University Cancer Research Fund

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UCRF Legislation

§ 116−29.1. University Cancer Research Fund.

(a) Fund. – The University Cancer Research Fund is established as a special revenue fund in the Office of the President of The University of North Carolina. Allocations from the fund shall be made in the discretion of the Cancer Research Fund Committee and shall be used only for the purpose of cancer research under UNC Hospitals, the Lineberger Comprehensive Cancer Center, or both.

(b) The General Assembly finds that it is imperative that the State provide a minimum of fifty million dollars ($50,000,000) each calendar year to the University Cancer Research Fund; therefore, effective July 1 of each calendar year:

(1) Of the funds credited to Budget Code 69430 in the Department of State Treasurer, the sum of eight million dollars ($8,000,000) is transferred from Budget Code 69430 to the University Cancer Research Fund and appropriated for this purpose.

(2) The funds remitted to the University Cancer Research Fund by the Secretary of Revenue from the tax on tobacco products other than cigarettes pursuant to G.S. 105−113.40A is appropriated for this purpose.

(3) An amount equal to the difference between (i) fifty million dollars ($50,000,000) and (ii) the amounts appropriated pursuant to subdivisions (1) and (2) of this subsection is appropriated from the General Fund for this purpose.

(c) Cancer Research Fund Committee. – The Cancer Research Fund Committee shall consist of five ex officio members and two appointed members. The five ex officio members shall consist of the following: (i) one member shall be the Chancellor of the University of North Carolina at Chapel Hill, (ii) one member shall be the Director of the Lineberger Comprehensive Cancer Center, (iii) one member shall be the Dean of the School of Medicine at The University of North Carolina, (iv) one member shall be the Dean of the School of Pharmacy at The University of North Carolina, and (v) one member shall be the Dean of the School of Public Health at The University of North Carolina. The remaining two members shall be appointed by a majority vote of the standing members of the Committee and shall be selected from persons holding a leadership position in a nationally prominent cancer program.

If any of the specified positions cease to exist, then the successor position shall be deemed to be substituted in the place of the former one, and the person holding the successor position shall become an ex officio member of the Committee.

(d) Chair. – The chair shall be the Chancellor of the University of North Carolina at Chapel Hill.

(e) Quorum. – A majority of the members shall constitute a quorum for the transaction of business.

(f) Meetings. – The Committee shall meet at least once in each quarter and may hold special meetings at any time and place at the call of the chair or upon the written request of at least a majority of its members.

(g) Report. – By November 1 of each year, the Cancer Research Fund Committee shall provide to the Joint Legislative Education Oversight Committee and to the Office of State Budget and Management an annual financial report which shall include the following components:

(1) Accounting of expenditures of State funds related to strategic initiatives, development of infrastructure, and ongoing administrative functions.

(2) Accounting of expenditures of extramural funds related to strategic initiatives, development of infrastructure, and ongoing administrative functions.

(3) Measures of impact to the State's economy in the creation of jobs, intellectual property, and start−up companies.

(4) Other performance measures directly related to the investment of State funds.

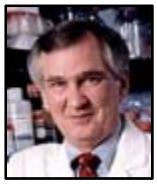
(5) Accounting of any fund balances retained by the Fund, along with information about any restrictions on the use of these funds. (2007−323, s. 6.23(b); 2009−451, s. 27A.5(e); 2010−31, s. 9.12; 2011−145, ss. 6.11(c), 9.4.)

Cancer Research Fund Committee

Cancer Research Fund Committee

The legislatively established Cancer Research Fund Committee, chaired by Holden Thorp, Chancellor of the University of North Carolina at Chapel Hill, oversees the University Cancer Research Fund. The seven-member committee includes five ex-officio members designated by the legislation who elect two at-large members. The at-large members are to be leaders at nationally prominent cancer programs. Currently, the two are Drs. Edward Benz (President and CEO, Dana Farber Cancer Institute) and John Mendelsohn (President Emeritus, MD Anderson Cancer Center).

Holden Thorp, Chair
Chancellor
The University of North Carolina at Chapel Hill



Edward J. Benz, MD
President and Chief Executive Officer
Dana Farber Cancer Institute

Robert Blouin, PharmD
Dean
Eshelman School of Pharmacy
The University of North Carolina at Chapel Hill

H. Shelton Earp, MD
Director
UNC Lineberger Comprehensive Cancer Center
The University of North Carolina at Chapel Hill

John Mendelsohn, MD
President Emeritus
The University of Texas M. D. Anderson Cancer Center

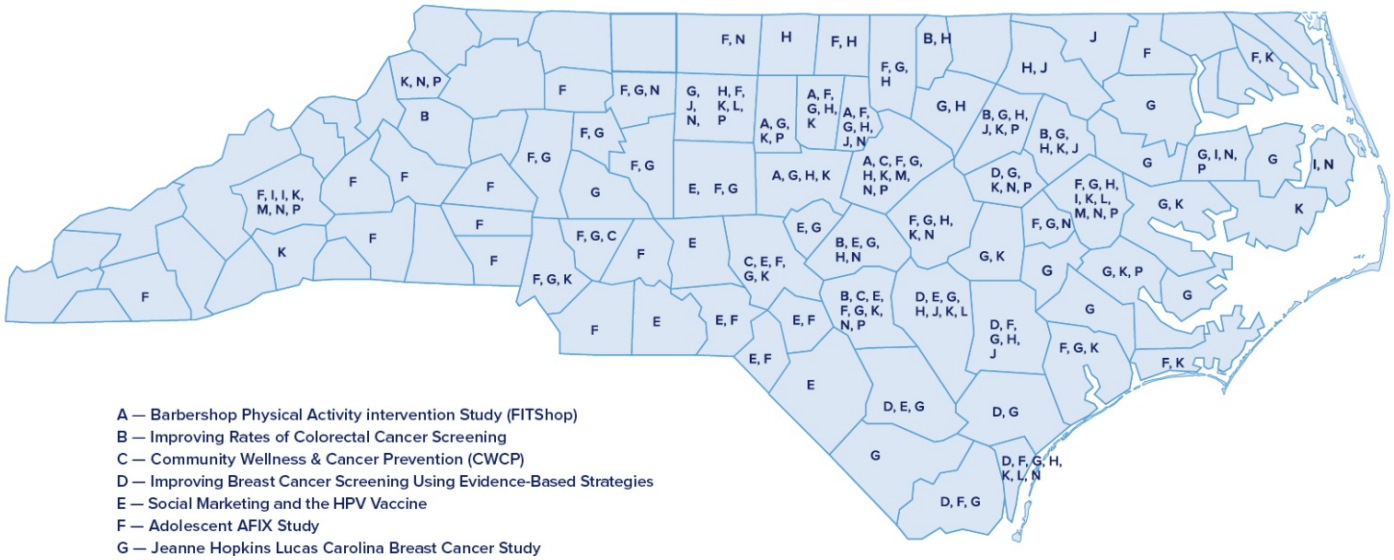
Barbara K. Rimer, DrPH
Dean
Gillings School of Global Public Health
The University of North Carolina at Chapel Hill

William L. Roper, MD, MPH
Dean, UNC School of Medicine
Vice Chancellor for Medical Affairs
CEO, UNC Health Care

UCRF Outreach Map

UCRF Outreach Across North Carolina

Statewide and Regional/Local Projects



A — Barbershop Physical Activity intervention Study (FITShop)
B — Improving Rates of Colorectal Cancer Screening
C — Community Wellness & Cancer Prevention (CWCP)
D — Improving Breast Cancer Screening Using Evidence-Based Strategies
E — Social Marketing and the HPV Vaccine
F — Adolescent AFIX Study
G — Jeanne Hopkins Lucas Carolina Breast Cancer Study
H — NC SPEED Outreach Network
I — Patient Navigator Education
J — Reducing Disparities in Breast Cancer Screening
K — UNC Cancer Network — Clinical Outreach
L — UNC Lineberger LiveSTRONG Center of Excellence in Cancer Survivorship
M — Research Partnerships
N — School Health Center Project

FY 11-12 Expenditures

UCRF Funding by Strategy and Expense

Strategy	Obj Name	Annual Budget	Year to Date Actual	Year to Date Encumbrances	Balance Available
Theme 1: Optimizing NC Cancer Outcomes	Budget	520,742.03	0.00	0.00	520,742.03
	Faculty Salaries	2,445,775.57	2,445,775.57	0.00	0.00
	EPA Student Salaries	362,615.89	362,615.89	0.00	0.00
	Staff Salaries	1,641,169.14	1,641,169.14	0.00	0.00
	Other staff	200,842.63	200,842.63	0.00	0.00
	Benefits	953,502.39	953,502.39	0.00	0.00
	Faculty/Non Faculty Benefits	203,551.18	203,551.18	0.00	0.00
	Phy Benefits	3,917.93	3,917.93	0.00	0.00
	Other Staff Benefits	29,119.86	29,119.86	0.00	0.00
	Transit Tax	(81,592.36)	(81,592.36)	0.00	0.00
	Consultants/Contracted Services	116,643.17	116,613.17	30.00	0.00
	Employee Education	173.84	173.84	0.00	0.00
	Repairs and Maint	(143,940.49)	(146,018.24)	2,077.75	0.00
	Other Current Services	269,873.49	213,989.74	55,883.75	0.00
	Supplies, Utilities, Other	99,219.77	80,357.29	18,862.48	0.00
	Travel	113,295.84	110,595.52	2,700.32	0.00
	Freight and Exp	1,668.41	1,168.41	500.00	0.00
	Maintenance Contracts	50,344.68	33,761.68	16,583.00	0.00
	Advertising	(11,163.51)	(11,163.51)	0.00	0.00
	Meetings & Amentites	159.00	159.00	0.00	0.00
	Printing and Binding	12,689.32	12,689.32	0.00	0.00
	Communication	50,039.33	49,907.95	131.38	0.00
	Contracted Serv	15,714.30	13,148.70	2,565.60	0.00
	Computer Services	1,860.11	1,860.11	0.00	0.00
	Rental/Lease Facilities	23,573.72	23,573.72	0.00	0.00
	Other Fixed Charges	1,025.00	1,025.00	0.00	0.00
	Equipment	327,392.58	327,392.58	0.00	0.00
	Study Subjects & Exp	117,660.05	117,660.05	0.00	0.00
	Student Support	95,446.29	95,446.29	0.00	0.00
	#N/A	0.00	0.00	0.00	0.00
	HCS Residents	(5,090.56)	(5,090.56)	0.00	0.00
Theme 1: Optimizing NC Cancer Outcomes Total		**7,416,228.60**	**6,796,152.29**	**99,334.28**	**520,742.03**

Strategy	Obj Name	Annual Budget	Year to Date Actual	Year to Date Encumbrances	Balance Available
Theme 2:Understanding Genetics in Cancer - Basic Approaches & Clinical Applications	Budget	(24,248.73)	0.00	0.00	(24,248.73)
	Faculty Salaries	1,672,036.69	1,672,036.69	0.00	0.00
	EPA Student Salaries	155,206.97	155,206.97	0.00	0.00
	Staff Salaries	959,199.61	959,199.61	0.00	0.00
	Other staff	122,458.81	122,458.81	0.00	0.00
	Benefits	545,260.63	545,260.63	0.00	0.00
	HCS Contracted Serv	0.00	0.00	0.00	0.00
	Faculty/Non Faculty Benefits	173,310.49	173,310.49	0.00	0.00
	Phy Benefits	7,435.66	7,435.66	0.00	0.00
	Other Staff Benefits	10,681.08	10,681.08	0.00	0.00
	Transit Tax	317,708.09	317,708.09	0.00	0.00
	Consultants/Contracted Services	13,425.00	13,425.00	0.00	0.00
	Employee Education	491.00	491.00	0.00	0.00
	Repairs and Maint	(75,142.13)	(75,158.38)	16.25	0.00
	Other Current Services	69,504.32	46,992.17	22,512.15	0.00
	Supplies, Utilities, Other	1,652,323.04	1,408,162.54	244,160.50	0.00
	Travel	55,586.18	55,586.18	0.00	0.00
	Freight and Exp	3,078.79	3,078.79	0.00	0.00
	Maintenance Contracts	618,522.12	607,492.29	11,029.83	0.00
	Advertising	0.00	0.00	0.00	0.00
	Meetings & Amentites	150.53	150.53	0.00	0.00
	Transfer Computer Science	0.00	0.00	0.00	0.00
	Printing and Binding	2,726.08	2,726.08	0.00	0.00
	Communication	11,640.52	11,640.52	0.00	0.00
	Contracted Serv	9,787.64	9,787.64	0.00	0.00
	Computer Services	4,825.70	4,825.70	0.00	0.00
	Rental/Lease Facilities	200,557.20	200,557.20	0.00	0.00
	Other Fixed Charges	4,000.00	4,000.00	0.00	0.00
	Equipment	2,415,065.45	2,345,225.26	69,840.19	0.00
	Insurance	1,270.61	1,270.61	0.00	0.00
	Student Support	54,554.55	54,554.55	0.00	0.00
	#N/A	0.00	0.00	0.00	0.00
	Utilities	73,215.73	73,215.73	0.00	0.00
Theme 2:Understanding Genetics in Cancer - Basic Approaches & Clinical Applications Total		**9,054,631.63**	**8,731,321.44**	**347,558.92**	**(24,248.73)**

Strategy	Obj Name	Annual Budget	Year to Date Actual	Year to Date Encumbrances	Balance Available
Theme 3: Developing New Cancer Treatments	Budget	139,988.87	0.00	0.00	139,988.87
	Faculty Salaries	1,184,827.13	1,184,827.13	0.00	0.00
	EPA Student Salaries	394,069.68	394,069.68	0.00	0.00
	Staff Salaries	562,978.42	562,978.42	0.00	0.00
	Other staff	55,137.49	55,137.49	0.00	0.00
	Benefits	373,678.50	373,678.50	0.00	0.00
	Faculty/Non Faculty Benefits	121,500.30	121,500.30	0.00	0.00
	Phy Benefits	0.00	0.00	0.00	0.00
	Other Staff Benefits	6,406.33	6,406.33	0.00	0.00
	Transit Tax	111,716.25	111,716.25	0.00	0.00
	Consultants/Contracted Services	6,000.00	6,000.00	0.00	0.00
	Repairs and Maint	443,620.88	438,055.24	5,565.64	0.00
	Other Current Services	441,974.11	433,229.41	8,744.70	0.00
	Supplies, Utilities, Other	1,297,685.73	1,047,294.46	250,391.27	0.00
	Travel	16,563.53	16,563.53	0.00	0.00
	Freight and Exp	7,049.76	7,049.76	0.00	0.00
	Maintenance Contracts	239,194.76	232,430.60	6,764.16	0.00
	Advertising	425.00	425.00	0.00	0.00
	Transfer Computer Science	0.00	0.00	0.00	0.00
	Printing and Binding	106.00	106.00	0.00	0.00
	Communication	4,177.05	4,177.05	0.00	0.00
	Computer Services	9,194.50	9,194.50	0.00	0.00
	Rental/Lease Facilities	(6,001.69)	(6,001.69)	0.00	0.00
	Other Fixed Charges	5,119.87	5,119.87	0.00	0.00
	Rental Equipment	0.00	0.00	0.00	0.00
	Equipment	681,230.80	535,175.81	146,054.99	0.00
	Employee on Loan	9,150.25	9,150.25	0.00	0.00
	Insurance	0.00	0.00	0.00	0.00
	Student Support	9,116.77	9,116.77	0.00	0.00
	#N/A	0.00	0.00	0.00	0.00
	HIPAA Deduct	350,000.00	350,000.00	0.00	0.00
Theme 3: Developing New Cancer Treatments Total		**6,464,910.29**	**5,907,400.66**	**417,520.76**	**139,988.87**

Strategy	Obj Name	Annual Budget	Year to Date Actual	Year to Date Encumbrances	Balance Available
Oppor: Opportunity Fund	Budget	1,543,236.69	0.00	0.00	1,543,236.69
	Faculty Salaries	722,686.08	722,686.08	0.00	0.00
	EPA Student Salaries	931,235.68	931,235.68	0.00	0.00
	Staff Salaries	736,107.73	736,107.73	0.00	0.00
	Other staff	252,805.26	252,805.26	0.00	0.00
	Benefits	436,310.53	436,310.53	0.00	0.00
	Faculty/Non Faculty Benefits	76,475.83	76,475.83	0.00	0.00
	Phy Benefits	1,490.81	1,490.81	0.00	0.00
	Other Staff Benefits	29,857.31	29,857.31	0.00	0.00
	Transit Tax	264,441.11	264,441.11	0.00	0.00
	Consultants/Contracted Services	23,762.04	23,762.04	0.00	0.00
	Repairs and Maint	506,670.12	375,345.34	131,324.78	0.00
	Other Current Services	167,564.71	155,845.91	11,718.80	0.00
	Supplies, Utilities, Other	1,139,059.21	1,107,027.18	32,032.03	0.00
	Travel	52,159.24	49,930.64	2,228.60	0.00
	Freight and Exp	16,371.96	16,266.21	105.75	0.00
	Maintenance Contracts	323,869.14	310,497.64	13,371.50	0.00
	Advertising	425.00	425.00	0.00	0.00
	Meetings & Amentites	232.96	232.96	0.00	0.00
	Printing and Binding	1,265.50	1,265.50	0.00	0.00
	Communication	14,077.72	14,077.72	0.00	0.00
	Computer Services	13,254.60	13,254.60	0.00	0.00
	Other Fixed Charges	1,178.00	1,178.00	0.00	0.00
	Equipment	1,456,644.40	1,445,803.18	10,841.22	0.00
	Study Subjects & Exp	200.00	200.00	0.00	0.00
	Student Support	60,726.21	60,726.21	0.00	0.00
	#N/A	0.00	0.00	0.00	0.00
Oppor: Opportunity Fund Total		**8,772,107.84**	**7,027,248.47**	**201,622.68**	**1,543,236.69**

Strategy	Obj Name	Annual Budget	Year to Date Actual	Year to Date Encumbrances	Balance Available
Infra 1: Infrastructure - Clinical Excellence and Outreach	Budget	(543,725.64)	0.00	0.00	(543,725.64)
	Faculty Salaries	3,862,147.13	3,862,147.13	0.00	0.00
	EPA Student Salaries	80,041.55	80,041.55	0.00	0.00
	Staff Salaries	1,234,362.45	1,234,362.45	0.00	0.00
	Other staff	59,648.34	59,648.34	0.00	0.00
	Benefits	781,911.25	781,911.25	0.00	0.00
	HCS Contracted Serv	668,156.98	668,156.98	0.00	0.00
	Faculty/Non Faculty Benefits	354,106.90	354,106.90	0.00	0.00
	Phy Benefits	164,471.60	164,471.60	0.00	0.00
	Other Staff Benefits	1,165.87	1,165.87	0.00	0.00
	Transit Tax	39,128.06	39,128.06	0.00	0.00
	Consultants/Contracted Services	82,549.01	82,549.01	0.00	0.00
	Repairs and Maint	1,513.57	1,497.32	16.25	0.00
	Other Current Services	306,017.44	260,128.45	45,888.99	0.00
	Supplies, Utilities, Other	314,360.73	276,157.69	38,203.04	0.00
	Travel	58,564.80	58,246.10	318.70	0.00
	Freight and Exp	3,168.27	3,168.27	0.00	0.00
	Maintenance Contracts	59,037.36	59,037.36	0.00	0.00
	Advertising	17,460.98	17,460.98	0.00	0.00
	Meetings & Amentites	9,468.98	9,468.98	0.00	0.00
	Printing and Binding	3,583.56	3,583.56	0.00	0.00
	Communication	20,614.98	20,191.08	423.90	0.00
	Contracted Serv	0.00	0.00	0.00	0.00
	Computer Services	13,699.88	13,699.88	0.00	0.00
	Rental/Lease Facilities	26,467.38	25,463.08	1,004.30	0.00
	Other Fixed Charges	9,892.17	9,892.17	0.00	0.00
	Equipment	25,955.01	25,713.26	241.75	0.00
	Study Subjects & Exp	3,343.45	3,343.45	0.00	0.00
	Employee on Loan	0.00	0.00	0.00	0.00
	Student Support	0.00	0.00	0.00	0.00
	#N/A	0.00	0.00	0.00	0.00
	HCS Residents	9,643.80	9,643.80	0.00	0.00
Infra 1: Infrastructure - Clinical Excellence and Outreach Total		**7,666,755.86**	**8,124,384.57**	**86,096.93**	**(543,725.64)**

Strategy	Obj Name	Annual Budget	Year to Date Actual	Year to Date Encumbrances	Balance Available
Infra 2: Infrastructure	Budget	(516,288.04)	0.00	0.00	(516,288.04)
	Faculty Salaries	1,615,669.37	1,615,669.37	0.00	0.00
	EPA Student Salaries	912,593.17	912,593.17	0.00	0.00
	Staff Salaries	2,886,063.74	2,886,063.74	0.00	0.00
	Other staff	160,039.15	160,039.15	0.00	0.00
	Benefits	1,158,420.50	1,158,420.50	0.00	0.00
	Faculty/Non Faculty Benefits	116,552.48	116,552.48	0.00	0.00
	Phy Benefits	2,464.20	2,464.20	0.00	0.00
	Other Staff Benefits	65,410.09	65,410.09	0.00	0.00
	Transit Tax	105,240.88	105,240.88	0.00	0.00
	Consultants/Contracted Services	28,172.69	28,172.69	0.00	0.00
	Repairs and Maint	37,767.36	16,363.76	21,403.60	0.00
	Other Current Services	631,708.93	610,386.64	21,322.29	0.00
	Supplies, Utilities, Other	427,367.55	401,030.22	26,337.33	0.00
	Travel	78,739.86	77,913.86	826.00	0.00
	Freight and Exp	1,677.52	1,677.52	0.00	0.00
	Maintenance Contracts	56,400.77	56,400.77	0.00	0.00
	Advertising	17,705.05	17,705.05	0.00	0.00
	Meetings & Amentites	1,602.45	1,602.45	0.00	0.00
	Transfer Computer Science	0.00	0.00	0.00	0.00
	Printing and Binding	7,023.43	7,023.43	0.00	0.00
	Communication	30,207.26	30,207.26	0.00	0.00
	Contracted Serv	166,507.43	157,224.88	9,282.55	0.00
	Computer Services	27,528.75	27,528.75	0.00	0.00
	Rental/Lease Facilities	0.00	0.00	0.00	0.00
	Other Fixed Charges	(59,651.74)	(59,651.74)	0.00	0.00
	Equipment	(567,457.46)	(918,817.85)	351,360.39	0.00
	Study Subjects & Exp	12,589.61	12,589.61	0.00	0.00
	Employee on Loan	0.00	0.00	0.00	0.00
	Student Support	381,063.16	381,063.16	0.00	0.00
	#N/A	0.00	0.00	0.00	0.00
Infra 2: Infrastructure Total		**7,785,118.16**	**7,870,874.04**	**430,532.16**	**(516,288.04)**
Grand Total		**47,159,752.38**	**44,457,381.47**	**1,582,665.73**	**1,119,705.18**

UCRF Strategic Plan

UCRF Strategic Plan Overview
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UCRF Strategic Plan Overview

Background and Context

Introduction

Cancer has overtaken heart disease as the leading cause of death in North Carolina. An estimated 40 percent of North Carolinians will develop cancer during their lifetimes. Approximately 46,416 North Carolinians are projected to receive a cancer diagnosis in 2009 with 18,277 projected cancer deaths this year. These numbers will increase as the population ages unless cancer prevention, early detection, and therapeutic research intervene. And as with other diseases, the impact of cancer falls disproportionately on disadvantaged communities. For example, African-Americans in North Carolina experience higher cancer incidence and mortality rates compared with other groups.

This growing challenge motivated the state legislature to fund the NC Cancer Hospital and, in August 2007, to create the University Cancer Research Fund (UCRF) "only for the purpose of cancer research under UNC Hospitals, the Lineberger Comprehensive Cancer Center, or both." With up to $50 million of funding per year from the Tobacco Trust Fund, an increased tax on smokeless tobacco products, and general revenue, the UCRF provides a unique opportunity to develop leading national (and international) cancer research and innovation while improving cancer outcomes for the people of North Carolina.

> "The UCRF's mission is to ensure that future generations of North Carolinians will develop cancer less often and live longer and better when they do. Research creates new knowledge, turns that knowledge into innovative treatment, screening, and prevention, and then assures delivery of innovations across the state – that research is the key unlocking the doors to a new and better future. The UCRF is helping make that research possible." (UCRF 2007-2008 Annual Report)

Strategic planning process overview

In order to most effectively realize the vision of improving cancer outcomes in North Carolina and to maximize the return on the State's investment, UNC and its Lineberger Comprehensive Cancer Center (LCCC) sought to develop a UCRF strategic plan, with a focus on clear goals with measurable outcomes and metrics of success. To that end, the strategic planning firm AltshulerGray was hired to lead the planning process and SRA International was retained to develop an evaluation plan.

AltshulerGray consultants worked with the LCCC Program Planning Committee (PPC) to establish a two-phase process that included a range of university stakeholders as well as outside experts. The initial phase included interviews with 50 internal and external stakeholders, a survey of 243 UNC faculty members, and six listening sessions conducted by UNC leaders to gather feedback from communities across the state, in addition to regular meetings of the PPC and reports to the UNC Oversight Committee, chaired by

Dean and Health System CEO Bill Roper, and the governance committee by the UCRF statute, the Cancer Research Fund Committee, chaired by President Erskine Bowles. (See Appendix A for the membership of the Cancer Research Fund Committee, the UNC Oversight Committee, and the LCCC Program Planning Committee.) This outreach and extensive faculty input built consensus around a vision, guiding principles, and a framework to help determine initial research strategies. The result was the definition of a three-tier investment strategy for UCRF funds, comprised of *Research Priorities*, an *Opportunity Fund*, and *Critical Infrastructure*, described in greater detail below.

Initial faculty feedback and subsequent discussions led to the identification of a list of potential research priorities. (See Appendix B.) These opportunities were evaluated according to three criteria:

- Will it address the needs of North Carolina, in terms of the goal of reducing the cancer burden in the state?
- Can we be world class at it? (Does it build on existing strengths, and is there an opportunity to lead?)
- Is there a strong economic model/justification for UCRF investment?

As a result of extensive analysis and faculty feedback, including a faculty-wide survey, three interconnected thematic research priorities were identified as the initial key strategic focus areas:

Understanding Genetics and its Role in Cancer Causation and Treatment, Developing New Cancer Treatments, and
***Optimizing NC Cancer Outcomes*.**

These three areas were the top priority areas identified in the faculty survey. (See Appendix C for survey results.)

In the second phase of strategic planning, three "theme teams" comprised of 5-7 faculty were charged with creating strategic and investment plans for each prioritized research area. In addition to laying out a vision of what would be possible with focused investment, the teams were asked to delineate the rationale for investment (i.e., why should this be done now, and why at UNC), current strengths and gaps at UNC, a potential funding model (e.g., how UCRF investment would be expected to generate increased funding from other sources, such as federal funding), and an implementation and launch plan. External experts from leading centers across the U.S. are being brought in to review the plans and provide constructive feedback to the proposals. (See Appendix D for list of external advisors.)

At the same time, faculty groups were convened to evaluate opportunities for disease-focused UCRF investment. 51 faculty members served on 12 disease teams. Each team produced a report outlining the opportunities and resource needs for its specific disease area and highlighting how research in these areas could best leverage investments in the three prioritized research initiatives. The theme teams used this disease team input to further refine their own plans. Critical needs identified by the disease teams to bolster clinical excellence and outreach – essential for conducting UNC and state-wide clinical cancer research – were considered as part of the planning for UCRF critical infrastructure investment.

Guiding principles and philosophy

Based on the stakeholder interviews in the first phase of strategic planning, the PPC developed guiding principles for investment:

- The UCRF should fund breakthrough innovation and excellence in cancer research, propelling UNC to national and international leadership
- UCRF research should focus on areas of great concern to the citizens of North Carolina
- UCRF research should have a real and tangible impact on the health of the state of North Carolina and beyond

Following from these guiding principles, a clear set of ground rules was established for determining how UCRF funds would be best spent. Specifically, it was agreed that UCRF funds *should*:

- Focus major resources on a limited set of opportunities in order to have the greatest impact
- Fund initiatives where UNC has the opportunity to establish a leadership position
- Be catalytic, self-sustaining, and provide leverage for additional funding from extramural sources
- Build fundamental cancer-related research capabilities that benefit UNC research programs
- Enhance North Carolina's economy by creating jobs, intellectual property, and start-up companies.

At the same time, it was agreed that UCRF funds *should not*:

- Invest diffusely in an attempt to make incremental improvements everywhere
- Provide in perpetuity funding that would limit future flexibility
- Undermine faculty innovation and competitiveness by eliminating the need for extramural grant funding
- Substitute for existing university or health system funding or new philanthropy
- Make expenditures based upon institutional or other needs outside cancer research.
- Negatively impact other research on campus, for example by appropriating shared research infrastructure or resources

Strategy Overview

The UCRF strategic plan is comprised of three tiers: Research Priorities, Opportunity Fund and Critical Infrastructure Fund.

The term *Research Priorities* refers to a limited number of initiatives, where with focused investment in major scientific programs, disease-based initiatives, or cutting-edge research platforms, UNC could have a substantial impact and achieve recognition as a world leader.

The initial UCRF research priorities are:

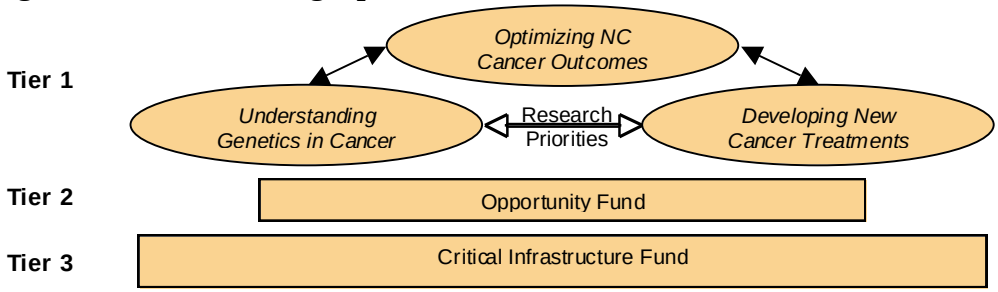
- Understanding Genetics and its Role in Cancer Causation and Treatment
- Developing New Cancer Treatments, and
- Optimizing NC Cancer Outcomes.

The first two will interrelate, making fundamental observations that will, as quickly as possible, be turned into clinical applications. The third will seek to understand North Carolina's cancer problem at a level unprecedented in the United States, and design research interventions to rectify these problems at the community, health system, and practice level.

The *Opportunity Fund* will ensure that the UCRF will remain nimble, allowing the opportunistic pursuit of programs, projects and capability development that cannot be foreseen in a strategic plan and would expand the capacity of the major initiatives.

Finally, the *Critical Infrastructure Fund* will enable these major initiatives by providing critical resources for cancer research that are not readily obtainable by extramural funding but upon which future progress relies. (See Figure A).

Figure A. UCRF strategic plan three-tier structure



Further detail on each of these strategic investment areas is provided below.

Research priorities

Supporting high-priority research is at the core of the UCRF strategic plan, as reflected in the guiding principles described above. In considering which areas to identify as initial research priorities, the PPC and UNC leadership assessed the relative merits of selecting specific cancer types or broader research themes. Understanding that basic and clinical discoveries often cut across multiple diseases, it was concluded that the UCRF would have the greatest impact if structured around addressing a set of critical research questions that could catalyze breakthroughs in all cancer types while extending the reach of UCRF investment beyond the fund itself (e.g. through resource acquisition and development available to all UNC). Nevertheless, disease-specific UCRF investment is seen as critical, and will occur within the initiatives, as well as via the Opportunity Fund and the clinical excellence infrastructure investment. Creating individual clinical/ translational research efforts led by visible clinician-scientists will be central to the national recognition to which UNC, with the help of UCRF, aspires.

A broad review of UNC strengths and key opportunities led to the selection of *Understanding Genetics and its Role in Cancer Causation and Treatment*, *Developing New Cancer Treatments*, and *Optimizing NC Cancer Outcomes* as the three initial research priorities. These three research themes span the basic, clinical, and public health research spectrum, but in a focused manner that will add critical knowledge – from improving our understanding of the underlying causes and progression of cancer, to developing novel therapies based on this new understanding, to optimizing the

dissemination and delivery of state-of-the-art care to the citizens of North Carolina. An overview of each thematic initiative is provided below.

Understanding Genetics and its Role in Cancer Causation and Treatment

Goal: To discover the genes that predispose families to cancer, and cancer patients to poor treatment outcomes. To investigate the mutant genes in specific cancer subtypes that lead to cancer therapy failure.

Why do certain cancers run in some families and not others? Why do patients respond to treatment differently? The answer to these questions lies in the genes we inherit from our parents. And cancer itself is caused by the mutation of these inherited genes. Although tremendous progress has been made in our understanding of genetics over the past two decades culminating in the sequencing of the entire human genome, these advances have not been sufficiently focused on the practical matter of human health and have yet to enter the clinical arena and tangibly improve the care of patients. Integrating basic research with clinical care will enable us to detect earlier and more curable forms of cancer and to develop more effective, highly targeted therapies. With significant expertise across the genetic spectrum enhanced by extraordinary support from UCRF, UNC is well positioned to realize the promise of the "Genetic Revolution".

The UCRF Cancer Genetics initiative will seek to track down inherited differences to determine whom to target for early detection, prevention and specific therapies, and will identify the derangements in individuals' tumors in order to individualize therapy. The initiative will pursue these goals by integrating and expanding existing strengths at UNC in genetic and molecular analysis from basic science through clinical application, and enabling integrated, high-throughput analyses. This vision will be realized through strategic recruitment of faculty in emerging fields, farsighted investment in cutting-edge technology, enhanced organizational capability for integrative analysis, and a focus on cancers that are especially amenable to this approach. This collaborative and multi-disciplinary strategy will incorporate disparate disciplines into a unified effort with the ultimate goal of improving our ability to prevent, detect, and treat cancer in North Carolina and beyond. This strategy will also provide fundamental knowledge upon which the next initiative will base its attempt to create new therapies.

Greater detail on the vision and plan for the UCRF cancer genetic/genomics effort will be provided in Appendix F.

Developing New Cancer Treatments

Goal: To devise novel therapies targeted to the specific vulnerabilities of treatment resistant cancers. To develop new ways of delivering therapeutic agents to reduce toxic side effects for all patients.

Of the 1.5 million people who will get cancer next year, fully 500,000 will die with untreatable forms of cancer. Some who receive curative treatment will have to live with debilitating side effects. Clearly, today's armamentarium is insufficient to deal with

many forms of advanced cancer. In addition, our therapies need to be based on biologic principles rendering them more effective and less toxic. Tremendous progress in our understanding of cancer has set the stage for new methods. However, it is true that many elegant basic cancer research observations never prove of value in the clinic. For example, although nearly 50,000 papers have been published on p53, a protein that is known to be involved in preventing cancer, our understanding of how to exploit this molecule for therapeutic endpoints remains virtually nil. For a novel discovery to benefit an actual human cancer patient, the new understanding must provide a "druggable" approach to therapy – the overriding challenge with regard to curing cancer.

The UCRF New Cancer Treatments initiative will seek to devise novel therapies targeted to the specific vulnerabilities of cancers, to prevent the emergence of resistant cancer cells and to eliminate the small proportion of cancer initiating cells which appear to prevent cancer cure by evading therapy and repopulating tumor sites. To reduce the toxicity of existing and novel therapies, research will also focus on new ways of delivering those drugs. In doing so, it will become the model for academic drug discovery and delivery research in cancer, providing an outlet for UNC investigators to test innovative ideas in drug development, which will improve delivery and efficacy of cancer therapies. Through a framework of collaboration and significant financial support for new therapeutic ideas, this initiative will 1) find and convincingly validate new targets for cancer therapies, 2) develop small molecule compounds to modulate identified targets, and 3) provide better delivery and formulation of promising therapeutics.

As a result of these efforts, patients at our hospital will initially benefit from a larger portfolio of novel clinical trials involving agents that underwent some portion of pre-clinical development at UNC. In the longer term, we expect to see this initiative bring new start-up companies to the region that will employ North Carolinians, attract venture and federal funding, and eventually lead to discoveries with the potential to treat, ameliorate, and possibly even cure cancer.

Appendix G will detail the vision and plan for the UCRF New Cancer Treatments initiative.

Optimizing NC Cancer Outcomes

Goal: To use the state of North Carolina as a laboratory tracking the occurrence and treatment of cancer through data systems and large population- and hospital-based studies. To use these data to initiate research aimed at improving community prevention, early detection in the population, and the quality of oncology and survivor care.

There is a strong evidence base of prevention, early detection, and quality-of-care precepts that, if applied uniformly, would improve cancer outcomes and reduce the burden of cancer in North Carolina. But while advances in medical care and treatment have had a notable impact on improving cancer outcomes in some areas, there remain enormous challenges in closing the gap between what is known to work to reduce cancer burden and what actually takes place. In addition, the application of prevention and quality care are not uniform across our state or among its constituent populations.

As an additional opportunity for this UCRF initiative, the nation is about to undergo health care reform, and many are concerned about the potential "rationing" of critical cancer care services. Thus, the time is especially ripe to answer the questions: What works in cancer prevention and early detection? How do we make it cost effective? Do cancer risk factors and outcomes vary across our state? How do we ensure that lower socioeconomic populations receive the best preventive and cancer care services? And how do we get doctors and health departments to adopt evidence-based practices?

The UCRF Optimizing Cancer Outcomes initiative will seek to optimize cancer outcomes in North Carolina by conducting innovative research to understand how best to deliver preventative and early detection services and high quality care in populations. Working in settings that range from rural communities to physician practices to local governments, researchers from UNC's nation-leading Schools of Public Health and Medicine will systematically design, test, disseminate, implement, and evaluate methods to identify and modify cancer risk factors to ensure that all North Carolinians have an opportunity to lower their cancer risk, get appropriate treatment and to improve the quality and length of life for cancer survivors. Findings and practices found to be effective will be disseminated and implemented across the state.

UCRF funds will make this work possible by enabling 1) the creation of a unique, comprehensive cancer information data system that tracks cancer patients, cancer services, and cancer treatment outcomes at a level of detail unprecedented in the United States; 2) the accrual of a 10,000 cancer patient cohort at UNC Hospitals to investigate many questions related to cancer outcomes among cancer survivors including response to therapy, 3) nation-leading research in population health disparities that lead to different cancer risk profiles and poorer outcomes among African Americans and lower socioeconomic status North Carolinians; and 4) research into cost effective methods to increase adoption of evidence-based cancer prevention, early-detection, and quality of care practices by individuals, communities, health systems, and providers. Since no such fully integrated and interactive system exists in the United States as envisioned here, North Carolina will be able to assume a true leadership position in this critical area.

Appendix H will provide greater detail.

Opportunity Fund

Goal: To promote innovation broadly by funding novel approaches and taking advantage of emerging technologies. To sponsor recruitments that bring new directions to the research initiatives and contribute to the overall UCRF mission.

The UCRF is committed to ongoing innovation and renewal. Recognizing that science is dynamic and that a research-focused strategic plan must be nimble, the UCRF will designate funds to support emerging opportunities outside the initial three identified research priorities. This Opportunity Fund will consist of three main components: a competitive peer-reviewed innovative pilot projects program; a competitive peer-reviewed technology and equipment acquisition program; and support for high-profile faculty with significant potential to enhance the UCRF's mission.

Innovative Pilot Projects

This competitive peer-reviewed effort continues the successful Innovation Award program ongoing during the UCRF's first two years. Projects funded by the Innovation Awards have and will continue to produce data that allow researchers to obtain external funding to expand their research. Opportunity Fund pilot projects will complement those funded by the three research priority initiatives, diversify the UCRF's portfolio of innovative cancer research, and build research funding and excellence at UNC. Moreover, the Opportunity Fund pilot projects will provide an antidote to the current extramural peer-reviewed funding systems, which has been criticized for its conservative investment in incremental, rather than innovative, research.

Innovative Technology and Equipment

Being at the technologic-forefront increasingly distinguishes leading research universities from the rest and provides a competitive advantage in research funding. Leading-edge techniques enable leading-edge research and discovery. The Opportunity Fund technology and equipment program will support the acquisition of novel, leading-edge technology and equipment for the use by multiple faculty members and the development of shared research resources. As with the Innovation Awards, this program will be competitive and rigorously peer-reviewed.

High-Impact Faculty Recruitment

UNC has the opportunity to attract faculty with significant potential for a positive effect on the UCRF mission – but who do not fit neatly into one of the three research priorities. This third portion of the Opportunity Fund will support the opportunistic recruitment of promising or established faculty. For example, the vast majority of our patients who die do so from metastatic cancer. The mutant genes driving metastasis will be the purview of the Cancer Genetics initiative and the drugging of targets promoting metastasis will be an outstanding aim for the New Cancer Treatments initiative. The Opportunity Fund will seed the recruitment of scientists in epithelial motility, metastasis genes, cell signaling systems biology, etc. and would enable the major research initiatives as well as the disease-specific programs. Opportunity Fund recruits over the next five years will include fundamental, translational, and population scientists. Prominent academic clinicians would be a high priority. They will propel UNC to national leadership in a particular clinical care specialty while helping to anchor a research program in that specialty.

Critical Infrastructure Fund

Goal: To expand the clinical care and research excellence of our faculty and provide all UNC researchers with the core resources necessary for clinical and translational cancer research. To initiate and maintain an outreach program beyond UNC for performing clinical care and quality of care research. To develop core resources in imaging, informatics, and fundamental research that will serve all faculty members. To plan and implement the UCRF research effort including its cancer research educational mission.

Innovative cancer research builds upon and is promoted by a strong, underlying infrastructure. External funding (NIH, etc) to enhance this infrastructure is lacking, despite acknowledgement that a healthy and proactively advanced research infrastructure

is critical to innovative research and necessary to compete successfully for external research funding. To complement the three research priority initiatives and the Opportunity Fund, the UCRF will establish a Critical Infrastructure Fund. Initially, this Fund will focus on four critical underlying research infrastructure components: clinical excellence and outreach, informatics, imaging, and key existing shared research resources and services. Investing in this critical infrastructure will enable and enhance not only UNC's cancer research; it will also strengthen the infrastructure and effectiveness of the campus's entire research enterprise.

Clinical Excellence and Outreach

Maintaining a strong foundation of quality cancer care and outreach at UNC Chapel Hill is critical for enabling leading-edge clinical research and its successful translation into community practice. The new NC Cancer Hospital provides an ideal setting for pioneering clinical research. The Critical Infrastructure Fund will help UNC recruit oncologists to expand the patient base for enhanced clinical and translational research. In addition, the NC Cancer Hospital, combined with UCRF Infrastructure support, will provide the videoconferencing/telemedicine hub that links UNC with cancer centers and oncologists across the state. These links and other services will increase physician collaboration, both promoting research and patient care quality, while increasing statewide access to UNC clinical trials.

Informatics

Modern research methods, such as high-throughput sequencing and other genomics approaches, generate vast pools of data. Informatics is the alchemy transforms that base information into knowledge. Informatics takes raw output from across the research spectrum and creates well-characterized, well-managed data from across the spectrum of research that can be powerfully linked together and then mined and analyzed. Although fundamental to innovative science and the UCRF's research priorities, informatics, particularly bio-and clinical informatics, is in short supply at UNC and at most research institutions. The Critical Infrastructure Fund will support development of informatics at UNC by recruiting faculty scientists who can push the envelope of this emerging field.

Imaging

In the years ahead, imaging will drive many vital advances in cancer research, diagnosis and treatment. By providing researchers and clinicians with the ability to literally see in real-time the cancer tumor inside the patient (or animal, in the case of research), powerful new imaging technologies offer significant promise of diagnosing cancer earlier than previously possible and of more closely monitoring response to treatment (whether experimental, or in the clinic). UNC is extremely well-positioned to lead in developing and applying these new imaging capabilities via its Biomedical Research Imaging Center and the under-construction Imaging Research Building. Supported by a forward-looking investment from the State of NC, the Imaging Research Building will be the largest research facility on campus. The UCRF will leverage this investment by the state and others by supporting purchase of key equipment and the recruitment of leading faculty and staff. The Imaging Research building will also have designated space for expanding the Developing New Cancer Therapies/Initiative both for drug development and nanomedicine as well as additional wet lab cancer research space.

Other Resources and Services

UCRF Critical Infrastructure funds will also help develop and expand other key research core facilities (such as tissue procurement and proteomics), clinical trials infrastructure, trainee support for the next generation of researchers, and research administration (including clinical trial contracting, clinical research administration, and other research administration). These resources will directly benefit the three research priorities, but will also have a broader impact -- benefiting all UNC researchers as well as partners outside of the university.

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Taken together, the three-tiered UCRF investment strategy ensures that UNC maintains a strong focus on a few key areas where it can leverage existing strengths, achieve breakthrough results in cancer research, *and* make a tangible impact on cancer outcomes in North Carolina and beyond.

Investment Plan

In the first two years of the UCRF, while a long-term strategic and investment plan was being developed, funds were directed towards building or expanding clinical excellence to prepare for the opening of the North Carolina Cancer Hospital; critical research infrastructure; basic, population and clinical science faculty; the technological base for topnotch genetic and animal models cancer research; and a state-wide outreach program for both clinical and public health research. Key faculty recruitments and retention in areas of UNC strength were accomplished in the first two years. Many of these initial investments were prescient, laying important groundwork for what have now been identified as UCRF strategic priorities. The investment plan presented in this document begins in year 3 of the UCRF, with a fully-funded budget of $50 million per year, but builds on the critical investments of the first two years.

For the next five years the Strategic Plan would, on average, allocate $8 million yearly to the three initiatives (Cancer Genetics, New Cancer Treatments and Optimizing Cancer Outcomes). These initiatives will benefit, as will all UNC cancer research, from the $16-17 million yearly Critical Infrastructure investments in clinical excellence faculty recruitment, clinical and translational research core resources, and imaging and informatics. A $9-10 million Opportunity Fund will drive innovation, technology development and translational research opportunities that initially fall outside the research themes. The interrelatedness of cancer biology and discovery, and their translation from model systems to human applicability make it highly likely that research initiatives will also benefit from these recruitments and investments in innovation.

To accomplish the aims of UCRF in each of its three-tiered components, faculty must seek extramural funding to expand the overall capacity of UNC cancer research. The objective is for the UCRF investment to produce funding replacing existing expenditures, thereby freeing up UCRF funds for re-investments. Cancer research is a dynamic process and UCRF investments, if used correctly, will be catalytic in not only expanding the size of UNC's overall cancer research effort but also its accomplishments and reputation.

Appendix E will provide the UCRF five-year investment plan.

Organization and Implementation

The Cancer Research Committee—Erskine Bowles, Chair

The legislation creating the UCRF specified that allocations be made at the discretion of a Cancer Research Committee that would consist of five ex officio members and two appointed members. The five ex officio members are the President of The University of North Carolina, the Director of the Lineberger Comprehensive Cancer Center, and the Deans of the School of Medicine, School of Pharmacy, and School of Public Health. The remaining two members shall be selected from persons holding a leadership position in a nationally prominent cancer program. This group elected Ed Benz, President of Dana

Farber Cancer Institute, and John Mendelsohn, President of MD Anderson. The Cancer Research Committee meets at least quarterly. The committee has been operating for two years and during its quarterly meetings has made decisions initiating many aspects of the research initiatives and critical infrastructure. They have received interim reports from the strategic planning process and will ultimately be responsible for approving and implementing the plan.

The Oversight Committee—William Roper, Chair

An Oversight Committee chaired by Dr. Roper, Dean of the UNC School of Medicine, CEO of the UNC Health Care System, and Vice Chancellor for Medical Affairs, provides ongoing monitoring of the UCRF. This committee includes leaders from throughout the Health Affairs Schools and the College of Arts and Sciences and is scheduled to meet quarterly to: monitor progress; provide advice on within year budget alterations; approve the award of innovation, program development, and research initiative pilot and project funding. They will also assess that expenditures and recruitments are congruent with the precepts of UCRF and the Cancer Research Committee.

UNC Lineberger Senior Leadership and Research Initiative Committees

The day-to-day management, planning, and coordination for the UCRF will be the responsibility of the LCCC senior leadership in frequent consultation with the Office of the Dean of the School of Medicine. The long-standing senior leadership team consisting of the director and associate directors for clinical research, basic science, population science, and outreach will be expanded to include the leaders of the three UCRF research initiatives. These will be considered to be at the associate director level. Each of the initiatives will be led by a committee that will consist of a rotating membership comprised of faculty members and senior scientists with specific expertise. Broad faculty input will come to the Cancer Center senior leadership through the program planning committee and the initiative leadership committees.

Other members of the senior leadership team will assume responsibility for the Opportunity Fund and Critical Infrastructure components of the UCRF. The full senior leadership will meet on a weekly basis to discuss activities and make decisions that affect the entire LCCC. Thus, UCRF leaders will be made aware of, and will participate in decision-making regarding, issues that extend beyond the UCRF. At the same time, a subcommittee of the senior leadership comprised of UCRF leaders may choose to meet to address UCRF-specific issues as they arise.

Each initiative committee will also be advised by a set of leaders in their relevant fields from top cancer centers across the United States. These advisors will meet with the committees at least yearly to review plans and observe the progress of each thematic area. These advisors will also be invited to join the LCCC Board of Scientific Advisors.

The LCCC senior leadership, in consultation with the School of Medicine Dean's Office, will develop and revise plans and propose detailed budgets for upcoming fiscal years. Those plans and budgets will be presented to the UCRF Oversight Committee, chaired by

Dean William Roper, and if approved by that committee, presented to the Cancer Research Fund Committee, chaired by UNC President Erskine Bowles.

Ensuring Success

Defining success and measuring progress

While it will be years before the full effect of North Carolina's visionary investment in cancer research will be fully evident, it will be possible, and indeed, essential, to track progress and to adjust the strategy as needed. Specifically, it will be important to assess in an ongoing way whether UCRF funds are being spent most wisely and are being clearly directed towards improving the health of North Carolinians.

Is the UCRF being invested to generate the greatest possible return?

While it is impossible to predict where research will lead and what finding will emerge, it is possible to evaluate whether funds are being invested in such a way as to maximize their return. That is the purpose of this strategic plan – to focus UCRF funds on their best use -- however, the plan may need to be modified over time.

As described above, the LCCC Board of Scientific Advisors will be asked to evaluate the scientific progress associated with UCRF investment. As part of this evaluation, they will be asked explicitly to assess whether the funds are being used most effectively.

In addition to this qualitative review, there are other, more quantitative ways of measuring whether UCRF funds are being most effectively spent. One key metric is the growth in extramural funding, and in particular, in federal research funding. If UCRF funds are spent wisely, UNC researchers will be able to compete more successfully for additional research support. An increase in federal grants will serve as an important validation of the quality and value of UCRF investments. It will also satisfy a critical goal for the UCRF articulated during the planning process – to be catalytic, self-sustaining, and provide leverage for additional funding from extramural sources.

Estimating precise increases in extramural funding levels is difficult, as the federal research budget in the last decade has been extremely variable, doubling over the first five years and remaining flat over the most recent five years. However, with substantial resources from UCRF, a good strategic plan, and continued recruitment of outstanding faculty, UNC should significantly increase its funding relative to other major public and private universities. UNC currently ranks in the top 15 nationally in funding from the National Cancer Institute with $44 million (total annual costs). Over the next seven years, we should aspire to move into the top five among cancer centers, as assessed by a combination of funding, high-impact publications, and peer assessment. Space for new recruitment is a major constraint and the BRIC building will come open in four years, thus the use of the seven year timeframe. The combination of UCRF and new space would be needed to achieve this aspiration. With respect to overall funding from federal, foundation, and private sources, which now totals ~$700 million to UNC at Chapel Hill,

it's reasonable to assume that the $50 million UCRF should at least generate a 4:1 stimulation, thus adding $200 million to the university's overall funding.

Will the UCRF directly impact the health of NC citizens?

It will take a long time before efforts can be measured as improvement in health at the state level or beyond, but important interim steps can, should, and will be tracked. In some cases, there will be clear and tangible benefits in the short term.

For example, the Optimizing NC Outcomes initiative includes activities designed to test the impact of interventions in defined communities across North Carolina, with a focus on counties that disproportionately contribute to the cancer burden in the state. If successful, these communities will see a direct benefit, and the findings will be disseminated more broadly across NC. Investments designed to bolster the level of cancer clinical care at UNC will have an immediate impact on the care of cancer patients, while providing the necessary conditions for cutting edge clinical research. The number of patients engaged in clinical trials, and thus able to benefit from important new therapies, will thus be an important metric to be tracked. Finally, the development of novel therapeutics can take years, but ultimately are expected to have widespread impact. Interim steps, as described in the New Cancer Treatments plan in Appendix G, include the development of promising drug candidates for pre-clinical and clinical testing.

An outside, independent evaluation will be conducted based on this strategic plan. A process to identify the organization that will conduct the evaluation is underway.

Contingencies that could hinder progress

Space constraints

One major potential threat to achieving UCRF goals is the current lack of adequate research space to carry out the strategic plan. This space constraint will be alleviated to some extent when two new buildings, the Imaging Research Building and the Genome Sciences Building, come on line in four years. However, the recruitment of both junior and particularly senior faculty requires more space than is currently available. This will either delay some of the major components of the plan, or interim solutions must be found. There is the potential to rent some space offsite for core facility development and expansion. In order to recruit the high-quality faculty necessary to achieve the objectives of the plan, they will need to be offered laboratory space on the Chapel Hill campus. One potential is to use some UCRF funds for renovation of campus space, for example, in the Mary Ellen Jones building, or for short-term utilization of other space being constructed on the campus, for example, the new Dental Research building. If for any reason sufficient space is not made available, this will curtail UNC's ability to recruit new faculty and to carry out the specific activities described in this strategic plan.

Ongoing evaluation and refinement of the strategic plan

While the strategic plan lays out a roadmap and expected budgetary priorities for future years, it is expected that specific opportunities and needs will require modifying these plans over time. As described above, the LCCC Executive Committee, advised by the LCCC Board of Scientific Advisors, will regularly review progress and will adjust the

plans accordingly. As well, in the fourth year of the five-year strategic plan period, UCRF leadership will undertake a thoroughgoing review of UCRF performance to date, as well as an assessment of emerging opportunities in cancer research, as part of developing a new five-year strategic plan.

Appendices

A. UCRF Committee Membership

Cancer Research Fund Committee

Erskine Bowles, Chairman
President, the University of North Carolina

Edward J. Benz, MD
President and CEO, Dana Farber Cancer Institute

Robert Blouin, PharmD
Dean, UNC School of Pharmacy

H. Shelton Earp, MD
Director, UNC Lineberger Comprehensive Cancer Center

John Mendelsohn, MD
President, The University of Texas M.D. Anderson Cancer Center

Barbara K. Rimer, DrPH
Dean, UNC Gillings School of Global Public Health

William L. Roper, MD, MPH
Dean, UNC School of Medicine

UCRF Oversight Committee

William L. Roper, MD, MPH, Chairman
Dean, UNC School of Medicine

Robert Blouin, PharmD
Dean, UNC School of Pharmacy

H. Shelton Earp, MD
Director, UNC Lineberger Comprehensive Cancer Center

Etta D. Pisano, MD
Vice Dean, Academic Affairs, UNC School of Medicine

Barbara K. Rimer, DrPH
Dean, UNC Gillings School of Global Public Health

Holden Thorp, PhD
Chancellor, the University of North Carolina

Marschall Runge, MD, PhD
Chair, Department of Medicine, UNC School of Medicine

Kevin FitzGerald, MPA
Executive Associate Dean for Finance and Administration, UNC School of Medicine

Joseph DeSimone, PhD
Chancellor's Eminent Professor of Chemistry, UNC

Tony Waldrop, PhD
Vice Chancellor for Research and Economic Development, UNC Chapel Hill

LCCC Program Planning Committee

Albert S. Baldwin, Jr., PhD
Professor, Cancer Cell Biology
LCCC Associate Director, Basic Research

Andrew F. Olshan, PhD
Professor, Cancer Epidemiology

Charles M. Perou, PhD
Associate Professor, Department of Genetics

Joseph DeSimone, PhD
Chancellor's Eminent Professor of Chemistry

Gary L. Johnson, PhD
Professor and Chair, Department of Pharmacology

Howard McLeod, PharmD
Fred Eshelman Distinguished Professor of Pharmacogenetics and Individualized Therapy
UNC Eshelman School of Pharmacy

Joel E. Tepper, MD
Professor and Chair, Department of Radiation Oncology

Jonathan S. Serody, MD
Thomas Associate Professor of Medicine and Immunology

Lisa A. Carey, MD
Associate Professor of Medicine
Medical Director of UNC Breast Center

Marci Campbell, PhD, MPH, RD
Professor, Cancer Prevention and Control

William F. Marzluff, PhD
William Rand Kenan Professor, Department of Biology

Cathy Melvin, PhD
Associate Professor, Cancer Prevention and Control

Norman E. Sharpless, MD
Associate Professor of Medicine and Genetics

Nancy Raab-Traub, PhD
Professor, Virology

Jenny Ting, PhD
Alumni Distinguished Professor, Immunology

Richard M. Goldberg, MD
Distinguished Professor, Clinical Research

Thomas C. Shea, MD
Professor of Medicine
Associate Division Chief, Division of Hematology/Oncology

Terry Magnuson, PhD
Sarah Graham Kenan Professor
Chair, Department of Genetics

David G. Kaufman, MD, PhD
Professor and Vice Chair for Research Development, Department of Pathology

Yue Xiong, PhD
William R. Kenan, Jr. Professor, Department of Biochemistry and Biophysics

B. Potential UCRF Research Priorities Considered by Planning Committee

Potential thematic areas for investment

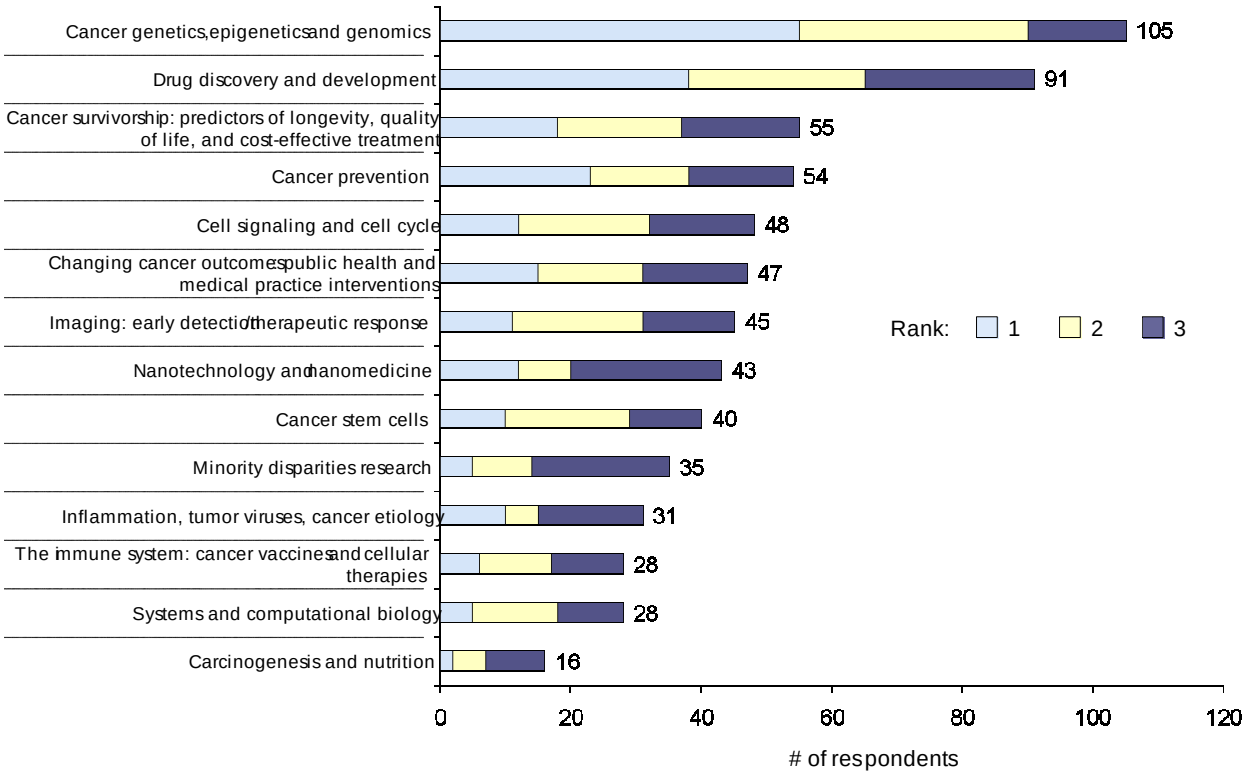
- Cancer Genetics, Epigenetics and Genomics: Basic and Applied
- Cancer Stem Cells
- Minority Disparities Research: From Biology to Health Services
- Drug Discovery and Development: New Targets, Their Structure and Novel Therapeutics
- Imaging: Early Detection and Therapeutic Response
- Inflammation, Tumor Viruses, and Cancer Etiology
- Changing Cancer Outcomes: Public Health and Medical Practice Interventions
- Cell Signaling and Cell Cycle: Pathways and Intracellular Visualization
- The Immune System: Cancer Vaccines and Cellular Therapies for Human Cancer
- Systems and Computational Biology
- Nanotechnology and Nanomedicine
- Cancer Prevention: Primary Prevention, Screening, and Early Detection Research
- Carcinogenesis and Nutrition

Potential technology/capability platforms for investment

- NC-wide collection of tissue with clinical annotation
- Upgrade and operation of genetics and genomics platforms
- Creation and assessment of animal models for drug development
- Imaging, instrumentation and analysis: from mouse to man
- Biomarkers/translational core facilities for tissue
- Improved state tumor registry and cancer surveillance
- Development and support of bioinformatics resources
- Clinical informatics: clinical database development
- Oncologist network across the state for clinical trials
- Oncology training programs
- Technology transfer and commercialization
- Microscopy: intracellular imaging and methods development

C. Faculty Survey: Top Priorities for UCRF Investment

Q. The following were suggested as potential thematic areas for major investment. Please indicate your top 3 choices. Use 1 for your top choice, 2 for your second choice, 3 for your third choice.



Source: UCRF Faculty Survey

D. UCRF Strategic Planning External Advisors

Understanding Genetics and its Role in Cancer Causation and Treatment

Peter Byers, MD
Professor, Pathology & Medicine (Medical Genetics)
University of Washington

Stacey Gabriel, PhD
Director, Genetic Analysis Platform
Broad Institute of MIT & Harvard

Allan Balmain, PhD, FRSE
Barbara Bass Bakar Distinguished Professor of Cancer Genetics
University of California, San Francisco

Developing New Cancer Treatments

R. Kiplin Guy, PhD
Chair, Chemical Biology & Therapeutics
St. Jude Children's Research Hospital

Tyler Jacks, PhD
David H. Koch Professor of Biology
Director, David H. Koch Institute for Integrative Cancer Research
Massachusetts Institute of Technology

Steven L. McKnight, PhD
Distinguished Chair in Basic Biomedical Research
Sam G. Winstead and F. Andrew Bell Distinguished Chair in Biochemistry
University of Texas Southwestern Medical Center

Karen L. Wooley, PhD
James. S. McDonnell Distinguished University Professor
Professor, School of Arts & Sciences, Department of Chemistry
Professor, School of Medicine, Department of Radiology
Washington University in St. Louis

Optimizing NC Cancer Outcomes

Graham Colditz, MD, DrPH, FAFPHM
Niess-Gain Professor of Surgery & Professor of Medicine
Department of Surgery
Associate Director Prevention and Control
Alvin J. Siteman Cancer Center
Deputy Director, Institute for Public Health
Washington University School of Medicine

Karen Emmons, PhD
Deputy Director, Center for Community Based Research
Professor, Dept of Society, Human Development & Health
Associate Dean of Research
Harvard School of Public Health

Jane Weeks, MD, MSc
Division Chief, Population Sciences
Director, Center for Outcomes and Policy Research
Professor of Medicine, Harvard Medical School

E. UCRF Investment Plan/Financial Model

University Cancer Research Fund (UCRF) - by tier and theme
All numbers $000

	2009 (Year 3)	2010	2011	2012	2013	5-year total
Resource needs						
Genetics	**$7,650**	**$10,400**	**$12,685**	**$13,240**	**$12,720**	**$56,695**
Faculty recruitment and startup	$1,400	$3,300	$4,775	$4,725	$3,975	
Research platforms / large initiatives	$4,000	$4,060	$4,440	$4,770	$5,000	
(sequencing/genotyping, survivorship cohort, bioinformatics, clinical genetics)						
Core resources	$750	$1,060	$1,165	$1,165	$1,165	
(RAM lab, collaborative cross, biostatistics)						
Innovation / project funding	$500	$1,400	$1,600	$1,800	$1,800	
(keystone projects, seed funding)						
Space, renovation, project management	$1,000	$580	$705	$780	$780	
Developing New Treatments	**$7,225**	**$10,255**	**$11,155**	**$11,855**	**$12,055**	**$52,545**
Faculty recruitment and startup	$1,150	$3,700	$4,500	$5,100	$5,300	
Research platforms / large initiatives	$2,500	$2,500	$2,500	$2,500	$2,500	
(small molecules core, mouse phase I unit, nanofabrication, tech/business devt)						
Core resources	$2,025	$2,300	$2,250	$2,150	$2,150	
(CHANL, clinical pharmacology / GLP, protein expression, animal models / imaging)						
Innovation / project funding	$1,000	$1,300	$1,400	$1,600	$1,600	
(preclinical testing, pilot projects)						
Space, renovation, project management	$550	$455	$505	$505	$505	
Optimizing NC Outcomes	**$6,375**	**$9,280**	**$10,180**	**$10,755**	**$11,155**	**$47,745**
Faculty recruitment and startup	$925	$1,900	$2,350	$2,800	$3,050	
Research platforms / large initiatives	$2,250	$3,400	$3,800	$3,900	$4,050	
(Carolina Breast Study 3, UNC survivorship, ICISS)						
Core resources	$2,000	$2,000	$2,000	$2,000	$2,000	
(community engagement, dissemination, rapid case, NC tumor registry, health communication, population biostats)						
Innovation / project funding	$500	$1,250	$1,500	$1,500	$1,500	
(NC survivorship, prevention / cancer control intervention, comparative effectiveness)						
Space, renovation, project management	$700	$730	$530	$555	$555	
Infrastructure	**$16,705**	**$17,205**	**$17,205**	**$17,205**	**$17,205**	**$85,525**
Clinical Excellence & Oncologist Recruitment	$4,630	$4,630	$4,630	$4,630	$4,630	
Clinical Research Program Development and Strategic Needs	$2,050	$2,050	$2,050	$2,050	$2,050	
Telemedicine & Outreach	$1,000	$1,500	$1,500	$1,500	$1,500	
(statewide patient navigation and survivorship, telemedicine tumor boards)						
Clinical/Translational Core Resources	$6,050	$6,050	$6,050	$6,050	$6,050	
(clinical trials network, informatics, BRIC)						
Basic Science Core Resources	$725	$725	$725	$725	$725	
Graduate Education & Training	$1,000	$1,000	$1,000	$1,000	$1,000	
Evaluation, Planning, & Research Support	$1,250	$1,250	$1,250	$1,250	$1,250	
Opportunity Fund	**$9,850**	**$10,350**	**$10,350**	**$10,350**	**$10,350**	**$51,250**
Ongoing recruitment	$2,100	$2,100	$2,100	$2,100	$2,100	
Opportunistic recruitment	$1,000	$3,000	$3,000	$3,000	$3,000	
Innovation Awards, Equipment / Technology Development, and Core Pilot Projects	$5,250	$5,250	$5,250	$5,250	$5,250	
Unassigned	$1,500	-	-	-		
Unallocated	**$2,195**	**$0**	**$0**	**$0**	**$0**	
Revenue						
Target revenue	**$0**	**$6,000**	**$10,100**	**$11,900**	**$12,000**	**$40,000**
Genetics	$0	$2,400	$4,700	$5,200	$4,700	
Treatments	$0	$2,300	$3,200	$3,900	$4,100	
Outcomes	$0	$1,300	$2,200	$2,800	$3,200	
Resource needs	**$50,000**	**$57,490**	**$61,575**	**$63,405**	**$63,485**	**$295,955**
Target revenues	**$0**	**$6,000**	**$10,100**	**$11,900**	**$12,000**	**$40,000**

Active Extramural Awards

UCRF	Current PI	Sponsor	Number	Begin Date	End Date	Title	Total Cost $
Theme Invest (HTS)	Aikat, J	National Science Foundation - Research (NSF)	OCI-1245783	12/1/2012	11/30/2014	CC-NIE Network Infrastructure: Enabling Data-Driven Research,	499,529
IA	Allbritton, N	National Cancer Institute	5-R01-CA139599-04	3/1/2009	1/31/2014	Multiplexed Measurement of Kinase Activity in Single Cancer Cells	552,746
IA	Allbritton, N	National Institutes of Health	5R01EB011763-03	4/1/2010	1/31/2014	Protecticides: A Tool for Drug Target Assays in Myeloma	518,482
Rec	Armistead, P	National Institutes of Health	1-K08-HL113594-01	5/1/2012	2/28/2015	Leukemia Stem Cell Antigen Discovery Using Advanced Genomic and Proteomic Methods	132,088
Ret	Ataga, K	National Institutes of Health	1R01HL111659-01	1/1/2012	2/31/2016	Endothelial Dysfunction in the Pathogenesis of Sickle Cell	504,596
Theme Invest (CC)	Aylor, D	National Institutes of Health	1-K99-ES021535-01	6/1/2012	5/31/2014	Epigenetics, Environmental Exposure, and Reproduction in the Collaborative Cross	87,921
Theme Invest (CC)	Aylor, D (Fellow) / Pardo Manuel de Villena, F	National Institutes of Health	F32-GM090667-02	8/1/2012	5/31/2012	System Genetics of Male Infertility in the Collaborative Cross	53,042
Ret	Bae-Jump, V	Gynecologic Cancer Foundation	NA	3/1/2011	4/30/2013	Cross-Species Investigation of the Impact of Obesity on Ovarian Cancer Pathogenesis	25,000
IA	Bae-Jump, V	National Cancer Institute	5-K23-CA143154-01-02	9/1/2010	8/31/2015	Metformin as a Novel Chemotheraeutic Strategy for the Treatment of Endometrial Cancer	170,873
Theme Invest (CC)	Baric, R	National Institutes of Health	1U19AI100625-01	8/5/2012	7/31/2017	Systems Immunogenetics of Biodefense Pathogens in the Collaborative Cross	4,594,721
Theme Invest (HTS)	Baric, R	National Institutes of Health - Oregon Health and Science University	AVGTIO103 (U54 AI081680 subcontract)	3/1/2010	2/28/2013	Systems Pathogenomics of Severe Acute Respiratory Virus Infection (Subcontract Pacific Northwest Regional Center for Excellence in Biodefense and Emerging Infectious	618,838
Rec	Baron, J	National Cancer Institute	5-R01-CA059005-17	9/30/1993	7/31/2014	Aspirin/Folate Prevention of Large Bowel Polyps	803,946
Rec	Baron, J	National Cancer Institute	5-R01-CA098286-10	12/1/2002	7/31/2013	Colorectal Chemoprevention with Calcium and Vitamin D	3,226,668
Rec	Baron, J	National Cancer Institute - University of Chicago	44706-D	10/1/2010	7/31/2015	Chemoprevention of Arsenic Induced Skin Cancer	49,636
Rec	Batrakova, E	National Institutes of Health	7R01NS057748-05	9/29/2008	6/30/2012	Inflammatory Cells for Transport of Therapeutic Polypeptides Across the	293,266
Theme Invest (HTS)	Beck, M	National Institutes of Health	5R01AI082298-03	4/1/2010	3/31/2013	Viral Adaptation to Host Selenium Status	366,300
IA	Blancafort, P	US Army Medical Research	W81XWH-10-1-0265	5/1/2010	4/30/2013	Re-writing the Histone Code of Breast Cancer Stem Cells	127,130
Rec	Brookhart, M	Amgen, Inc.	142969	5/19/2011	12/31/2012	Denosumab Adherence Study	50,050
Rec	Brookhart, M	Amgen, Inc.	2011561720	12/16/2011	12/31/2013	Methodological Issues in Drug Utilization Research	244,960
Rec	Brookhart, M	Amgen, Inc.	138938/7100060173	1/1/2012	12/31/2012	Patterns of Anemia Management in United States Hemodialysis	145,728
Rec	Brookhart, M	Brigham and Women's Hospital	106073/HHSA290200500161	7/19/2011	7/18/2012	Validation of Inverse Probability of Missing Data Approach for the Inclusion of Laboratory Data in Healthcare Database Research	120,000

UCRF	Current PI	Sponsor	Number	Begin Date	End Date	Title	Total Cost $
Rec	Brookhart, M	National Institutes of Health	1R01AG042845-01	9/1/2012	8/31/2014	A Retrospective Cohort Study of the Safety of Testosterone Therapy in Older Men	228,000
IA	Burridge, K	National Institutes of Health	5-R01-GM029860-30	4/1/1981	8/31/2014	Cell Adhesion and the Regulation of Rho GTPases	423,592
Rec	Carpenter, W	National Cancer Institute	5U54CA153602-03	9/1/2010	8/31/2015	Pilot Project - Clinical Trial Accrual	110,956
Rec	Carpenter, W	University of Otago New Zealand	NA	9/12/2011	5/12/2013	Comparative Effectiveness Research: One-off Sigmoidoscopy or iFOBT	27,819
Rec	Chavala, S	National Institutes of Health	5K08EY021171-02	3/1/2011	2/28/2016	Regulation of Adult Ciliary Body Progenitor Cells for Cell Replacement Therapy	236,392
Rec	Chen, R	Accuray Inc.	NA	6/1/2012	5/31/2013	Comparative Effectiveness of Management Options for Localized Prostate Cancer Parallel Study to Include Patients Treated with Cyberknife Radiation Therapy	100,000
Rec	Chera, B	National Cancer Institute	NA	8/1/2011	7/31/2012	Improving Cancer Outcomes for Underserved Populations in SE North Carolina - Subcontract Agreement with New Hanover	10,279
Rec	Coghill, J	National Institutes of Health	1-K08-HL111205-01	4/1/2012	3/31/2016	Targeting CC-Chemokine Receptor 7 for the Prevention of Graft-versus-Host Disease	132,327
Theme Invest (HTS)	Copenhaver, G.	National Science Foundation	MCB-1121563	8/1/2011	7/31/2014	Identifying and Characterizing Genetic Interactors of DMC1	204,999
Theme Invest (HTS)	Crews, S	National Institutes of Health	5R01NS075079-02	7/1/2011	5/31/2016	Molecular Genetics of Midline Glial Development	323,750
Theme Invest (HTS)	Crowley, J	National Institutes of Health	1K01MH094406-01A1	3/1/2012	2/29/2016	Systems Genetics of Fluoxetine-Induced Neurogenesis and Antidepressant Response	156,686
Ret	Damania, B	Burroughs Wellcome Fund	1006269	7/1/2006	6/30/2014	Role of Viral Signaling Proteins in the Pathogenesis of Kaposi's Sarcoma-Associated Herpesvirus (KSHV)	56,250
Ret	Damania, B	National Cancer Institute	5-R01-CA096500-06-10	7/1/2002	5/31/2013	Role of KSHV K1 in Viral Pathogenesis	271,364
Ret	Damania, B	National Cancer Institute	5P01CA019014-33	7/1/2011	6/30/2016	Modulation of Cell Migration; Survival and Angiogenesis by KSHV	291,380
Ret	Damania, B	National Institutes of Health	2-R01-DE018281-06	6/1/2007	5/31/2017	Innate Immunity and KSHV	365,968
Theme Invest (HTS)	Dangl, J	Gordon and Betty Moore Foundation	3030	9/1/2011	8/31/2016	Understanding Plant Immune System Function in Complex Microbial Environments	333,333
Theme Invest (HTS)	Dangl, J	National Science Foundation	NSF-IOS-0929410	9/1/2009	8/31/2013	Arabidopsis 2010: Mechanisms of NB-LRR Disease Resistance Protein Function	457,446
Ret	Dayton, P	National Cancer Institute	1R01CA170665-01	9/1/2012	6/30/2016	Micro-Tumor Detection by Quantifying Tumor-Induced Vascular Abnormalities (PQ-13)	456,910
Ret	Dayton, P	National Institutes of Health	1-S10-OD010410-01	5/15/2012	5/14/2013	Vevo 2100 High Resolution Ultrasound System For Preclinical	556,410
Ret	Dayton, P	National Institutes of Health - North Carolina State University	550424	4/1/2009	2/28/2013	Precision Engineering of Ultrasonically-Targeted Drug Delivery Vehicles	316,715

UCRF	Current PI	Sponsor	Number	Begin Date	End Date	Title	Total Cost $
Ret	Dayton, P	National Institutes of Health - North Carolina State University	NA	7/3/2010	6/30/2013	Immune-Shielded, Ultrasound-Stimulated Contrast Agents for Molecular Imaging	98,477
Ret	Dayton, P	US Department of Defense	W81XWH-12-1-0303	8/1/2012	7/31/2015	Piezoelectric Composite Micromachined Multi-Frequency Transducers for High-Resolution, High-Contrast Ultrasound Imaging for Improved Prostate Cancer	167,458
IA	Demore, N	National Cancer Institute	5-R01-CA142657-03	7/1/2010	5/31/2015	SFRP2 and NFAT are Therapeutic Targets in Angiosarcoma	297,887
IA	Der, C	National Cancer Institute	5-R21-CA161494-02	7/6/2011	6/30/2013	Genetic Dissection and Inhibitor Targeting of Rac Signaling in Pancreatic Cancer	160,950
IA	Deshmukh, M	National Institutes of Health	5-R01-GM078366-07S1	9/1/2006	8/31/2014	Cytochrome C Degradation: A Mechanism to Restrict Apoptosis in	52,947
Ret	DeSimone, J	Colorado State University (subcontract)	G-5441-2	7/1/2011	6/30/2014	Molecular Mosquitocides: Development of an Innovative and Robust, Platform-Based Approach for Sustainable Insecticidal Control of Anopheline Mosquitoes	99,165
Ret	DeSimone, J	Liquidia Technologies	NA	9/1/2005	8/31/2012	Research Agreement between UNC and Liquida in the Area of PFPE, Lithography, Microfluidics, Nanostudies and Membrane Studies	424,000
Ret	DeSimone, J	National Cancer Institute	5-U54-CA151652-03	9/1/2010	7/31/2015	Carolina Center of Cancer Nanotechology Excellence	2,484,269
Ret	DeSimone, J	National Institutes of Health	5-R01-EB009565-04	5/1/2009	4/30/2013	Engineered Organic Particles of Controlled Size, Shape and Surface Chemistry	311,584
Ret	DeSimone, J	Office of Naval Research	N00014-10-1-0550	2/1/2010	1/31/2013	Novel Perfluoropolyether and Fouling Release Coatings: Investigation of Structure	161,355
Ret	DeSimone, J	Office of the Director, National Institutes of Health	5-DP1-OD006432-03	9/30/2009	7/31/2014	Delivery of Biological Therapeutics	732,600
Ret	DeSimone, J	Prostate Cancer Foundation	NA	6/1/2011	5/31/2013	Prostate Cancer Foundation-Honorable A. David Mazzone Special challenge Award Research Program	154,902
Ret	Dittmer, D	Leukemia and Lymphoma Society of America	R6169-10	10/1/2005	9/30/2012	Pharmacogenomics of Viral Lymphomas	57,143
Ret	Dittmer, D	National Cancer Institute	5-R01-CA109232-08, 08S1	8/1/2004	4/30/2015	Regulation Of The KSHV Latent Promoter	299,387
Ret	Dittmer, D	National Cancer Institute	5-R01-CA163217-01-02	9/1/2011	7/31/2016	Targeted Therapies for HIV-Associated Kaposi Sarcoma and	305,754
Ret	Dittmer, D	National Cancer Institute	5P01CA019014-33	7/1/2011	6/30/2016	Cellular Reprogramming by KSHV Latent Genes and MIRNAs	291,273
Ret	Dittmer, D	National Cancer Institute - University of Miami	66249P	9/22/2006	7/31/2012	Targeting of EBV Latency in Burkitt's Lymphoma	23,246
Ret	Dittmer, D	National Institutes of Health	5-R01-DE018304-01-05	5/15/2007	4/30/2013	ART Modulation of Viral Pathogenesis in Oral Epithelia	50,843
Ret	Dittmer, D	The EMMES Corporation	PO 1568 G NA643	9/1/2010	8/31/2012	AMC Biomarker Core	50,851
Rec	Doerschuk, C	National Institutes of Health	2-T32-HL007106-36	7/1/1975	3/31/2017	Multidisciplinary Research Training in Pulmonary Diseases	406,452
Rec	Doerschuk, C	National Institutes of Health	5-R37-HL048160-22	4/10/1992	3/31/2013	Neutrophil Sequestration and Emigration in the Lung	370,000

UCRF	Current PI	Sponsor	Number	Begin Date	End Date	Title	Total Cost $
Rec	Doerschuk, C	National Institutes of Health	1-R01-HL114388-01	6/1/2012	3/31/2017	Rho-Mediated Signaling in Lung Endothelial Cells Induced by Neutrophil Adhesion	619,559
Ret	Dokholyan, N	National Institutes of Health	1-R01-AI102732-01	7/1/2012	6/30/2016	Immunogen Design to Target Carbohydrate-Occluded Epitopes on the HIV Envelope	514,331
Ret	Dokholyan, N	National Institutes of Health	2-R01-GM080742-06	4/1/2007	3/31/2016	Protein Misfolding and Disease	279,122
Ret	Dokholyan, N	National Institutes of Health	5-F31-NS073435-02	2/1/2011	1/31/2014	The Impact of Post-Translational Modification on SOD1 Aggregation in	30,526
Ret	Dokholyan, N	National Institutes of Health	5-F31-AG039266-02	12/1/2010	11/30/2013	Identification of Drug Leads Targeting SOD1 Dissociation for the Treatment of ALS	30,526
Ret	Dokholyan, N	Sandia National Laboratories	1176733	10/1/2011	9/30/2012	Enhance Enyzmatic Activity	30,000
Rec	Dudley, A	National Cancer Institute	5-R00-CA140708-05	9/1/2009	8/31/2014	Tumor Endothelial Cell Abnormalities	249,000
Theme Invest (CBCS, HTS)	Earp, HS	National Cancer Institute	2P50CA058223-19A1	8/5/2012	8/31/2017	SPORE in Breast Cancer	1,933,963
Rec	Earp, HS (Major, MB)	National Cancer Institute	5-P30-CA147893-01-02	9/30/2009	8/31/2012	Early Stage Investigator Recruitment in Cancer Research	205,142
Ret	Evans, J	National Institutes of Health	1-U01-HG006487-01	12/5/2011	11/30/2015	NC GENES: North Carolina Clinical Genomic Evaluation by NextGen Exome Sequencing	1,630,816
Rec	Foster, M	Genzyme Corporation	NA	3/24/2010	3/23/2013	LCCC 0909 A Pharmacokinetic Study Of Oral And Intravenous Clofarabine In Patients	56,666
Rec	Fry, R	National Institutes of Health	5-R01-ES019315-01-03, 03S2	9/20/2010	5/31/2015	In Utero Exposure to Arsenic, Links to Epigenetic Alterations and Disease	527,793
Rec	Fry, R	Society of Toxicology	NA	7/1/2012	12/31/2012	SOT-Graduate Student Fellowship - Novartis Award - Julia Rager	20,000
Rec	Frye, S	National Cancer Institute - SAIC-Frederick Inc	A56768/29XS126	7/13/2010	8/12/2013	Task Order#7- BOA under 5-58589 as a Comprehensive Chemical Biology Screening Center -	890,000
Rec	Frye, S	National Cancer Institute - SAIC-Frederick Inc	29XS126/A59101	2/1/2011	1/31/2013	Task Order #8- BOA under 5-58589 as a Comprehensive Chemical Biology Screening Center- (Master (BOA) Agreement IPF#09-5399)	222,969
Rec	Frye, S	National Cancer Institute - SAIC-Frederick Inc	29XS126/A62138	10/21/2011	4/20/2013	ROR2	387,718
Rec	Frye, S	National Institutes of Health	1-R01-GM100919-01	5/1/2012	1/31/2016	Discovery of Chemical Probes for Methyl-Lysine Readers	281,200
Rec	Frye, S	North Carolina Biotechnology Center	2012-IDG-1005	2/1/2012	1/31/2013	Acquisition of a Tecan EVO 200 Robotic Sample Processor for UNC-CH CICBDD	200,000
Rec	Furey, T	National Cancer Institute - Fred Hutchinson Cancer Research Center	712036	9/1/2010	8/31/2012	Mechanism-Based Classification and Targeting of Castration-Resistant Prostate Cancer	25,377
Rec	Furey, T	National Cancer Institute - University of California at San Francisco (UCSF)	6970SC	10/1/2011	8/31/2012	Validation of Prognostic and Pathway Signatures in Lethal Prostate Cancer	18,866

UCRF	Current PI	Sponsor	Number	Begin Date	End Date	Title	Total Cost $
Rec	Furey, T	University of California at San Francisco (subcontract)	6648SC	10/1/2010	9/30/2012	Characterizing and Targeting Androgen Receptor Pathway-Independent Prostate Cancer	45,000
Rec	Garcia-Martinez, JV	Magee-Womens Research Institute and Foundation	7264	9/1/2010	8/31/2012	Topical Antiretrovirals to Prevent Rectal HIV Infection	277,817
Rec	Garcia-Martinez, JV	National Institutes of Health	5-R01-AI033331-18	3/1/1999	5/31/2013	Nef Function	392,657
Rec	Garcia-Martinez, JV	National Institutes of Health	5U19AI096113-02	7/8/2011	6/30/2016	BLT Model of Latency and Eradication	341,067
Rec	Garcia-Martinez, JV	National Institutes of Health	5-R01-AI096138-02, -02S1	7/1/2011	6/30/2015	Next Generation Pre-Exposure Prophylaxis	990,531
Rec	Garcia-Martinez, JV	National Institutes of Health	1-F32-AI100775-01	5/1/2012	4/30/2014	Fellow: Swanson, M (Mechanisms of Cell-Associated HIV Transmission in Humanized Mice)	49,214
Rec	Garcia-Martinez, JV	National Institutes of Health - Johns Hopkins University	2001057406	9/1/2010	8/31/2012	Mucus-Penetrating Nanoparticles for Sustained Drug Delivery	134,235
Rec	Gershon, T	National Institutes of Health	1-K08-NS077978-01	4/1/2012	3/31/2016	Aerobic Glycolysis Regulates Apoptosis in Neurogenesis and	174,921
Rec	Gershon, T	St. Baldrick's Foundation	NA	7/1/2011	6/30/2014	Jak-Stat Signaling: a Driving Force and Novel Target for	110,000
IA	Goldstein, R	National Science Foundation - Research (NSF)	IOS-0917726	7/1/2009	6/30/2013	Cell Polarization in Response to Wnt Signaling in C. elegans	150,000
Rec	Grilley-Olson, J	Bayer HealthCare LLC	NA	10/13/2011	10/12/2014	BAY 80-6946 A Phase 1 Study of BAY 80-6946 (Phosphatidylinositol-3 Kinase Inhibitor) in Combination with Gemcitabine (Treatment A) or Cisplatin plus Gemcitabine (Treatment B) in Subjects with	14,300
Ret	Hahn, K	American Cancer Society	PF-10-183-01-TBE	7/1/2010	6/30/2013	Small Molecule Based Biosensors for p38 Mitogen-Activated Protein	50,000
Ret	Hahn, K	American Heart Association	12POST10950000	7/1/2012	6/30/2014	Spatiotemporal Dynamics of ICAM-1-to-Rho Signaling in Transendothelial Migration	82,000
Ret	Hahn, K	Angelman Syndrome Foundation	PD201104	7/1/2011	6/30/2013	Designing Therapeutic Strategies for Angelman Syndrome by Identifying Upstream Regulators of Ube3a	104,000
Ret	Hahn, K	Arthritis Foundation	5536	10/1/2011	9/30/2013	Spatio-Temporal Dynamics of Rho Family Signaling in Leukocyte TEM	100,000
Ret	Hahn, K	Autism Speaks	7760	2/1/2012	1/31/2014	Bi-directional Regulation of Ube3a Stability by Cyclic AMP-Dependent Kinase	120,000
Ret	Hahn, K	Human Frontier Science Program	RGP0022/2010-C102	8/1/2010	7/31/2013	Optogenetics for Small G-Proteins and Protein Kinases in Neuroscience	100,000
Ret	Hahn, K	National Institutes of Health	5-F30-HL094020-05	8/5/2008	8/4/2013	Leukocyte Transendothelial Migration: Coordination of Rho	33,886
Ret	Hahn, K	National Institutes of Health	5-R01-GM057464-12	6/1/1999	8/31/2013	Dye-Based Biosensors: Simultaneous Imaging of Multiple Protein Activities	362,637
Ret	Hahn, K	University of Wisconson-Madison	412K285	8/1/2012	5/31/2013	A Toolkit for Imaging and Photo-Manipulation of Signaling in	318,371
Ret	Hahn, K (Danuser, multi PI)	National Institutes of Health - Harvard Medical School	5R01GM090317-04	9/30/2009	8/31/2014	Quantitative Imaging of Signaling Networks	322,826
Ret	Hayes, DN	Genentech, Inc.	NA	7/16/2007	7/15/2013	OSI3602s Multicenter Randomized Phase II Study of Erlotinib, Cisplatin	28,438

UCRF	Current PI	Sponsor	Number	Begin Date	End Date	Title	Total Cost $
Ret	Hayes, DN	ImClone Systems, Inc.	NA	7/6/2006	7/5/2012	Prospective, Longitudinal, Multi-Center, Descriptive Registry of	28,525
Ret	Hayes, DN	Lilly Research Laboratories	NA	5/21/2010	5/20/2013	I4E-MC-JXBA Phase 2 Study to Evaluate the Pharmacokinetics and Drug-Drug Interaction	39,493
Ret	Hayes, DN	National Cancer Institute	3-U24-CA143848-02S1	9/1/2010	8/31/2012	Gene Expression Patterns in Human Tumors Identified Using Transcript Sequencing	417,337
IA	Huang, L	National Cancer Institute	5-R01-CA129421-05	3/5/2008	2/28/2013	Interaction of Cationic Lipids with Dendritic Cells	292,148
Ret	Ibrahim, J	Amgen, Inc.	PO#7200322732	7/31/2008	12/31/2012	Supported Research Agreement	105,000
Ret	Ibrahim, J	Merck and Co., Inc.	NA	7/1/2009	2/28/2014	Methods for Interim Analysis with Incomplete Adjudication of Events	470,369
Ret	Ibrahim, J	National Cancer Institute	5-T32-CA106209-07	5/1/2004	6/30/2016	Biostatistics for Research in Genomics and Cancer	259,028
Ret	Ibrahim, J	National Cancer Institute	5P01CA142538-03	4/1/2010	3/31/2015	Methods for Post Marketing Surveillance and Comparative Effectiveness Research (Subproject)	113,127
Ret	Ibrahim, J	National Institutes of Health	5-R01-GM070335-14	3/1/1996	8/31/2015	Bayesian Approaches to Model Selection for Survival Data	284,557
Ret	Ibrahim, J	Novartis Pharmaceuticals Corporation	65201018	6/1/2008	12/31/2012	Supported Research Agreement with Novartis Pharmaceuticals Corporation	10,000
Rec	Innocenti, F	National Cancer Institute	5-K07-CA140390-05	9/23/2009	8/31/2014	Genome-Wide Molecular Epidemiology of Treatment Outcome	130,502
Rec	Innocenti, F	National Institutes of Health	7-R21-DK081157-03	5/1/2009	4/30/2013	Genome-Wide SNP Genotyping and Expression Analysis in Human Livers	169,065
Rec	Irvin, W	Quintiles	NA	3/8/2012	3/7/2015	IMCL CP12-1134 An Open-Label, Multicenter, Randomized, Phase 2 Study Evaluating the Efficacy and Safety of Ramucirumab (IMC-1121B) Drug Product in Combination with Eribulin Versus Eribulin Monotherapy in Unresectable, Locally-Recurrent or Metastatic Breast Cancer Patients Previously	32,183
Rec	Irvin, W	Susan G. Komen Breast Cancer Foundation	KG100355	5/18/2010	5/17/2013	Validating CYP2D6 Genotype-guided Tamoxifen Therapy for a Multiracial U.S. Population	149,905
Rec	Jin, J	National Institutes of Health	2U19MH082441-06	7/1/2012	4/30/2017	Functional Selectity: A Novel Approach for CNS Drug Discovery - Chemistry Project	380,000
Theme Invest (Drug, HTS)	Johnson, G	National Institutes of Health	1R01GM101141-01	4/15/2012	1/31/2016	Kinome Reprogramming in Response to Targeted Kinase Inhibitors	278,929
IA	Johnson, G	US Department of Defense, Department of the Army, Army Medical Research Acquisition Activity	W81XWH-12-1-0129	9/30/2012	9/29/2014	Targeted Therapy for MAP3K1 and MAP2K4 Mutant Estrogen Receptor Positive Breast Cancer	236,501
Theme Invest (HTS)	Juliano, J	National Institutes of Health	5R01AI089819-03	6/1/2010	5/31/2015	Within Host Selection of P. falciparum Variants by Artemisinin Combination Therapies	553,975
Rec	Kabanov, A	National Cancer Institute	7U01CA151806-03	2-Sep-10	31-Jul-15	High Capacity Nanocarriers for Cancer Chemotherapeutics	421,035
Rec	Kabanov, A	National Institutes of Health	7R01NS051334-07	4/1/2005	3/31/2015	Polypeptide Modification for Enhanced Brain Delivery	247,416

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Rec	Kasow, K (aka Wichlan, K)	Children's Healthcare of Atlanta, Inc.	NA	5/10/2011	5/9/2014	Toward a Less Toxic Yet Highly Effective Conditioning Regimen in Allogeneic Hematopoietic Stem Cell Transplantation for Children and Adolescents with Severe Sickle Cell	3,000
Rec	Kasow, K (aka Wichlan, K)	National Childhood Cancer Foundation	NA	3/1/2010	2/28/2013	CTN 0601 Unrelated Donor Hematopoietic Cell Transplantation	9,547
Rec	Kasow, K (aka Wichlan, K)	National Childhood Cancer Foundation	NA	3/1/2010	2/28/2013	CTN 0802 A Multi-Center, Randomized, Double Blind, Phase III	9,573
Rec	Kasow, K (aka Wichlan, K)	National Institutes of Health - New England Research Institutes	NA	8/1/2009	7/31/2014	TCRN-NMD-0901 Unrelated Donor Hematopoietic Cell Transplantation for Children with Severe Thalassemia Using a Reduced Intensity Conditioning Regimen (The URTH	8,000
Op Fund Invest	Keku, T	National Cancer Institute	5-R01-CA136887-01-04	5/1/2009	2/28/2014	Intestinal Microbiota, Diet and Risk of Colorectal Adenomas	297,887
Ret	Key, N	American Thrombosis and Hemostasis Network		1/15/2011	1/14/2013	Data Collection Using WebTracker/Lab Tracker, Train Data Manger	12,748
Ret	Key, N	Baxter Healthcare Corporation	NA	10/14/2011	10/13/2013	An Observational Study of Postoperative Deep Venous Thrombosis (DVT) in Hemophilics Undergoing Major Orthopedic	120,000
Ret	Key, N	Biogen, Inc.		10/13/2010	10/12/2013	998HB102 An OL, Multicenter Evaluation of the Safety, Pharmacokinetics, & Efficacy of Recombinant, Long Acting Coagulation Factor IX Fc Fusion (rFIXFc) in the Prevention & Treatment of Bleeding in Previously	7,000
Ret	Key, N	Hemostasis and Thrombosis Research Society	NA	7/1/2012	6/30/2014	Exploratory Study to Assess the Potential Contribution of Tissue Factor and Microparticles to Disease Pathogenesis and the Activated State of Coagulation in Inflammatory	150,000
Ret	Key, N	McMaster University (subcontract)	NA	5/7/2009	10/31/2014	DODS - D-dimer Optimal Duration Study	5,600
Ret	Key, N	Minneapolis Medical Research Foundation	07193-01	1/1/2012	12/31/2012	HIV Effects on Coagulation Biology	4,743
Ret	Key, N	National Institutes of Health	2-T32-HL007149-36A1	7/1/1975	6/30/2017	Research Fellowship in Hematology/Oncology	302,383
Ret	Key, N	National Institutes of Health	5-U01-HL072355-10	9/30/2002	8/31/2012	Transfusion Medicine/Hemostasis Clinical Trials Network	159,688
Ret	Key, N	National Institutes of Health - New England Research Institutes	NA	9/1/2007	8/31/2012	Transfusion Medicine/Hemostasis Clinical Trial Network	44,490
Ret	Key, N	Novo Nordisk Helth Care A.G.	NA	1/1/2012	12/31/2012	Access to Insight Fellowship (Hua)	79,443
Ret	Kim, HJ	Society of Surgical Oncology	NA	4/1/2010	9/30/2012	Role of Palladin in Breast Cancer Metastasis	50,000
Theme Invest (HTS)	Knowles, M	National Institutes of Health	2 R01 HL 68890-11A1	8/1/2012	6/30/2015	Gene Modifiers in CF Lung Disease	750,612
Rec	Laederach, A	National Institutes of Health	1-R01-HL111527-01	1/1/2012	12/31/2016	Non-coding RNA Structure Change in Chronic Obstructive Pulmonary	360,052

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Rec	Laederach, A	National Institutes of Health	7-R00-GM079953-05	7/15/2007	6/30/2013	Multi-Scale Dynamic Modeling of RNA Folding and Assembly	246,510
Rec	Laederach, A	National Institutes of Health	1-R01-GM101237-01	5/1/2012	4/30/2016	Structural and Functional Consequences of Disease SNPs on	273,639
Rec	Lai, S	National Institutes of Health	5-R21-AI093242-02	1/1/2011	12/31/2012	Trapping HIV in Mucus with IgG Antibodies	219,709
Rec	Lai, S	National Institutes of Health	1-R21-AI090507-02	8/1/2011	7/31/2013	Diffusion of Viruses across Human Airway Mucus and Trapping by	219,709
Rec	Lai, S	National Institutes of Health - Boston University	9500241409	8/1/2011	7/31/2012	Optimizing Plantibodies for Trapping HIV and HSV in Cervicovaginal Mucus	143,560
Rec	Lai, S	National Institutes of Health - Boston University	9500301035	3/3/2012	7/31/2012	Diversity Supplement: Optimizing Plantibodies for Trapping HIV and HSV in Cervicovaginal Mucus	26,134
Rec	Lai, S	National Science Foundation - Research (NSF)	DMR-1151477	4/15/2012	3/31/2017	Synthetic Nanoprobes Reveal Novel Biophysical Immune Protective Mechanism of Mucus	400,000
IA	Lawrence, D	National Cancer Institute	5-R01-CA140173-04	5/1/2009	2/28/2014	Signaling Network Dynamics in Metastatic Prostate Cancer	411,004
Rec	Lee, C	Quintiles	NA	11/10/2011	11/9/2014	E7050-703 An Open-Label, Multicenter, Randomized, Phase Ib/II Study of E7050 in Combination with Cisplatin and Capecitabine versus Cisplatin and Capecitabine Alone in Patients with Advanced or Metastatic Solid Tumors and	29,076
Rec	Lemon, S	Confidential	40420	2/10/2012	2/9/2014	Confidential Collaborative Research Agreement	128,423
Rec	Lemon, S	Merck and Co., Inc.	NA	5/11/2011	5/10/2013	Deep Sequencing for the NS3-Coding Region in Co-Infected Patients	137,631
Rec	Lemon, S	Merck and Co., Inc.	NA	1/17/2012	1/16/2013	Merck Primer Study	50,000
Rec	Lemon, S	National Cancer Institute	1-R01-CA164029-01	5/1/2012	3/31/2017	Murine Model of HCV-Associated Human Liver Cancer	470,695
Rec	Lemon, S	National Cancer Institute - University of Kentucky Research Foundation	3048105880-11-149	5/1/2010	8/31/2012	Hepatitis C and Tumor Suppressors in Hepatocellular Carcinoma (HCC)	231,400
Rec	Lemon, S	National Institutes of Health	1R01AI103083-01	9/24/2012	8/31/2017	Membrane Hijacking: Biogenesis and Fate of Enveloped Hepatovirus	380,000
Rec	Lemon, S	National Institutes of Health	5-R01-AI095690-01-02	4/15/2011	3/31/2016	Micro-RNA 122 and Chronic Hepatitis C	368,389
Rec	Lemon, S	National Institutes of Health - Johns Hopkins University	2001169668	8/1/2010	7/31/2012	Mechanisms of Hepatitis C Virus Evolution	131,470
Rec	Lemon, S	Scynexis	NA	4/1/2012	3/31/2014	SCY635 Induction of Interferon	33,075
Rec	Lemon, S	Tibotec Pharmaceuticals Ltd	P20784122R	4/26/2011	4/25/2013	Innate Immune Signaling and Direct Acting Antivirals Targeting HCV Tibotec Research Collaboration	132,715
Ret	Lieb, J	Damon Runyon Cancer Research Foundation	2083-11	1/1/2011	12/31/2013	When Paths Diverge: Patterns and Mechanisms of Asymmetric Cell Division	78,000
Ret	Lieb, J	National Institutes of Health	5-R01-GM072518-07	8/1/2005	7/31/2015	Uniting Disparate Fields to Explore Transcription Factor Binding	301,206

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Ret	Lieb, J	National Institutes of Health	1-R01-HG006787-01	4/23/2012	2/28/2015	Highly Parallel Functional Characterization of Human Regulatory Elements	446,265
Ret	Lieb, J	National Institutes of Health	1-F32-GM099265-01A1	5/1/2012	7/31/2014	Probing the Global Stability of Transcription Factor-DNA	52,190
Ret	Lieb, J	Progeria Research Foundation	N/A	1/1/2010	8/31/2012	Interactions between Genes and lamin A/Progerin A Window to Understanding Progeria Pathology	50,000
Ret	Linnan, L	National Cancer Institute	5U54CA156733-03	9/28/2010	8/31/2015	Promoting Physical Activity in Black Barbershops	156,936
Ret	Lund, P	National Cancer Center	NA	6/1/2011	5/31/2013	Identification and Functional Validation of a Putative Intestinal Stem Cell Specific Tumor Suppressor	42,000
Ret	Lund, P	National Institutes of Health	1-R01-AG041198-01A1	8/1/2012	6/30/2017	Aging Intestinal Stem Cells and Insulin/IGF System	309,425
Ret	Lund, P	National Institutes of Health	5-R01-DK040247-20	5/1/1989	6/30/2015	Intestinal Adaptation - Role of Hormones & Growth Factors	335,435
Ret	Lund, P	National Institutes of Health	R01-DK047769-13, 12S1	9/1/1995	3/31/2014	Growth Factors and Inflammatory Bowel Disease	498,207
Ret	Lund, P	National Institutes of Health	5-F31-AG040943-02	7/1/2011	6/30/2013	Fellow: Bortvedt, S (Insulin Receptor in Intestinal Growth, Tumorigenesis, Aging, and Obesity)	29,181
IA	Mackman, N	National Institutes of Health	5-R01-HL095096-01-05, -04S1	9/26/2008	7/31/2013	Mechanisms of Venous Thromboembolism in Cancer	581,883
Theme Invest (CC)	Magnuson, T	National Institutes of Health	8U42OD010924-13	9/30/2010	2/28/2015	A Carolina Center to Characterize and Maintain Mutant Mice	1,443,739
Rec	Major, MB	Office of the Director, National Institutes of Health	1-DP2-OD007149-01	9/30/2010	8/31/2015	Exploitation of Near-Haploid Human Cells for Functional Gene Discovery	444,000
Rec	Makowski, L (aka Hayes, L)	National Institutes of Health	5-R00-AA017376-05	8/1/2007	12/31/2012	Macrophage Mitochondrial Stress in Inflammation, Insulin Resistance & Obesity	239,338
Rec	Marks, L	Centers for Disease Control and Prevention	5-U58-DP003414-02	9/30/2011	9/29/2014	Improving Access and Utilization of Support Services in Young Breast Cancer Survivors	260,242
Rec	Marks, L	National Cancer Institute	5-R01-CA069579-15	5/1/1996	5/31/2013	Radiation-Induced Cardiopulmonary Injury in Humans	214,198
Theme Invest (HTS)	Matera, AG	National Institutes of Health	5-R01-GM053034-16	5/1/2011	4/30/2015	Biogenesis of Small Ribonucleoproteins	311,661
Theme Invest (HTS)	Matera, AG	National Institutes of Health	5-R01-NS041617-12	5/1/2001	7/31/2014	Coilin, Cajal Bodies and Spinal Muscular Atrophy	294,830
Ret	Miller, R	Damon Runyon Cancer Research Foundation	45-09	7/1/2009	12/31/2012	Genomics-Driven Drug Development for Glioblastoma	150,000
Theme Invest (CBCS, HTS)	Millikan, R	National Cancer Institute - Roswell Park Cancer Institute	55-8006-01	8/1/2011	7/31/2012	Epidemiology of Breast Cancer Subtypes in African-American Women: a Consortium	928,034
Theme Invest (CBCS, HTS)	Millikan, R	Susan G. Komen Breast Cancer Foundation	NA	5/1/2012	4/30/2013	Carolina Breast Cancer Study: Phase III	301,054
Theme Invest (HTS)	Mohlke, K	National Institutes of Health	5R01DK072193-07	9/1/2010	5/31/2015	Targeted Genetic Analysis of T2D and Quantitative Traits	627,665

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Theme Invest (HTS)	Mohlke, K	National Institutes of Health	5-R01-DK093757-01-02	9/5/2011	7/31/2016	Genetic Epidemiology of Rare and Regulatory Variants for Metabolic Traits	618,801
Rec	Moody, C	National Cancer Institute	5-R00-CA137160-03-04	9/20/2008	8/31/2013	The Role of Caspase Activation in the Differentiation-Dependent Life Cycle of HP	241,530
Rec	Muss, H	Breast Cancer Research Foundation	NA	10/1/2010	9/30/2012	The Effect of Chemotherapy on Aging in Older Women with Breast Cancer	225,000
Rec	Muss, H	City of Hope National Medical Center (subcontract)	23030.914940.6695	8/15/2011	7/31/2012	Clinical and Biological Predictors of Chemotherapy Toxicity in Older Adults with Cancer	29,047
Ret	O'Neil, B	Aptium Oncology	NA	4/6/2010	4/5/2013	09PAN01 A Phase 1b Study of Erlotinib in Combination with	16,250
Ret	O'Neil, B	Aptium Oncology	NA	9/27/2010	9/26/2013	AG/ICC 09CRC02 A Dose Finding and Phase II Study of AZD6244 (Hyd-Sulfate) in Combination with Irinotecan in 2nd Line Patients with K-ras or B-raf Mutation Positive Advanced or Metastatic Colorectal	7,424
Ret	O'Neil, B	Aptium Oncology	NA	9/7/2011	9/6/2014	11PAN01 A Phase II/III, Multi-center, Randomized, Controlled Study to Compare the Efficacy and Safety of Gemcitabine Alone vs. ON 01910.Na Combined with Gemcitabine in Patients with Previously Untreated Metastatic Pancreatic Cancer	30,935
Ret	O'Neil, B	Averion International Corp	NA	11/6/2009	11/5/2012	GC-002US A Phase I, Open-Label, Multi-center, Dose-escalation Study	10,931
Ret	O'Neil, B	GlobeImmune, Inc	NA	11/1/2006	9/30/2012	Ph 2 Dbl-Blind, Trial of GI-4000; an Inactivated Recombinant Saccharomyces Cerev	14,256
Ret	O'Neil, B	INC Research, Inc.	NA	12/5/2011	12/4/2014	MM-121-05-01-05 A Phase 1 Study of MM-121 in Combination with Cetuximab and Irinotecan in Patients with Advanced Cancers	65,785
Ret	O'Neil, B	National Cancer Institute - H. Lee Moffitt Cancer Center and Research Institute	NA	5/11/2010	5/10/2013	NCI 8233 A Phase II Trial of Temsirolimus and Bevacizumab in Patients with Endometrial	12,034
Ret	O'Neil, B	Novartis Pharmaceuticals Corporation	NA	2/1/2008	12/31/2012	CRAD001C2493 A Sequential Phase I Study of the Combination of EverO1ImUs (RAD0	25,000
Ret	O'Neil, B	Novartis Pharmaceuticals Corporation	NA	9/22/2011	12/31/2013	CSOM230DUS22T Phase II Single Arm Study of Everolimus and Pasireotide (SOM230) in Patients with Advanced or Metastatic Hepatocellular Carcinoma (HCC)	54,086
Ret	O'Neil, B	Quintiles	NA	9/28/2011	9/27/2014	E7050-701 An Open-Label, Multicenter, Randomized, Phase Ib/II Study of E7050 in Combination with Sorafenib versus Sorafenib Alone as First Line Therapy in Patients with	87,801
Theme Invest (CC)	Pardo Manuel de Villena, F	National Institutes of Health	5-R01-HD065024-03	5/1/2010	4/30/2015	Collaborative Cross: A System Genetics Approach to the Study of Male Infertility	330,366

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Theme Invest (CC)	Pardo Manuel de Villena, F	National Institutes of Health	5-P50-HG006582-04, -04S1	9/30/2009	8/31/2014	An Interdisciplinary Program for Systems Genomics of Complex Behaviors	902,279
Theme Invest (CC)	Pardo-Manuel de Villena, F	National Institutes of Health	1R21MH096261-01	4/1/2012	3/31/2014	Effect of Paternal Age on Mutational Burden and Behavior in Mice	222,000
Theme Invest (CC)	Pardo-Manuel de Villena, F	National Institutes of Health	Neogen Corp	5/1/2012	5/31/2013	Content Selection for a New Mouse Genotyping Array	75,000
Theme Invest (CC)	Pardo-Manuel de Villena, F	National Institutes of Health - Jackson Lab	2P50GM076468-06, subcontract	7/1/2012	6/30/2013	Genome Dynamics: Evolution, Organization and Function	221,594
Theme Invest (CC)	Pardo-Manuel de Villena, F	National Institutes of Health - University of Colorado	FY13.236.001 - 5U01DE020054-04	9/21/2009	4/30/2011	Genetic Determinants of Orofacial Shape and Relationship to Cleft Lip/Palate	132,701
Rec	Park, S	Allos Therapeutics, Inc.	NA	2/8/2011	2/7/2014	Prospective, Longitudinal, Multinational Registry of Patients with Newly Diagnosed Peripheral T-	1,125
Rec	Park, S	GlaxoSmithKline, Inc	NA	2/13/2012	2/12/2015	OMB110928 Ofatumumab versus Rituximab Salvage Chemoimmunotherapy followed by ASCT in Relapsed or Refractory	12,800
Rec	Park, S	GlaxoSmithKline, Inc	NA	5/6/2010	5/5/2013	OMB112517 A Phase III, Open Label, Randomized, Multicenter Trial of Ofatumuma	6,188
Rec	Park, S	Millennium Pharmaceuticals, Inc.	NA	9/14/2011	9/13/2014	C14011 A Multicenter, Phase 1-2 Study of MLN8237, an Oral Aurora A Kinase Inhibitor, in Patients with Relapsed or Refractory Aggressive B-Cell Lymphoma Treated with	29,900
Rec	Park, S	Seattle Genetics, Inc	NA	4/26/2012	4/25/2015	LCCC 1115 A Pilot Feasibility Trial of Induction Chemotherapy with ABVD Followed by Brentuximab Vedotin (SGN-35) Consolidation in Patients with Previously Untreated Non-Bulky Stage I or II Hodgkin Lymphoma (HL)	60,000
Rec	Park, S	Seattle Genetics, Inc.	NA	8/19/2010	8/18/2013	SGN35-009 A Phase 1 Dose-Escalation Safety Study of Brentuximab Vedotin in Combination with ABVD as Frontline Therapy in Patients with Hodgkin Lymphoma	78,142
Theme Invest (HTS)	Perou, C	Alliance for Clinical Trials in Oncology Foundation	NA	9/1/2011	8/31/2013	Genomic Analysis of CALGB 40603, a Neoadjuvant Trial for Triple-Negative Breast Cancer Patients	418,000
Theme Invest (HTS)	Perou, C	Breast Cancer Research Foundation	NA	10/1/2010	9/30/2012	Molecular Therapeutics for Luminal Tumor Subtypes	225,000
Theme Invest (HTS)	Perou, C	National Cancer Institute	5-U24-CA143848-04	9/29/2009	7/31/2014	Gene Expression Patterns in Human Tumors Identified Using Transcript Sequencing	3,802,733
Theme Invest (HTS)	Perou, C	Susan G. Komen Breast Cancer Foundation	NA	4/1/2012	3/31/2013	Single Cell Genomics to Study the Microenvironment and Tumor Evolution	111,811
Theme Invest (HTS)	Perou, C; Rosen, J; et al	National Cancer Institute - Baylor College of Medicine	5R01CA148761-03	3/17/2010	12/31/2014	Therapeutic Targeting of Breast Cancer Tumor Initiating Cells	491,675

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Theme Invest (HTS)	Philpott, B	National Institutes of Health	1R01MH093372-01A1	12/9/2011	11/30/2016	Epigenetic Regulation of UBE3A as a Treatment for Angleman Syndrome	614,344
Theme Invest (HTS)	Prins, J	National Institutes of Health	1R01HG006272-01A1	5/23/2012	3/31/2015	Unlocking Transcript Diversity via Differential Analyses of Splice Graphs	425,000
Ret	Pruthi, R	GTx, Inc.	NA	8/12/2011	8/9/2013	G20075 Phase II, Open Label, Dose Finding Study of the Effect of GTx-758 on Total and Free Testosterone Levels in Men with Prostate Cancer Compared to a Luteinizing Hormone Releasing Hormone Agonist	37,302
Ret	Ramsey, JM	National Institutes of Health - University of Pittsburgh	0023300(119860-1)	7/1/2011	6/30/2015	Single Cell Electroporation	58,802
Ret	Ramsey, JM	US Defense Advanced Research Project Agency	HR0011-12-2-0001	11/7/2011	9/30/2016	Reconfigurable Multi Element Diagnostic ReMeDx	1,000,000
Ret	Ramsey, JM	Waters Technologies Corporation		11/1/2006	12/31/2012	Micro Chip HPLC	181,188
Theme Invest (HTS)	Randell, S & Hogan, B	National Institutes of Health	1 U01 HL 111018-01	1/1/2012	12/31/2016	An Integrated Approach to Airway Epithelial Repair and Regeneration - UNC MPI Subcontract	214,600
Rec	Reeve, B	Childrens Research Institute	NA	1/2/2012	1/1/2013	Preliminary Content Validation Steps for the Pediatric Oncology Patient Self-Report CTCAE	8,770
Rec	Reeve, B	National Cancer Institute	1R01CA174453-01	9/21/2012	7/31/2016	PROMIS Validation in Prospective Population-based Prostate Cancer Research Study	283,860
Rec	Reeve, B	National Cancer Institute	HHSN261201100480P	9/20/2011	9/19/2012	Expert Consultation to Advance Measurement of Patient-Reported Outcomes (PROs)	24,995
Rec	Reeve, B	National Cancer Institute - H. Lee Moffitt Cancer Center and Research Institute	10-16373-99-01-G1	9/9/2011	7/31/2016	Health-Related Quality of Life Values for Cancer Survivors: Enhancing the Application of PROMIS Measures for Comparative Effectiveness	53,567
Rec	Rini, C	National Institutes of Health	5-R01-AR057346-03	9/20/2010	6/30/2013	Internet-Based Osteoarthritis Pain Coping Skills Intervention	658,632
Rec	Robinson, W	National Cancer Institute	1K01CA172717-01	9/11/2012	8/31/2017	Racial Disparities in Cancer Outcomes: Quantifying Modifiable	128,922
Rec	Rogers, A	National Cancer Institute	5-R21-CA158661-02	3/1/2011	2/28/2013	Epigenetic Regulation Of Sex-dependent Liver Cancer	160,950
Rec	Sanoff, H	National Cancer Institute	7K07CA160722-02	9/12/2011	8/31/2016	Use and Comparative Effectiveness of Innovative Therapies for Hepatocellular Carcinoma	170,100
Rec	Sarantopoulos, S	Fred Hutchinson Cancer Research Center (subcontract)	737103	9/1/2011	8/31/2012	Project 1 and 2	18,165
Rec	Sarantopoulos, S	National Institutes of Health	5-K08-HL107756-02	7/12/2011	6/30/2015	BAFF Pathology: Novel Therapeutic Targets in Chronic Graft versus Host Disease	132,493
Rec	Sarantopoulos, S	US Army Medical Research	W81XWH-11-1-0537	8/1/2011	7/31/2014	BAFF-driven Targeted Immunotherapy for Patients with	440,220
Ret	Schoenfisch, M	National Institutes of Health	1R21AI097539-01A1	7/1/2012	6/30/2014	Temporal Analysis of Nitric Oxide as Potential Sepsis Biomarker	182,741

UCRF	Current PI	Sponsor	Number	Begin Date	End Date	Title	Total Cost $
Ret	Schoenfisch, M	National Institutes of Health	5R01EB000708-09	9/25/2002	1/31/2013	Nitric Oxide-Releasing Glucose Biosensors	315,443
Rec	Sethupathy, P	National Institutes of Health	4R00DK091318-02	6/1/2012	5/31/2015	Discovery of Micro-RNA Regulatory Modules Controlling Human Pancreatic Islet Funct	248,575
Ret	Shaheen, N	American Society for Gastrointestinal Endoscopy	NA	7/15/2010	7/14/2012	Is the Neosquamous Epithelium "Normal" Following Endoscopic Ablation of Dysplastic Barrett's	75,000
Ret	Shaheen, N	BARRX Medical, Inc.	NA	3/3/2006	7/1/2013	Ablation of Intestinal Metaplasia Containing Dysplasia (AIM Dysplasia Trial) Multi-Center, Randomized, Sham-Controlled Trial	41,109
Ret	Shaheen, N	BARRX Medical, Inc.	NA	8/17/2009	6/30/2014	B500 HALO Patient Registry Ablation of Barrett's Esophagus	27,804
Ret	Shaheen, N	CSA Medical, Inc.	NA	8/1/2012	7/31/2013	TruFreeze Effectiveness in Eliminating Barrett's Esophagus	126,223
Ret	Shaheen, N	CSA Medical, Inc.	NA	5/15/2012	5/14/2013	Study Design, Development, and Consult Services with CSA	176,013
Ret	Shaheen, N	Kaiser Foundation	115-9607-02	9/1/2010	8/31/2012	Adipokines and Barrett's Esophagus	46,529
Ret	Shaheen, N	National Cancer Institute	5U54CA156733-03	9/28/2010	8/31/2015	Racial Disparity in Barrett's Esophagus	389,376
Ret	Shaheen, N	National Cancer Institute - Case Western Reserve	RES506502	9/26/2011	8/31/2012	Barrett's Esophagus Translational Research Network (BETRNet)	38,162
Ret	Shaheen, N	National Cancer Institute - Fred Hutchinson Cancer Research Center	NA	9/21/2009	8/31/2012	Barrett's and Esophageal Adenocarcinoma Consortium Genetics Susceptibility Study	82,740
Ret	Shaheen, N	National Institutes of Health - Case Western Reserve	RES504795	9/1/2009	8/31/2012	Familial Barrett's Esophagus	22,603
Ret	Shaheen, N	Oncoscope, Inc	NA	10/19/2009	10/18/2012	Clinical Validation of A/LCI for Detecting Pre-Cancerous Lesions in	23,123
IA	Sharpless, N	G-Zero Therapeutics	1R43AI084284-01	9/1/2009	8/31/2012	SBIR-NIAID Advanced Technology	95,306
Rec	Shen, D	National Cancer Institute	5-R01-CA140413-03	7/6/2010	12/31/2014	Online Collection of Patient-Specific Information for Daily Prostate Segmentation	335,124
Rec	Shen, D	National Institutes of Health	1-R01-AG041721-01A1	8/1/2012	5/31/2015	Quantifying Brain Abnormality by Multimodality Neuroimage Analysis	413,404
Rec	Shen, D	National Institutes of Health	5-R01-EB006733-04A1	9/17/2008	8/31/2012	Development and Dissemination of Robust Brain MRI Measurement	531,904
Rec	Shen, D	National Institutes of Health	5-R01-EB008374-04	9/15/2009	8/31/2013	Continued Development of 4-dimensional Image Warping and Registration Software	320,080
Rec	Shen, D	National Institutes of Health	1-R01-EB009634-02	9/1/2011	8/31/2015	Fast, Robust Analysis of Large Population Data	333,000
Theme Invest (CC)	Sparling, PF	National Institutes of Health	5-U54-AI057157-10	3/1/2012	2/28/2013	SERCEB Administrative Supplement Request to support inbreeding and genotyping of the CC	241,570
Ret	Stinchcombe, T	BiPar Sciences, Inc.	NA	9/23/2010	9/22/2013	20090321 Randomized Phase 3 Trial of Gemcitabine/Carboplatin With or Without BSI-201 (SAR240550) (a PARP1 Inhibitor) in Patients with Previously Untreated Stage IV Squamous Non-Small Cell Lung	43,320
Ret	Stinchcombe, T	Genentech, Inc.	NA	9/18/2009	9/17/2012	AVF499s A Multicenter Phase II Trial of Carboplatin, Pemetrexed, And Bevacizumab	32,801

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IA	Su, L	Baylor University Research Institute	NA	6/1/2012	5/31/2014	Modeling Novel HCV Vaccines in Humanized Mice In Vivo	443,244
IA	Su, L	National Institutes of Health	1-R01-AI095097-01A1	12/1/2011	11/30/2016	HIV Co-Infection and HCV-Induced Liver Fibrosis In Vivo	370,000
Theme Invest (HTS)	Sullivan, P	National Institutes of Health	R21 MH097173-01	4/1/2012	3/31/2014	Biomarkers of Olanzapine-Induced Weight Gain in Mice	222,000
Theme Invest (HTS)	Swanstrom, R	National Institutes of Health	R37 AI44667	4/1/2010	3/31/2015	Biological Properties of HIV-1 V3 Evolutionary Variants	324,594
IA	Thomas, N	National Cancer Institute	5-R01-CA112243-06-08	5/13/2005	1/31/2015	Melanoma RAS/BRAF Mutation: Heterogeneity-Risk-Prognosis	511,659
Theme Invest (CC)	Threadgill, D	National Cancer Institute	5U01CA105417-09	8/15/2004	7/31/2014	Modeling Heterogeneity for Safe Cancer Prevention and Detection	737,075
Theme Invest (CC)	Threadgill, D	National Cancer Institute	5-U01-CA134240-05	9/28/2007	8/31/2013	Systems Genetics Research Consortium	1,024,847
Rec	Troester, M	Avon Foundation	02-2009-077/2011-084	11/1/2009	10/31/2012	Characterizing Variation in Breast Cancer Microenvironment	150,000
Rec	Troester, M	National Cancer Institute - Washington University @ St. Louis, Mo.	WU-12-19/2916595T	9/14/2010	11/11/2012	Gene Expression Profiles of Histologically Normal Breast Tissue	384,000
Rec	Troester, M	National Institutes of Health	5-U01-ES019472-03, -03S2	8/17/2010	5/31/2015	Pregnancy, Obesogenic Environments, and Basal-like Breast	520,649
Rec	Valdar, W	National Institutes of Health	1R01GM104125-01	9/30/2012	8/31/2017	Statistical Modeling of Complex Traits in Genetic Reference Super	241,086
Rec	Vaziri, C	National Institutes of Health	2-R01-ES009558-16	8/1/1998	4/30/2017	A Novel Carcinogen-Induced Cell Cycle Checkpoint	333,000
Rec	Vaziri, C	National Institutes of Health	5-R01-ES016280-05	8/1/2008	5/31/2013	A Novel Role for the Franconi Anemia Pathway in Replication of BaP Adducted DN	293,736
Rec	Vaziri, C	National Institutes of Health	5-F30-ES019449-03	8/1/2010	7/31/2015	Regulatory Signaling in Repair of Environmentally Induced DNA	30,529
Rec	Wan, Y	Lupus Research Institute	NA	1/1/2011	12/31/2013	Functional Instability Of Treg Cells in SLE	150,000
Rec	Wan, Y	National Institutes of Health	1-R01-AI097392-01A1	5/1/2012	4/30/2017	The Roles of Gata3 in Controlling Treg Function	368,389
Rec	Wang, A	National Academies Keck Futures Initiative	NAKFI IS12	5/3/2011	6/30/2013	Development of Nanoparticle-Based Multiplex Multimodality Imaging Agents	50,000
Rec	Wang, G	National Cancer Institute	4R00CA151683-04	9/1/2012	8/31/2015	Cancer Epigenetics: Understanding Histone Methylation in Leukemia Stem Cells	249,000
Rec	Weiss, J	Acceleron Pharma	NA	3/27/2012	3/26/2015	A041-03 An Open-label Phase 2 Study of ACE-041 in Patients with Recurrent or Metastatic Squamous Cell Carcinoma of the Head and Neck	14,300
Rec	Weiss, J	Celgene	NA	9/8/2011	9/7/2014	ABX270 A Phase II study of Carboplatin, Nab-Paclitaxel and Cetuximab for Induction Chemotherapy for Locally Advanced Squamous Cell Carcinoma of the	21,000
Rec	Weiss, J	University of Pennsylvania	NA	3/10/2011	3/9/2014	UPCC#15309 A Phase II Study of Capecitabine and Lapatinib in Squamous Cell and Undifferentiated Carcinoma of the Head and Neck	31,200

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Rec	Whitehurst, A	American Association for Cancer Research	SU2C-AACR-IRG1211	6/1/2011	5/31/2014	Framing Therapeutic Opportunities in Tumor-Activated Gametogenic Programs	247,500
Rec	Whitehurst, A	National Cancer Institute	5-R00-CA128926-04	1/15/2009	12/31/2012	Harnessing Functional Genomics to Reveal Cancer Specific Determinants of Mitosis	241,530
Rec	Whitehurst, A	National Cancer Institute	5-R01-CA154699-02	12/13/2010	11/30/2015	Mechanistic Elaboration of Fragility in the Cancer Cell Mitotic Spindle	302,525
Theme Invest (HTS)	Wilhelmsen, K	National Institutes of Health	5-R01-DA030976-03	9/30/2010	5/31/2015	Deep Sequencing Studies for Cannabis and Stimulant Dependence	3,385,844
IA	Xiong, Y	National Cancer Institute	1R01CA163834-01	3/1/2012	2/28/2017	Mechanisms of Metabolic Gene Mutations in Cancer	357,100
Theme Invest (Drug)	Xiong, Y	National Cancer Institute - SAIC-Frederick Inc	A56711/29XS126	7/23/2010	1/31/2013	Task Order#4- BOA under 5-58589 as a Comprehensive Chemical Biology Screening Center	1,136,995
Rec	Yang, Y	National Institutes of Health	5-K01-AG036745-03	8/1/2010	7/31/2015	Sex Differences in Health and Longevity: A Social and	120,339
Rec	Zamboni, W	American Brain Tumor Association	NA	7/1/2012	6/30/2013	Nanoparticle Agents for the Treatmetn of Metastatic and Central Nervous System Malignancies	50,000
Rec	Zamboni, W	National Institutes of Health - University of Pittsburgh	0000017/113312-2	5/1/2008	7/31/2012	A New Dimension in Renal Clearance Design Criteria for Dendrimer Nanostructures	3,000
Rec	Zamboni, W	Nemucore Medical Innovations, Inc.	NA	6/15/2012	6/14/2013	ICP-MS Analysis of Platinum (Pt) and Gadolinium (Gd) in Plasma and Tissues as part of the Pharmacokinetic Study of NMI-300 Formulations in Non-Tumor Bearing	15,000
Rec	Zamboni, W	SciDose, LLC	NA	9/15/2010	9/14/2013	Pharmacology Studies of Curcumin-Succinate-PEG400 Conjugate compared with Curcum	247,229
Op Fund Invest	Zhou, O	Carestream Health, Inc.	NA	4/30/2012	4/29/2013	Portable Tomosynthesis System Using Carbon Nanotube X-Ray	150,000
Op Fund Invest	Zhou, O	Duke University (subcontract)	12-DHS-1035	9/23/2011	9/22/2012	X-Ray Scatter and Phase Imaging for Explosive Detection	177,868
Op Fund Invest	Zhou, O	National Cancer Institute	5-R01-CA134598-04	6/19/2009	4/30/2013	Next Generation Digital Breast Tomosynthesis Scanner	395,157
Op Fund Invest	Zhou, O	National Cancer Institute	5-RC2-CA148487-02	9/30/2009	8/31/2012	Nanotechnology Enabled Desktop Image-Guided Microbeam Radiation Therapy System	310,098
Theme Invest (CC)	Zou, F	National Institutes of Health	2R01GM074175-05	4/1/2006	8/31/2015	Robust Methods for Complex Trait Mapping with Collaborative Cross	220,676
TOTAL							**87,969,823**