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Summer Research Program in Review
The Summer Cancer Research Fellowship Program provides a unique opportunity for a sophomore or junior college student to engage in innovative, integrative biology approaches to cancer research through the National Cancer Institute’s (NCI’s) Integrative Cancer Biology Program (ICBP).

Since the inception of the NCI–ICBP Summer Cancer Research Fellowship Program in 2006, 55 eager faces and curious minds have been accepted into the program to experience what cancer research is all about. These fellows may comprise the next generation of cancer researchers, that is, they will be the investigators using unique thinking and integrative approaches, who may make tremendous strides in solving the highly complex cancer problem.

During the summer, fellows are exposed to rigorous training, seminars, and other scientific interactions at one of the NCI-supported ICBP Centers for Cancer Systems Biology. Fellows participate in frequent conferences with fellows at the other ICBP Centers, along with mentors and NCI staff members. The NCI–ICBP is making a wise investment in these individuals to help them understand the underlying biology of cancer and to develop mathematical and computational models for the diagnosis and treatment of the cancer disease.

Student Quotes from the Summer of 2009
“I think that it is a wonderful program and gives you access to the many different approaches in the field of cancer research.”

“I learned a completely different perspective of the biological sciences that I would never had done if it hadn’t been for this opportunity. Also I met people with the same career goals and interests as me with whom I will be able to network later on in my career.”

“This program was an excellent learning experience for me and I would highly recommend it to my peers so. I did not have a strong background in computer science or even biology of cancer but this program allowed me to learn as the program went along, allowing me to learn and help contribute to today’s top notch cancer research.”

“I really have learned so much this summer - it has been incredible. It was an invaluable, unique way for me to get into computational biology research, by being guided by my helpful mentor and buddy. I hope to continue with this research even past the end of the program.”

2010 WebMeeting Conference Schedule
The kickoff for this summer’s WebMeeting conferences was held June 16th. The kickoff agenda included a welcome from Dr. Dan Gallahan, Deputy Director of the NCI’s Division of Cancer Biology, a demonstration of the WebMeeting application, introduction of students, and mentors’ overview of projects. On June 30th, Drs. Bruce Tidor and Fei Hua described and lead a discussion about careers in academic research and industry. The WebMeeting on July 7th was a “students only” session which was highly successful; a second similar session will be scheduled near the end of the nine week program. The WebMeeting webcast conferences will be held Wednesdays, 3:15–4:15 PM (EDT) on the following days:

July 14 Selected discussion topics
July 28 Student presentations
August 4 Student presentations
Conclusion

Alumni—Where Are They Now?
Dhaval Desai (2006)
I am finishing up my second year of medical school at the University of Wisconsin in Madison. ICBP definitely got me excited about the future in science and medicine. Through me ICBP experience,
I have gained an appreciation for the importance of interdisciplinary research, especially in understanding cancer biology. The knowledge I gained in my training has helped me understand the clinical aspects of cancer very well. Although I have not yet decided what I want to specialize in, oncology is something I can see myself practicing in future.

After the summer of 2006, I returned to UW-Madison and continued doing breast cancer research with my mentor until I finished my undergraduate degree in May 2008. I worked at a small biotech firm near Madison for couple months before I started medical school. The summer after my first year of medical school, I worked on a clinical research project with an Interventional Cardiologist at the UW Hospital looking at CT characteristics of coronary arteries that would help predict coronary catheterization success rates.

Joohee (Alice) Kim (2006)

I am currently at the Ohio State University College of Medicine. The ICBP ignited my passion for research further and made me want to pursue research even as a medical doctor in the future.

I did one year of IRTA at NIH after graduating from college in 2007 and got into medical school. While I was an IRTA at NIH, I was able to contribute to publishing a paper in my lab.

In medical school, I participated in translational research in the Department of Radiology for 8 weeks and presented my poster on Research Day at OSUMC.

Graduate student, Engineering Science and Applied Mathematics department at Northwestern University

Hannah Choi (2007)

The ICBP program encouraged me to pursue career in scientific research. Especially, through the experience, I found my interest in applying mathematical methods in biology.


I am currently hiking the Appalachian Trail prior to enrolling in graduate studies to pursue a PhD in biology.

The ICBP allowed me to work alongside leaders of the field in cancer research and allowed me to enjoy the benefits of collaborative research with great resources at my disposal. I was able to experience the cutting edge areas of cancer research that served as encouragement and inspiration to pursue further studies in cancer research.

I was a coauthor in a recent Nature Journals paper characterizing dasatinib in lung cancer.

Michael Quien (2008)

I am finishing my senior year as a biomedical engineer at Rutgers University graduating with honors. I have been accepted into the 2014 class at Rush Medical School.

Participating in the ICBP program solidified my desire to do research and also reaffirmed that I wanted to be a practicing physician and not a full time researcher.

I have been a part of the Biomedical Engineering Honors Academy at Rutgers University. I have also conducted my senior design project in the labs here at Rutgers.

Robin Kang (2009)

I am currently a third year undergraduate at University of California Berkeley majoring in Public Health and Integrated Biology. The project I participated in last summer was in Lawrence Berkeley National Lab (Grey Lab) located in Berkeley, CA. I will be applying to medical school after graduation next year May 2011.

I enjoyed my project this summer because I was able to learn about the biological background of cancer and how it affects millions of patients. Researching transcription factors allowed me to realize that cancer biology is indeed complex because of the many cell-signaling pathways, but with cutting edge research and brilliant minds, cancer research is being pushed forward rapidly, giving people all over the world hope for targeted treatments. ICBP has motivated me to be a part of this process and consider going into medical oncology after completing medical school. Doing
research was a very rewarding experience for me and made me realize I would like to work with cancer patients directly and relay my scientific knowledge to them because I see a very large barrier between academia and the real world. The research that is being done is not very well understood by the general public, and I would like to change that in the future.

Since participating in the program, I have kept in touch with my mentor: Dr. Debo Das in LBNL and expressed my desire to continue doing research with him. I will be continuing working with Dr. Das on GI50 data from recent drugs. I may also continue with my transcription factor project. Either way, I am very grateful to ICBP for opening the door to this wonderful opportunity of working with Dr. Das in Grey Lab.

My biggest accomplishment was the intellectual growth I experienced after completing the Integrative Cancer Biology Summer Program. I was able to contextualize cancer biologically and understand that certain cell signaling pathways, like PI3K, integrate many different transcription factors and any disturbances in these pathways may lead to cancer. Transcription factors lie at the heart of almost every developmental and homeostatic process in organisms, including DNA replication, DNA repair, cell growth, cell division, control of apoptosis, and cellular differentiation, so any defects in transcription factor structure and function contribute to human carcinogenesis. I came into the program with no prior knowledge of cancer biology or biostatistics, but I have learned so much through ICBP. The death of my father was very devastating yet motivating for me to go into cancer research, so turning a personal experience with cancer into an intellectual enlightenment is the most important accomplishment for me. I would like to sincerely thank NCI ICBP for making this unforgettable experience possible.

Veronika Bordas (2009)

I am currently in my senior year of undergraduate studies at Harvard. I participated in the NCI-ICBP Fellowship program this past summer, working with Dr. Thomas Deisboeck’s group developing a computational model for EGFR-mediated signaling. I was lucky enough to be able to continue my summer research after the program officially ended, and actually developed my work into a senior thesis. My research has produced many interesting results, which I got to share at the ICBP Junior Investigators Meeting in Berkeley this past fall, and I have been working on various publications with my group. This program gave me a great opportunity to extend my undergraduate studies in applied mathematics, while getting involved in a rewarding budding field of research. I will be going to law school in the fall, but I am sure I will cross paths with computational biology again in the future!

Lila Cheung (2009)

I am a senior at Princeton University, planning to graduate in June 2010. Afterwards, I am planning to go to medical school at the University of Connecticut. The ICBP gave me insight about research and that it is not all about results but the skills I acquired. Trying different methods perfected my lab skills and understanding of my research goals.

I did a senior thesis project in Professor Prud’homme lab looking at how nanoparticles interact with macrophages. Specifically I looked at how size and surface chemistry of the nanoparticle determine its uptake by macrophages.

My experience in Professor Prud’homme lab has been great. I presented my work in a poster competition at the American Institute of Chemical Engineering Society for Biological Engineering Regional Conference and won first place. Because of my hard work, Professor Prud’homme has asked me to stay at Princeton over the summer to continue my thesis research project.

Timmy Wang (2009)

Currently, I am a third year undergraduate student at the University of Alabama at Birmingham and I will soon be applying for medical school. Since participating in NCI-ICBP, I have been continuing my work in qualitative changes with
Saccharomyces cerevisiae aging in the Department of Genetics at University of Alabama School of Medicine. I have also become a member of the editorial board for Inquiro, the undergraduate research magazine at UAB, and was selected to be one of five upcoming teaching assistants for the University Honors Program at UAB. I believe that my participation in NCI-ICBP has influenced me in that I have further developed my interest in cancer biology and one day I hope to become a pediatric oncologist, who cares for cancer patients as well as do further research on treating pediatric cancers.

Kaleb Naegeli (2009)

I am finishing my senior year at Indiana University (Bloomington). I will begin my graduate education starting in August at Duke Medical School in their molecular cancer biology program.

ICBP gave me an excellent opportunity to pursue research work further, and much of what I have learned through my research has deepened my undergraduate education, contributed to the advancement of science and medicine, and led me towards my current career path/helped confirm that this is the route I want to pursue.

Erin Young (2009)

I was able to graduate last December and am now working full-time in Dr. Cicely Jette’s Laboratory at the Huntsman Cancer Institute in Salt Lake City as a laboratory technician. I applied for graduate school last fall and was accepted into the University of Utah’s Molecular Biology Ph.D. program, which I will be attending in the fall.

The ICBP made me realize how much I wanted to be in the research environment. I overloaded my last semester at Utah State so I could graduate a semester early. I realized how different research is when not interrupted by other things like class. I wanted to gain more full time research experience before entering graduate school.

The ICBP also helped me realize how much I do not know about cell biology, cancer, and the scientific method in general. It was something that really helped me grow as a researcher.

I am currently working in Dr. Cicely Jette’s laboratory at the Huntsman Cancer Institute. We are studying apoptotic mechanisms in cancer.

Since participating in the ICBP, I was able to graduate from Utah State University with the Undergraduate Researcher Transcript Designation. I was also chosen as Valedictorian in the College of Agriculture at Utah State University for fall commencement.

Rebecca Lowe (2009)

I am currently finishing up my senior year at the University of South Carolina and preparing for graduation in a few weeks. The ICBP program was a wonderful experience that broadened my understanding of the health care field. I realized that there is more to the medical field than simply practicing medicine and that I could contribute to the advancement in medicine in other ways. Since the program, I decided that instead of going to medical school, I want to go to veterinary school. Veterinarians develop an understanding of the physiology of various species which can then be used to better understand human physiology. Since changing my career direction, I have shadowed several veterinarians and learned about the profession. Over my winter break, I shadowed veterinary technicians at an animal hospital and observed their daily duties. I was recently accepted for a summer internship at Riverbanks Zoo in Columbia, SC. I will be working with the cat and bear senior zoo keeper to move animals, clean exhibits, prepare diets, and observe veterinary procedures. The animals I will be caring for include lions, tigers, grizzly bears, siamangs, koala bears, baboons, and hyennas. I plan on applying to veterinary school this coming fall and begin the road to becoming an exotic animal veterinarian.
Corey Tong (2009)

I am an undergraduate senior at The College of New Jersey finishing up the last month of my undergraduate career. Research is the process of trial and error, confusion, frustration, and every so often a bit of success. Through the ICBP program I have learned to realize and embrace a life of discovery. I strongly believe that each discovery opens a new world of knowledge that is meant to be learned and implemented. Starting the fall of 2010 I will be attending Robert Wood Johnson Medical School as part of the Class of 2014. It may say odd to pursue a medical degree given my interests and experience in research; however, it is research that has driven me to a career in medicine. I am fascinated by the applications of new findings and one day hope to be in the position to incorporate and implement these results in the clinical setting. Research has played a major role in my life and by no means do I plan on giving it up. I hope to continue to research at UMDNJ in the coming years and plan on applying for a master’s in clinical and translational science so as to pursue a career as a physician scientist.

I have been working on a project entitled, “Sublimation of Electrodynamicall Levitated Ice Crystals in Simulated Upper-Tropospheric Conditions.” I have had the wonderful opportunity to travel San Francisco to attend the American Geophysical Union’s International Conference to present my research. We hope to publish this work in the coming months. In addition, I have presented my summer’s work on, “Construction of a DNA plasmid containing modified restriction sites for mismatch repair” at The College of New Jersey’s celebration of student achievement.

Since participating in the ICBP I have been inducted into Phi Beta Kappa and Phi Kappa Phi honor societies, received the Phi Kappa Phi Student-Faculty Research Award for work on “Sublimation of Electrodynamicall Levitated Ice Crystals in Simulated Upper-Tropospheric Conditions” and accepted and will be matriculating into Robert Wood Johnson Medical School’s Class of 2014.

Arshed Al-Obeid (2009)

I'm a graduating senior at the University of Arizona. I will be pursuing graduate education in biology next year. Participating in the ICBP program helped me confirm my academic interests and encouraged me to pursue graduate education in cancer systems biology. Since my ICBP experience, I have continued in undergraduate research, namely working on mechanisms of genomic instability in yeast. I have also won some campus and departmental awards, including the MCB Excellence in Undergraduate Research Award.

Publications from ICBP Centers

A complete listing of ICBP-related publications can be found on the ICBP web site under “Resources”: http://icbp.nci.nih.gov

2010 ICBP Summer Fellows

Case Western Reserve University

Web site: http://www.case.edu/med/icbp/
Principal Investigator: Ken Loparo, Ph.D.

Raymond Moore

I desire to be a part of the ICBP Summer 2010 Cancer Research Fellowship Program because it provides an outstanding opportunity to explore my unique passion for both medicine and computer science. As a Systems and Control Engineering major with a declaration in Pre-Health, I appreciate the value of interdisciplinary research. I am very excited to apply my education to the cutting-edge field of bioinformatics and systems biology, as well as to spend nine weeks on the campus that I already love (Case Western).

Dana-Farber Cancer Institute

Web site: http://www.broad.mit.edu/cancer/collaborations/icbp/
Principal Investigator: Todd R. Golub, M.D.
**Andrea Jensen**

I am very excited to be a part of the ICBP because it will allow me to bring together all of the important concepts that I have learned in my scientific coursework to ask a complex, biomedically relevant question. Additionally, I’m interested to see how genome analysis not only provides a broader view of cancer, but also contributes an increased molecular understanding of this disease.

**E. O. Lawrence Berkeley National Laboratory**

Principal Investigator: Joe Gray, Ph.D.

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**Lauren Comisar**

I love learning about cell and molecular biology in my college courses, and I am excited to have the opportunity to apply what I’ve learned by doing research in the Lawrence Berkeley National Laboratory. I’m looking forward to working to elucidate the molecular factors governing the pathology and treatment of cancer.

**Massachusetts Institute of Technology**

Principal Investigator: Doug Lauffenburger, Ph.D.

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**Kelsey Capron**

As a pre-med biology major, I am extremely excited to get involved in the Integrative Cancer Biology Program this summer! The study of cancer is not only fascinating and relevant to my field, but is also an important and challenging hurdle in the world of medicine. I’m particularly interested in the study of cancer for many reasons: many of my family members have been affected by it, millions of people could be happier and healthier if more was known about cancer, and it presents such a challenge that I would love to have a chance at unlocking some if its secrets.

**The Ohio State University**

Web sites: [http://icbp.med.ohio-state.edu/](http://icbp.med.ohio-state.edu/)  
[http://mbi.osu.edu/](http://mbi.osu.edu/)  
[http://bioinformatics.med.ohio-state.edu/](http://bioinformatics.med.ohio-state.edu/)
Principal Investigator: Tim Huang, Ph.D.

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**Leslie Watkins**

I am a student majoring in Mathematics with a Statistics minor at Meredith College in Raleigh, NC. The reason I am especially interested in this program on cancer research is that my youngest son had cancer when he was five years old. The year of treatments we went through taught me a respect and curiosity for what the human body can do, and how cancer develops. I want to be able to use my skills to help learn about and develop ways to treat cancer, and to try to improve the lives of those who contract it and give them hope for a good recovery, as we had.

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**Yue (Phoenix) Xu**

I look forward to pursue a career in cancer research. ICBP Summer Cancer Research Program blends knowledge from mathematical and scientific area. This is a new combination that I have not done before and undoubtedly it is a hard-won opportunity to develop my critical thinking skill.

**The Ohio State University – Indiana University**

Principal Investigator: Tim Huang, Indiana University

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**Cong (Karl) Guo**

This fellowship will give me a taste of what I will be experiencing in graduate school in the years to come. I have always wanted to step out of my comfort zone and perform research in a new setting.
Working with leading cancer researchers and meeting people with similar interests is what I look forward to the most this summer! Among all my experiences, I know this experience is my first step toward my goal to one day become a professor.

**Phillip Wu**

Phillip Wu has been interested in studying widespread diseases like cancer and AIDS ever since high school, and has pursued a major in human biology to that end. His career goal is to discover and publish contributions that may ultimately lead to cures or better treatment.

**Stanford University School of Medicine**

Web site: [http://icbp.stanford.edu](http://icbp.stanford.edu)

Principal Investigator: Sylvia Plevritis, Ph.D.

**Sean McGee**

The NCI-ICBP Cancer Research Fellowship allows me to work in a dynamic scientific setting alongside some of the best minds in medical research. I know that this experience will help me better define my career goals, and I am very excited to work and learn at Stanford.

**Vanderbilt University Medical Center**

Web site: [http://vibc.vanderbilt.edu/vibc/](http://vibc.vanderbilt.edu/vibc/)

Principal Investigator: Vito Quaranta, M.D.

**Margalit Goldgof**

This program fits perfectly with my previous work and will expand my knowledge of not only the medical aspects of different cancers, but also the bioinformatics involved. It will improve my skills at integrating computational and experimental approaches to understanding cancer biology. I expect that this internship will give me the exciting opportunity to work and learn with world-class researchers in the NCI sponsored state-of-the-art laboratories as well as feed my passion for research.

**MariaSanta Mangione**

It is a privilege to be a part of the NCI ICBP summer program because I will be able to spend the summer working on two of the things about which I am the most passionate. I never tire of learning about the intricate networks that control the mechanisms required for life, and I spend much of my time raising money and awareness for cancer patients and research with the University of Maryland’s Relay for Life. However, I want to help end the hurt cancer causes in other ways, and now I have the chance to do that while I am learning new things about cell biology from dedicated and experienced scientists who share this passion.

**And a Final Thought…..**

Whether you are a current fellow or an “alum,” may your experiences in the ICBP Summer Research Fellowship Program kindle curiosity, joy, and an appreciation of the challenges of cancer research.

**ICBP Newsletter**

Managing Editor: Teresa Stitely (SAIC-Frederick, Inc.)

Contributors to the newsletter include ICBP staff members and associates, participating students and alumni.

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