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April 1, 2018

Steven K. Libutti, MD, FACS
Director
Rutgers Cancer Institute of New Jersey
195 Little Albany Street
New Brunswick, NJ 08903

Dear Dr. Libutti,

On March 14, 2018 the External Advisory Board (EAB) met to review the Programs, Shared Resources, Essential Characteristics, and overall direction of the Cancer Center as it will be presented at your CCSG competitive renewal site visit on April 26, 2018.

Dr. Strom, RBHS Chancellor and Executive VP of Health Affairs at Rutgers University, welcomed the board and briefly discussed the unique oncology care and research landscape in New Jersey. The plans to maintain prominence as a provider of clinical care through Rutgers/RWJBarnabas Health, under your leadership, seem optimal for positioning Rutgers Cancer Institute among its competitors.

You presented your strategy for the Cancer Institute of New Jersey which, as the only NCI comprehensive cancer center in the State of New Jersey, has the obligation to provide the best cancer services, cancer research, and research value for the State - its catchment area.

New Jersey is the most densely populated state in the nation with a population of approximately 8.9 million; it is also one of the most ethnically diverse states in the US. There is a high cancer incidence and mortality rate in New Jersey with 50,000 new cases annually and 16,100 cancer deaths. In terms of cancer incidence and mortality in the state, there is a lot of geographic diversity as you go from north to south and east to west. Through various partnerships with health systems, the Cancer Institute of New Jersey has been able to more effectively deliver care and conduct research across the state. Significant disparities across racial distinctions exist in a number of counties throughout New Jersey due to limited access to care.

Rutgers Cancer Institute of New Jersey's vision and mission is to become the State's resource for and leader in cancer research, prevention, diagnosis, treatment, surveillance, and survivorship. Your overview of the center's history, leadership team, consortium relationship, structure, and partnerships is well articulated and will be helpful to site visitors. There are significant opportunities, given the consortium relationship with Princeton University, to drive research across the state. The twelve partner hospitals within RWJBarnabas Health, and additional statewide partners across New Jersey, illustrate that CINJ is not just a cancer center within a health system, but is truly the state's cancer center.

Your attention to the Cancer Center Support Grant review for 2011 as you prepare for your upcoming review is wise and you illustrated well the ways in which you addressed concerns and capitalized on opportunities identified at your previous review, from recruitment of new leadership to the increased focus of Programs, to the launch of new initiatives. The EAB continues to be concerned with the many roles Dr. White has in the cancer center; the decision to replace Dr. White as Program Co-Leader of Cancer Metabolism and Growth is a wise one.

The Cancer Institute of New Jersey derives significant strength from realignment within Rutgers University as an independent unit. You have increased NCI and overall peer-reviewed funding since the prior grant period and there has been an increase in interventional investigator initiated clinical trial accrual and increased collaborative publications across programs.

Your access to clinical revenue is very important to highlight; many other cancer centers do not have access to this revenue and this should be added to your description of the annual Institutional Commitment. The committee appreciated that the Catchment Area was presented early on in the meeting, but would like to advise that Community Outreach and Engagement should immediately follow the Director's Overview as the Community Outreach and Engagement presentation will help to set the stage for all the research programs that are to follow. While discussions illuminated your success in the use of pilot funds, the slides did not adequately showcase these successes.

The Consortium began through mutual recognition concerning the benefit of combining Princeton's cancer basic science with the research portfolio of the Cancer Institute of New Jersey. Princeton lacks a medical school; the Cancer Institute of New Jersey fulfills Princeton's need to accommodate translational and clinical opportunities for their faculty. The consortium was formalized in 2009, recognized by NCI in 2011, and renewed in 2015. There are a total of 19 faculty members at Princeton that are also members of the Rutgers Cancer Institute. Shared resources have sites that are both at Rutgers and Princeton (Metabolomics, Flow Cytometry, and Small Molecule Screening), as well as sites that are directed by Princeton's faculty (Metabolomics, Genome Editing, and Small Molecule Screening). The Consortium Steering Committee is made up of the leadership of both Rutgers and Princeton; they provide significant oversight for the activities of the consortium. Over the last seven years a total investment of \$450k in pilot awards with Princeton University members resulted in a \$1.5M return on investment of externally awarded grants, plus several high-profile publications. The future direction of the Consortium Steering Committee is to strengthen cancer population research collaborations between CPC Program and Princeton's Woodrow Wilson School of Public and International Affairs, integrate Princeton's research excellence in computational biology and genomics into the Precision Oncology efforts, build on success of the joint MD/PhD program to obtain a joint NIH training grant in molecular oncology, and to use Rutgers Cancer Institute as a focal point for joint faculty recruitments of Cancer Institute of New Jersey's resident faculty who also have an academic appointment at Princeton. The consortium relationship with Princeton University is a rare gem and should continue to be nurtured.

Cancer Metabolism and Growth Program (CMG)

Dr. Eileen White, Co-Leader of the Cancer Metabolism and Growth Research, provided an overview of the CMG program. The overall goal is to determine how oncogenic alterations promote tumor cell metabolism, growth and survival and alter tumor-host interaction to facilitate disease progression. The ultimate goal is to identify new approaches to improve cancer treatment through innovative biochemical, molecular and biological research. There are three aims geared toward the Cancer Metabolism and Growth Program. These are, Identified Metabolic Dependencies in Cancer, Identified Mechanisms of Nutrient Scavenging, and Metastasis Mechanisms and Role of Microenvironment. The program has 59 members with

peer reviewed grant support that totals \$14.3 million with \$3.0 million coming from the National Cancer Institute. Dr. Wei-Xing Zong, professor of Chemical Biology at Rutgers University, was added as Co-Leader to CMG. Collaborative funding, impactful science, consortium members, funding cancer focus and publication were all increased.

The program was rated outstanding in the previous review and the members of Cancer Metabolism and Growth have worked to improve the program further. There has been a significant increase in overall publications, most importantly collaborative publications. The increase in multi-PI grants has been a driving force in the collaborative science with most of the grants incorporating the Rutgers-Princeton Consortium.

Comments/Recommendations:

The EAB noted that the presentation would benefit from more pictures or diagrams. The cancer relevance of each grant should be thoroughly explained and the roles of each Program Leader should be expanded on. In addition, the future plans could be further developed.

Genomic Instability and Cancer Genetics Program (GICG)

Dr. Zhiyuan Shen, Co-Leader of the Genome Instability and Cancer Genetics, provided an overview of the GICG program, which aims to determine how genomic instability is produced and how it contributes to tumorigenesis, and to define cancer genome landscapes.

Genomic Instability and Cancer Genetics Program has 44 members and \$8.6 million in cancer relevant funding. Since scoring outstanding in the previous site visit, there has been more emphasis on the underlying mechanisms applicable to multiple cancer types, expansion in cancer genomics, increased memberships, increased collaborative funding, increased collaborative publications, and enhanced translational research.

Relevant to the catchment area, GICG addresses common cancer types that have higher-than-average incidence rates in New Jersey, including breast cancer, leukemia, brain tumors, prostate cancer, and colon cancer.

Comments/Recommendations:

The interaction between Princeton investigators and Rutgers Cancer Institute of New Jersey investigators should be highlighted and an example of inter-program collaborations with Princeton should be shown. While breast cancer is clearly not the only focus of the program, that needs to be better demonstrated in the presentation.

Cancer Pharmacology Program (CP)

Dr. Stephen Burley, Co-Leader of the Cancer Pharmacology Program, gave a brief overview on Cancer Pharmacology. The overall goal of the program is to discover more effective cancer treatments through pharmacology-based preclinical research. The Cancer Pharmacology program has 36 members with peer reviewed grant support totaling \$17.1 million with \$2.6 million coming from the National Cancer Institute. Improvements such as collaborative publications and multi-PI grants (4 R01's, 1 R21, 1 R43/R44) have been made in addition to thematic integration and chemistry discovery and development. Since 2011 the program has been reorganized to sharpen the focus on Cancer Pharmacology, two Princeton University chemists have been added and seven new Rutgers faculty members have been recruited. The program has become more productive in terms of collaborations, publications, and Federal grant funding. In partnership with Princeton University, Cancer Pharmacology has established a Small Molecule Screening Eco System that allows program members to take new targets through the entire drug discovery pipeline.

Working with clinical investigators in large and small bio pharmaceutical companies, the Cancer Pharmacology Program has made significant contributions to the translational pipeline. Going beyond the accomplishments described in the three aims, a novel topoisomerase 1 inhibitor previously developed by Dr. Lavoie and his colleagues has gone through multiple human clinical trials. Work is now progressing on a prodrug form of this compound targeting colorectal cancer and it appears to have great potential as a single agent and in combination with immune checkpoint inhibitors. In addition to Drs. Lavoie, Sabaawy and Bertino are targeting self-renewing tumor initiating cells, reducing intracellular BMI-1 levels using a novel compound (C209) that selectively inhibits mRNA translation. In research relevant to the catchment area, Cancer Pharmacology members routinely conduct studies using locally sourced patient derived materials to test new agents in cancers with high incidence in the State of New Jersey.

Comments/Recommendations:

The three aims of the program need to include a disease relationship and the Rab1 highlight should include clinical implications. It should be highlighted that Cancer Pharmacology adds value to Princeton University.

Clinical Investigations and Precision Therapeutics Program (CIPT)

Dr. Janice Mehnert, Co-Leader, Clinical Investigations and Precision Therapeutics Program, gave a brief overview. The overarching goal of the Program is to translate science into early phase trials and to new diagnostic, prevention, and therapeutic strategies. The Clinical Investigations and Precision Therapeutics Program would like to foster inter-programmatic collaborations with the other CCSG Research Programs. The membership within this program is quite diverse; there are experts in pathology, radiology, biostatistics, computational imaging, and also experts from multiple clinical disciplines. The diversity of the program members allows the program to foster collaborations with the health program and build strong inter-programmatic collaboration with the other CCSG research programs. The program is composed of 60 members, 22 departments, seven schools, and one university. The peer review grant support funding for this program totals \$5.8 million in annual direct costs and consists of eight fully focused R01 equivalent projects, nine multi-PI grants, and seven PI/PDs. Publications and multi-PI grants have more than doubled since the prior submission period.

There is ongoing significant progress towards strategic goals within this program. Leadership has changed in this program with the appointments of Drs. Mehnert and Ganesan. The program has been reorganized to include Precision Medicine Oncology focused translational activities such as development of genomic sequencing trials, the molecular tumor board, and mutation directed ISTs. There has been an increase in representation of investigators from surgical and radiation oncology disciplines. Translational immune-oncology focused research has increased, along with team science approaches and collaborative funding.

Comments/Recommendations:

When speaking about the south Asian population, more should be said to explain who is represented within this population. There was no mention of the support given to junior faculty by the program; this is of high importance.

Cancer Prevention and Control Program (CPC)

Dr. Cristine Delnevo, Co-Leader of the Cancer Prevention and Control Program, gave a brief overview of the goals of the Program. The overall goal is focused on the entire cancer control continuum to reduce the cancer burden in New Jersey and beyond. Cancer Prevention and Control is organized around these specific aims; 1) to develop and evaluate strategies to reduce cancer risk and enhance quality of life through psychological and behavioral interventions; 2)

enhance oncology care delivery, with an emphasis on the unique needs of New Jersey's catchment; 3) to understand determinants of cancer risk, treatment and survival and quality of life outcomes through epidemiological investigations with an emphasis on minorities and underserved populations; and 4) to understand tobacco use and implement effective tobacco control strategies at the individual, system, and population level. The program carries 25 members with \$4.6 million of the funding coming from the National Cancer Institute. There has been significant progress towards strategic goals. Publications have doubled, intra-programmatic research has grown, cancer epidemiology members have grown from three to seven, there are numerous active grants, and a significant increase in tobacco control funding.

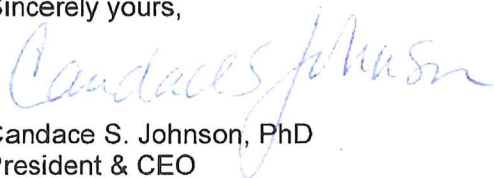
As a result of the research performed by Program members, there have been changes in public health policy, such as indoor tanning regulations, dietary guidelines for cancer prevention, and the sale of flavored cigarettes labeled as cigars.

Comments/Recommendations:

The EAB felt that there should be a more detailed focus on cross-programmatic collaborations. A slide explaining Drs. Delnevo and Bandera's expertise, duties both separately and complementary, should be added to the presentation. On the policy slide the grants and publications should be added. A story should be told in which the presenter builds upon the findings and shows the impact in terms of policy changes.

The Cancer Institute of New Jersey has received significant state support and state-wide recognition, authority, and commitment and has become well positioned to positively impact the catchment area and beyond during the next grant period. As always, we are here to serve you and help you in your role as the Cancer Center Director. Please let us know if you need anything else.

Sincerely yours,



Candace S. Johnson, PhD
President & CEO
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Chair, Rutgers CINJ External Advisory Board