

# Peer Reviewed Cancer Research Program

## Strategic Plan

### INTRODUCTION

The Congressionally Directed Medical Research Programs (CDMRP) represents a unique partnership among the U.S. Congress, the military, and the public to fund innovative and impactful medical research in targeted program areas.

In 2015, an ad hoc committee of the National Academies of Sciences, Engineering, and Medicine was assembled to evaluate the CDMRP's two-tier review process and its coordination of research priorities with the National Institutes of Health (NIH) and the Department of Veterans Affairs (VA). As part of their final report,<sup>1</sup> the committee recommended that each CDMRP program "... develop a strategic plan that identifies and evaluates research foci, benchmarks for success, and investment opportunities for 3–5 years into the future," and that these strategic plans "should specify the mission of the program, coordination activities with other organizations, research priorities, how those priorities will be addressed by future award mechanisms, how research outcomes will be tracked, and how outcomes will inform future research initiatives."

In response to these recommendations, this document presents the current strategy for the CDMRP's Peer Reviewed Cancer Research Program (PRCRP). The PRCRP Strategic Plan identifies the high-impact research goals most important to its stakeholders while providing a framework that is adaptable to changes in the medical research environment to address those goals. This plan has been formulated to provide greater clarity of the program's goals over time to the public and other stakeholders. Funding for the PRCRP is Congressionally appropriated on an annual basis; therefore, there is no guarantee of future funding. The PRCRP Strategic Plan will be reviewed during the program's annual Vision Setting meeting and updated as necessary.

### PRCRP BACKGROUND AND OVERVIEW

The overarching theme of the PRCRP is to improve the quality of life of those Service members, their families, and the American public who are affected by cancer. This singular idea emphasizes the PRCRP's strategy of funding research into cancers that may develop due to exposures that are relevant to unique military situations/settings, as well as addressing knowledge gaps in cancer care and research that may have a profound effect on mission readiness and the health and well-being of all military beneficiaries. Through innovative mechanisms, militarily relevant focus areas, and targeted investment strategies to develop the next generation of cancer researchers, the PRCRP answers the need to successfully promote high-impact research for cancer prevention, detection, treatment, and survivorship for Service members, their families, and the American public.

### VISION AND MISSION OF THE PRCRP

**VISION:** To advance mission readiness of U.S. military members affected by cancer and to improve quality of life by decreasing the burden of cancer on Service members, their families and the American public

**MISSION:** To successfully promote high-impact research for cancer prevention, detection, treatment, and survivorship.

**FUNDING HISTORY**

From its inception in fiscal year 2009 (FY09) through the current fiscal year, Congressional language has directed the amounts to be appropriated and the different topic areas to be funded under the PRCRP (**Table 1**). The total amount appropriated for the PRCRP from FY09 through FY17 is \$259.8 million (M), with an additional \$80M designated for FY18.

**Table 1: PRCRP Appropriation and Topic Areas per Fiscal Year**

Fiscal Year	Appropriation/ (Awards) ‡	Topic Areas*
2009¥	\$16M (38)	\$4M – Melanoma and other skin cancers as related to deployments of Service members to areas of high exposure; \$2M – Pediatric brain tumors within the field of childhood cancer research; \$8M – Genetic cancer and its relation to exposure to the various environments that are unique to a military lifestyle; and \$2M – Noninvasive cancer ablation treatment, including selective targeting with nanoparticles.
2010	\$15M (30)	Melanoma and other skin cancers; Pediatric brain tumors within the field of childhood cancer research; Genetic cancer research and genomic medicine; Kidney cancer; Blood cancer; Colorectal cancer; Listeria vaccine for cancer; and Radiation protection utilizing nanotechnology.
2011	\$16M (44)	Melanoma and other skin cancers; Pediatric cancer research; Genetic cancer research; Kidney cancer; Blood cancer; Colorectal cancer; Pancreatic cancer; Mesothelioma; <i>Listeria</i> vaccine for cancer; and Radiation protection utilizing nanotechnology.
2012	\$12.8M (27)	Melanoma and other skin cancers; Pediatric brain tumors; Genetic cancer; Pancreatic cancer; Kidney cancer; Blood cancer; Colorectal cancer; Mesothelioma; and <i>Listeria</i> vaccine for cancer.
2013	\$15M (27)	Melanoma and other skin cancers; Pediatric brain tumors; Genetic cancer; Pancreatic cancer; Kidney cancer; Blood cancer; Colorectal cancer; Mesothelioma; and Neuroblastoma.
2014	\$25M (47)	Blood cancer; Colorectal cancer; Genetic cancer research; Kidney cancer; <i>Listeria</i> vaccine for cancer; Melanoma and other skin cancers; Mesothelioma; Myeloproliferative disorders; Neuroblastoma; Pancreatic cancer; Pediatric brain tumors; and Cancers related to radiation exposure.
2015	\$50M (110)	Colorectal cancer; Genetic cancer research; Kidney cancer; <i>Listeria</i> vaccine for cancer; Liver cancer; Melanoma and other skin cancers; Mesothelioma; Myeloproliferative disorders; Neuroblastoma; Pancreatic cancer; Stomach cancer.
2016	\$50M (89)	Bladder cancer; Colorectal cancer; Immunotherapy; Kidney cancer; <i>Listeria</i> vaccine for cancer; Liver cancer; Lymphoma; Melanoma and other skin cancers; Mesothelioma; Myeloproliferative disorders; Neuroblastoma; Pancreatic cancer; Pediatric brain tumor; and Stomach cancer.
2017†	\$60M (90)	Bladder cancer; Brain cancer; Cancer in children, adolescents, and young adults; Colorectal cancer; Immunotherapy; <i>Listeria</i> -based regimens for cancer; Liver cancer; Lymphoma; Melanoma and other skin cancers; Mesothelioma; Neuroblastoma; Pancreatic cancer; Pediatric brain tumor; and Stomach cancer.
2018	\$80M (TBD)	Adrenal Cancer; Bladder cancer; Blood Cancer; Brain cancer; Cancer in children, adolescents, and young adults; Colorectal cancer; Immunotherapy; <i>Listeria</i> -based regimens for cancer; Liver cancer; Lymphoma; Melanoma and other skin cancers; Mesothelioma; Myeloma; Neuroblastoma; Pancreatic cancer; Pediatric brain tumor; and Stomach cancer.

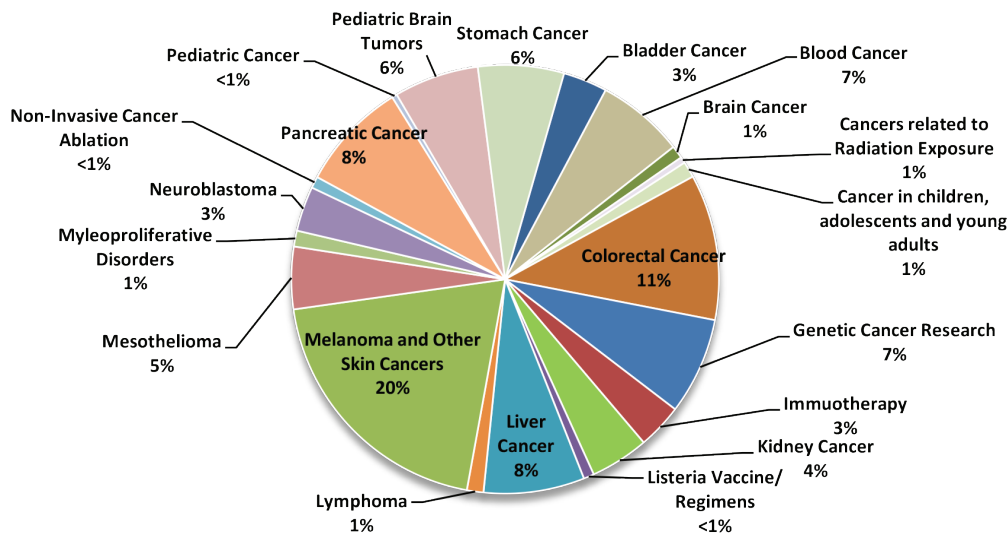
‡ Number of awards represents all open, pending closeout, and closed awards; does not include withdrawals.

\* Topic areas are designated by Congressional language, as published in the specified Public Law, Congressional Record, and post-Presidential signature communications for clarification on language.

¥ FY09 Congressional language allotted amount to be invested per topic area.

† FY17 recommended awards were under negotiation at the time of this writing and could change once negotiations are complete.

**Figure 1** shows the percentage of PRCRP dollars invested in each topic area from FY09-FY17. Applications are evaluated using a two-tier review system, including peer review (charged with assessing the technical merit and impact) and programmatic review (charged with comparing the merits of each application and assessing it against the portfolio composition). More information regarding the two-tier review system can be found at <http://cdmrp.army.mil/about/2tierRevProcess>. The investment portfolio is affected by whether or not a topic area is included for a specific fiscal year; the number of pre-applications and full applications received for each topic area; the merit of the science, as determined during peer review, and the impact of the proposed outcomes; and the appropriation amount with respect to the total number of topic areas. The topic area, *Melanoma and other skin cancers*, has been continuously included under the PRCRP since the beginning of the program. Each topic area is considered during the programmatic review to ensure a balanced portfolio with respect to the specific fiscal year topic areas.

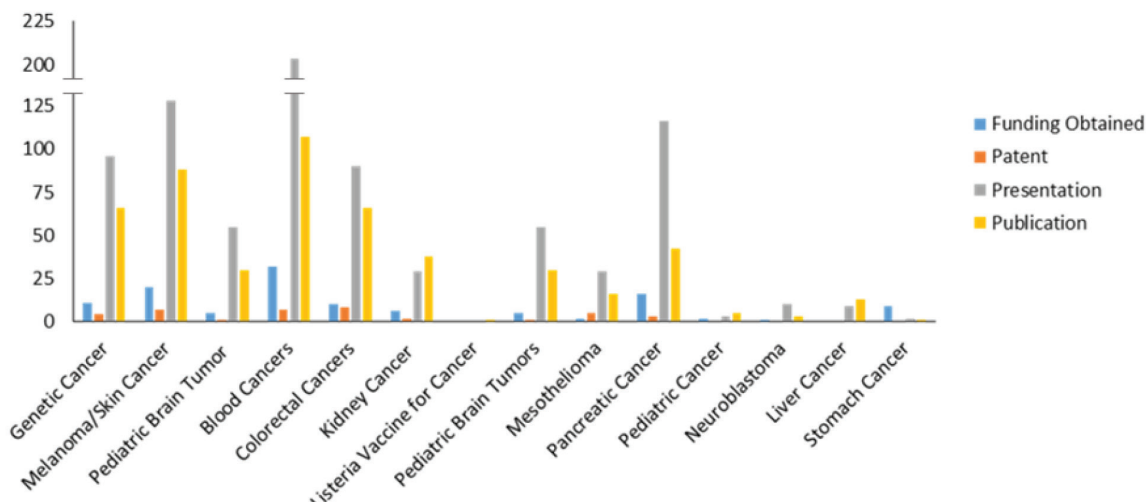


**Figure 1: FY09-FY17 PRCRP Research Investment per Topic Area (% Research Dollars)**

FY17 recommended awards were under negotiation at the time of this writing and could change once negotiations are complete. Negotiation will be finalized by 30 September 2018.

## RESEARCH ACCOMPLISHMENTS

Over the 10-year history of the PRCRP, multiple topic areas have been funded. Research outcomes and accomplishments are measured by the number of knowledge products and the clinical outcomes (**Figure 2**).



**Figure 2: FY09-FY15 Outcomes per Topic Area**

\*Outcomes for FY16 and FY17 are pending.

Analysis was completed in May 2018, at which point FY16-FY17 outcomes were pending. The analysis will be updated annually to reflect the progression of outcomes over time.

## PROGRAM PRIORITIES

As a research funding program, the most significant method the PRCRP has to influence the quality of life of Service members and their families is through creative and impactful research, i.e., funding solutions that emphasize the health and well-being of this community. The PRCRP is uniquely positioned to pursue the following program priorities, which are focused on the health and welfare military Service members, their families, and Veterans (**Table 2**).

### Priorities in Cancer Research Relevant to the Military

- Environmental risk factors and exposures associated with cancer (e.g., ionizing radiation, chemicals, infectious agents, environmental carcinogens, and stress) that impact Service members, Veterans, and their beneficiaries.
- Gaps in cancer prevention, screening, early detection, diagnosis, treatment, and/or survivorship that impact mission readiness and the health and well-being of Service members, Veterans, and their beneficiaries.

The VA has acknowledged that certain exposures increase the cancer risk of Service members and their families.<sup>2</sup> The environment in which Service members serve may lead to increased incidence of cancer occurrence years or decades later and should be researched to understand the risks and how they can be mitigated.

Service members perform their duties in both developed and developing nations. Exposure related to cancer risks include, but are not limited to, chemical weapons, including storage; ionizing radiation; herbicides; electromagnetic fields; jet fuel; organic materials; biological agents; ultraviolet radiation, etc. Depending on the deployment environment, exposure risks will vary. For example, while utilization of exposed asbestos as a building material has declined in the United States, many countries where Service members are deployed still rely on asbestos as a major material for housing and building manufacturing.<sup>3</sup> In the developing world, exposure to asbestos is a cancer risk, causing cancers such as mesothelioma, lung cancer, and cancer of the larynx, pharynx (throat), stomach, colon, and rectum.<sup>4</sup> Asbestos-related diseases, such as mesothelioma, are a known risk for Naval shipyard work.<sup>5</sup> A new study by the Centers for Disease Control and Prevention reported a rise in mesothelioma deaths by 5% from 1999 to 2015.<sup>6</sup> Thus, asbestos and other elongated mineral particles remain a relevant exposure and carcinogen.

Long-term exposure risks for Veterans include Agent Orange and other pesticides, radiation, air pollutants, and occupational hazards (such as asbestos and lead), as well as chemical and biological warfare weapons. The Selected Cancers Cooperative Study Group showed that Veterans of the Vietnam War had a 50% increase in risk of Hodgkin's disease compared with subjects who had not served in Vietnam.<sup>7,8</sup> Evidence links an increased risk for soft tissue sarcomas, non-Hodgkin's lymphoma, Hodgkin's disease, and chronic lymphocytic leukemia to Vietnam War Service.<sup>9</sup> Additionally, the U.S. Congress has tasked the National Academy of Medicine to deliver a report on the health effects of Agent Orange exposure. The latest report analyzed the herbicide and cancer risk and revealed sufficient evidence of an association between exposure and cancer development for soft tissue sarcomas, non-Hodgkin's lymphoma, Hodgkin's disease, and chronic lymphocytic leukemia.<sup>10</sup> It also provided suggestive evidence of an association between exposure and development of cancers including lung, prostate, bladder, and multiple myeloma.

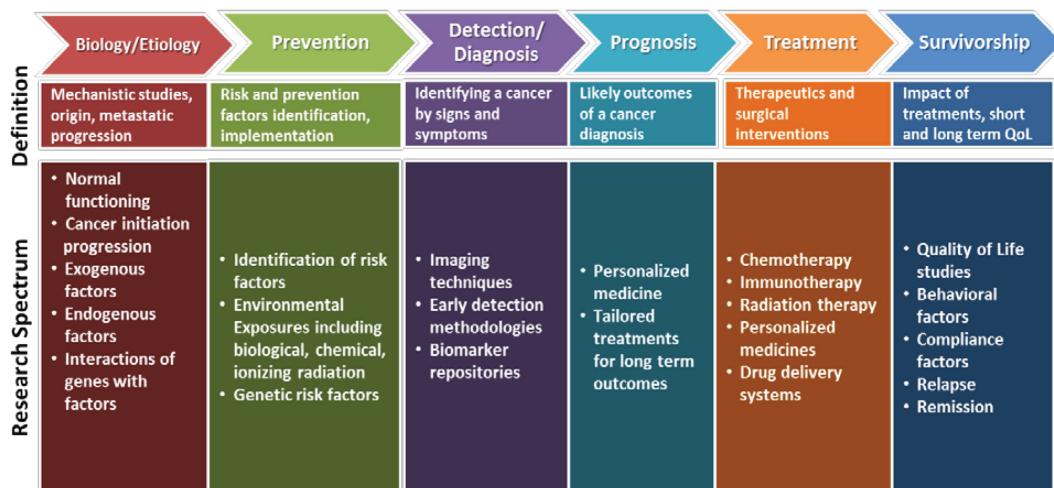
In addition, Service members, their families, and Veterans are also susceptible to infectious agents that increase the risk of cancer development. It is estimated that over 18% of cancers, such as gastric adenocarcinoma, cervical carcinoma, and hepatocarcinoma, may be a result of infections.<sup>11</sup> Service members are increasingly presenting with sero-positive scores for infectious agents such as *Helicobacter pylori*.<sup>12</sup> These Service members may be more at risk for chronic inflammation and the development of cancers of the gastrointestinal tract. The majority of patients diagnosed with gastric cancer present with incurable, late-stage disease because early-stage gastric cancer is often asymptomatic, and there are currently no established screening tests. Gastric cancer incidence has recently been on the rise in individuals aged 25 to 39. The majority of the active duty force is younger than 39 years old.<sup>13</sup>

**Table 2: Topic Areas and Military Relevance**

Topic Area	PRCRP Priorities	Relevance to Service Members, Their Families, and Veterans <sup>13</sup>
Adrenal Cancer	Exposure/Readiness	Rare cancer occurring more in women, ages 46 and above. Estimated 200-500 people diagnosed in the United States per year. Linked to genetic predisposition and chemical/environmental exposure.
Bladder Cancer	Exposure	Fourth most common cancer in U.S. Veteran population; 2x incidence rate in Veteran population compared to general population; linked to pesticide containing arsenic.
Adult and Pediatric Brain Cancer	Exposure/Readiness	Adult Brain Cancer – occupational exposure link (especially electromagnetic fields); Pediatric Brain Tumor (PBT)/Neuroblastoma – in all childhood populations, PBT has the highest mortality rates of any childhood cancer; both cancer types affect mission readiness.
Blood Cancers (including Lymphoma, Myeloma)	Exposure	Exposure to toxic chemicals/herbicides shown to increase risk; VA acknowledged association of Agent Orange and other herbicides to certain cancers in Veterans.
Cancers in Children, Adolescents, Young Adults	Readiness	Active duty Service members’ support system (family members) cancers affect mission readiness: 86% of the military are under the age of 39 (adolescent and young adults, ages 15-39 years old).
Gut Cancers (Colorectal, Liver, Pancreatic, Stomach Cancer)	Exposure/Readiness	Colorectal Cancer: Active duty screening decreases the mortality rates, but a report in 2008 showed that only 58% are up to date on screening; link to infectious diseases. Liver Cancer: Veteran population has an increased hazard ratio; increased alcohol use leads to increased risk. Pancreatic Cancer: Direct link to environmental exposures (herbicides, smoking) may increase odds ratio in Veterans. Stomach Cancer: Due to increased exposure to infectious agents ( <i>H. pylori</i> ), Veterans may have an increased risk.
Melanoma and Other Skin Cancers	Exposure/Readiness	Studies have shown an increased risk of developing melanoma when exposed to high intensity solar radiation (with respect to area of deployment): increased risk compared to the Surveillance, Epidemiology and End Results (SEER) data.
Mesothelioma	Exposure	Veterans account for greater than 33% of all cases in the United State: exposure to asbestos is the leading cause.

Another critical research priority of the PRCRP includes investigations into areas that may impact mission readiness. A cancer diagnosis of a Service member affects not only an individual Soldier, Airman, Marine, or Sailor, but every part of the unit and mission as well. Each Service member plays a critical role in mission readiness. To have a Service member at risk or under treatment decreases the mission readiness of the unit. This also extends to the Service members’ families. When a Soldier’s support, the family, has a member diagnosed with cancer, the Soldier is affected too. It may lead to a request for transfer, exceptional status, or even separation. All of these actions lead to an impact on mission readiness. Research into the different areas of the Cancer Care Spectrum (CCS) (**Figure 3**), including biology/etiology, prevention, detection/diagnosis, prognosis, treatment, and survivorship, strengthens the ability of the medical system to respond and react to a cancer concern. Therefore, the PRCRP strives to answer this call by targeting knowledge gaps across the CCS and funding areas of research that represent dire needs so that Service members can be ready when called to duty. A healthy family unit, free of serious illnesses, allows the Service member to focus on his or her role and facilitates the overarching military mission.

There are over 300,000 military beneficiaries with a cancer diagnosis, for a prevalence of 4.1%, comprised of more than 60 different cancer types. The cost of cancer care within the Military Health System (MHS)



**Figure 3: Cancer Care Spectrum**



in FY02 was over \$1 billion.<sup>15</sup> As shown by Lee, et al., the MHS continues to diagnose and treat active duty Service members for a wide variety of cancers.<sup>16</sup> Many of the cancers funded by the PRCRP are understudied and underfunded by traditional funding sources.<sup>16</sup> Funding studies on the detection, diagnosis, treatment, and prevention of these diseases benefits both the Warfighters and the American public, ultimately leading to increased survival rates and decreased costs of medical care.

**RESEARCH FUNDING LANDSCAPE**

To maximize the PRCRP’s ability to fill gaps in the research funding landscape, answer unmet needs in patient care, and fulfill its commitment to military relevance, the strategic plan for the PRCRP must acknowledge, compare, and understand the investments of other programs funding cancer-related research. The National Cancer Institute (NCI) funds broad areas of cancer research and uses the Common Scientific Outline portfolio analysis to assess the status of its investment. Comparisons with the NCI portfolio by topic area (cancer site) with respect to years funded by the PRCRP shows the variations of the investments and indicates where the two merge, as well as diverge, in responding to the needs of the research and patient community (see Appendix 1).

**STRATEGIC DIRECTION**

**MILITARY RELEVANCE**

With input from active duty oncologists on the Programmatic Panel, the PRCRP acknowledges the following three knowledge gaps with respect to Service members affected by cancer:

- Decrease in toxicity of treatments
- Decrease in complexity of cancer care
- Identification of gaps in cancer surveillance

Each of these gaps identifies vulnerabilities within the CCS and affects the ability of the MHS to respond to a cancer threat. The design of the PRCRP strategic direction and goals responds to these specific unmet gaps.

**PRCRP STRATEGIC GOALS**

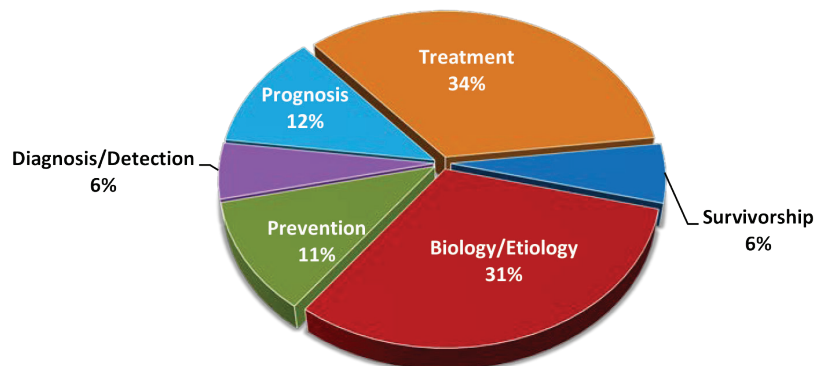
- Advance the mission readiness of U.S. military members affected by cancer
- Improve quality of life by decreasing the burden of cancer on Service members, their families, and the American public

A core consideration of cancer research with respect to how it affects the military should be effectively responding to the cancer diagnosis so that Service members may rejoin the mission quickly and easily. Changing the way cancer healthcare is delivered can only improve the mission of the military. The PRCRP remains uniquely positioned to incorporate military relevance across a broad spectrum of cancer threats. Hence, the PRCRP requires all applications to address the military relevance focus areas as a study goal (**Table 3**).

**Table 3: PRCRP Military Relevance Focus Areas**

Militarily relevant risk factors associated with cancer (e.g., ionizing radiation, chemicals, infectious agents, and environmental carcinogens)
Gaps in CCS that may impact mission readiness and the health and well-being of Service members, Veterans, and their beneficiaries

**Figure 4** shows FY09-FY16 PRCRP research investments across the CCS. Addressing the key elements of the CCS is crucial to the PRCRP’s mission in relation to Service members, their families, Veterans, and the American public. Each category of the CCS designates a particular area of cancer care that needs to be researched in order to provide the best overall care to military members



**Figure 4: FY09-FY16 PRCRP Research Investments Across the CCS (% Research Dollars)**



and their families. Investment in basic research builds the foundations for long-term applied and translational research, while funding more applied areas of the CCS shifts the field forward toward the ultimate goals of the advancement of mission readiness while increasing the quality of life for those affected by cancer. The CCS is a useful tool to assess the PRCRP portfolio. By using the CCS as a guide to the critical areas of need in cancer research, the PRCRP may invest in knowledge gaps for cancer care in the MHS.

### Career Development

Without a strong base of early-career investigators, the future of cancer care and research will be in jeopardy. Investment in this segment of the research community reflects a strategy to strengthen the future and plan for issues that may continue in the cancer field. With the historically low funding rates at the NIH and other federal agencies, scientists and clinicians entering the research community may not advance as quickly, may stagnate in non-tenured positions, or may leave the research community altogether. Through funding opportunities, the PRCRP is positioned to offer new investigators a means toward pursuing areas of study in underdeveloped areas of cancer research.<sup>16</sup> Multiple cancers under the umbrella of the PRCRP lack not only funding, but investigators to commit to a career in research and study of that topic area. Investment into early-career development builds and secures the next generation of basic, translational, and clinical cancer scientists supporting the national health and the well-being of the military. All funding opportunities are open to both extramural and intramural investigators, thus developing both the civilian and military healthcare systems. Influencing the focus and awareness of young investigators on military relevance builds a culture within extramural organizations. Since the beginning of the program, the PRCRP has used a variety of different funding opportunities to answer investment in early-career investigators. Because the PRCRP offers this pool of funds for early-career investigators, the PRCRP is uniquely positioned to invest in less-funded cancer topic areas and therefore expand the knowledge base and potential for cutting-edge research leading to an acceleration of cures in these areas.

### High-Risk/High-Reward Research

Cancer funding disparities exist.<sup>17</sup> Much of the funding for cancer research is either not disease-specific or focuses on those cancers that impact large numbers of people or are highly visible to the public. The PRCRP addresses lethal or treatment-intensive cancers that impact the population and/or may present a significant burden to the military. Identifying new ideas that can lead to more advanced investigations is extremely important to fill gaps in the CCS, with the ultimate goal of offering the best care for those affected by cancer in the military. To affect an impact on these unmet gaps, the PRCRP funds innovative and impactful research with an ultimate focus on accelerating promising findings toward translation and clinical applicability.



Figure 5: PRCRP Strategic Direction

## INVESTMENT STRATEGY

The PRCRP's short-term investment strategy outlines the program's approach to solicit the type of research that will facilitate accomplishment of its strategic goals in the short term, while ensuring that PRCRP investments remain complementary with other funding sources. This investment strategy will be re-evaluated and updated as necessary during the program's annual Vision Setting meeting.

### SHORT- TO MEDIUM-TERM GOALS (3 TO 5 YEARS)

*Investment into early-career investigators through the Career Development Award mechanism to support independent, early-career investigators conducting impactful research with the mentorship guidance of an experienced cancer researcher.* Through this funding mechanism, recruitment of investigators into cancers with smaller research communities will be secured. A mentored experience with a career guide will present an opportunity for guidance and experience while fostering a future community for underrepresented cancers in research.



**Investment into high-risk/high-gain research through the Idea Award with Special Focus mechanism to support innovative, untested, high-risk/potentially high-reward concepts, theories, paradigms, and/or methods in cancer research.** Through this funding mechanism, the cultivation of new, untested concepts may be introduced into new cancer areas with little advancements due to low funding resources across the research landscape. The special focus of this funding mechanism narrows the playing field toward research that is relevant to the military.

**Investment into translational studies to accelerate the pathway toward clinical applicability through the Translation Team Science Award mechanism to support hypothesis-driven clinical research studies.** Through this mechanism, the advancement of clinical observations paired with laboratory investigations offers a synergistic approach to patient care issues. The Translational Team Science Award brings together a multi-disciplinary team with a focus on translational research toward an endgame of enhancing clinical studies.

**Investment in continuity of research and toward applied research studies through the Impact Award Mechanism to support hypothesis-driven, high-impact research.** Through this mechanism the direction for the PRCRP shifts toward critical scientific and clinical cancer issues to bring about major impact in multiple fields of cancer research. Additionally, the aim to cross pollinate studies across different cancer disciplines will help to advance clinical applicability.

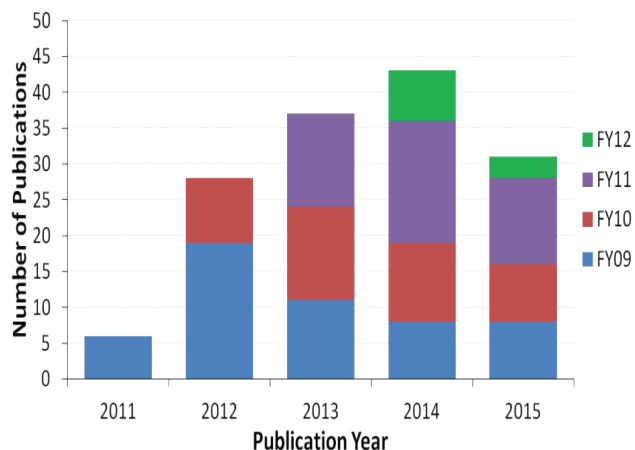
### MEDIUM- TO LONGER-TERM STRATEGIC PRIORITIES / STRATEGY ADJUSTMENTS (5 TO 10 YEARS)

Over the medium to longer term, the PRCRP will consider expanding its focus to address additional research funding priorities. These will be considered based upon the Congressionally directed topic areas, the results of research supported by the program in the near term, and the progress made by others in the field. The PRCRP must consider the topic areas, the appropriation amount, the needs of the military, and the merit of the science when constructing and revising longer-term strategic goals.

## MEASURING PROGRESS

Progress toward the PRCRP's strategic goals will be measured in multiple ways, including reviewing and monitoring the research outcomes of funded applications. Through continued monitoring of results and outcomes, both knowledge products and realized products will be captured and assessed to determine the PRCRP's ongoing role as a funder of cancer research. Evaluation of the progress made by the PRCRP's research awards will include, but will not be limited to, reviews of publications, patents, presentations, follow-on funding obtained, and the career advancement of funded investigators. Previous PRCRP evaluation studies of outcomes, such as publications, have shown that realization of outcomes takes at least 2 years and up to 6 years. As shown in **Figure 6**, a review of publications by early-career investigators funded by the PRCRP demonstrates the number of publications released from calendar years 2011-2015 with respect to the fiscal year when the award was issued.

Therefore, the short-term (within 3 years) and long-term (up to 10 years) progress of the PRCRP will be determined by continuously monitoring the progress of the award recipients for outcomes. The short-term outcomes should reap the highest numbers (as shown in Figure 6), but long-term review is necessary to capture all potential outcomes as well. In consideration of the outcomes, the PRCRP will evaluate each of the awards for knowledge readiness levels (KRLs; also known as technology readiness levels) at the start of the period of performance and then again at the end of the period of performance (hence, assessing the progress of the awards toward clinical applicability). As a study matures, the KRL increases from basic studies (KRL 2) toward more applied studies (KRLs 3-4) and finally toward clinical transition (KRLs 5-6). Evaluation of the PRCRP portfolio shows that 25% or more studies move toward clinical applicability and transition within a 3-year period of performance, while over 50% become more mature and focus on applied studies. The metric goals of the PRCRP Strategic Plan are shown in see **Table 4**.



**Figure 6: Publications Released from Calendar Years 2011-15 with Respect to the Fiscal Year of the Award**

**100% – Support research applications into one of the PRCRP militarily relevant focus areas (as published in the funding opportunities/program announcements) for the benefit of Service members and their families**

**50% – Funded portfolio invested in innovative research for the development of new discoveries in the PRCRP Congressionally directed topic areas**

**25% – Funded portfolio invested in the development of early-career investigators in the PRCRP Congressionally directed topic areas**

**25% – Funded portfolio invested in translational/clinical/applied research in the PRCRP Congressionally directed topic areas**

**Table 4: Metric Goals of the PRCRP Strategic Plan**



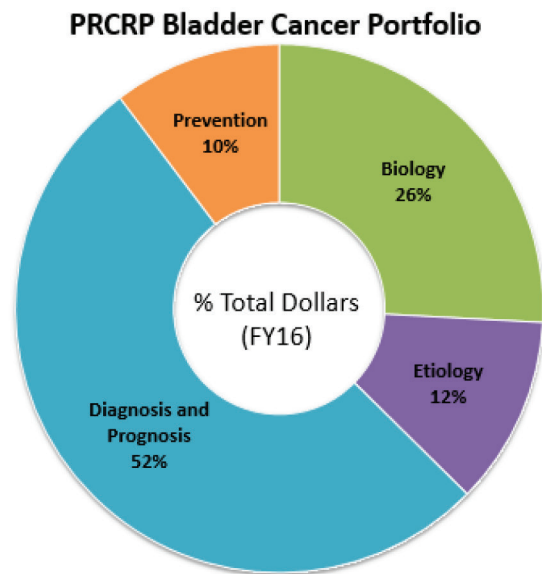
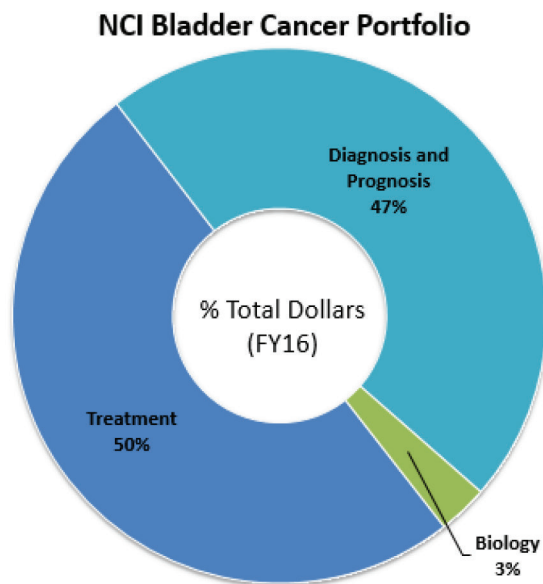


## REFERENCES

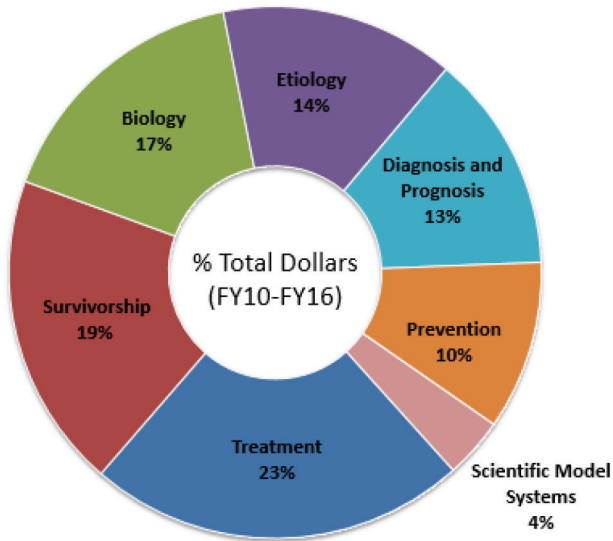
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## APPENDIX 1: NATIONAL INSTITUTES OF HEALTH (NIH)/NATIONAL CANCER INSTITUTE (NCI) CANCER RESEARCH PORTFOLIO VS. PRCRP RESEARCH PORTFOLIO

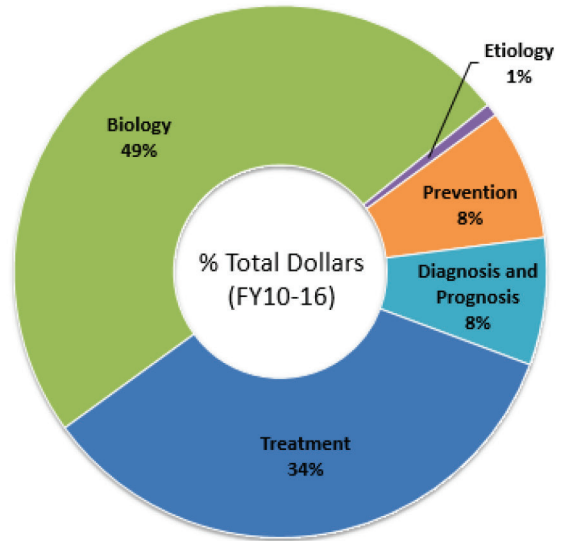
The NCI's estimated investments in cancer research are depicted below. The investments shown are only for those cancers that are also within the PRCRP portfolio. The portfolio analysis is based on the Common Scientific Outline used by participants within the International Cancer Research Partnership. The dollar value available for the NCI investment in cancer research is 10-20 times greater on average per topic area than that for the PRCRP. Therefore, the research addressing the funding gaps is critical to increasing the impact of the PRCRP's investment. Overall, the PRCRP invests in basic biology and treatment studies, although this may vary according to the organ(s) where specific cancers originate. It is important to acknowledge the efforts by alternate funding sources for the disease areas targeted by the PRCRP to ensure synergy and increased progress toward translational and impactful clinical outcomes.



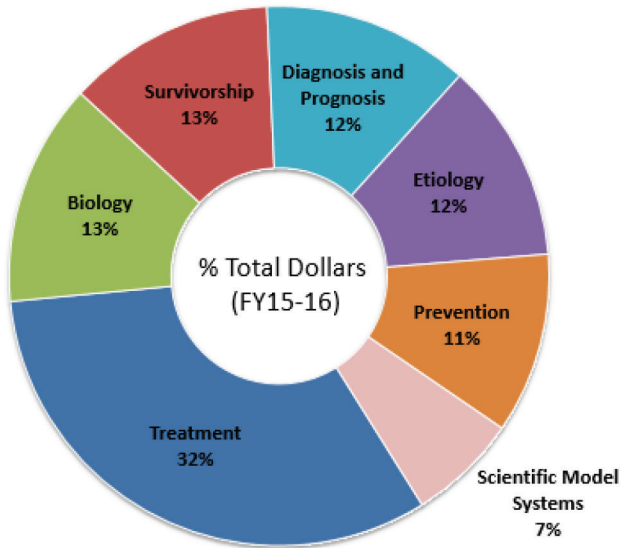
**NCI Colorectal Cancer Research Portfolio**



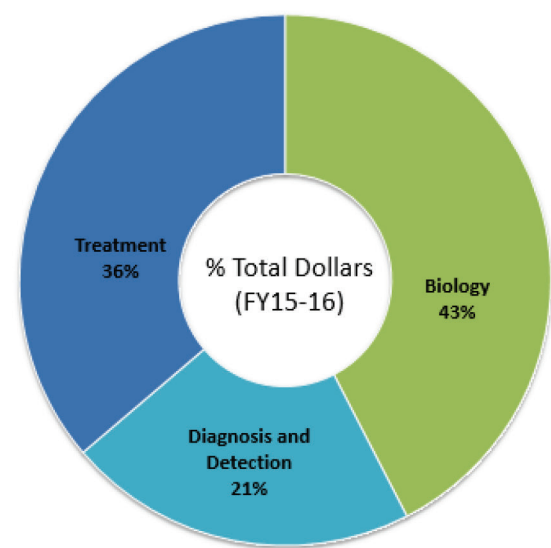
**PRCRP Colorectal Cancer Portfolio**



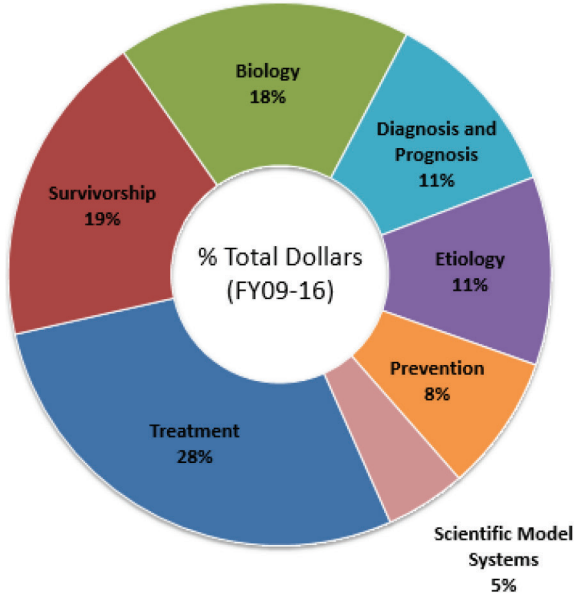
**NCI Liver Cancer Portfolio**



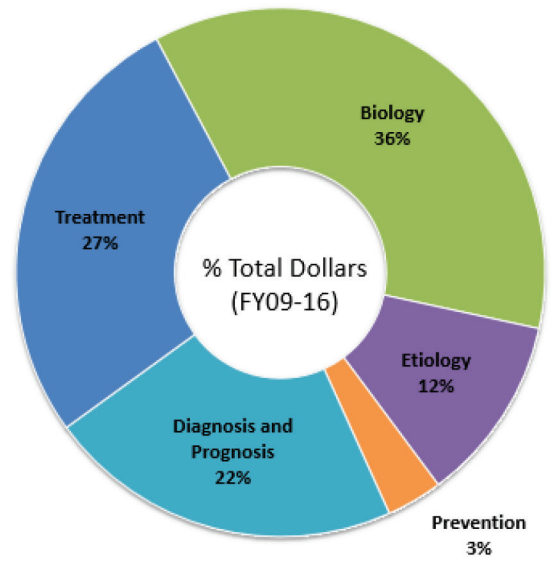
**PRCRP Liver Cancer Portfolio**



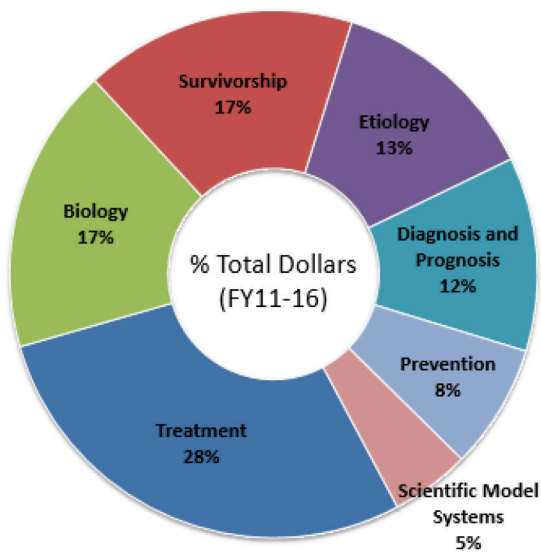
**NCI Melanoma Portfolio**



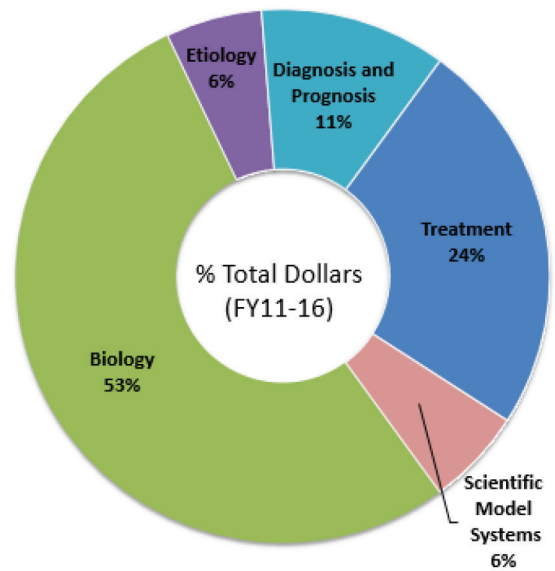
**PRCRP Melanoma/Skin Cancer Portfolio**



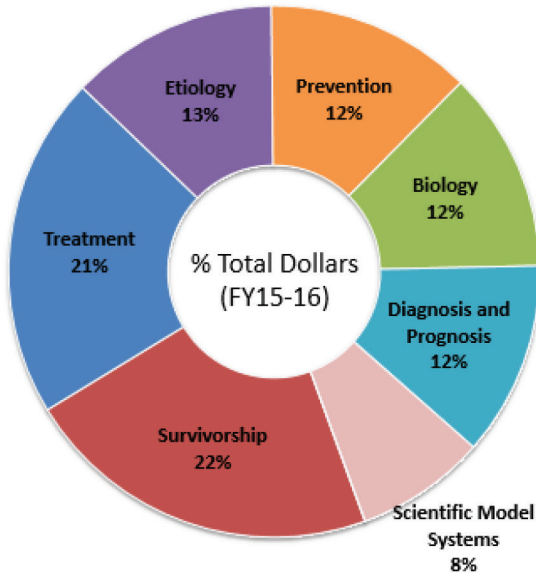
**NCI Pancreatic Cancer Portfolio**



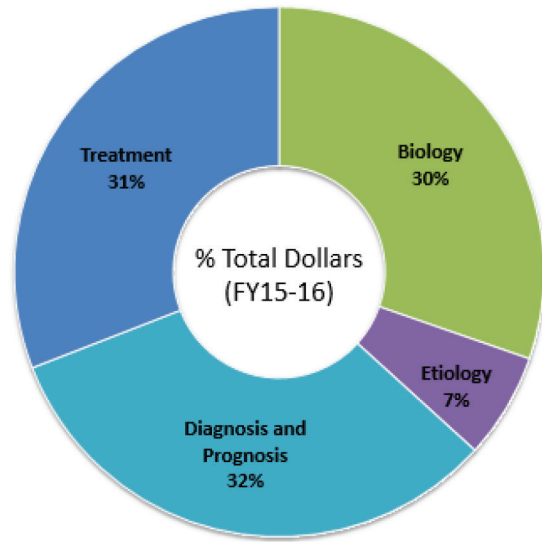
**PRCRP Pancreatic Cancer Portfolio**



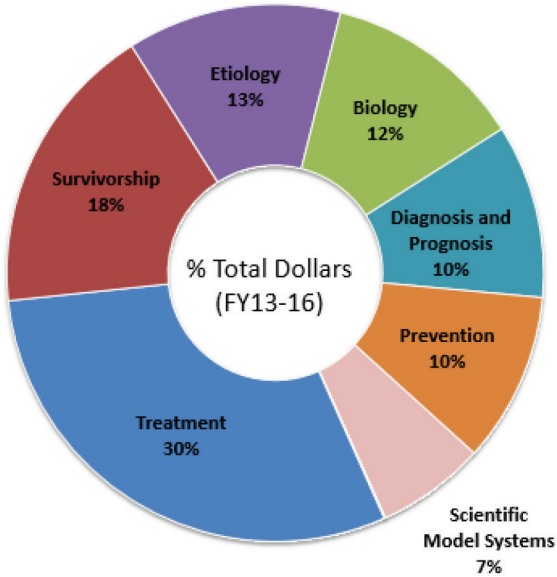
**NCI Stomach Cancer Portfolio**



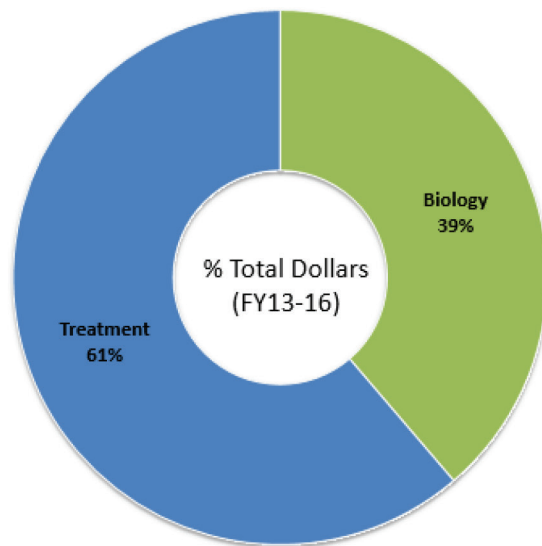
**PRCRP Stomach Cancer Portfolio**



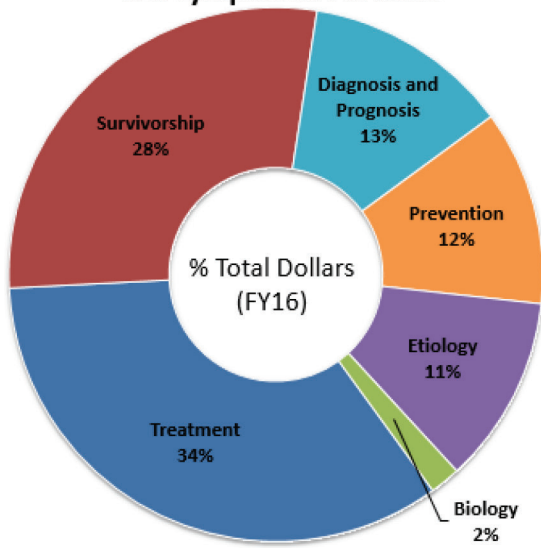
**NCI Neuroblastoma Portfolio**



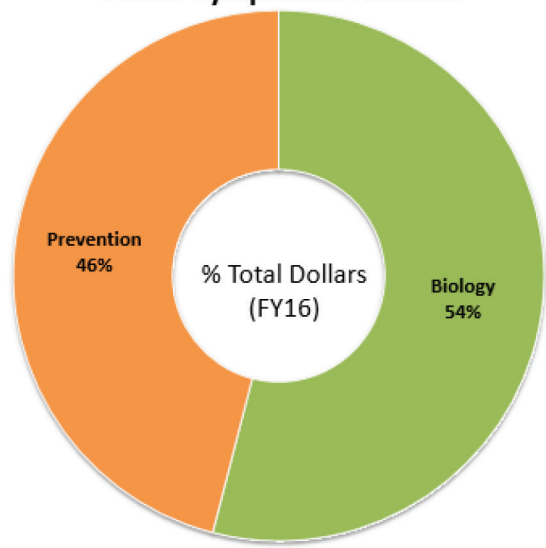
**PRCRP Neuroblastoma Portfolio**



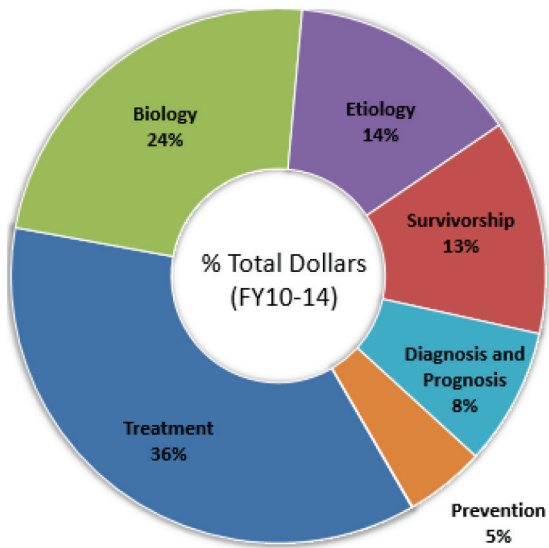
**NCI Lymphoma Portfolio**



**PRCRP Lymphoma Portfolio**



**NCI Leukemia Portfolio**



**PRCRP Blood Cancers Portfolio**

