

UNC Lineberger Comprehensive Cancer Center

Research Strategic Plan: 2005 - 2010



UNC Lineberger Comprehensive Cancer Center

Strategic Directions for Cancer Research: 2005 - 2010

December, 2003

I. Introduction

The UNC Lineberger Comprehensive Cancer Center, its leadership, and its membership have established a Research Strategic Plan to guide development over the next five years of cancer research at the University of North Carolina at Chapel Hill. This five-year Research Plan updates the previous five-year plan and complements a major clinical facilities planning process for a new freestanding Cancer Hospital.

II. Mission, Precepts, and Goals

Mission

The UNC Lineberger Comprehensive Cancer Center's (UNC LCCC) overall mission is to reduce cancer incidence, morbidity and mortality in North Carolina through research into its causes, prevention, early detection, and treatment, and through education, patient care, and outreach programs that serve the state. At the University of North Carolina at Chapel Hill, the Center's mission is to organize and focus the resources of the University on the cancer problem.

Precepts

In January 2003, the Center undertook updating the 1999 Strategic Plan. (Appendix I contains a description of the process). The Center began by asking faculty to define the research areas and implementation strategies most likely to reduce cancer mortality and morbidity. Since one Center cannot cover all areas, the Center also asked faculty which important directions could build on existing strengths and which would require new program development. Through an inclusive process driven by senior and program leaders and aided by an outside consultant and broad participation by UNC Lineberger membership, nine key precepts emerged. These precepts, endorsed by large segments of the involved faculty, represent areas, directions, or implementation strategies we believe to be important to the Center's continued development. The nine precepts, which are not listed in priority order, are:

- Smoking, diet and lack of physical activity played out against a background of human genetic predisposition are major causes of cancer in the United States.
- Subtle or complex genetic alterations in the capacity for DNA recombination repair and epigenetic control can be perturbed by environmental agents leading to malignancies and, in some cases, perhaps in concert with cytotoxic chemotherapy, the occurrence of second malignancies in cancer survivors.
- Studies in the mouse, including strain differences in cancer predisposition and the creation of increasingly sophisticated mouse models of human cancer, will greatly enhance our understanding of cancer etiology. These will also provide models for more accurate efficacy testing of novel cancer therapies (singly or in combination) and chemoprevention strategies.
- An in-depth understanding of cell signaling and the regulation of growth, differentiation, apoptosis, and necrosis will lead to novel therapeutic targets as well as an understanding of why current targeted therapies are not always effective in the treatment of human cancers.
- Analysis of exposure data, blood, and tissue samples from large population-based epidemiologic studies and comparison with those obtained from protocol-driven translational clinical studies will allow more rapid testing of hypotheses regarding prognosis and prediction of human therapeutic response. Population and clinical studies need to be linked seamlessly by informatics systems.
- The bottleneck for therapeutic advancement will be the rapid performance of Phase I and II clinical trials testing novel agents in combination. To enhance UNC Lineberger's contributions, we need to: i.) increase the size of our clinical care programs; ii.) incorporate outside hospital and practice venues associated with UNC Lineberger in our trials programs; iii.) create a network

of oncology practices in the state; and, iv.) collaborate with the other two North Carolina comprehensive cancer centers.

- Patients die from invasive, metastatic disease. An understanding of tumor biology, stromal-tumor cell interactions, angiogenesis, and the processes by which cells escape from their normal niche and survive in new settings will be key to developing agents that turn cancer into a treatable chronic disease.
- It is our responsibility to the state as cancer researchers and caregivers to reduce the disproportionate burden of cancer among the poor and ethnic/minority populations. While our aim is to reduce cancer incidence and mortality and extend survival for all populations, we must pay particular attention to disadvantaged and vulnerable populations.
- Behavior changes at the individual, community, and population levels are key to improving cancer prevention and early detection. Emphasis on the science of health communication and dissemination of evidence-based interventions to individuals, community organizations, physician practices, health systems and state and national agencies will be central to reducing cancer incidence, mortality and improving quality of life.

Goals

From our precepts, we state the following goals.

- 1) Build on excellence in basic and population sciences. Provide new, shared resources to serve this expansion. Continue to press for the integration of fundamental research with molecular epidemiology and epidemiology and behavioral research with the clinical programs.
- 2) Continue growth of our clinical care and clinical research programs by utilizing recently provided resources to increase the number of faculty, integrating them fully into multidisciplinary oncology clinical programs and their associated research directions.
- 3) Integrate and support translational research across the clinical and population sciences with expanded or new core resources. Invest in informatics and databases. Participate in the University's push to develop imaging research.
- 4) Build the areas of health communication, dissemination research, and research dissemination with an emphasis on North Carolina as a laboratory to improve the public's health.
- 5) Make an impact on minority disparities in cancer incidence, survival, morbidity and mortality by understanding the mechanism for differences in cancer incidence as well as the individual, societal and medical care system factors resulting in later discovery and under-treatment of minority patients. Design and test interventions at multiple levels to overcome these disparities.

These goals, guided by our precepts and translated into targeted strategic directions, are ambitious. The 1999 Strategic Plan identified two major deficits, cancer genetics and angiogenesis, which we successfully addressed. In addition, the Center had numerous other accomplishments and recruitment in areas of strength. Though we may not accomplish completely all goals outlined in this plan, the precepts which underlie the goals and which translate into strategic directions, will guide investments over the next five years as faculty slots, private funds, and new space become available.

III. Research Strategic Plan: Specific Objectives and Themes

The specific objectives of the UNC Lineberger's Research Strategic Plan incorporate three major themes or areas:

- Targeted strategic directions for research;
- New or improved shared resources that support the research; and
- Organizational strategies to improve collaboration and interdisciplinary interactions.

Of primary importance is the need for research directions to cut across disciplines by incorporating a variety of Cancer Center programs and, where possible, promoting interactions among basic, clinical, and population scientists. In addition, targeted research directions should apply to a number of disease groups. The strategic plan will direct new recruitments and realign existing areas of research. In addition, it will enhance new and existing research by providing support facilities. Finally, it will facilitate extension of information gained to the public, high-risk persons, patients, educators, physicians and health care providers throughout the state.

IV. Targeted Strategic Directions

The Center has identified eleven targeted research directions for continued growth and development over the next five years. These directions are grouped at the intersections of our traditional three program areas (see Figure 1). These eleven directions represent equally important opportunities for investment by a comprehensive cancer center.

A. Basic/Clinical/Population Directions

Four strategic directions lie at the intersection of all three program areas: Cancer Genetics/Molecular Epidemiology, Health Disparities, Primary Prevention, and Imaging.

Disparities in Health and Health Care in Minority Populations Rationale

North Carolina has a diverse population. Approximately 22% of its 8.5 million persons are African-American, and the state has one of the fastest growing Hispanic populations in the U.S. Minority and underserved populations in North Carolina bear a disproportionate share of the cancer burden. For major solid tumor cancers, such as lung, breast, prostate, and colorectal cancers, African Americans in North Carolina have higher mortality and often have higher incidence and a later stage at diagnosis. Unfavorable differentials in risky behavior, healthy behaviors, and use of screening tests exist by race, ethnicity, and/or socioeconomic status. Research and interventions specific to these populations in need are critical to reducing these disparities.

UNC LCCC and the University of North Carolina at Chapel Hill have a strong record of research and intervention to address disparities. Cancer Center epidemiologists have been national leaders in population-based, molecular epidemiologic studies specifically designed to investigate potential racial differences in cancer etiology. Cancer prevention and control researchers have developed interventions targeted to underserved communities to promote healthy diets, physical activity, and cancer screening. Epidemiologists and clinicians are now collaborating to study disparities in patterns of care and outcomes. Over the next five years, the Cancer Center plans to build and expand on this strength and tradition by continuing to emphasize research that addresses North Carolina's diverse populations and health disparities.

Areas for Recruitment and Research

- Etiologic studies to investigate differences in incidence and, for survivors, disease progression
- Clinical/health services research to address differences in morbidity and mortality
- Behavioral studies to target interventions

Cancer Genetics/Molecular Epidemiology Rationale

Over the past three years, the field of cancer genetics has grown rapidly at UNC Chapel Hill with development of a new Department of Genetics and the Carolina Center for Genome Science, both under the leadership of Cancer Center Program Leader, Terry Magnuson, Ph.D. In addition, the Center's Cancer Epidemiology Program, which emphasizes population-based molecular epidemiology, is

exceptionally strong under the leadership of Andrew Olshan, Ph.D. The potential to join existing excellence in the population-based sciences, genetics, and clinical prediction is limited only by resource availability. UNC LCCC has co-recruited faculty with the Departments of Genetics, Cell Biology, Epidemiology, Biostatistics, and Biochemistry in both genetics and bioinformatics and will continue to do so.

Areas for Recruitment and Research

- Modifier Genes
- Gene/Environment Interactions
- Epidemiology
- Genetics/Nutrition
- Genetic Networks
- Epigenetics
- Molecular Diagnostics and Prognostics
- Genotype/Phenotype Interface
- Bioinformatics
- Statistical Genetics

Primary Prevention Rationale

According to a 2003 National Cancer Policy Board report, implementing and maintaining proven cancer prevention and early detection methods could prevent 60,000 lives lost each year. If efforts to change cancer-related health behaviors were accelerated and then maintained, by 2015, the US could experience a 19% decline in cancer incidence and a 29% decline in cancer mortality. UNC LCCC has the opportunities and expertise to accelerate knowledge that could improve the health of North Carolinians and others.

Two areas --- tobacco control and the inter-related areas of diet, obesity and physical activity (DOPA)-- are critical for UNC LCCC. Both represent important scientific and public health opportunities. Currently, 26% of North Carolina adults say they smoke, 26% report no leisure time physical activity, and 78% report that they don't eat enough fruits and vegetables. Both areas also represent current Cancer Center strengths in which additional investment could enhance UNC Lineberger's national leadership. By applying interdisciplinary approaches that span the spectrum from fundamental and epidemiologic research to intervention research, dissemination research, and disseminations, UNC LCCC can build on its many strengths to improve the public's health. One priority should be continued investment in tobacco control to accelerate knowledge, develop effective individual and community interventions, and develop innovative therapies for tobacco addiction. A second priority should be enhanced investment in interdisciplinary diet, obesity, and physical activity (DOPA) research to understand the mechanisms of action underlying the relations between DOPA and cancer cause/progression and then to develop effective interventions to promote healthy behaviors. Special attention should be devoted to studies that include adequate numbers of ethnic and minority groups. Strengthening collaborations with genetics investigators could facilitate better understanding of the underlying mechanisms of addiction and individual differences in response to treatments. Similarly, it is important to understand the underlying genetic factors that affect DOPA and susceptibility to cancer. This latter area clearly intersects with the cancer genetics/molecular epidemiology direction described above.

UNC traditionally has had great strength in developing interventions for children and adolescents in both domains. This capacity should be strengthened.

Areas for Recruitment and Research

- Tobacco prevention and cessation interventions for children, adolescents and adults
- Diet, exercise and obesity – understanding mechanisms; developing interventions
- Animal models of obesity and cancer predisposition
- Genetics of addiction

Imaging

Rationale

Advances in functional imaging in human and animal models will open new avenues for early detection, clinical decision making, clinical trial design with surrogate endpoints, and virtual dissection of the processes of tumorigenesis, angiogenesis, invasion and metastases. The potential to detect and follow the effect of novel therapeutics not only on tumor size but tumor metabolism is opening a new era in efficacy assessment in cancer patients and mouse models of human cancer. Fundamental researchers can address questions regarding gene expression in animal models as influenced by physiologic or therapeutic interventions. The ability to image proteins genetically or chemically tagged in live cells presents a new frontier with which to study intracellular spatial and temporal assessments. High throughput live cell microscopy offers a novel method for drug screening based upon processes as diverse as cell shape changes or interference with or promotion of protein: protein interactions. The clinical and early detection uses of functional imaging in cancer patients or predisposed families broadens the potential contribution of these developments to all areas of the Cancer Center. A planned university-wide thrust in imaging research will involve biomedical engineering, physics, computer science, and statistics as well as traditional medical school departments.

Areas for Recruitment and Research

- Biomedical engineering
- Image analysis
- Medical physics
- Radiochemistry
- Computer Science
- Radiology and Radiation Oncology

B. Basic/Clinical Directions

Four strategic directions lie at the intersection of basic and clinical science including Epithelial Biology, Hematopoiesis, Immunotherapeutics, and Novel Therapeutics.

Epithelial Biology

Rationale

Epithelial malignancies are a major challenge. They account for the majority of cancer diagnoses and remain the most intractable to treat, accounting for a high percentage of cancer-associated mortality. Research is needed into the areas of pathogenesis, cell biology, and therapeutics. UNC LCCC has major strength in mouse models of epithelial cancers, integrins, cytoskeletal proteins, and the signal transduction pathways that are important in epithelial cell transformation. Complementing this strength will require new recruitment of investigators interested in tumor cell biology, specifically in the area of systems modeling the interaction of epithelial cells with extracellular matrices. High end microscopy will be essential to this effort and intersects with the imaging direction described above.

Areas for Recruitment and Research

- Stromal-epithelial cell interactions; model systems for investigation
- Invasion and metastasis
- Angiogenesis

Hematopoiesis

Rationale

UNC LCCC has clinical expertise in the area of hematologic malignancies, including leukemias, multiple myeloma, lymphomas, and myelodysplasia. It also has a growing bone marrow transplantation group and basic science that has provided much of the impetus for the clinical development of proteasome inhibitors for the treatment of hematologic diseases. A number of laboratory investigators are interested

in stem cell biology, cell differentiation, chromatin remodeling, lymphopoiesis, and signaling, but there is not yet a critical mass or the cohesion to develop a program of national stature in translational research. The potential for understanding the molecular basis for these malignancies and for developing new targeted therapies is unlimited. To capitalize on this potential, the UNC LCCC should expand its research capabilities into the areas of stem cell self-renewal and differentiation. In addition, the area of stromal cell:hematopoietic cell interactions is highly relevant to the problems of cell differentiation and the susceptibility of leukemic cells to drug-induced apoptosis. Expansion of the clinical research efforts in this area will benefit from the development of a translational core facility. Understanding stem cell self renewal and its relation to stromal will be a point of interaction with the above Epithelial Biology effort.

Areas for Recruitment and Research

- Stromal cell interactions
- Stem cell biology
- Hematopoietic stem cell self-renewal and differentiation
- Clinical research

Immunobiology/Immunotherapeutics

Rationale

The growth of immunobiology as a discipline and the UNC LCCC's strengths in structural biology, basic and tumor immunology, and virology have resulted in a cross-disciplinary immunology research program with promise for high clinical relevance. Investigators have collaborated on the development of novel strategies for enhancing CTL responses to tumor antigens and, using structural biology, they have designed peptides that lead to enhanced responses to HLA-associated antigens in vitro. These findings have been translated into the development of tumor vaccines directed at HER2/neu epitopes in breast cancer. Currently, novel viral vectors are being used to introduce proteins or portions thereof into human dendritic cells to enhance immune responses. The development of tumor vaccines is both time-consuming and labor-intensive, and expansion of this effort will require recruitment of several immunobiologists with interest in therapeutic clinical applications. Enhanced imaging capabilities will be essential to both animal model testing and human trials of dendritic cell vaccines.

Areas for Recruitment and Research

- Tumor vaccines
- Tumor virology, immunobiology

Novel Therapeutics

Rationale

The extension of knowledge gained from basic research to new therapeutic interventions in cancer is now being realized. Existing Cancer Center strengths in cell biology, signaling, and oncogenesis and the potential for co-recruitment with the Departments of Pharmacology, Medicine, Medicinal Chemistry, and others make this area one of especially high priority for future growth. A major objective will be the rapid translation of laboratory findings into novel clinical trials, using, where appropriate, surrogate markers and clinical trial design to incorporate biologic endpoints. Integral to the success of this effort will be the further development of the Phase I trial group and the ability to perform correlative science for Phase I and II studies on human tissue and blood specimens. A number of support mechanisms will be required for a successful program, including expansion of the capabilities of the tissue procurement core, the development of a new translational research core facility and Phase I trial support through the Clinical Protocol Office. Increased interactions with pharmaceutical companies to allow the testing of compounds of interest to both clinical and laboratory scientists and the development of a chemical/structural biology and drug screening program will be of additional importance.

Areas for Recruitment and Research

- Identification and validation of molecular targets
- Drug screening and discovery
- Chemical and structural biology
- Clinicians with Phase I clinical trial expertise

C. Population/Clinical Directions

Three strategic directions fall at the intersection of population and clinical science. These are Survivorship, Dissemination, and Health Communications.

Survivorship

Rationale

More than 8.9 million U.S. cancer survivors are alive today. The NCI has identified survivorship as one of its Extraordinary Opportunities for investment. Cancer survivors may adapt well and suffer few long-term effects, but many survivors experience negative sequelae and some outcomes are poorly understood. Understanding the physiologic and psychologic late effects of cancer and cancer treatment is critical for prevention of deleterious outcomes and optimization of survivorship. UNC LCCC investigators are well-suited to study the range of questions related to survivorship and to develop not only an understanding of the mechanisms and processes involved but also interventions to improve survivorship. More research is needed in understudied populations and disease sites, particularly sites other than breast and prostate cancer. The study of cancer survivorship requires an interdisciplinary focus, including genetics, nursing, epidemiology, clinical sciences and the social and behavioral sciences.

Areas for Recruitment and Research

- Interventions to improve outcomes (from diagnosis through treatment to long-term survival)
- Quality of life measurement; health services research
- Interventions to improve coping and prevent recurrence

Dissemination Research and Dissemination

Rationale

For many years, researchers, clinicians and policy-makers have identified a substantial gap between research and practice. A review of clinical research found that it took an average of 17 years for 14% of original research findings to become part of clinical practice. Diffusion is a passive process by which a program, product or innovation is absorbed into more widespread use. Dissemination is an active process to facilitate widespread adoption. Although diffusion methods are slow and cumbersome, there is remarkably little understanding of how to promote dissemination. Moreover, in the current health care system, dissemination generally is not defined as anyone's responsibility. Research that focuses on the development and testing of strategies to speed dissemination can enhance the Cancer Center's capacity to reduce cancer incidence, morbidity, and mortality in North Carolina and throughout the nation.

To this end, UNC LCCC will work with partners in the University, State and region to speed the process of dissemination for evidence-based interventions. We will do this by enhancing capability for dissemination research, especially within NC, and by actively collaborating with partners to disseminate evidence-based interventions. We will use and, if needed, adapt criteria developed by the NCI (Cancer Control PLANET -- <http://cancercontrolplanet.cancer.gov>) to determine standards for evidence-based interventions.

Areas for Recruitment and Research

- Dissemination Research
- Health Outcomes

Health Communication Rationale

Health communication is vital to quality health care as defined by both experts and patients. Communication plays an important, substantive role at every point in the cancer control continuum from prevention, detection, diagnosis and treatment to survivorship and end-of-life care. Effective communication can and should be used to narrow the growing gap between discovery and broad application and to reduce cancer-related health disparities among our citizens. Communication can affect people's willingness to cease risky behaviors, to adopt healthy behaviors, and to obtain screening tests. Communication is fundamental to informed decision making. For those with cancer, communication is crucial for adherence to complicated regimens.

UNC Chapel Hill faculty have been leaders in studying cancer communication and in developing innovative interventions, including those for underserved populations. We propose expansion of cancer communication research, consistent with its designation as one of the NCI's Extraordinary Opportunities. Basic cancer communication research is needed to understand underlying mechanisms that might explain people's reactions to communications. More rigorous intervention trials are needed to refine intervention methods on a range of topics, including informed decision making, risk communication, and adaptation to cancer survivorship. We plan to conduct innovative studies that integrate new media, such as Internet-delivered interventions, and mass and interpersonal media. In addition, we will focus attention not only on individuals but also on health professionals, policy makers, journalists and communities.

Areas for Recruitment and Research

- Basic and applied human communication and decision making research, including the study of risk communication
- Strategies to influence individual, community, and population outcomes
- Use of new technologies to improve the reach and individualization of health communication

D. Clinical Directions

Clinical Care and Research Rationale

Strongly linked to the development of novel therapeutics is the expansion of the clinical care and research efforts with the specific objective of strengthening our ability to rapidly conduct innovative clinical trials. UNC Hospitals and the UNC School of Medicine have demonstrated very strong support for the growth of the Oncology clinical programs and the construction and operation of a new Cancer Hospital. The recruitment of Dr. Richard Goldberg as head of the Division of Hematology/Oncology, Associate Director for Clinical Research, and Director of the Oncology Service Line has brought additional leadership, expertise, and financial resources that will allow for program expansion and the addition of new faculty in Oncology. To build upon current multidisciplinary programs and initiatives, faculty will be recruited to specific target areas where the impact on clinical research will be the greatest and where there is the best fit with our other targeted strategic directions. There is also a major need to develop a clinical network of oncology practices and to integrate clinical research protocols across North Carolina's three comprehensive cancer centers to increase accrual to clinical trials. Finally, the infrastructure for implementing new clinical trial designs, the clinical databases, and the ability to acquire and analyze tissue samples are areas that need further expansion and enhancement. As our cancer patient population grows so will the research opportunities and the need for expansion in tissue procurement, translational, data management and informatics resources, as well as the Clinical Protocol Office capabilities.

Areas for Recruitment and Research

- Melanoma
- Epithelial Malignancies: GI, GU, Thoracic, Head and Neck
- Hematopoietic Malignancies: Acute Leukemia, Lymphoma
- Biostatistics

V. Shared Resources

UNC LCCC offers a number of widely used and highly rated shared or core resources. To support most effectively the Center's strategic research directions, UNC LCCC will enhance and expand current resources and develop new resources.

Expansion of Existing Resources

Tissue Procurement; Population Biospecimens Handling; Biomarkers

The Center should continue expansion of tissue procurement services to promote interdisciplinary, translational research across the Cancer Center. Services, storage, and data management must meet investigators' increasing demand for human tissues and tumor. The recent expansion of services to Rex Hospital, a UNC HealthCare facility in Raleigh, NC and the enhanced integration with UNC Hospitals has and will help meet the new demand.

Volume and plans to expand population based molecular epidemiology/genetics studies have and will generate increased need for services for handling thousands of biospecimens. Functions include blood processing, separation, lymphocyte isolation, (for cryopreservation and/or immortalization), DNA extraction, aliquoting, and storage. Other specimens such as fat biopsies, buccal washes, etc., are and will be stored in this service component. Blood and DNA aliquoting and preparation of DNA samples in 96/384 well platforms for high throughput genotyping will also take place in this facility. Specimen tracking and laboratory management systems will need to be upgraded.

Translational Research Core Facility

Increased emphasis on innovative clinical and population studies with translational end points requires improved capability for tissue-based assays, including: development of surrogate marker assays on tumor specimens; antibody validation and application for the analysis of phosphoproteins; apoptosis assays; and, a variety of more specialized tests (e.g. NF κ B nuclear translocation assays). This work relies on fresh, frozen, or paraffin-embedded tissues and includes development of new techniques for small clinical studies and high throughput immunohistochemistry with auto-stainers for large, population-based studies.

Emerging as a separate entity from the Tissue Procurement and Biospecimens Core, a Translational Core will enable correlative studies for approved institutional clinical research protocols, as well as support population-based studies. As it continues to expand, this Core will also facilitate research by providing pathology-validated tissue microarrays for specific tumors. Investigators will consult with the Core on the design, feasibility, and applicability of studies, particularly for institutional protocols with correlative endpoints. In a more specialized component, this Core provides a range of available and custom developed assays to assess environmental damage to cellular proteins or nucleic acids. A molecular epidemiology component provides and develops assays to detect somatic mutations in small tumor samples. This Core will have close ties to Tissue Procurement and through the Biostatistics and Data Management Core will link to databases and clinical information through an honest broker system.

Biostatistics, Data Management and Bioinformatics

From genomics and proteomics to clinical care and behavioral intervention, UNC LCCC investigators agree that the Center needs to invest in data management that facilitates intra- and

interdisciplinary research from the basic, clinical, and population sciences. These services should include larger scale databases and programming to store, manipulate, and prepare biologic and clinical data analysis for multiple translational research projects. Services should also include smaller scale databases and data collection expertise to assist individual clinical and population sciences research projects. These functions will be an extension of the existing Biostatistics and Data Management Core Facility and the Genomics and Bioinformatics Core Facility. Integration with NCI through the caBIG project will help develop some of these capabilities but a substantial investment from the Center will be necessary.

New Shared Resources

Small Animal Imaging

Extensive use of mouse and other animal models to study malignant diseases requires small animal imaging capabilities. The Cancer Center and the University have already undertaken efforts to increase access to MRI, microCT, and optical imaging. Increased availability of human PET scanning for research studies and the development of microPET will require an on-site cyclotron and radiochemical effort. Associated data management and image processing are also priorities. Live cell imaging capability with innovative probe development for assessing protein-protein interactions and signaling cascades is also targeted for development. This Core supports a number of strategic research directions but will be particularly important for Cancer Genetics and Molecular Therapeutics. The Core has been initiated, but continued investment and development are needed.

Structural Biology

To support research in epithelial biology, cancer genetics, molecular therapeutics, and others areas, the Center will continue to organize strengths in modeling and determining biologic structures. X-ray crystallography and NMR services combined with molecular modeling and computational biology are needed to promote research in this area. The Structural Biology Core Facility, which is operational, will be a key opportunity for investment and development.

Communications for Health Applications and Intervention (CHAI)

The Communication for Health Applications and Interventions (CHAI) Core provides to population sciences researchers and others an integrated set of services that support several of the Center's targeted strategic directions including health communication, dissemination, survivorship, primary prevention and health disparities. The CHAI Core's mission is to apply state-of-the-art resources and techniques to the development of interventions aimed at promoting health and preventing disease in populations at risk. The Core fills a critical gap in existing resources by facilitating the translation of science-based research relevant to communication, health behavior theory, intervention design, and evaluation into strategies and tools that produce more effective interventions. Consulting and services are offered in six areas: qualitative/formative research, process evaluation and participant tracking, intervention materials development, computer-based multimedia design/consultation, usability testing, and survey design.

Dissemination Research and Dissemination

To promote the Center's strategic research direction for translation of research to communities, the Center should create centralized core activities to support dissemination research and the dissemination process itself. This Core will provide investigators with necessary expertise and tools to study how best to expedite movement of evidence-based interventions from academia to community. In the process, the Center will support actual dissemination and outreach from evidence-based interventions developed through clinical and population sciences research.

Potential for Other Shared Resources

As the Center's research program develops over the next ten years, other shared resources may emerge, such as a Drug Screening Core (to screen compounds for therapeutic and scientific objectives) or a Monoclonal Antibody Core.

VI. Opportunities for Enhancing Collaborations

The major strength of the UNC LCCC is its diverse and talented membership. At the same time, the large number of members, the varied and unique foci of their work, and multiple locations across the UNC campus and the State make it difficult to take advantage of the exciting and relevant collaborative, research opportunities. We believe that by connecting the wealth of knowledge available within the Center, innovative and collaborative ideas and research projects would emerge. Some mechanisms include:

Seminars

Seminar series in the basic, clinical, and population sciences have brought in outside speakers of national renown. The Center will increase the number of in-house speakers to enhance the potential for collaborations, especially in transdisciplinary areas. Seminars in the clinical and population sciences should receive additional attention. The Center will also look for speakers who can address key questions in the targeted research directions, strategic cross-disciplinary areas, and shared resources.

Seed Grants Targeted to Interdisciplinary Collaborative Research

Making planning funds available for grants that feature new, interdisciplinary collaborations will stimulate interest among investigators and demonstrate commitment to collaborative research. The Center will continue the new annual internal interdisciplinary grant awards that complement the long-standing seed grant award programs in Clinical/Translational Research and in Population Sciences Research.

Annual Center-wide Research Retreat

In addition to ongoing intra-program retreats and meetings, the UNC LCCC needs to continue its annual Research Retreat. This retreat showcases the Center's many outstanding research efforts and acknowledges individuals and groups that have made significant contributions to the field of cancer research.

Promote Interactions with Other Centers within UNC Chapel Hill, UNC, and State-wide

North Carolina has three NCI-designated comprehensive cancer centers, offering an unparalleled opportunity for pooled resources and collaboration. Currently, a number of interactions exist at the individual investigator or project level. The Cancer Center should work to develop larger, more comprehensive efforts. The UNC LCCC has proposed a Phase II clinical trial including UNC, Duke, and Wake Forest to develop high interest clinical trials and to increase disease-specific accrual. Within the University, UNC Chapel Hill is notable for strong research centers including ones in genome sciences, gene therapy, cardiovascular disease, neurosciences, cystic fibrosis, infectious diseases, and others. Mechanisms to promote interactions with these areas of excellence will be developed. Finally, interactions within UNC Chapel Hill, across other NCI comprehensive cancer centers, with minority-serving institutions in North Carolina, and with state agencies and community groups across the state continue to be critical for the development of population sciences and clinical research programs, as well as dissemination research.

Promote/Enhance Interactions with Industry

Development of new cancer drugs and research into the early detection, prevention and treatment of cancer are intertwined. The Center should build stronger partnerships with the biotechnology,

biomedical engineering, and pharmaceutical industries, due to the economies of scale that can be realized through such a partnership. The sharing of resources and intellectual capital between UNC LCCC and both large and small companies has great potential for advancement of the development of novel therapeutics.

Reinforce Disease-Site Oriented Teams

The Center has enjoyed success in developing a breast cancer program and has developing programs in GI and prostate cancers. The NCI's SPORE program has been one of the most effective mechanisms for the development of interdisciplinary, collaborative research. The Center should continue to stimulate these disease site oriented teams, programs and grants to promote critical interdisciplinary, translational research focused on specific cancer sites.

Figure 1:

UNC Lineberger Strategic Directions for Cancer Research: 2005-2010 Translational Overview: Targeted Directions and Program Areas



**UNC Lineberger Comprehensive Cancer Center
Strategic Directions for Cancer Research: 2005 - 2010**

Appendix 1

Research Strategic Planning Process

UNC Lineberger Comprehensive Cancer Center Research Strategic Planning Process 2003

Introduction

During 2003, the UNC Lineberger Comprehensive Cancer Center built upon its previous 1999 Strategic Plan and worked with a broad array of faculty and staff to create “Research Strategic Plan 2005-2010”, a five-year strategic plan for the continued development of cancer research at UNC Chapel Hill. This document outlines the process to develop the plan.

Purpose of the Plan

The UNC Lineberger Research Strategic Plan 2005-2010 articulates the Center’s vision for the continued development of cancer research at UNC Chapel Hill over a ten-year period. The plan updates “Growth and Excellence”, the Center’s prior strategic plan completed in 1999. This research strategic plan and process complement the Center’s ongoing clinical strategic process and plan.

Building on the Center’s and University’s current strengths and weaknesses, the research strategic plan identifies critical research directions for the Center and its scientific programs. These critical directions represent opportunities in cancer research for the UNC Lineberger to contribute to improved cancer incidence, mortality, and morbidity.

Over the next ten years, the Director, senior leadership, and Program Planning Committee will use this plan to help guide acquisition and investment of resources in faculty recruitment, core facility development, seed grant/developmental funding, space, equipment, and other areas that promote cancer research at UNC Chapel Hill.

Process

Between January, 2003 and December, 2003, the research strategic planning process is taking place in three stages: (1) Planning and Data Collection; (2) Discussion and Draft; and, (3) Review and Approval. Primary participants in the process include the Center’s senior leadership, Program Planning Committee, membership, Policy Advisory Committee, and Board of Scientific Advisors. Throughout the process, Vic Cocowitch Consulting, Inc is working with the senior leadership and the Program Planning Committee to lead the process and develop the plan.

I. Planning and Data Collection

Following initial discussions among senior leadership in January, 2003, the UNC Lineberger hired Vic Cocowitch Consulting, Inc, a local firm experienced in strategic thinking and management, to help the Center develop its planning process and plan. During February senior leadership, Cocowitch, and the Program Planning Committee developed the final three-phase process and announced the planning process to the membership.

The initial phase of the planning process was devoted to gathering data and ideas from the research programs and the membership as a whole. During March, 2003 data collection efforts included: a email survey of all Center members; program meetings and/or small group discussions within research programs; and individual follow-up discussions between program leaders and program members. Efforts during this stage focused on development of program-specific research directions, as well as on Center-wide research directions. At three Program Planning Committee meetings in March and April, 2003 the Program Planning Committee reviewed and synthesized input that program leaders had gathered.

On May 2, 2003 the initial data gathering phase concluded with a Center-wide retreat that included more than 100 Center members. In addition to presentations, discussion, and small group work, the retreat featured a research poster session for fellows and students with awards for the best posters in each of three

categories (basic science, clinical/translational science, population science). More than 50 posters were presented.

II. Discussion and Draft

During May and June, 2003 the Program Planning Committee incorporated feedback from the retreat, members, and other key persons into an outline for the plan. Throughout this second phase, Vic Cocowitch Consulting continued to work with the Director, senior leadership, and program leaders to shape ideas, promote discussion, and produce the plan outline. A first draft of the final research strategic plan is to be presented to the Program Planning Committee at its regularly scheduled September or October meeting.

III. Review and Approval

The final plan was presented to the Center's Board of Scientific Advisors at its annual meeting on November, 17, 2003.

Future

Over the next five years, the Center will use the final plan to acquire and invest resources to guide development of cancer research. The Center's strategic planning process will continue to be ongoing, and there will be future reviews of progress vis a vis the Plan.