Pediatric Cancer Research Group Supported by the Nebraska Legislature (LB 417) in collaboration with The Fred & Pamela Buffett Cancer Center, University of Nebraska Medical Center and Children's Nebraska

The State of Nebraska has funded the Pediatric Cancer Research Group (PCRG) since 2013. These resources are being leveraged with key strategy leaders within the University of Nebraska system, the State of Nebraska and Children's Nebraska to change the landscape of pediatric cancer research for generations to come. The group has now grown to over 170 members focusing on issues children with cancer and their families face within our state.

This year, the PCRG hosted the eighth annual Pediatric Cancer Research Group Symposium on August 20, 2025. The Symposium, co-sponsored by the Child Health Research Institute, was attended by more than 120 participants and focused on hematological malignancies, including addressing the critical challenges in leukemia and lymphoma. **Senator Danielle Conrad** whose efforts in the legislature started the PCRG in 2013 gave introductory remarks and participated in a panel discussion with **Dr. Jeffrey Gold**, President of the Nebraska University System, and **Chanda Chacon**, CEO of Children's Nebraska. **Paul Liu, MD, PhD**, senior investigator, National Human Genome Research Institute, National Institutes of Health (NIH), delivered the keynote address**. James O. Armitage, MD**, Joe Shapiro professor, UNMC Division of Oncology & Hematology, served as the featured speaker. Updates from the PCRG Hematological Malignancies Group were provided by **Kate Hyde, PhD**, associate professor, UNMC Department of Biochemistry and Molecular Biology, and associate director for Shared Resources, Fred & Pamela Buffett Cancer Center, and **Kyle Hewitt, PhD**, associate professor, UNMC Department of Genetics, Cell Biology, and director of the Single Cell and Spatial Transcriptomics Core.

A patient advocacy and philanthropic initiatives panel was featured with contributions from organizations such as the **RUNX1 Research Program, Angels Among Us, Leukemia & Lymphoma Society, and Team Jack Foundation**. The event concluded with flash talks, poster sessions, and awards recognizing outstanding research contributions.

A report of the current composition of the Pediatric Cancer Research Group and an accounting of the usage of the $1.8 million dollars follows:

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New Projects:

Translational Science Research:

1. *Development of a Targeted Nanoparticle Drug Delivery System for Geranylgeranyl Diphosphate Synthase Inhibitor Therapy for Osteosarcoma*

   Osteosarcoma is the most common type of bone cancer in children and adolescents. This cancer commonly spreads to the lungs and survival rates are

low. Unfortunately, current treatments rely on combinations of chemotherapy agents that have not changed in decades and can cause long-term side effects. Dr. Sarah Holstein and her team have developed a novel drug that targets an enzyme (GGDPS) that causes osteosarcoma cell stress and death. Dr. Holstein proposes to develop a novel nanoparticle-based formulation of our GGDPS inhibitor that will selectively target osteosarcoma cells. This strategy will improve anti-tumor activity while minimizing any potential ill effects on healthy cells. The major aims of this proposal are to 1) develop and optimize the nanoparticle formulations and 2) evaluate the lead nanoparticle formulation in a mouse model of metastatic osteosarcoma. Ultimately, the long-term goal will be to successfully advance this novel treatment to the clinic so that it will improve the outcomes of children diagnosed with osteosarcoma.

2. *Targeting Ras Signaling in Rhabdomyosarcoma*

   Rhabdomyosarcoma (RMS) is the most common soft tissue cancer in children and often comes back after treatment, especially when it has spread. Two major types of RMS are driven by different genetic changes, but both rely on abnormal Ras signaling - a pathway that tells cells to grow and divide. Dr. Michel Ouellette's lab has early results that show that a new drug, ADT-007, which blocks all Ras proteins, can kill RMS cells without harming healthy ones. This project will explore how active Ras is across different RMS types, whether a key cancer-driving gene (PAX3-FOXO1) increases Ras activity, and how well the drug works in mice with RMS tumors. The goal is to show that blocking Ras could be an effective treatment for many RMS patients, even those without Ras mutations. These studies will provide critical data to support a larger grant application aimed at developing safer, more effective therapies for children with RMS.

3. *Placental Mechanism of Resilience: Knowledge Transfer to Tumor Tissues*

   This project will redefine how DDR and NTK stress-responsive signaling regulate the invasive cell behavior of tumors. It will examine this question by leveraging the unique biology of placental trophoblasts. By establishing mechanistic parallels between placental and cancer invasion, Dr. Mona Al-Mugotir's work will open a novel translational pathway to limit metastasis in pediatric chronic myeloid leukemia (CML) and gynecological cancer conditions where current therapies often fail. Moreover, this study will fill a critical knowledge gap in placental biology, providing insights into complications such as preeclampsia and fetal growth restriction, which remain poorly understood at the molecular level. By profiling stress-responsive signaling in both normal and pathological contexts, the findings promise to impact two major fields, oncology and obstetrics, while laying the groundwork for cross-disciplinary therapeutic innovation.

4. *Fatty Acid Oxidation-Mediated Metabolic Flexibility in Ewing Sarcoma*

   Ewing sarcoma (EWS) is among the most common malignant bone tumors in children and young adults, often spreading in the body and leading to death. Previous research showed that 9 out of 10 EWS patients have increased activity in

a cell signaling pathway that is known by two of its prominent proteins: receptor tyrosine kinase and insulin-like growth factor 1 receptor (IGF-1R). This enhanced signaling pathway promotes formation and spread of EWS tumors and increases their resistance to chemotherapy. Dr. Hamid Band's team explores this pathway for proteins that may be vulnerable to targeted inhibition with new therapeutic drugs. The proposed project will investigate a two-pronged strategy that not only inhibits IGF-1R to impede metabolism in the tumor cells but also inhibits the fatty acid oxidation pathway that appears to provide the tumor cells with a crucial backup energy supply. By testing this concept in cell culture and mouse experiments, the team hopes to advance a powerful new combination strategy that could ultimately be used to improve treatment outcomes for patients.

Neuro-Oncology Research

1. *Targeted Nanomedicine of SRX3305 and miRNA 217 Hairpin Inhibitor for Effective Treatment of Medulloblastoma*

   Medulloblastoma (MB), the most common pediatric brain tumor, is treated by surgery, radiation and chemotherapy. While significant progress has been made, children with MB often suffer from severe side effects due to radiation and develop multidrug resistance to chemotherapy upon repeated use. Dr. Ram Mahato's project aims to develop an effective therapy by testing SRX3305, which is a potent BRD4/PI3K inhibitor. In addition, the lab has also demonstrated that miR217 is upregulated in MB and has oncogenic properties. Dr. Mahato and his team propose to combine SRX3305 with miR217 hairpin inhibitor for synergistical treatment of MB. Since free small molecule drugs and RNA molecules do not cross the blood-brain barrier efficiently on their own, the lab will deliver SRX3305 and miR-217 hairpin inhibitor via polymeric nanoparticles that incorporate Rabies virus glycoprotein (RVG) peptide for targeted delivery to brain tumor. The long-term goal is to develop a platform technology for treating brain tumors using these innovative nanomedicines of small molecule and therapeutic RNA.

2. *Investigating Biodistribution, in Vivo Toxicity and Maximum Tolerated Dose of TMPyP4 in Mice for Targeting G4-structures in Medulloblastoma*

   Medulloblastoma (MB) is a highly aggressive, malignant tumor, accounting for 20-25% of all pediatric brain tumors. Despite extensive research efforts, targeted therapies remain unavailable. Unfortunately, the current standard of care with high doses of radiation and chemotherapies results in severe side effects, such as neurocognitive impairment, learning disabilities, and hearing loss, drastically reducing quality of life for survivors. Moreover, in some patients, residual tumors lie dormant for years and then relapse leading to tumor recurrence and metastasis. Therefore, more research is needed to develop a new therapeutic strategy to sensitize these therapy resistant cells, prevent tumor recurrence and improve the quality of life of MB patients. Dr. Kishor Bhakat's study will examine if small molecule TMPyP4, which targets a four-stranded DNA structure known as G-quadruplex (G4) structure, can serve as a chemo and radio sensitizer and be used

to reduce the standard doses of chemo and radiation to improve the quality of life of pediatric cancer survivors.

3. *Safely Improving the Immunological Effectiveness of Chemotherapy for Neuroblastoma with a Histone Deacetylase Inhibitor*

   Neuroblastoma is an aggressive pediatric cancer that often has poor prognosis, and the currently available treatments can lead to severe side effects. This research project led by Dr. Joyce Solheim will investigate a novel treatment approach that involves pairing a new drug called M344 with a standard chemotherapy drug that is used for neuroblastoma. The objective is to learn if including this new drug will enable a lower dose of the chemotherapy to be used, thereby reducing damaging side effects. In this project, the lab team will also evaluate whether including this new drug will help stimulate immune responses against neuroblastoma that will contribute to reducing tumor growth.

4. *Development of Tumor-targeted Peripherally Cross-linked Polymer Micelles to Improve the Systemic Treatment of Solid Pediatric and Adult Tumors with PROTACs Drugs*

   The proposed research aims to improve cancer treatment by enhancing the efficacy and reducing the toxicity of a new class of drugs known as PROTACs. These drugs can degrade specific proteins in cancer cells, but therapeutic application faces challenges like poor solubility and high toxicity. By encapsulating PROTACs in specially designed polymer micelles that target tumors, the research seeks to increase the drugs' solubility and potency while minimizing side effects. The study led by Dr. Joseph Vetro will focus on two types of cancer: neuroblastoma, common in children, and triple-negative breast cancer, affecting adults. Successful outcomes could lead to more effective and safer cancer treatments for both pediatric and adult patients.

Clinical Research

1. *Using Ultrafast Ultrasound Elastography and Pulse Wave Velocity to Detect Myocardial and Arterial Stiffness as Early Signs of Cardiovascular Dysfunction in Childhood Cancer Survivors*

   Childhood cancer survivors are at higher risk for heart problems later in life due to treatments like chemotherapy and radiation. These treatments can damage the heart and blood vessels, so identifying such issues early is important. In this study, Dr. Ling Li will use two new, non-invasive techniques—ultrafast ultrasound elastography and pulse wave velocity—to measure how stiff the heart and arteries are. Her team will compare 25 childhood cancer survivors (ages 5 to 30) with 25 healthy individuals of similar age and sex. All participants will have a heart ultrasound and a test that measures how fast the pulse travels through their arteries. The lab will look at how these stiffness measures relate to other heart function tests and treatment histories, such as chemotherapy doses or radiation. By identifying early signs of heart damage, this study aims to improve long-term

care and health outcomes for childhood cancer survivors, helping them live healthier, longer lives.

Population Health Research

1. *SEEDS - Study of Environmental Exposures and Diseases in Rural Communities*

   Cancer is the leading cause of death by disease among children after infancy in the United States. Each year, thousands of children and teens are diagnosed, with leukemia, brain tumors, and lymphomas being the most common types. Rates of pediatric brain tumors vary across the country, influenced by both demographics and environmental exposures. For example, higher rates are seen in non-Hispanic White children and in more urban or higher-income areas, while children in rural or high-poverty areas may face different risks tied to healthcare access and environmental exposures. Factors such as pesticides, nitrate-contaminated well water, and other pollutants are especially important in agricultural regions. Nebraska and neighboring Midwest states have higher pediatric cancer rates, making them critical areas for study. This project, led by Dr. Shinobu Watanabe-Galloway, aims to identify how demographic and environmental risks interact, with the goal of informing strategies to reduce childhood cancer and protect vulnerable communities.

<u>Continued Projects:</u>

Translational Science Research:

1. *Investigation of the Protective Effect of OPA1 in Primordial Follicle Oocytes against Cyclophosphamide-induced Toxicity*

   There are approximately 450,000 childhood cancer survivors in the United States, and 6.5 million worldwide. Remarkable advances in early cancer diagnosis and treatment strategies have led to a dramatic rise in pediatric cancer survival rates over the past several decades. While these advances are encouraging, they have also heightened awareness of the side effects of cancer therapy and the importance of long-term quality of life post-cancer. The ovarian reserve, critical for female endocrine health and fertility, is frequently compromised by standard cancer treatments. Dr. So-Youn Kim's research focuses on elucidating the role of the mitochondrial protein OPA1 in protecting oocytes during chemotherapy. Additionally, her lab aims to explore potential adjuvants that enhance OPA1 activity, ultimately safeguarding the ovarian reserve. This study will provide valuable insights to inform future clinical strategies for preserving ovarian function in pediatric cancer patients who undergo gonadotoxic chemotherapy.

2. *Role of FBXO21 as an Oncogene in AML*

   Acute myeloid leukemia has a poor prognosis in pediatric patients, and a better understanding of the transformation of normal myeloid cells to leukemia cells could lead to new treatment modalities. Drs. Hyde, Natarajan and Buckley are investigating FBXO21, a potential oncogene thought to play a role in the transformation and progression of these cells. Their early studies could further promote FBXO21 as a potential therapeutic target in this disease.

3. *The Role of HMGB3 in Acute Myeloid Leukemia*

   A protein called HMGB3 is involved in the promotion of multiple types of malignancies, and its role in acute myeloid leukemia (AML) is being explored in Dr. Samantha Swenson's lab. The team is working on generating various experimental models, including cultured cell systems to evaluate how HMGB3 regulates cell proliferation, cell death, and colony formation, and experimental mice to evaluate how it affects survival. These steps to understanding how HMGB3 functions in the disease biology of AML will be crucial to securing extramural funding for longer-term translational research to achieve much-needed new treatments.

4. *Role of TME in Refractory Pediatric ALL: Is NOTCH Signaling a Viable Target for ALL Therapy*

   Although most pediatric acute lymphoblastic leukemias (ALL) are treatable with chemotherapies to induce remission, infant ALLs are very aggressive. Developing an effective treatment strategy for infant ALLs requires understanding how molecular and cellular features of the tumor microenvironment regulate ALL progression. More specifically, Dr. Shantaram Joshi is interested in how signaling proteins of the NOTCH pathway are activated in the ALL tumor microenvironment, and how drugs could target those proteins to treat ALL. Research aims include measuring the expression of key members of the NOTCH pathway in patients' cells and tissues and evaluating the therapeutic value of NOTCH inhibitor drugs in cultured ALL cell lines and in mice bearing ALL.

5. *Co-Targeting IGF-1R and Glutaminase in Ewing Sarcoma*

   Ewing sarcoma is the second most common bone-associated cancer among children and young adults. While survival of patients with locally or regionally confined disease has improved, current management is beset with enormous morbidities and life-long disabilities, with a high rate of recurrence. Outcomes of metastatic disease remain poor, with only a 39% 5-year survival rate. The need for newer therapeutic avenues is urgent. Hyperactivity of a protein called IGF-1R helps promote Ewing sarcoma tumor growth, spread and resistance to current therapies. When IGF-1R is combined with glutaminase inhibitor drug candidates that have been found safe in clinical trials, the combination most profoundly inhibits the growth and spreading behavior of Ewing sarcoma tumor cells in the lab compared to individual drugs. Dr. Hamid Band's lab will test if a combination of these two drug candidates can provide a more effective approach to treat Ewing sarcoma. Given their safety in clinical trials, the novel combination could move

into clinical trials quickly. The combination of IGF-1R and glutaminase inhibitors is a novel approach never tested previously.

6. *Targeting B7-H3 for Fluorescence-guided Surgery of Extracranial Pediatric Tumors*
   Amongst many clinical challenges with childhood malignancies, late diagnosis of the cancer is often associated with poor survival rates. To improve diagnosis and surgery procedures, fluorescence-guided Surgery (FGS) utilizes pre- and intra-operative imaging to guide the surgery. Dr. Aaron Mohs's lab is exploring utilizing fluorescent probes that specifically target biomarkers upregulated in tumors cells to help surgeons achieve complete resection of any residual tumor.

Neuro-Oncology Research:

1. *Pediatric Oncology Translational Therapeutics and Drug Development for Assessment of Novel CNS Penetrants*
   The treatment of pediatric brain tumors remains challenging, resulting in high death rates, even though these tumors only account for about 25% of all childhood cancers. In addition, current treatments have significant toxicities associated with them. The development of safe and effective cancer therapies for children with brain tumors is critical to improving outcomes. One major challenge in the development of new therapies for brain tumors is the ability of drugs to move from the plasma and get to the brain and effectively treat brain tumors. To address this problem, Dr. DJ Murry's team will use bench top methods (in vitro studies), mouse studies (in vivo studies) and computer modeling to identify novel compounds that can effectively cross this brain barrier. A total of six novel compounds with activity against brain tumors will be evaluated. Based on study results, these novel compounds will then be prioritized for further evaluation in brain tumor models.

2. *Targeting DNA G-quadruplex Structures and FACT Complex to Prevent Medulloblastoma Recurrence*
   After surgery, high doses of chemotherapies and radiation are required to control and prevent medulloblastoma (MB) recurrence. Unfortunately, these treatments cause multiple side effects leading to devastating consequences to the quality of life of pediatric cancer survivors. Therefore, development of new therapeutic agents to prevent tumor recurrence is crucial. However, efficient delivery of systemic therapies to the brain is a major hurdle due to blood brain barrier and low targeted delivery of drugs to tumor cells. Dr. Kishor Bhakat will develop and characterize a novel drug delivery system loaded with small molecules which can cross the blood brain barrier and preferentially target therapy-resistant MB cells and sensitize them to radiation and chemotherapies. Further, the lab will test if this novel strategy prevents tumor recurrence.

3. *Targeting JMJD6 in Group 3 Medulloblastoma*
   One of the most severe forms of brain cancer in children is Group 3 medulloblastoma (MB). One trait of these tumors is that cells contain large

amounts of the protein MYC. This causes cells to grow and multiply at an unhealthy rate. New treatments that kill Group 3 MB tumors with fewer side effects are needed in order to help save lives and preserve quality of life for survivors. Past studies showed it is not practical to attack MYC protein with drugs. This led researchers to consider other "partner" proteins that interact with MYC as possible targets. Recently, Dr. Nagendra Chaturvedi's lab has studied a MYC partner protein known as JMJD6 and found that patients with high JMJD6 tend to have poor outcomes. The lab grew Group 3 MB cells and inhibited their JMJD6 protein and saw signs that this stopped tumor cell growth. The team proposes that the strategy of inhibiting JMJD6 could help cure Group 3 MB patients. The study will provide vital insight on a strategy that could improve survival and quality of life for children with Group 3 MB.

4. *Prevention of Leukemia Cell CNS Migration*

   Treatment of childhood leukemia is complicated by the fact that cancer cells can hide in the central nervous system and current therapies have difficulty crossing the blood brain barrier. This project led by Dr. Mark Westbroek seeks to better understand the ways leukemia cells are able to obtain access to the central nervous system.

Clinical Research:

1. *Implementation of Screening and Virtual Reality-Based Exposure Therapy for Claustrophobia that Interferes with Radiology Care*

   Children undergoing MRI and radiotherapy frequently experience fear/anxiety related to these procedures. Virtual Reality (VR) simulation can efficaciously treat claustrophobia and can reduce pain and anxiety for pediatric patients. Dr. Justin Weeks, psychologist, designed this project to improve identification of patients who experience medically relevant claustrophobia and examine whether treatment via VR exposures to MRI and radiotherapy reduces indices of claustrophobia (measured with BE CALMeD scores). Ultimately, the project aims to help pediatric patients reduce anxiety and improve quality of life.

2. *Metabolic Bone Health in Childhood Cancer Survivors*

   While 80% of children will survive their pediatric cancer, 75% of survivors go on to have chronic medical conditions. Among the most common of these are impacts on the health of bones. Dr. Melissa Acquazzino, the Director of the Survivorship clinic at Children's Nebraska, has assembled a research team to investigate the impact of exercise on the overall bone health of survivors of pediatric tumors.

3. *Pediatric Cancer Database – Pathology Coding of All Pediatric Tumors*

   In the state of Nebraska every patient with childhood cancer is evaluated at either Children's Nebraska or the University of Nebraska Medical Center. Although exceedingly rare exceptions exist, this allows for the cataloging of pathological samples of all tumors resected within our state. This project led by Dr. Jill Beck

seeks to establish a searchable database of samples that can be utilized by future investigators for clinical or translational research.

Population Research:

1. *Impact of Social and Environmental Factors on Pediatric Cancer Survival*
   While pediatric cancer survival rates have improved over the last few decades, significant differences in survival rates exist by cancer type, sex, race and ethnicity, and socioeconomic status. The goal of this project by PhD Candidate and Graduate Assistant, Emma Hymel, is to examine social and environmental predictors of pediatric cancer survival, including neighborhood deprivation, rurality, and travel burden in the United States.

2. *Financial Hardship among Caregivers of Pediatric Cancer Patients: Survey Pilot Study*
   Cancer is one of the most expensive conditions to treat. In 2019, in the United States, cancer treatment was associated with a net patient economic burden of $21.1 billion. There is a dearth of research on financial hardship affecting the pediatric cancer population. In this cross-sectional pilot study, PhD Candidate and Graduate Assistant, Josiane Kabayundo, will collect data from primary caregivers of pediatric cancer patients diagnosed within the past five years. The study will develop an instrument that will assess financial hardship in primary caregivers of pediatric cancer patients. The study's significance lies in understanding the burden and predictors of financial hardship among caregivers, which will serve as a basis for developing interventions that address financial hardship and improve the quality of life among pediatric cancer patients and their families.

3. *Development of Patient Engagement Training Program to Promote Participation of Pediatric Cancer Patients and their Caregivers in Clinical Translational Research*
   While many grassroots organizations have been developed to advocate to improve the lives of pediatric cancer patients and caregivers, there is dearth of research to understand how best to engage pediatric cancer patients and caregivers to participate in research processes. Dr. Shinobu Watanabe-Galloway and team are creating an advisory board of caregivers of pediatric cancer patients to review existing training materials and provide feedback. The research team will work to tailor the materials to the pediatric cancer population and test the materials among the target audience. The project has potential to improve the process and outcomes of research studies which incorporate input from the affected populations. Also, the project may be extended for other pediatric health conditions.

4. *Education of New Researchers*
   The Pediatric Cancer Epidemiology Research (PCER) Lab was established in June 2022 to address the pediatric cancer burden in Nebraska and beyond through research workforce development and promotion of patient-engaged research. The PCER Lab is led by Dr. Watanabe-Galloway and Dr. Jenna Allison and seeks to advance scientific knowledge in pediatric cancer and survivorship research

through an interdisciplinary and team-science approach. Three predoctoral fellows are completing research on the impact of symptom clusters on the quality of life of pediatric survivors, environmental and social factors that impact the development of childhood tumors, and the financial hardship of a childhood cancer diagnosis on a family.

Successful Federal Funding:

In order to determine the impact of state pilot resources on eventual successful National Institutes of Health (NIH) funding, the PCRG polled all members to identify which state funded projects resulted in successful NIH grants. Most of the NIH projects that were reported focus solely on pediatric cancer, but pilot funding has also led to supporting the training of new scientists and research programs in other related diseases.

While several submissions are still being reviewed, the following NIH grants have been awarded to key PCRG members in 2025. This highlights the successful outcomes from pilot funding, infrastructure and collaborative research that would not have been possible without the investment by the State of Nebraska.

1. NIH T32 (GM153375): Fundamental Training Program in Biochemistry and Molecular Biology Research. Principal Investigator: Kate Hyde, PhD ($312,396)

2. NIH R01 (GM141232): Regulation of SPRTN protease and SPRTN-mediated DNA-Protein Crosslink Repair. Principal Investigator: Gargi Ghosal, PhD ($314,675)

3. NIH R01 (CA263504): Mechanisms underlying USP1-mediated bypass of EWS-FLI1 oncogene-induced replication stress in Ewing sarcoma. Principal Investigator: Gargi Ghosal, PhD ($351,131)

4. NIH R01 (HL155439): GATA Factor Mechanisms in Erythroid Regeneration. Principal Investigator: Kyle Hewitt, PhD ($383,750)

5. NIH R01 (CA258621): Geranylgeranyl diphosphate synthase inhibitor therapy for multiple myeloma. Principal Investigator: Sarah Holstein, PhD and Aaron Mohs, PhD ($503,088)

6. NIH R01 (NS119266): Discovery and characterization of selective D4R antagonists and their evaluation in preclinical models of PD-LIDs. Principal Investigator: Corey Hopkins, PhD ($416,487)

7. NIH R01 (NS116037): Overcoming resistance mechanisms in Hedgehog and Myc-amplified Medulloblastoma. Principal Investigators: Ram Mahato, PhD and Don Coulter, MD ($360,369)

8. NIH R01 (DK135817): Development and Preclinical Evaluation of Nanoformulations in Liver Fibrotic Mice. Principal Investigator: Ram Mahato, PhD ($365,775)

9. NIH R01 (NS128336): Lipid nanomedicine targeting multiple signaling pathways of medulloblastoma. Principal Investigator: Ram Mahato, PhD ($475,579)

10. NIH R01 (CA266759): Nanomedicine of Hedgehog and AKT/ERK Dual Inhibitors for Pancreatic Cancer. Principal Investigator: Ram Mahato, PhD ($442,114)

11. NIH R01 (CA259090): Preclinical development of a novel antibody conjugate for intraoperative detection of pancreatic cancer. Principal Investigator: Aaron Mohs, PhD ($356,318)

12. NIH R01 (CA197999): Development of Quinoxaline Based IKKbeta Inhibitors for Kras Driven Cancers. Principal Investigator: Amar Natarajan, PhD ($383,750)

13. NIH R01 (CA260749): UPR Activators for Cancer Therapy. Principal Investigator: Amar Natarajan, PhD ($351,131)

14. NIH R01 (HD106590): Small Molecule Drug Discovery for CLN3 and CLN6 Disease. Principal Investigator: Paul Trippier, PhD ($503,579)

15. NIH R01 (GM145647): Deciphering the Enzymatic Mechanism of Superoxide Dismutase. Principal Investigator: Gloria Borgstahl, PhD ($431,383)

16. NIH R03 (CA297351): Silencing B7-H3 mitigates tumor aggressiveness in group 3 medulloblastoma. Principal Investigator: Sid Mahapatra MD, PhD ($76,750)

21. NIH R21 (CA297629): Co-targeting IGF-1R and Glutaminase in Ewing Sarcoma. Principal Investigator: Hamid Band, MD, PhD ($391,186)

Published Manuscripts (2025):

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PCRG FY2025 Expenditures

Current Research Personnel

Don Coulter, MD (PCRG Director, COG PI UNMC)	124,055
Jill Beck, MD (COG PI)	26,142
Benefits	8,758
Current Personnel Subtotal	158,955

Core Lab Operational Costs

Supplies, Scientific Services, Publication Costs, etc.	189,047
Travel	5
Capital	134,126
Operational Costs Subtotal	323,178
TOTAL RESEARCH PERSONNEL AND CORE LAB FY2025	**$482,133**

Awarded Projects FY2025

Development of Tumor-Targeted Peripherally	Vetro	100,000
Development of Novel CNS Penetrants	Murry	100,000
Co-Targeting IGF-1R and Glutaminase in Ewing	Band	100,000
AI Approach for Categorizing AML	Wan	50,000
Pediatric Cancer Database – Pathology	Beck	90,000
Role of FBXO21 as Oncogene in AML	Hyde/Natarajan	147,674
Targeting B7-H3 for Fluorescence-guided Surgery	Mohs	40,000
Prevention of Leukemia Cell CNS Migration	Westbroek	9,000
Investigation of Protective Effect of OPA1	Kim	65,000
Education of New Investigators	Watanabe-Galloway	84,275
Development of Patient Engagement E-Module	Watanabe-Galloway	15,891
TOTAL AWARDED FY2025		**$801,813**

Planned Funding FY2026

Development of tumor-targeted PROTACs drugs	Vetro	100,000
Using Ultrafast Ultrasound Elastography	Li	49,898
Targeted Nanomedicine of SRX3305	Mahato	100,000
Investigating Biodistribution, Toxicity of TMPyP4	Bhakat	50,000
Development of Targeted Nanoparticle Drug	Holstein	100,000
Targeting Ras Signaling in Rhabdomyosarcoma	Ouellette	60,000
Fatty Acid Oxidation-Mediated Metabolic	Band	100,000

SEEDS Study of Environmental Exposures	Watanabe-Galloway	200,000
Placental Mechanism of Resilience	Al-Mugotir	66,842
Safely Improving Immunological Effectiveness	Solheim	100,000
Research Package	Chaturvedi	50,000
TOTAL PLANNED FUNDING TO DATE FY2026		**$976,740**
TOTAL PLANNED FUTURE FUNDING FY2026 (Includes Fred & Pamela Buffett Cancer Center Projects)		150,000
TOTAL PROJECTS FUNDED FY2025 – FY2026		**$1,928,553**