



UNIVERSITY OF
LOUISVILLE



**NCI R25 Cancer
Education Program**

Educating future researchers to reduce the effects of cancer in Kentucky and the world.

ON THE COVER: 2015 NCI Cancer Education Program undergraduate Thomas Packer, Jr. with La Creis Kidd, PhD, the James Graham Brown Foundation “Our Highest Potential” Endowed Chair in Cancer Research, associate professor of pharmacology and toxicology, and director of the NCI Cancer Education Program.



Jingjing Xiao
Cancer Educ. Prog.
Yale University

“This summer, I’ve learned more about the cancer research career path in CEP than I could have ever learned in class. Exposure to real life experience and testimony helped me clarify my career goals more than I imagined.”

— *Jingjing Xiao*,
Yale University, 2015
NCI Cancer Education
Program undergraduate,
with Brian Cerese, PhD,
associate professor
of pharmacology
and toxicology

Producing the next generation of cancer researchers

The University of Louisville NCI Cancer Education Program recruits, educates and motivates outstanding undergraduate and professional students to pursue further training and future careers in cancer research.

Cancer incidence, morbidity and mortality in the Commonwealth of Kentucky are among the highest in the nation. The mission of the James Graham Brown Cancer Center, which serves as the academic host of the program, is to reduce cancer incidence, morbidity and mortality particularly within the Commonwealth and the region we serve.

The Cancer Education Program, funded by an R25 grant from the National Cancer Institute, is open to medical, dental, nursing, public health, undergraduate and pre-matriculating professional/graduate students.

Over a period of 10 weeks, typically during the summer, students formulate a cancer research project in collaboration with their mentors, who are members of the James Graham Brown Cancer Center. Students experience a rich environment of cancer-related research seminars and educational sessions. As a capstone event, students present their research findings at the annual Research!Louisville meeting, where they are judged and prizes awarded to both students and their mentors.

PHOTO: Students and faculty of the 2015 UofL NCI R25 Cancer Education Program



UofL NCI Cancer Education Program participants have been recruited from these prestigious institutions:

Auburn University

Emory University

St. Louis University

University of Louisville

Campbellsville University

Indiana University

SUNY-Binghamton

University of Kentucky

Cheyney University
of Pennsylvania

Massachusetts Institute of
Technology

University of Alabama

University of Notre Dame

Clemson University

Michigan State University

University of Chicago

Washington University

Cornell University

Middle Tennessee
State University

University of Cincinnati

Western Kentucky University

Drexel University

Morehead State University

University of Houston

Wheaton College

Duke University

Roosevelt University

University of Louisiana-
Monroe

Yale University

Program Components

Professional development & training activities

- Research ethics and integrity/responsible conduct of research
- Human subjects/HIPAA
- Animal care and use
- Lab safety, hazardous waste and blood-borne pathogens
- Distinction in Research program
- Creating an individualized career development plan
- How to write and submit a manuscript
- How to prepare award-winning research abstracts
- How to prepare and present award-winning research posters
- How to write a personal statement for application to professional or graduate school

Navigating careers in cancer research

Discussions led by past participants and/or faculty mentors:

- Careers in academia
- Careers in government
- Careers in public health
- Careers in medicine
- Careers in community outreach & education
- PhD and combined MD/PhD training programs
- Women in science

Cancer research seminars

- Research presentations by former NCI Cancer Education Program participants
- James Graham Brown Cancer Center seminar series
- Colloquia on Cancer Biology & Therapeutics seminar series
- Special colloquia seminar on the career path of academic faculty members at the James Graham Brown Cancer Center
- Departmental seminars including graduate student seminars

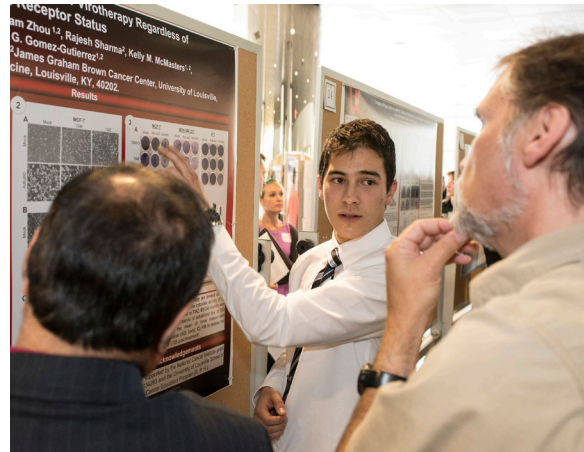
PARTICIPANT DEMOGRAPHICS AND CANCER RESEARCH OUTCOMES

	FIVE YEAR GOAL	PROGRESS AT YEAR THREE	PROGRESS AT YEAR FOUR
Number of participants who completed the program	115	89	121
Number of student participants who completed and presented their research project	100	89	121
Number of participants from underrepresented minority groups who completed the program	37	21	34
Number of student participants who continued in cancer research and/or training	25	50	Data will be collected in 2016
Number of medical students who pursued "Distinction in Research"	-	19	23
Number of student participants who continued their cancer research project within the program	-	5	11
Number of female participants who completed the program	66	33	49
Number of undergraduate student participants who have enrolled in MD/PhD programs	-	3	Data will be collected in 2016
Number of undergraduate student participants who have enrolled in PhD graduate programs	-	12	Data will be collected in 2016
Number of undergraduate student participants who have enrolled in health professional (MD, DMD, PharmD) programs	-	15	Data will be collected in 2016
Number of undergraduate student participants who have enrolled in Master's graduate programs	-	2 (MPH, MSSW)	Data will be collected in 2016



“With the NCI R25 Program I have been exposed to the way real scientists discover new knowledge, gained a deeper appreciation of the scientific process, learned how to communicate results in an effective way, and most most most importantly walked away with a very positive experience and a passion for research. I also feel much more confident about my ability to conduct research. I am so glad I chose to spend my summer in the R25 Program.”

— **Maggie Chang**, University of Louisville, 2015 Cancer Education Program undergraduate



“As a first-generation Latino college student, I want to continue to pursue my dream of earning an MD/PhD and contribute to the scientific community through research and discovery...I want to ameliorate the lives of other families who struggle with cancer.”

“Just as the physician works to heal patients, I plan to work in creating better treatments for combating cancer. After receiving a medical education, I plan to work at the James Graham Brown Cancer Center with the intention of advancing the health of the entire global community.”

— **Rigoberto Perez-Hernandez**,
Cornell University, 2015 NCI Cancer Education Program undergraduate

Perez-Hernandez will present his research at the Society for the Advancement of Chicanos and Native Americans in Science (SACNAS) in Washington, D.C.

Student Profiles



Lindsey Wattley

*Massachusetts Institute
of Technology*

2014 program participant Lindsey Wattley is a junior at Massachusetts Institute of Technology (MIT) majoring in biology and brain & cognitive sciences. Since graduating from the UofL Cancer Education Program, Wattley has completed research in the Griffith Lab at MIT investigating intestinal spheroids and micro-fluidics, and an internship at Mount Auburn Hospital in Cambridge, Mass., in the radiation oncology department. Upon graduation from MIT in 2017, she plans to enter a MD/PhD program.



Divine Anene

*University of Louisville,
Johns Hopkins University*

2012 program participant Divine Anene was accepted to both the University of Michigan Medical School and Johns Hopkins University School of Medicine. He chose to attend Johns Hopkins. He plans to do clinical work as well as teaching and research on pharmacological agents that may modulate the immune response to neoplastic cells. He currently is working on a project to identify the unique proteins expressed by Kupffer cells in the liver as a marker of inflammation.



Joshua Mitchell

*University of Louisville,
University of Kentucky*

An undergraduate student participant in 2012 who returned to the program in 2013, Joshua Mitchell is enrolled in the MD/PhD program at the University of Kentucky. Mitchell has published results from his cancer research project in *Front Genet.* 2014; 5:237. PubMed Central PMCID: PMC4112935. Mitchell has submitted an individual NIH F30 research grant proposal (F30 GM117926-01) that scored very highly and is expected to be funded.

PROGRAM PARTICIPANTS' POST-GRADUATE DEGREE PROGRAMS/INSTITUTIONS

PhD Programs

- Johns Hopkins University
- University of Louisville
- University of South Carolina

MD Programs

- Columbia University
- Drexel University
- East Tennessee State University
- Johns Hopkins University
- St. Louis University
- University of Louisville
- University of Kentucky

MD/PhD Programs

- University of Louisville
- University of Kentucky

PharmD Programs

- Lake Erie College of Osteopathic Medicine
- University of Kentucky

Master of Public Health Programs

- University of Louisville

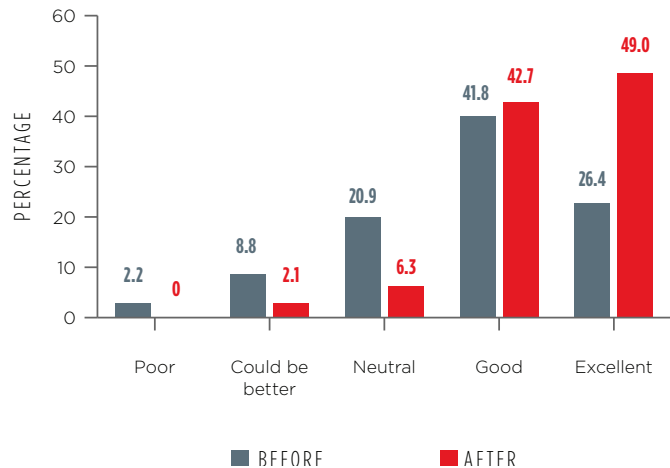
Master of Science in Social Work Programs

- University of Louisville

EFFECT OF PROGRAM ON PARTICIPANT INTEREST IN CANCER RESEARCH

Students were surveyed about their interest in cancer research before and after participating in the UofL NCI R25 Cancer Education Program

Students' interest level in cancer research before (gray bar) and after (red bar) participation in the cancer Education Program. Evaluation scores corresponded to 1 = poor, 2 = could be better, 3 = neutral, 4 = good, and 5 = excellent.



Students present their research at national meetings and in peer-reviewed publications

In addition to presenting posters at Research!Louisville, students have presented their research at national and international scientific venues, including:

- Academic Surgical Congress
- American Association for Cancer Research
- Atlantic Coast Conference Meeting of the Minds
- Biomedical Engineering Society
- Breast Cancer Research Symposium
- International Cannabinoid Research Society Symposium
- International Endocrine Society
- Keystone Cancer Conference
- National Student American Institute of Chemical Engineers
- Society for the Advancement of Chicanos and Native Americans in Science
- Society of Toxicology



Kendall Huddleston

University of Kentucky, University of South Carolina

Kendall Huddleston presented the research poster she prepared as an NCI Cancer Education Program undergraduate at the National Student American Institute of Chemical Engineers (AIChE) conference in Atlanta, Ga. There she placed second in the undergraduate poster competition in the Food, Pharma, and Biotechnology II division. Huddleston is a graduate research assistant at the University of South Carolina where she is pursuing a PhD in Chemical Engineering. Her research focus is on using innovative immunoengineering techniques for the prevention and treatment of colon cancer.

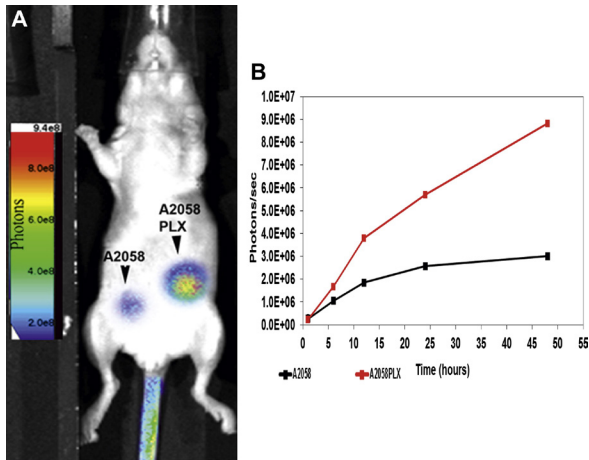


Connor Kinslow

SUNY-Binghamton, Columbia University

NCI Cancer Education Program 2013 undergraduate student Connor Kinslow presented his research poster at the American Association for Cancer Research meetings in San Diego, Calif.

Kinslow continued the project he began in the NCI Cancer Education Program at UofL (patient-derived models of non-small cell lung cancer metabolism) at the University of Kentucky. During the summer of 2014, he interned in the Pediatric Oncology Education Program at St. Jude Children's Research Hospital. As of 2015, he is enrolled in the MD program at Columbia University.

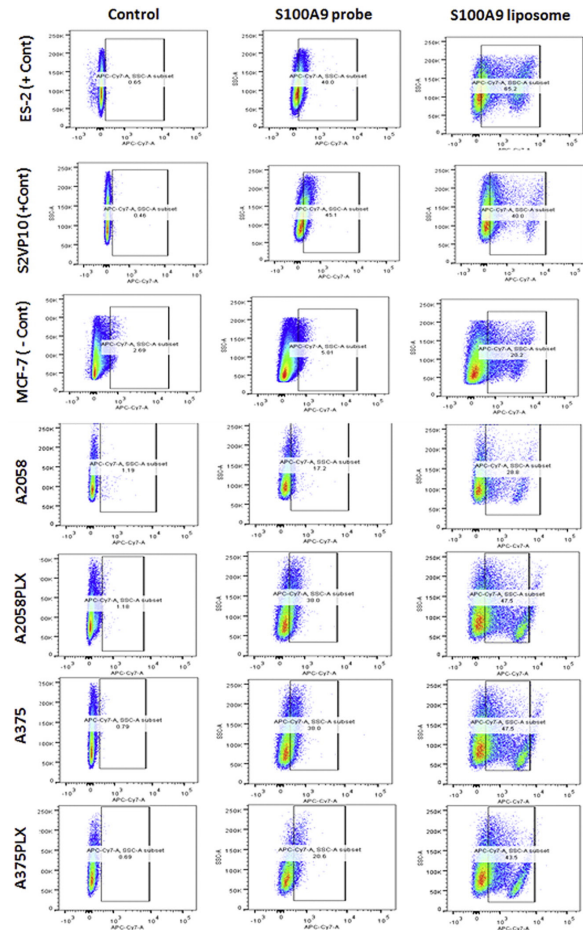


ABOVE AND RIGHT: Targeting of BRAF resistant melanoma via extracellular matrix metalloproteinase inducer receptor," published in *Journal of Surgical Research*, Volume 190, Issue 1, 2014, 111-118.

Matthew Zeiderman & Tess Dupre

University of Louisville & University of Louisiana-Monroe

Cancer Education Program students and mentors designed a novel drug delivery vehicle for treatment of metastatic melanoma that has developed resistance to the BRAF inhibitor vemurafenib. The research was published in the *Journal of Surgical Research*, Volume 190, Issue 1, 2014, 111-118. Two of the authors, including first author Matthew Zeiderman, are NCI Cancer Education Program graduates. Zeiderman is a UofL medical student who is continuing his cancer research



in the Distinction in Research Program. He presented his work at the Ninth Annual Academic Surgical Congress in San Diego, Calif. The other student author is Tess Dupre, an undergraduate student from the University of Louisiana-Monroe and now a UofL PhD candidate in pharmacology and toxicology. Dupre has received a travel award to present cancer research results on her PhD dissertation research at the American Society of Nephrology meeting.



PHOTO: Program graduate Douglas Saforo and 2015 undergraduate Karen Udoh

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THE UofL NCI R25 CANCER EDUCATION PROGRAM OFFERS:

- Opportunity to interact with renowned cancer research faculty members
- Opportunity to interact with renowned translational cancer researchers
- Receipt of a subsistence allowance (set by NCI)
- Housing and parking accommodations
- Funds to present research at national meetings

For more information on the UofL NCI Cancer Education Program, including student participants, faculty mentors, videos of program sessions and research abstracts/posters, visit:

<http://uofl.me/nci-r25>

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