 35. Zhu G, Chow LM, Bayazitov IT, Tong Y, Gilbertson RJ, Zakharenko SS, Solecki DJ, Baker SJ. Pten deletion causes mTorc1-dependent ectopic neuroblast differentiation without causing uniform migration defects. *Development*. 2012; 139:3422-31.

Faculty, Staff, and Trainees

Faculty Members

John Perentesis, MD, FAAP, Professor

Leadership Deb Kleisinger Endowed Chair of Novel Cancer Treatments; Executive Co-Director, Cancer and Blood Diseases Institute; Director, Division of Oncology; Director, Leukemia/Lymphoma Program; Cincinnati Children's Principal Investigator, Children's Oncology Group (COG); Cincinnati Children's Principal

Investigator, National Cancer Institute Pediatric Phase I Consortium

Research Interests New anticancer drug development; molecular oncogenesis and pharmacogenetics in high risk leukemia, lymphoma and pediatric cancers

Michael Absalon, MD, PhD, Assistant Professor

Leadership Director, Medical Education Program; Associate Director, Leukemia/Lymphoma Program

Research Interests New therapeutics; relapsed leukemia and lymphoma, post-transplant lymphoproliferative disease, T-cell lymphoma

Denise M. Adams, MD, Professor

Leadership Marjory J. Johnson Chair Vascular Tumor Translational Research; Medical Director, Comprehensive Hemangiomas and Vascular Malformation Clinic; Director, Hematology/Oncology Fellowship Program

Research Interests Angiogenesis, endothelial cell proliferation, vascular anomalies, mTOR inhibition as a therapeutic approach to complex vascular anomalies

Karen Burns, MD, Assistant Professor

Leadership Clinical Director, Cancer Survivor Center

Research Interests Childhood cancer survival; fertility preservation and outcomes; adolescent and young adult outcomes and quality of life

Lionel Chow, MD, Assistant Professor

Leadership St. Baldrick's Foundation Scholar

Research Interests Molecular genetics of pediatric high-grade glioma, animal models of brain tumors, translational therapeutics for gliomas

Biplab Dasgupta, PhD, Assistant Professor

Research Interests Brain development, energy metabolism, brain cancer

Mariko DeWire, MD, Assistant Professor

Research Interests Developmental therapeutics in pediatric brain tumors

Rachid Drissi, MD, Assistant Professor

Research Interests Replicative senescence, telomere disruption signaling to DNA damage pathways

Maryam Fouladi, MD, FRCP, Professor

Leadership Marjory J. Johnson Chair of Brain Tumor Translational Research; Medical Director, Neuro-Oncology Program; Cincinnati Children's Principal Investigator, Collaborative Ependymoma Research Network (CERN)

Research Interests Novel drug development for the treatment of children with recurrent or poor prognosis brain tumors

James I. Geller, MD, Associate Professor

Leadership Medical Director, Kidney and Liver Tumors Program; Co-Medical Director, Retinoblastoma Program

Research Interests Developmental therapeutics for pediatric solid tumors, especially liver and kidney tumors and retinoblastoma

Adrienne Hammill, MD, Assistant Professor

Research Interests New approaches to the assessment and treatment of hemangiomas and vascular

malformations

Trent Hummel, MD, Assistant Professor

Research Interests New therapeutics in neuro-oncology; diffuse intrinsic pontine glioma, neurofibromatosis type 1 and 2 related tumors, biomarker development

Beatrice Lampkin, MD, Professor Emerita

Research Interests Blood and bone marrow morphology and the significance thereof in relationship to patients' case histories

Benjamin Mizukawa, MD, Instructor

Research Interests Pediatric leukemia and lymphoma; role of small Rho GTPases in leukemogenesis and leukemic stem cell biology and their potential as therapeutic targets in acute myeloid leukemia

Rajaram Nagarajan, MD, Assistant Professor

Leadership Outpatient and Inpatient Clinical Director; Director of Cancer Control and Outcomes Research, Cancer Survivor Center

Research Interests Bone tumors; functional and quality of life outcomes following cancer therapy

Maureen O'Brien, MD, Assistant Professor

Leadership Associate Director, Leukemia/Lymphoma Program

Research Interests High-risk acute lymphoblastic leukemia; novel therapies for relapsed leukemia and lymphoma; complications of leukemia therapy

Christine Phillips, MD, Assistant Professor

Research Interests Developmental therapeutics for acute myeloid leukemia; pharmacogenomics of cytarabine and other chemotherapeutic agents

Lisa Privette, PhD, Instructor

Research Interests Molecular mechanisms of tumorigenesis and chemotherapeutic drug resistance in breast cancer, with a particular interest in breast cancer stem cells

Brian Turpin, DO, Instructor

Research Interests Developmental therapeutics in pediatric brain tumors

Brian D. Weiss, MD, Associate Professor

Leadership Associate Director for Safety and Compliance, Cancer and Blood Diseases Institute; Medical Director, Neuroblastoma Program; Cincinnati Children's Principal Investigator, New Approaches to Neuroblastoma Therapy Consortium (NANT)

Research Interests Targeted agents for neurofibromatosis type 1-related malignancies (including plexiform neurofibromas, optic pathway gliomas, and juvenile myelomonocytic leukemia); chemotherapy safety

Susanne Wells, PhD, Associate Professor

Leadership Director, Epithelial Carcinogenesis and Stem Cell Program

Research Interests Epithelial malignancies, human papillomavirus biology and new targets of the HPV E6/E7 oncogenes, the role of epithelial stem cells in carcinogenesis

Joint Appointment Faculty Members

Ahna Pai, PhD, Associate Professor (Adherence Psychology)

Saulius Sumanas, PhD, Assistant Professor (Developmental Biology)

Clinical Staff Members

Carina Braeutigam, MD Vasudha Narayanaswamy, MD

Trainees

Andrew Bukowinski, MD, PGYIV, Children's Hospital of Pittsburg
Christopher Dandoy, MD, PGYVI, Miami Children's Hospital
Kathleen Dorris, MD, PGYVII, Children's Memorial Hospital, Northwestern University
Anne Hladik, MD, PGYV, Baylor College of Medicine, Houston
Dawn Pinchasik, MD, PGYVI, Children's Hospital of Pittsburgh
Ralph Salloum, MD, PGYVI, Detroit Medical Center/Wayne State University

Jennifer Williams, MD, PGYVI, T.C. Thompson Children's Hospital/University of Tennessee

Division Collaboration

Adolescent Medicine; Behavioral Medicine and Clinical Psychology; Biostatistics and Epidemiology; Human Genetics; Neurology; Physical Medicine and Rehabilitation » L. Ayensu-Coker, D. Drotar, M. Kim, S. Knapke, R. Hopkin, M. Sutton, and D. Pruitt

Scholar Training Program in Cancer Survivorship, funded by the Hyundai Hope on Wheels Foundation. (J. Perentesis, K. Burns, R. Nagarajan)

Behavioral Medicine and Clinical Psychology; Human Genetics; Neurology; Pathology; Physical Medicine and Rehabilitation; Radiology » M. Ernst, L. Bao, T. Smolarek, M. Sutton, R. McMasters, J. Mo, D. Pruitt, and M. Gelfand

Leukemia/Lymphoma Program clinical multidisciplinary care. (J. Perentesis, M. Absalon, K. Burns, A. Hammill, M. O'Brien, C. Phillips)

Behavioral Medicine and Clinical Psychology » D. Drotar and A. Pai

Adherence research; "Promoting Treatment Adherence in Adolescent Leukemia" (NIH).

Biomedical Informatics; Biostatistics and Epidemiology; Clinical Pharmacology; Pathology; Radiology » B. Aronow, M. Kim, A. Vinks, D. Witte, M. Gelfand, and A. Towbin

Scholar Training Program in Pediatric Oncology Developmental Therapeutics and Clinical Pharmacology, funded by the Hyundai Hope on Wheels Foundation. (J. Perentesis, M. Fouladi)

Biomedical Informatics; Human Genetics; Developmental and Behavioral Pediatrics; Biostatistics and Epidemiology » B. Aronow, T. Smolarek, D. Schonfeld, and M. Kim

Down syndrome leukemia research: etiology and risk factors, pharmacogenetics of therapy and outcomes. (J. Perentesis)

Bone Marrow Transplantation & Immune Deficiency » P. Mehta

Xenograft analysis of Fanconi Anemia patient cord blood CD34+ cells. (B. Mizukawa)

Center for Professional Excel Rsch & EBP » R. Pickler

Local and Systemic Responses and Epi-Genetic Influences on Preterm Birth among Hispanic Women. (R. Drissi)

Developmental Biology; Pain Management » Y. Yutaka and M. Jankowski

Endocrinology » S. Rose and M. Rutter

Endocrinology services for oncology patients; Children's Oncology Group and other clinical research activities.

Experimental Hematology and Cancer Biology; Pathology; University of Cincinnati Department of Cancer and Cell Biology; University of Minnesota » N. Ratner, M. Collins, G. Thomas, S. Kozma, and D. Largaespeda Cincinnati Center of Neurofibromatosis Research (P50). (J. Perentesis)

Experimental Hematology and Cancer Biology » Y. Zheng

Cdc42 inhibition for xenograft conditioning and mobilization. (B. Mizukawa)

Experimental Hematology and Cancer Biology; Human Genetics » R. Waclaw, Q. Pang, and R. Stottman Brain Development. (B. DasGupta)

Experimental Hematology and Cancer Biology; Bone Marrow Transplantation & Immune Deficiency; Human Genetics » N. Ratner, K. Komurov, A. Kumar, and G. Grabowski

Cancer Metabolism. (B. DasGupta)

Experimental Hematology and Cancer Biology » D. Starczynowski

Cancer (B. DasGupta)

Experimental Hematology and Cancer Biology » J. Cancelas

Provide technical services with flow cytometry and intellectual input on identifying cancer stem cells. (L. Privette-Vinnedge)

Experimental Hematology and Cancer Biology » K. Komurov

Facilitating cell culture and murine model experiments for his studies while assisting with bioinformatics and data mining for projects. (L. Privette-Vinnedge)

Experimental Hematology and Cancer Biology » H. Geiger

Breed mice for stem cell studies. (L. Privette-Vinnedge)

Gastroenterology, Hepatology and Nutrition; Radiology; Nephrology; Cardiology; Pathology » N. Yazigi, A.

Brody, J. Goebel, R. Spicer, K. Uzark, and D. Witte

Post-Transplant Lymphoproliferative Disease Working Group. (M. Absalon)

Genetics » T. Smolarek and L. Dyer

Molecular (FISH, SNP) characterization of TFE (translocation-type) Renal Cell Carcinoma. (J. Geller)

Hemangioma & Vascular Malformation Clinic; Orthopaedic » J. Sorger

Effective of Knee surgery for children with vascular malformation of the knee. (D. Adams, A. Hammill, B. Dasgupta)

Human Genetics » L. Bao and T. Smolarek

Genetic services for oncology patients; Children's Oncology Group clinical research activities.

Human Genetics; Neurology; Clinical Pharmacology; Radiology; Neurosurgery; Ophthalmology;

Orthopaedic Surgery; Physical Medicine and Rehabilitation; Pathology » E. Schorry, R. Hopkin, A. Vinks, A.

Towbin, S. Sharp, M. Gelfand, M. Sutton, M. Collins, D. Pruitt, C. West, A. Crawford, and K. Crone Multidisciplinary clinical services for patients with neurofibromatosis; clinical research related to neurofibromatosis, including national clinical trial of mTOR inhibition to treat NF1-related plexiform neurofibromas. (B. Weiss, J. Perentesis, T. Hummel.

Human Genetics » N. Leslie

Pediatric Hereditary Cancer Predisposition Clinic (J. Geller).

Infectious Diseases; Investigational Pharmacy; Radiology; Crusade Labs » B. Connelly, M. Cloughessy, D.

Lagory, J. Racadio, A. Towbin, M. Brown, and J. Connor

Phase I trial of HSV1716. (J. Geller)

Nephrology » S. Goldstein

Study ADVL1315 - Biomarkers of renal injury during anti-angiogenic therapy. (J. Geller)

Nephrology » S. Goldstein

Urinary Biomarkers of Acute Kidney Injury in Children with Cancer receiving Nephrotoxic Chemotherapy. (M. O'Brien)

Neurology; Ophthalmology; Radiology » D. Rose, C. West, and J. Leach

Visual pathway research for children with retinal or optic pathway tumors. (J. Geller)

Neurosurgery; Pathology; Radiology » T. Maugins, J. Yin, M. Gelfand, and S. Sharp

Neuroblastoma Program: (B. Weiss, R. Nagarajan)

Rayburg M et al. Langerhans cell histiocytosis in a patient with stage 4 neuroblastoma receiving oral fenretinide. *Pediatr Blood Cancer.* 53(6): 1111-1113. Dec, 2009.

Neurosurgery » C. Stevenson

Culture and xenografts of pediatric brain tumors. (L. Chow)

Neurosurgery; Pathology » C. Stevenson and L. Miles

Prognostic Role of Telomerase Expression in Pediatric High-Grade Gliomas.

Telomerase Activity and *hTERT* mRNA Expression Predict Shorter Progression-free and Overall Survival in Pediatric Medulloblastoma.

(R. Drissi, M. Fouladi, K. Dorris)

Neurosurgery; Pathology » C. Stevenson and L. Miles

A Pilot Study of SAHA in combination with 13-cis-retinoic acid for high risk medulloblastoma/PNET following craniospinal irradiation therapy and high dose chemotherapy with stem cell rescue, A phase II study of SAHA in combination with 13-cis-retinoic acid in recurrent/ refractory medulloblastoma/PNET, ATRT, ependymoma, high grade glioma.

A Safety and Feasibility Study of Radiotherapy and Concurrent Imetelstat Followed by Maintenance Imetelstat in Patients with Newly Diagnosed with High Grade Gliomas and Diffuse Intrinsic Pontine Gliomas.

Pediatric Brain Tumor Repository at Cincinnati Children's Hospital Medical Center: The primary goal of this study is to develop a pediatric brain tumor repository resulting in a long-term goal of improving our understanding in the biology of pediatric brain tumors. This will be achieved by two means: 1) conducting systematic autopsy studies on pediatric brain tumor patients who succumb to their illness and 2) by obtaining tumor and control tissue for future clinical/translational research.

(M. DeWire, R. Drissi, M. Fouladi)

Obstetrics and Gynecology » L. Ayensu-Coker

Fertility Consultation Service for oncology patients. (K. Burns)

Obstetrics and Gynecology; Christ Hospital » L. Ayensu-Coker and S. Lindheim

Cincinnati chapter of the Oncofertility Consortium.

Ophthalmology; Radiology » J. Augsburger and T. Abruzzo

Locoregional therapy (intraaterial and intravitreal chemotherapy) for Retinoblastoma. (J. Geller)

Pathology » A. Gupta

Molecular characteristics of Angiosarcoma (L. Chow).

Pathology » L. Miles

ACNS0822: a randomized phase II/III study of suberoylanilide hydroxamic acid (SAHA) (IND# 71976) and local irradiation or temozolomide and local irradiation or arsenic trioxide and local irradiation followed by maintenance bevacizumab (IND# 7921) and irinotecan in children with newly diagnosed high-grade glioma. (M. Fouladi, J. Geller, R. Drissi)

Pathology; Bone Marrow Transplantation & Immune Deficiency; Experimental Hematology and Cancer Biology; University of Cincinnati » K. Wikenheiser-Brokamp, D. Witte, S. Ho, S. Davies, P. Mehta, N. Nassar, M. Bahassi, P. Stambrook, K. Wilson, K. Casper, and Y. Patil Studies in DEK in Hematopoietic stem cells. (S.Wells)

Pathology » L. Miles

Characterization of mouse glioma models. (L. Chow)

Pathology; Radiology; Surgical Services » M. Gelfand, S. Sharp, A. Towbin, J. Yin, and T. Maugins Clinical services for neuroblastoma patients; clinical research related to neuroblastoma. (J. Perentesis, B. Weiss)

Pathology » D. Witte, M. Collins, J. Yin, J. Mo, R. McMasters, and L. Miles

Pathology services for oncology patients; Children's Oncology Group clinical research activities.

Pathology » D. Witte

Cincinnati Children's to develop an assay for High-grade patents eligibility. (R. Drissi)

Physical Medicine and Rehabilitation » D. Pruitt

Rehabilitation services for oncology patients; Children's Oncology Group and other clinical research activities.

Radiology; » M. Gelfand and A. Towbin

Nuclear medicine services for oncology patients; Children's Oncology Group clinical research activities.

Radiology; General and Thoracic Surgery; Pathology » A. Towbin, D. von Allmen, and K. Bove
Director: Multidisciplinary Solid Tumor Board - a weekly educational session pertaining to solid
tumors, for all levels of care providers. (J. Geller)

Radiology; Ophthalmology » T. Abruzzo and J. Augsburger

Protocol Chair: CCHMC IARB1 – (IND# 111358) - A Pilot Study of Intra-Ophthalmic Artery Topotecan Infusion for the Treatment of Retinoblastoma. (J. Geller)

Radiology; Surgery » B. Cooley, C. Doumalin, J. Racadio, D. Podberesky, and D. vonAllmen

Advancement of High Frequency Ultrasound (HIFU) for pediatric oncology patients. (J. Geller)

Radiology » E. Crotty and N. Cost

Nephrometry for pediatric renal tumors. (J. Geller)

Surgical Services » R. Azizkhan and G. Tiao

Surgical services for oncology patients; Children's Oncology Group clinical research activities.

Surgical Services; Gastroenterology, ; Hepatology and Nutrition; Developmental Biology; Radiology; Pathology » J. Nathan, M. Alonso, F. Ryckman, G. Tiao, M. Leonis, J. Bucuvalas, K. Campbell, A. Towbin, K. Kukreja, K. Bove, A. Gupta, R. Sheridan, and M. Kim

Liver transplantation clinical services and clinical research activities for hepatoblatoma patients. (J. Geller)

Surgical Services; Otolaryngology; Dermatology; Radiology; Pathology; Cardiology; Gastroenterology, Hepatology and Nutrition; Urology; Endocrinology; Orthopaedics; Neurology; Pulmonary Medicine; Ophthalmology; Pain Management and Palliative Care; Human Genetics » R. Azizkhan, A. Dasgupta, R. Elluru, A. Lucky, M. Patel, T. Abruzzo, W. Ball, A Zbojniewicz, K. Crone, A. Gupta, P. Eghtesday, K. Goldchneider, R. Hirsch, R. Hopkin, A. Kaul, P. Reddy, M. Rutter, J. Sorger, M. Sutton, R. Wood, K. Yakuboff, J. Taylor, M. Yang, M. Seid, B. Dickie, J. McCarthy, K. Shah, C. Merrow, A. Schwentker, E. Mundt, M. Visscher, L. Burns, D. Neilson, and N. Weidner

Hemangioma and Vascular Malformation Center, clinical services and clinical research, including a clinical trial of rapamycin and sirolimus for complicated vascular anomalies, a vascular tumor registry, and a vascular anomaly tissue repository. (D. Adams, A. Hammill)

UC Cancer and Cell Biology » S. Waltz

Provide technical services with murine modes of breast cancer, intellectual input, career mentoring. (L. Privette-Vinnedge)

UC Drug Discovery Center » R. Papoian

Pediatric leukemia, solid tumor, and brain tumor drug discovery screening. (J. Perentesis, B. Weiss, M. Absalon, M. O'Brien)

UC Environmental Health » S. Ho

Provide shared reagents and intellectual input regarding hormone studies, co-mentor and co-author. (L. Privette-Vinnedge)

UC Division of Hematology/Oncology » M. Czyzk-Krzeska

Autophagy in TFE (Translocation-type) RCC. (J. Geller)

UC College of Pharmacy » G. Weber

Providing reagents and samples for analysis. (L. Privette Vinnege)

UC College of Pharmacy » P. Desai

Preclinical testing of aromatase inhibitor in glioma. (L. Chow)

UC Division of Radiation Oncology » J. Breneman and R. Lavigne

Radiation oncology clinical services for oncology patients; Children's Oncology Group clinical research activities.

Grants, Contracts, and Industry Agreements

Grant and Contract Awards Annual Direct

ADAMS, D

Phase II Study of Rapamycin for Complicated Vascular Anomalies

Food and Drug Administration

R01 FD 003712 09/22/09-07/31/13 \$258,707

CHHIPA. R

Identifying survival factors for Diffuse Intrinsic Pontine Glioma (DIPG) Stem Cells

Cancer Free Kids

	06/01/13-05/31/14	\$25,000
CHLON, T		
Pelotonia Fellowship Program		
Ohio State University Comprehensi	ve Cancer	
	03/01/13-02/28/15	\$39,264
CHOW, L		
Micro-RNA Expression in Pediatric		
Childhood Brain Tumor Foundation		
-	09/01/11-08/31/13	\$22,727
Molecular Targeting of High-Grade The Sontag Foundation	Astrocytoma	
-	10/01/11-09/30/15	\$130,435
Molecular Targeting of Pediatric H	igh-Grade Glioma	
St. Baldrick's Foundation		
	07/01/11-06/30/14	\$110,000
CRIPE, T		
Neurofibromatosis Preclinical Cor	nsortium Center Award	
The Children's Tumor Foundation		
2011-05-003	07/01/11-06/30/13	\$204,545
DASGUPTA, B		
Regulation of Forebrain Neurogene	esis by the Energy Sensor AMP Kinase	
National Institutes of Health		
R01 NS 072591-01A1	07/01/12-06/30/17	\$230,208
DORRIS, K		
Molecular Epidemiology in Children National Institutes of Health(University)	n's Environmental Health Training Program	
T32 ES 010957	10/01/12-06/30/13	\$40,635
132 L3 0 10937	10/01/12-00/30/13	Ψ40,033
DRISSI, R		
Telomerase as a Marker and Ther Team Connor Childhood Cancer Fo	apeutic Target for Pediatric High-Grade Glioma	
TCCCF	01/01/13-12/31/13	\$60,000
FOULADI, M		

U10 CA 098543 04/13/12-02/28/14 \$11,550

Children's Oncology Group Chair

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

The Pediatric Brain Tumor Con		
National Institutes of Health(St		
U01 CA 08155	04/01/11-03/31/14	\$44,11
	al Diffuse Intrinsic Pontine Glioma (DIPG) Registry	
The Cure Starts Now Foundation		0004.00
	01/01/12-05/31/14	\$231,09
The Pediatric Brain Tumor Cons		
National Institutes of Health(St. VU01 CA 08155	04/01/11-03/31/14	\$9,25
	04/01/11-03/31/14	ψθ,20
GELLER, J		
Epigenetic and Clinical Impact	of SMARCB1 Loss in Cancer	
National Institutes of Health(Chi	ldren's Memorial Hospital)	
R21 CA 166790	07/01/2012-06/30/2014	\$9,27
MOREIRA RIDSDAL,D		
The Role of CDC42 in MLL-AF9	nduced AML Xenograft Model	
American Society of Hematology	/	
	06/01/13-05/31/14	\$5,00
	herapy-Resistant Pediatric Acute Myeloid Leukemia	φ3,00
Molecular Targeting of Chemot Hyundai Hope on Wheels	herapy-Resistant Pediatric Acute Myeloid Leukemia	
Molecular Targeting of Chemot Hyundai Hope on Wheels O'Brien-HOW PERENTESIS, J	herapy-Resistant Pediatric Acute Myeloid Leukemia 12/01/12-11/30/13	
Molecular Targeting of Chemot Hyundai Hope on Wheels O'Brien-HOW PERENTESIS, J Children's Oncology Group Cha	herapy-Resistant Pediatric Acute Myeloid Leukemia 12/01/12-11/30/13	
Molecular Targeting of Chemot Hyundai Hope on Wheels O'Brien-HOW PERENTESIS, J Children's Oncology Group Cha	herapy-Resistant Pediatric Acute Myeloid Leukemia 12/01/12-11/30/13 ir - Millennium	\$75,00
Molecular Targeting of Chemot Hyundai Hope on Wheels O'Brien-HOW PERENTESIS, J Children's Oncology Group Cha	herapy-Resistant Pediatric Acute Myeloid Leukemia 12/01/12-11/30/13 ir - Millennium Idren's Hospital of Philadelphia) 03/01/12-02/28/17	\$75,00
Molecular Targeting of Chemot Hyundai Hope on Wheels O'Brien-HOW PERENTESIS, J Children's Oncology Group Cha National Institutes of Health(Chi	herapy-Resistant Pediatric Acute Myeloid Leukemia 12/01/12-11/30/13 ir - Millennium Idren's Hospital of Philadelphia) 03/01/12-02/28/17 ir - Workload Intensity	\$75,00
Molecular Targeting of Chemot Hyundai Hope on Wheels O'Brien-HOW PERENTESIS, J Children's Oncology Group Cha National Institutes of Health(Chi Children's Oncology Group Cha	herapy-Resistant Pediatric Acute Myeloid Leukemia 12/01/12-11/30/13 ir - Millennium Idren's Hospital of Philadelphia) 03/01/12-02/28/17 ir - Workload Intensity	\$75,000 \$10,39
Molecular Targeting of Chemot Hyundai Hope on Wheels O'Brien-HOW PERENTESIS, J Children's Oncology Group Cha National Institutes of Health(Chi Children's Oncology Group Cha National Institutes of Health(Chi	herapy-Resistant Pediatric Acute Myeloid Leukemia 12/01/12-11/30/13 ir - Millennium Idren's Hospital of Philadelphia) 03/01/12-02/28/17 ir - Workload Intensity Idren's Hospital of Philadelphia) 03/01/12-02/28/17	\$75,000 \$10,39
Molecular Targeting of Chemot Hyundai Hope on Wheels O'Brien-HOW PERENTESIS, J Children's Oncology Group Cha National Institutes of Health(Chi Children's Oncology Group Cha National Institutes of Health(Chi U10 CA 098543 Children's Oncology Group Pha	herapy-Resistant Pediatric Acute Myeloid Leukemia 12/01/12-11/30/13 ir - Millennium Idren's Hospital of Philadelphia) 03/01/12-02/28/17 ir - Workload Intensity Idren's Hospital of Philadelphia) 03/01/12-02/28/17	\$75,000 \$10,39
Molecular Targeting of Chemot Hyundai Hope on Wheels O'Brien-HOW PERENTESIS, J Children's Oncology Group Cha National Institutes of Health(Chi Children's Oncology Group Cha National Institutes of Health(Chi U10 CA 098543 Children's Oncology Group Pha	herapy-Resistant Pediatric Acute Myeloid Leukemia 12/01/12-11/30/13 ir - Millennium Idren's Hospital of Philadelphia) 03/01/12-02/28/17 ir - Workload Intensity Idren's Hospital of Philadelphia) 03/01/12-02/28/17 se I / Pilot Consortium	\$75,000 \$10,399 \$27,79
Molecular Targeting of Chemot Hyundai Hope on Wheels O'Brien-HOW PERENTESIS, J Children's Oncology Group Cha National Institutes of Health(Chi Children's Oncology Group Cha National Institutes of Health(Chi U10 CA 098543 Children's Oncology Group Pha National Institutes of Health(Nat	herapy-Resistant Pediatric Acute Myeloid Leukemia 12/01/12-11/30/13 ir - Millennium Idren's Hospital of Philadelphia) 03/01/12-02/28/17 ir - Workload Intensity Idren's Hospital of Philadelphia) 03/01/12-02/28/17 se I / Pilot Consortium ional Childhood Cancer Founation) 09/01/06-07/31/15	\$75,000 \$10,399 \$27,79
Molecular Targeting of Chemot Hyundai Hope on Wheels O'Brien-HOW PERENTESIS, J Children's Oncology Group Cha National Institutes of Health(Chi Children's Oncology Group Cha National Institutes of Health(Chi U10 CA 098543 Children's Oncology Group Pha National Institutes of Health(Nat U01 CA 097452	herapy-Resistant Pediatric Acute Myeloid Leukemia 12/01/12-11/30/13 ir - Millennium Idren's Hospital of Philadelphia) 03/01/12-02/28/17 ir - Workload Intensity Idren's Hospital of Philadelphia) 03/01/12-02/28/17 se I / Pilot Consortium ional Childhood Cancer Founation) 09/01/06-07/31/15 ment	\$75,000 \$10,399 \$27,79
Molecular Targeting of Chemot Hyundai Hope on Wheels O'Brien-HOW PERENTESIS, J Children's Oncology Group Cha National Institutes of Health(Chi Children's Oncology Group Cha National Institutes of Health(Chi U10 CA 098543 Children's Oncology Group Pha National Institutes of Health(Nat U01 CA 097452 COG Supplemental Reimburser	herapy-Resistant Pediatric Acute Myeloid Leukemia 12/01/12-11/30/13 ir - Millennium Idren's Hospital of Philadelphia) 03/01/12-02/28/17 ir - Workload Intensity Idren's Hospital of Philadelphia) 03/01/12-02/28/17 se I / Pilot Consortium ional Childhood Cancer Founation) 09/01/06-07/31/15 ment	\$75,000 \$10,399 \$27,79
Molecular Targeting of Chemot Hyundai Hope on Wheels O'Brien-HOW PERENTESIS, J Children's Oncology Group Cha National Institutes of Health(Chi Children's Oncology Group Cha National Institutes of Health(Chi U10 CA 098543 Children's Oncology Group Pha National Institutes of Health(Nat U01 CA 097452 COG Supplemental Reimburser	herapy-Resistant Pediatric Acute Myeloid Leukemia 12/01/12-11/30/13 ir - Millennium Idren's Hospital of Philadelphia) 03/01/12-02/28/17 ir - Workload Intensity Idren's Hospital of Philadelphia) 03/01/12-02/28/17 se I / Pilot Consortium ional Childhood Cancer Founation) 09/01/06-07/31/15 ment en's Hospital of Philadelphia) 03/01/12-02/18/17	\$10,39 \$27,79 \$22,52
Molecular Targeting of Chemot Hyundai Hope on Wheels O'Brien-HOW PERENTESIS, J Children's Oncology Group Cha National Institutes of Health(Chi Children's Oncology Group Cha National Institutes of Health(Chi U10 CA 098543 Children's Oncology Group Pha National Institutes of Health(Nat U01 CA 097452 COG Supplemental Reimburser St. Baldrick's Foundation(Children)	herapy-Resistant Pediatric Acute Myeloid Leukemia 12/01/12-11/30/13 ir - Millennium Idren's Hospital of Philadelphia) 03/01/12-02/28/17 ir - Workload Intensity Idren's Hospital of Philadelphia) 03/01/12-02/28/17 se I / Pilot Consortium ional Childhood Cancer Founation) 09/01/06-07/31/15 ment en's Hospital of Philadelphia) 03/01/12-02/18/17 tium (per case)	\$75,00 \$10,39 \$27,79 \$22,52

Pediatric Phase I Scientific Leader	rship	
National Institutes of Health(Childre	en's Hospital of Philadelphia)	
UM1CA097452	09/26/12-07/31/15	\$11,501
Children's Oncology Group Phase	I / Pilot Consortium - per patient	
National Institutes of Health(Childre	en's Hospital of Philadelphia)	
U01 CA097452	09/01/06-07/31/12	\$125,705
PHILLIPS, C		
Genetic Model of Cytarabine Sensi	itivity in Children with AML	
American Association for Cancer R	esearch	
	07/01/12-06/30/14	\$50,000
PRIVETTE, L		
Cincinnati Interdisciplinary Women	n's Health Research Career Training Grant	
National Institutes of Health(University	sity of Cincinnati)	
K12 HD 051953	07/01/12-06/30/14	\$79,933
Therapeutic DEK Targeting Strateg	gene in Breast Cancer Stem Cell Tumorigenicity Ad F gies	Pre-Clinical Testing of
Ride Cincinnati Foundation		
RCF	04/01/13-03/31/14	\$40,000
ROMICK-ROSENDALE, L		
Environmental Carcinogenesis and	d Mutagenesis	
National Institutes of Health(University	sity of Cincinnati)	
T32 ES 007250	09/01/12-06/30/13	\$41,170
WEISS, B		
Phase I Trial of the MEK 1 Inhibitor	AZX6244 with Plexiform	
Children's Tumor Foundation(Child	ren's Hospital of Philadelphia)	
	02/01/12-01/31/14	\$37,182
Children's Oncology Group Chair -	Workload Intensity	
National Institutes of Health(Childre	en's Hospital of Philadelphia)	
U10 CA 098543	03/01/12-02/28/17	\$11,550
WELLS, S		
Fanconi Anemia and HPV Transfor	mation	
National Institutes of Health		
R01 CA 102357	09/28/09-08/31/14	\$191,834
Role and Regulation of the Human	DEK Proto-Oncogene	
National Institutes of Health		
R01 CA 116316	09/05/12-06/30/17	\$174,318

Targeting the Ron-DEK Signaling Axis in Brea	ast Cancer	
Department of Defense		
W81XWH-12-1-0194	09/01/12-08/31/14	\$125,000
WILLIAMS, J		
ETV2 Role in Tumor-Induced Lymphangiogen	nesis, A Putative Therapeutic Target	
St. Baldrick's Foundation		
	07/01/12-06/30/14	\$69,659
	Current Year Dire	ct \$2,610,576
Industry Contracts		
FOUALDI, M		
Genetech, Inc		\$19,250

Industry Contracts

FOUALDI, M

Genetech, Inc \$19,250

GELLER, J

Bayer Healthcare, Inc \$73,615

WAGNER, L

Sarcoma Alliance for Res through Collaboration \$2,887

WEISS, B

Children's Hospital Los Angeles \$12,890

Current Year Direct Receipts \$108,642

Total \$2,719,218