



NATIONAL CANCER INSTITUTE AT FREDERICK

SUMMER 2013

FNLCR Set to Launch Full-Scale Assault on *Ras*

By Frank Blanchard, Staff Writer

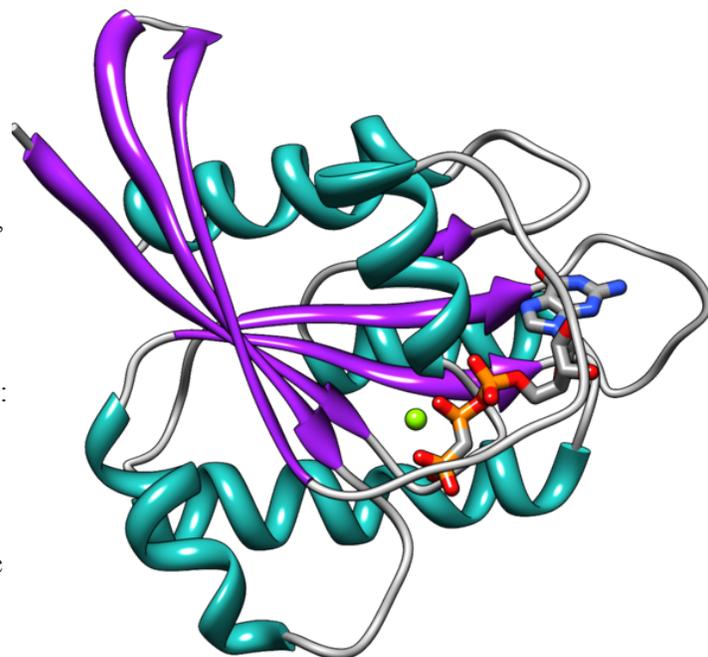
Armed with an array of leading-edge technologies, scientific and technical expertise, and the full backing of the National Cancer Institute's (NCI's) scientific advisers, the Frederick National Laboratory for Cancer Research (FNLCR) is preparing to launch a full-scale attack against an intractable problem: the cancer-causing family of *Ras* genes.

Ras genes code for a set of proteins that are instrumental in cellular signaling, and when mutated, permit uncontrolled cellular proliferation in colorectal, lung, and pancreatic cancers, and many other malignancies.

This gene family underlies 33 percent of all human cancers, including 90 percent of pancreatic cancers. The genes were first identified decades ago, but little progress has been made over the years in converting this scientific understanding into effective treatments for cancer patients. This may be about to change.

With unanimous concurrence of both the National Cancer Advisory Board (NCAB) and the NCI Board of Scientific Advisers (BSA), FNLCR is gearing up for what may be the most concerted effort to date against *Ras*.

Using the Advanced Technology Research Facility as its base, FNLCR will anchor a nationwide program that will unite geographically and scientifically disparate research groups already at work on *Ras* in a focused effort to flesh out



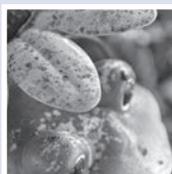
H-Ras structure PDB 121p ribbon showing strands in purple, helices in aqua, and loops in gray. Also shown are the bound GTP analog and magnesium ion.

Image from Wikipedia, https://en.wikipedia.org/wiki/Ras_subfamily

scientific understanding of the potent gene family and to translate that understanding into candidate drugs for clinical testing.

“This unanimous endorsement by BSA/NCAB is really a big milestone for the program,” said Dave Heimbrook, Ph.D., chief executive officer of SAIC-Frederick. Details of the program are evolving as discussions continue among NCI leadership, FNLCR leadership, and the broader cancer research community.

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What is it?

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Ras Program

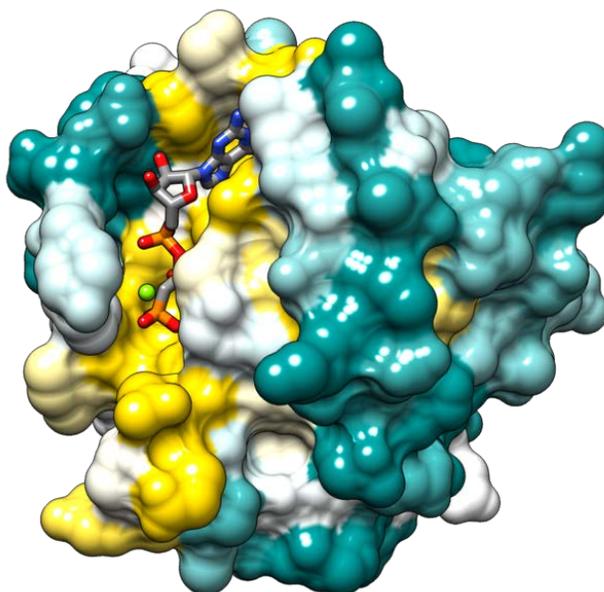
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Using Resources in a Focused Way

The initial concept grew out of the NCI-Frederick Advisory Committee (NFAC), which favors using FNLCR resources in a highly focused and collaborative way to take on major problems in cancer research and development that have been difficult to solve by other means. About \$10 million annually in existing funding is being reprogrammed within the SAIC-Frederick contract to support the program.

FNLCR will serve as the anchor, or hub, with spokes that connect academic, nonprofit, biotech, and pharmaceutical partners. FNLCR proposes to be the multidisciplinary, catalytic engine that develops and provides reference-quality reagents and novel assays. Intellectual collaboration and coordination of effort will be a central component for success.

Hand-in-hand with its collaborators, FNLCR will bring its technological expertise to bear in the following areas: imaging; proteins and protein biophysics and assays; cells and cell lines; in vivo models; genomics; proteomics and biomarkers; and nanotechnology.



H-Ras structure PDB 121p surface colored by conservation in Pfam seed alignment: gold, most conserved; dark cyan, least conserved.

Image from Wikipedia, https://en.wikipedia.org/wiki/Ras_subfamily

Program Leadership Team to Be Led by Frank McCormick

Earlier this year, NCI Director Harold Varmus, M.D., and Frank McCormick, Ph.D., director of the Helen Diller Family Comprehensive Cancer Center at the University of California, San Francisco, and associate dean of the School of Medicine, co-chaired a workshop in

San Francisco that was attended by Heimbrook and Chief Technology Officer Atsuo Kuki, Ph.D., along with members of NFAC and about 30 academic and industrial cancer biology experts, to further develop the concept.

The *Ras* program will be led by McCormick, who signed a consulting agreement in May with SAIC-Frederick. He will spend about half of his time helping develop and lead the national *Ras* program. A *Ras* program leadership team will consist of McCormick, NCI leadership, and SAIC-Frederick leadership, with additional guidance from an NFAC subcommittee.

In his presentation to the NCI advisory boards, McCormick outlined five proposed components of the program: (1) target mutant alleles; (2) explore KRAS selective compounds; (3) attempt to disrupt KRAS complexes; (4) map the surface of KRAS cancer cells; and (5) develop next-generation, synthetic lethal screens in vivo.

He punctuated his remarks to the advisory boards this way:

"The time is right."

Office of AIDS Research Grants

\$200,000 Grants Awarded to CCR Researchers for HIV/AIDS Studies

By Nancy Parrish, Staff Writer

Earlier this year, the Office of AIDS Research (OAR) awarded two, two-year grants of \$200,000 each to Anu Puri, Ph.D., and Robert Blumenthal, Ph.D., both of the Center for Cancer Research (CCR) Nanobiology Program, and to Eric Freed, Ph.D., of the HIV Drug Resistance Program, for their research on potential new treatments for HIV.

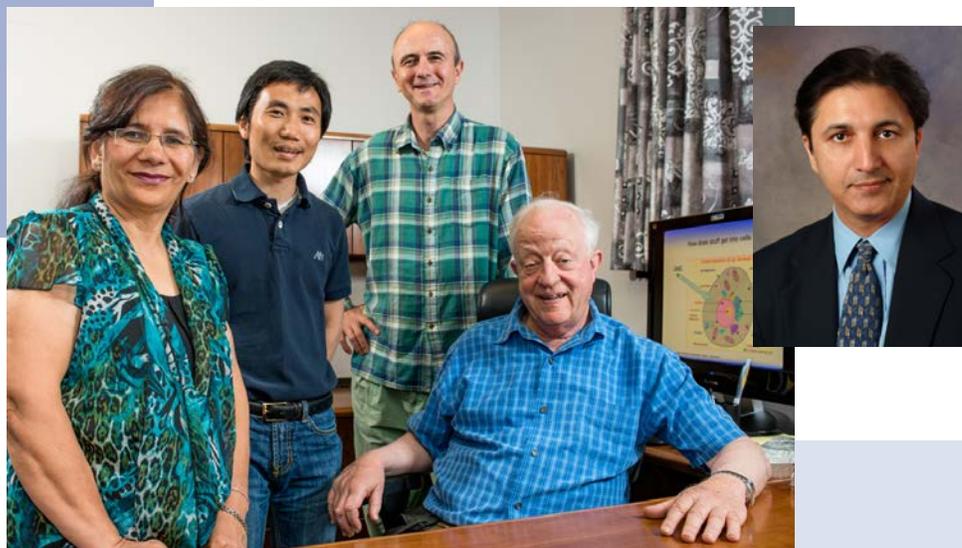
In its announcement, OAR indicated that the grants were awarded in support of the U.S.–India Joint Working Group

(JWG) on the Prevention of Sexually Transmitted Diseases and HIV/AIDS. The proposals submitted by Puri and Freed underwent a two-level peer review process that involved scientists from both the National Institutes of Health and the Indian Council of Medical Research, the lead agencies under JWG. "These projects will further develop crucial research infrastructure and capacity building between U.S. and Indian biomedical research communities," the announcement letter stated.

Puri to Develop Nano-Drug Delivery System

Lead investigator Puri said her group is using their grant to develop a drug delivery system that uses targeted nanoparticles containing FDA-approved anti-HIV-1 drugs. Currently available drugs are aimed at interrupting the virus's life cycle and are primarily designed to be delivered systemically, Puri explained. However, these drugs "are limited by common elements such as poor bioavailability, systemic toxicity,

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Anu Puri, Ph.D., left, and her team are developing a drug delivery system that uses targeted nanoparticles containing FDA-approved anti-HIV-1 drugs. Shown with Puri are, from left: Weizao Chen, Ph.D., Dimiter Dimitrov, Ph.D., and Robert Blumenthal, Ph.D. Inset: Sanjay Malhotra, Ph.D. Their work is in collaboration with Rinti Banerjee, Ph.D., at the Indian Institute of Technology Bombay, Mumbai, India.

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and development of drug resistance.” In addition, these drugs can cost as much as \$25,000 per year, she said.

“Nano-drug delivery systems, coupled with site-specific targeting ligands, constitute a promising system to boost efficacy and bioavailability of existing drugs and pharmaceuticals,” Puri said. “Our objective is to increase the efficacy, reduce toxicity, bypass multidrug resistance and make the treatments affordable in countries such as India.”

Puri and Blumenthal will work with investigators from the CCR Cancer and Inflammation Program, Dimiter Dimitrov, Ph.D., and Weizao Chen, Ph.D., as well as with Sanjay Malhotra, Ph.D., head, Laboratory of Synthetic Chemistry, SAIC-Frederick. As an expert in the area of protein engineering, Dimitrov will design HIV-1-specific ligands, Puri said, and Chen will be “instrumental in generating suitable small protein ligands.” Malhotra will be involved in the “modification of existing drug molecules for successful incorporation into nanoparticles,” she added.

Puri is collaborating with Rinti Banerjee, Ph.D., professor, Department of Biosciences and Bioengineering,

Indian Institute of Technology Bombay, Mumbai, India. She anticipates traveling to India “to transfer the targeted nanoparticles technology and provide insights into lipid assemblies and the fundamentals of viral entry pathways.” She will also learn about the nanocochleates formulation technology that Banerjee is developing, she said. In addition, she will use the opportunity to “deliver educational seminars and provide guidance to the students there, especially in the area of HIV-1/AIDS and nano-drug delivery technology.”

Freed’s Research to Focus on Virus Maturation

Freed plans to develop anti-HIV drugs known as maturation inhibitors. “These compounds block the maturation step in the virus replication cycle,” he said, which is “a process triggered by the cleavage of the viral structural protein Gag by the viral protease. The maturation step is essential for the virus to become infectious after it is released from the infected cell.”

Freed will collaborate with Ritu Gaur, Ph.D., associate professor, Life Sciences and Biotechnology, South Asian

University, New Delhi, India. Gaur, who was a postdoc in Freed’s laboratory about 10 years ago, is now a principal investigator in her own laboratory, Freed said. They plan to “test the efficacy of these compounds against viral isolates prevalent in the U.S. and Europe (so-called subtype B) as well as subtype C strains prevalent in India,” Freed said.

As HIV becomes increasingly resistant to currently available drugs, new drugs are becoming necessary, Freed noted. He hopes that the research made possible by the grant will help increase the understanding of HIV assembly and maturation, which in turn will advance the development of novel inhibitors toward clinical use. “It is our hope that the novel maturation inhibitors that we are currently developing and testing will prove effective not only against strains of HIV-1 circulating in the U.S. and Europe, but also against those prevalent in developing regions of the world,” including Africa and India. ■



Eric Freed, Ph.D., right, is working with Ritu Gaur, Ph.D., South Asian University, New Delhi, India, to develop anti-HIV drugs known as maturation inhibitors. At left is Gaur, who spent a month working in Freed’s lab earlier in the summer.

IL-27 Found to Play Significant Role in Conferring HIV Resistance

By Nancy Parrish, Staff Writer

The human immunodeficiency virus (HIV) targets specific immune cells in the body known as macrophages because these are the cells that eliminate foreign material such as bacteria or viruses. HIV is able to reproduce and spread throughout the body if it can avoid destruction by macrophages.

A recent study by Lue Dai, Ph.D., and colleagues revealed that the human cytokine IL-27 helps promote the body's production of macrophages that are resistant to HIV. The study further found that IL-27 suppresses a gene known as SPTBN1, which facilitates the survival of HIV cells. This breakthrough research was recently published in the *Journal of Experimental Medicine*.

The new findings suggest that using IL-27 to modulate the SPTBN1 level "renders human macrophages resistant to HIV-1 infection," said Dai, a postdoctoral fellow in the Laboratory of Human Retrovirology (LHR), Applied and Developmental Research Directorate, SAIC-Frederick. Because treatment with IL-27 does not interfere with the viability or functionality of macrophages, he

said, it could be a promising therapeutic candidate to prevent HIV-1 infection.

The next step, he said, is to develop a preclinical trial to assess the anti-HIV effect of IL-27 in vivo, using an animal model.

Long-Term Research Interest

Dai received his Ph.D. in immunology and virology at the University of Massachusetts Medical School, where he first began investigating HIV. "It then became my long-term research interest to understand how host factors impact HIV infection," he said. In 2010, he joined LHR, where he continues his research to "identify the host target of IL-27 which blocks HIV infection in macrophages."

He says he owes the success of his current research to a "collaborative effort" among his supervisor, Tomozumi Imamichi, Ph.D., head of LHR, H. Clifford Lane, M.D., National Institute of Allergy and Infectious Diseases, colleagues in the Clinical Services Program, SAIC-Frederick, and collaborators in the Optical Microscopy and Analysis Laboratory, SAIC-Frederick. "[They] have offered



Lue Dai, Ph.D., postdoctoral fellow, Laboratory of Human Retrovirology, Applied and Developmental Research Directorate, SAIC-Frederick.

great support and assistance to help me advance the project rapidly and smoothly," he noted. "It is a once-in-a-lifetime experience to make new discoveries with such a strong supportive team."

IL-27 Inhibits HIV-1 Infection in Human Macrophages by Down-Regulating Host Factor SPTBN1 during Monocyte to Macrophage Differentiation

Lue Dai, Kristy B. Lidie, Qian Chen, Joseph W. Adelsberger, Xin Zheng, DaWei Huang, Jun Yang, Richard A. Lempicki, Tauseef Rehman, Robin L. Dewar, Yanmei Wang, Ronald L. Hornung, Kelsey A. Canizales, Stephen J. Lockett, H. Clifford Lane, and Tomozumi Imamichi
Journal of Experimental Medicine 210(3):517–534, 201

The susceptibility of macrophages to HIV-1 infection is modulated during monocyte differentiation. IL-27 is an anti-HIV cytokine that also modulates monocyte activation. In this study, we present new evidence that IL-27 promotes monocyte differentiation into macrophages that are nonpermissive for HIV-1 infection. Although IL-27 treatment does not affect expression of macrophage differentiation markers or macrophage biological functions, it confers HIV resistance by down-regulating spectrin β nonerythrocyte 1 (SPTBN1), a required host factor for HIV-1 infection. IL-27 down-regulates SPTBN1 through a TAK-1-mediated MAPK signaling pathway.

Knockdown of SPTBN1 strongly inhibits HIV-1 infection of macrophages; conversely, overexpression of SPTBN1 markedly increases HIV susceptibility of IL-27-treated macrophages. Moreover, we demonstrate that SPTBN1 associates with HIV-1 gag proteins. Collectively, our results underscore the ability of IL-27 to protect macrophages from HIV-1 infection by down-regulating SPTBN1, thus indicating that SPTBN1 is an important host target to reduce HIV-1 replication in one major element of the viral reservoir. ■

The following 33 articles have been selected from 13 of the most prestigious science journals published during the last six months.

Blood

Haso, W, DW Lee, et al. Anti-CD22-chimeric antigen receptors targeting B-cell precursor acute lymphoblastic leukemia. *Blood* 121(7):1165-1174, 2013. <http://bloodjournal.hematologylibrary.org/content/121/7/1165.long>

Unnisa, Z, JP Clark, et al. Meis1 preserves hematopoietic stem cells in mice by limiting oxidative stress. *Blood* 120(25):4973-4981, 2012. <http://bloodjournal.hematologylibrary.org/content/120/25/4973.long>

Waldmann, TA, KC Conlon, et al. Phase 1 trial of IL-15 trans presentation blockade using humanized Mik-Beta-1 mAb in patients with T-cell large granular lymphocytic leukemia. *Blood* 121(3):476-484, 2013. <http://bloodjournal.hematologylibrary.org/content/121/3/476.long>

Cancer Research

Garcia-Closas, M, N Rothman, et al. Common genetic polymorphisms modify the effect of smoking on absolute risk of bladder cancer. *Cancer Res* 73(7):2211-2220, 2013. <http://cancerres.aacrjournals.org/content/73/7/2211.long>

Liu, Y, KQ Chen, et al. Cell surface receptor FPR2 promotes antitumor host defense by limiting M2 polarization of macrophages. *Cancer Res* 73(2):550-560, 2013. <http://cancerres.aacrjournals.org/content/73/2/550.long>

Zhu, Z Q, V Singh, et al. High-avidity T cells are preferentially tolerized in the tumor microenvironment. *Cancer Res* 73(2):595-604, 2013. <http://cancerres.aacrjournals.org/content/73/2/595.long>

Cell

Lauberth, SM, T Nakayama, et al. H3K4me3 interactions with TAF3 regulate preinitiation complex assembly and selective gene activation. *Cell* 152(5):1021-1036, 2013. <http://www.sciencedirect.com/science/article/pii/S009286741300144X>

Journal of Biological Chemistry

Hatanaka, T, S Ohzono, et al. Human IgA-binding peptides selected from random peptide libraries affinity maturation and application in IgA purification. *J Biol Chem* 287(51):43126-43136, 2012. <http://www.jbc.org/content/287/51/43126.long>

Jalah, R, M Rosati, et al. The p40 subunit of interleukin (IL)-12 promotes stabilization and export of the p35 subunit implications for improved IL-12 cytokine production. *J Biol*

Chem 288(9):6763-6776, 2013. <http://www.jbc.org/content/288/9/6763.long>

Madenspacher, JH, KM Azzam, et al. Apolipoproteins and apolipoprotein mimetic peptides modulate phagocyte trafficking through chemotactic activity. *J Biol Chem* 287(52):43730-43740, 2012. <http://www.jbc.org/content/287/52/43730.long>

Singh, A, EF Winterbottom, et al. Abl interactor 1 (Abi1) and its interaction with Wiskott Aldrich Syndrome Protein (Wasp) are critical for proper eye formation in xenopus embryos. *J Biol Chem* 2013. <http://www.jbc.org/content/288/20/14135>

Strathern, J, F Malagon, et al. The fidelity of transcription RPB1 (RPO21) mutations that increase transcriptional slippage in *S. cerevisiae*. *J Biol Chem* 288(4):2689-2699, 2013. <http://www.jbc.org/content/288/4/2689.long>

Zhou, YN, L Lubkowska, et al. Isolation and characterization of RNA polymerase rpoB mutations that alter transcription slippage during elongation in *Escherichia coli*. *J Biol Chem* 288(4):2700-2710, 2013. <http://www.jbc.org/content/288/4/2700.long>

Journal of Clinical Investigation

Horn, HF, Z Brownstein, et al. The LINC complex is essential for hearing. *J Clin Invest* 123(2):740-750, 2013. <http://www.jci.org/articles/view/66911>

Klatt, NR, LA Canary, et al. Probiotic/prebiotic supplementation of antiretrovirals improves gastrointestinal immunity in SIV-infected macaques. *J Clin Invest* 123(2):903-907, 2013. <http://www.jci.org/articles/view/66227>

Xi, SC, H Xu, et al. Cigarette smoke mediates epigenetic repression of miR-487b during pulmonary carcinogenesis. *J Clin Invest* 123(3):1241-1261, 2013. <http://www.jci.org/articles/view/61271>

Journal of Experimental Medicine

Dai, L, KB Lidie, et al. IL-27 inhibits HIV-1 infection in human macrophages by down-regulating host factor SPTBN1 during monocyte to macrophage differentiation. *J Exp Med* 210(3):517-34, 2013. <http://jem.rupress.org/content/210/3/517.long>

Journal of Immunology

Canary, LA, CL Vinton, et al. Rate of AIDS progression is associated with gastrointestinal dysfunction in simian immunodeficiency virus-infected pigtail macaques. *J Immunol* 190(6):2959-2965, 2013. <http://www.jimmunol.org/content/190/6/2959.long>

Chen, X, XQ Wu, et al. TNFR2 is critical for the stabilization of the CD4(+)Foxp3(+) regulatory t cell phenotype in the inflammatory environment. *J Immunol* 190(3):1076-1084, 2013. <http://www.jimmunol.org/content/190/3/1076.long>

Kobayashi, N, CM Hong, et al. Oligodeoxynucleotides expressing polyguanosine motifs promote antitumor activity through the up-regulation of IL-2. *J Immunol* 190(4):1882-1889, 2013. <http://www.jimmunol.org/content/190/4/1882.long>

Wu, YZ, JM Lu, et al. Activation of TLR4 is required for the synergistic induction of dual oxidase 2 and dual oxidase A2 by IFN-gamma and lipopolysaccharide in human pancreatic cancer cell lines. *J Immunol* 190(4):1859-1872, 2013. <http://www.jimmunol.org/content/190/4/1859.long>

Journal of the American Chemical Society

Dong, SW, T Qin, et al. Synthesis of chamaecyanone C analogues from in situ-generated cyclopentadienones and their biological evaluation. *J Amer Chem Soc* 134(48):19782-19787, 2012. <http://pubs.acs.org/doi/full/10.1021/ja3084708>

Journal of the National Cancer Institute

Kohaar, I, P Porter-Gill, et al. Genetic variant as a selection marker for antiprostata stem cell antigen immunotherapy of bladder cancer. *J Natl Cancer Inst* 105(1):69-73, 2013. <http://jnci.oxfordjournals.org/content/105/1/69.long>

Xu, H, W Yang, et al. Novel susceptibility variants at 10p12.31-12.2 for childhood acute lymphoblastic leukemia in ethnically diverse populations. *J Natl Cancer Inst* 2013. <http://jnci.oxfordjournals.org/content/early/2013/03/08/jnci.djt042.long>

Nature

Burns, MB, L Lackey, et al. APOBEC3B is an enzymatic source of mutation in breast cancer. *Nature* 494(7437):366-370, 2013. <http://www.nature.com/nature/journal/v494/n7437/full/nature11881.html>

Mudd, PA, MA Martins, et al. Vaccine-induced CD8(+) t cells control AIDS virus replication. *Nature* 491(7422):129-U152, 2012. <http://www.nature.com/nature/journal/v491/n7422/full/nature11443.html>

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Morrison Receives NIH Award for Major Ras/Raf Breakthroughs

By Ashley DeVine, Staff Writer

Deborah Morrison, Ph.D., laboratory chief, Laboratory of Cell and Developmental Signaling, Center for Cancer Research (CCR), received an NIH Director's Award in June "for major breakthroughs in elucidating the mechanisms of Ras/Raf signaling that will be critical for diagnosis and treatment of disease," according to the NIH Director's Awards Ceremony brochure.

She was nominated by Ira Daar, Ph.D., senior investigator, Developmental Signal Transduction Section, Laboratory of Cell and Developmental Signaling, CCR.

Daar's nomination stated that over the past few years, "Morrison has produced a series of papers reporting major advancements in our understanding of the Ras/Raf signaling pathway, which is one of the critical pathways underlying human cancer biology and certain developmental disorders."

Morrison was honored at the NIH Director's Awards Ceremony in June. ■



Deborah Morrison, Ph.D.,
Laboratory Chief, Laboratory of
Cell and Developmental Signaling,
Center for Cancer Research.

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Oncogene

Liu, YN, JJ Yin, et al. MiR-1 and miR-200 inhibit EMT via slug-dependent and tumorigenesis via slug-independent mechanisms. *Oncogene* 32(3):296-306, 2013. <http://www.nature.com/onc/journal/v32/n3/full/onc201258a.html>

Proceedings of the National Academy of Sciences

Arnold, ES, SC Ling, et al. ALS-linked TDP-43 mutations produce aberrant RNA splicing and adult-onset motor neuron disease without aggregation or loss of nuclear TDP-43. *Proc Natl Acad Sci U S A* 110(8):E736-E745, 2013. <http://www.pnas.org/content/110/8/E736.long>

Patel, V, R Jalah, et al. DNA and virus particle vaccination protects against acquisition and confers control of viremia upon heterologous simian immunodeficiency virus challenge. *Proc Natl Acad Sci U S A* 110(8):2975-80, 2013. <http://www.pnas.org/content/110/8/2975.long>

Meyerson, JR, EEH Tran, et al. Molecular structures of trimeric HIV-1 Env in complex with small antibody derivatives. *Proc Natl Acad Sci U S A* 110(2):513-518, 2013. <http://www.pnas.org/content/110/2/513.long>

Takala-Harrison, S, TG Clark, et al. Genetic loci associated with delayed clearance of *Plasmodium falciparum* following artemisinin treatment in Southeast Asia. *Proc Natl*

Acad Sci U S A 110(1):240-245, 2013. <http://www.pnas.org/content/110/1/240.long>

Timofeeva, OA, NI Tarasova, et al. STAT3 suppresses transcription of proapoptotic genes in cancer cells with the involvement of its N-terminal domain. *Proc Natl Acad Sci U S A* 110(4):1267-1272, 2013. <http://www.pnas.org/content/110/4/1267.long>

Science

Apps, R, Y Qi, et al. Influence of HLA-C expression level on HIV control. *Science* 340(6128):87-91, 2013. <http://www.sciencemag.org/content/340/6128/87.long> ■



Spring Research Festival

Spring Research Festival Sponsored by NICBR for First Time

By Melissa Porter, Staff Writer



From left: Maryland State Senator Ron Young; Col. Bernard L. DeKoning, former commander, U.S. Army Medical Research Institute of Infectious Diseases (USAMRIID); and Craig Reynolds, Ph.D., director, NCI Office of Scientific Operations.

For the past 16 years, the annual Spring Research Festival has been sponsored by NCI at Frederick and Fort Detrick to acquaint fellow researchers, students, and the community at large with the important discoveries being made at this facility to fight cancer, AIDS, and other infectious diseases.

This year marked the first time the Spring Research Festival, held on May 8 and 9, was sponsored by the National Interagency Confederation for Biological Research (NICBR). Every day, collaborations occur between the scientists at NCI at Frederick and the other agencies located at Fort Detrick. The NICBR sponsorship of the Spring Research Festival highlights the importance of these collaborations and the significant research that is a result of this combined effort.

More than 1,000 people attended the festival, which featured 151 researchers who presented posters, 34 exhibitors in the Health Education and Community Services Exhibition, and 150 vendors in the Commercial Science and Technology Expo.

Talks Kick Off Festival Week

A postdoctoral and postbaccalaureate symposium on Host Response to Disease was held on May 6, the first day of festival week. Covering a wide range of areas related to host response, talks were given by postbaccalaureate and postdoctoral fellows working for the various NICBR organizations. Topics included survival and differentiation of hematopoietic stem and progenitor cells potentially affected by Id2 expression, and resistant and susceptible soybeans following fungal infection. Awards were given to select projects for outstanding presentations by postbaccalaureate and postdoctoral researchers.

Postbaccalaureate winner Katie Stagliano, of the Center for Cancer Research and a graduate student at The George Washington University, presented her thesis research project, which she is conducting in the Laboratory of Molecular Immunoregulation, headed by Andy Hurwitz, Ph.D. She explained her group's study of very low avidity endogenous memory (EM) CD8+ T cells and their effect on tumor growth. The research generated mice that have a very low avidity TCR transgene that is specific for the melanoma antigen tyrosinase-related protein 2. Using these mice, Stagliano described a population of very low avidity EM-T cells that delayed subcutaneous B16 melanoma growth when compared with wild-type mice.

These mice, Stagliano said, may provide a useful tool and a unique model for further study of EM-T cells and their effect, and a possible use as an immunotherapeutic tool for combating cancer.

Mandy Kendrick, Ph.D., U.S. Department of Agriculture (USDA) Agricultural Research Service, won an award for best



Mandy Kendrick, Ph.D., best speaker in the postdoctoral category, presents her research on a soybean fungus, which could lead to the development of a broad-spectrum resistant line of soybeans.



Best speaker in the postbaccalaureate category, Katie Stagliano, addresses the symposium on the first day of Spring Research Festival week. Her research focused on developing a unique mouse model to study EM-T cells and their effect on tumor growth.

speaker in the postdoctoral category. She described resistance and susceptibility in soybean crops following fungal infections. Demonstrating the importance of soybean crops to the U.S., Kendrick also enlightened the audience to some of the challenges that are faced in fighting numerous microbial pathogens that threaten the crops.

Kendrick's research focuses on *Phakopsora pachyrhizi*, a fungus that causes the destructive disease Asian soybean rust (ASR) and was first detected in the U.S. in 2004. Currently, there are no

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Spring Research Festival

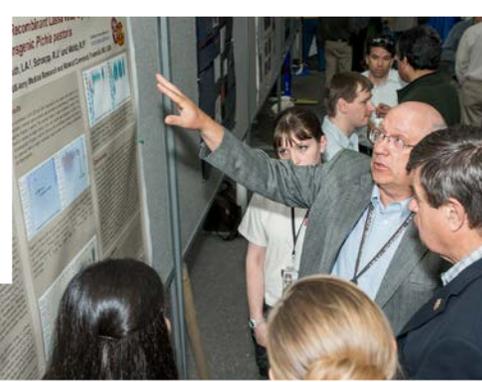
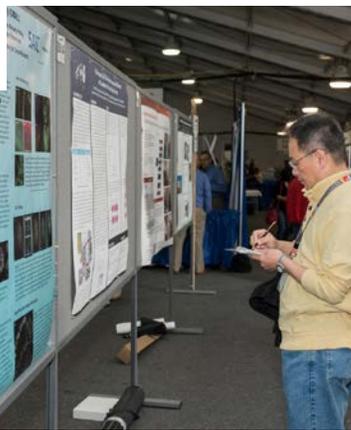
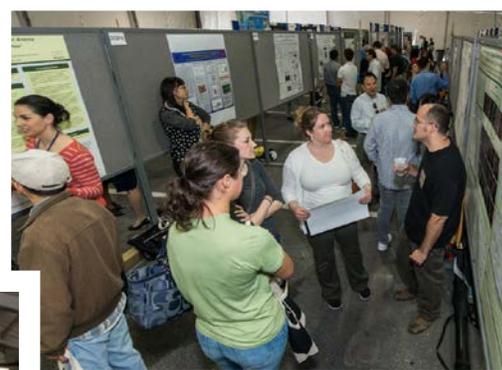
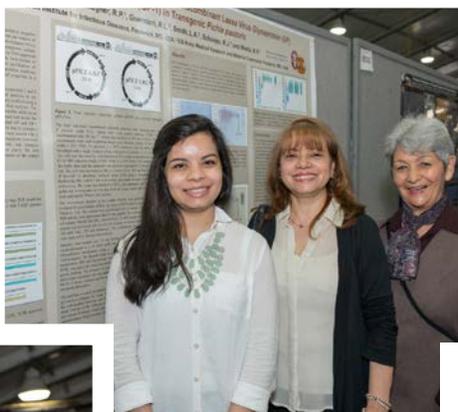
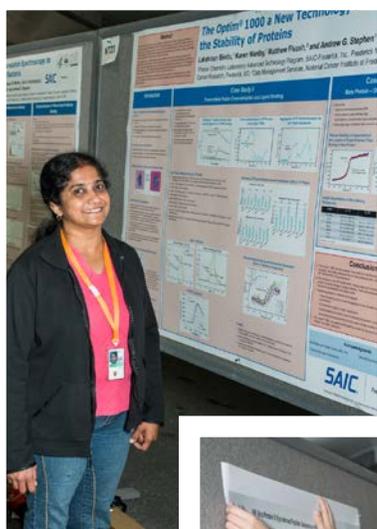
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ASR-resistant soybeans commercially available to U.S. farmers. Kendrick has identified novel secondary metabolites produced in soybeans as a resistance response to *P. pachyrhizi*. Through microarray analysis and gene silencing, a lengthy process in plants, Kendrick is gaining further understanding of metabolite production during the ASR-resistance response and is able to build a more detailed model of microbial pathogen resistance in soybeans. Her studies could ultimately lead to development of a broad-spectrum resistant line of soybeans.

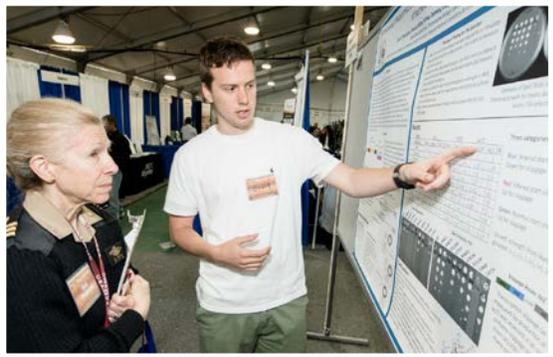
Winners of the symposium received a travel subsidy as well as a certificate recognizing their achievement. In addition to Stagliano, an award was given to Shakir Saud, Laboratory of Cancer Prevention, in the postbaccalaureate category. Postdoctoral

winners included, in addition to Kendrick, Mairi McLean, Laboratory of Molecular Immunoregulation, NCI; Janani Varadarajan, HIV Drug Resistance Program, NCI; and John Trefry, U.S. Army Medical Research Institute of Infectious Diseases.

The NICBR partner agencies include the U.S. Army Medical Research and Materiel Command and U.S. Army Medical Research Institute of Infectious Diseases (USAMRIID); National Institute of Allergy and Infectious Diseases; National Cancer Institute; U.S. Department of Agriculture; National Biodefense Analysis and Countermeasures Center; Centers for Disease Control and Prevention; Naval Medical Research Center; and U.S. Food and Drug Administration. ■



Spring Research Festival



Best Collaborative Publication Announced during Spring Research Festival Week

By Nancy Parrish, Staff Writer

The winner of the 2012 competition for the best collaborative publication was announced on May 7, as part of the lead-up to the Spring Research Festival sponsored by the National Interagency Confederation for Biological Research (NICBR) and the National Cancer Institute at Frederick on May 8 and 9.

The winning paper was selected from five entries for best publication resulting from collaborative research between two or more NICBR partners based on the Fort Detrick campus. The partner agencies include the U.S. Army Medical Research and Materiel Command and U.S. Army Medical Research Institute of Infectious Diseases (USAMRIID); National Institute of Allergy and Infectious Diseases; National Cancer Institute; U.S. Department of Agriculture; National Biodefense Analysis and Countermeasures Center; Centers for Disease Control and Prevention; Naval Medical Research Center; and U.S. Food and Drug Administration.

The paper focuses on a potential therapeutic agent against Staphylococcal enterotoxin B (SEB), a deadly toxin produced by *Staphylococcus aureus*, which has been associated with severe—even fatal—food poisoning. Exposure to SEB, according to the paper, can trigger an exaggerated immune system response, often leading to toxic shock syndrome associated with organ failure and death.

Collaboration Began at 2010 Spring Research Festival

The study was the result of a collaboration that began at the 2010 Spring Research Festival, when David Waugh, Ph.D., senior investigator, Macromolecular Crystallography Laboratory, NCI at Frederick, opened discussions with Kamal Saikh, Ph.D. principal investigator, Integrated Toxicology Division, USAMRIID, about the research presented in Saikh's poster. Waugh said that he realized "Saikh's

research could be enhanced and extended by employing biophysical methods such as NMR [nuclear magnetic resonance] and X-ray crystallography to study the interactions of small molecules with proteins that propagate signals in the innate immune response pathway."

Those discussions led to research that



Kamal Saikh, Ph.D., left, and David Waugh, Ph.D., were winners of the 2012 competition for best collaborative publication among NICBR partners.

focused on *MyD88*, a gene involved in the body's immune response. The researchers produced a synthetic compound based on *MyD88* that was introduced into mice either before or after SEB exposure. The effect was to reduce the level of immune response to the toxin and, in fact, protected the mice from getting toxic shock syndrome.

Waugh's laboratory, which focuses on high-throughput protein expression and purification, and structural biology, produced the recombinant *MyD88* protein for the studies, including samples enriched with the stable isotope ^{15}N for the NMR experiments conducted by the laboratory of Julius Rebeck, Ph.D., at The Skaggs Institute for Chemical

Biology, The Scripps Research Institute. Sun Ping, Ph.D., a visiting fellow in Waugh's lab did the hands-on work for the project.

Saikh's laboratory led the investigation.

Collaboration Was Key to Promising Results

Both researchers believe that the promising results of their study would not have been possible without the

collaboration fostered by NICBR. "It enabled us to make an impact on the rapidly developing field of innate immunity, where complex signaling cascades are being uncovered," Waugh said. This type of research "is not something we would normally do in my lab," he added.

Saikh felt the collaboration enabled his research to progress toward developing therapeutic agents to treat SEB. "Currently, no licensed treatments are available for SEB intoxication," he said. "Our work, combined with the work of Dr. Waugh's group, enabled us to identify and validate a target-based potential lead candidate for the treatment of SEB."

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NICBR Best Collaborative Publication

continued from page 10

Waugh appreciates the chance to collaborate with other NICBR agencies. These collaborations, he said, present “an opportunity to participate in biomedical research that is not being conducted at my own institute, but which interests me nonetheless.” Further, he said that “in an environment in which resources for biomedical research in my own institute (NCI) have been reduced to an unprecedented low point, and with additional budget cuts all but certain, collaborations like this one are essential for us to be able to continue to conduct meaningful scientific research.”

Other interagency collaborations his laboratory is involved in include studies of Venezuelan equine encephalitis virus and human protein tyrosine phosphatases involved in cancer and host response to infectious agents. Both studies are collaborations with USAMRIID. ■

Best Collaborative Publication among NICBR Partnering Laboratories, 2012

Therapeutic Inhibition of Pro-inflammatory Signaling and Toxicity to Staphylococcal Enterotoxin B by a Synthetic Dimeric BB-Loop Mimetic of MyD88.

Teri L. Kissner,¹ Gordon Ruthel,¹ Shahabuddin Alam,¹ Enrique Mann,² Dariush Ajami,² Mitra Rebeck,² Eileen Larkin,¹ Stefan Fernandez,¹ Robert G. Ulrich,¹ Sun Ping,³ David S. Waugh,³ Julius Rebeck, Jr.,³ and Kamal U. Saikh^{1,*}

¹Department of Immunology, United States Army Medical Research Institute of Infectious Diseases, Frederick, Maryland; ²Department of Chemistry, The Skaggs Institute for Chemical Biology, The Scripps Research Institute, La Jolla, California; ³Macromolecular Crystallography Laboratory, National Cancer Institute at Frederick, Frederick, Maryland

PLoS ONE 7(7): e40773. doi:10.1371/journal.pone.0040773

To view the full article, go to:

<http://www.plosone.org/article/info%3Adoi%2F10.1371%2Fjournal.pone.0040773>.

Technology Transfer Center

Nineteen Patents Issued in 2012 for Inventions by Frederick Researchers

By Karen Surabian, Contributing Writer

Patents provide a period of exclusivity and are a way to exclude others from making, using, or selling an inventor's novel technology. For the National Institutes of Health (NIH), patents are an incentive for an outside party to license, develop, and commercialize NIH technologies that will benefit public health, especially those that require substantial further development by an outside party, such as therapeutics and diagnostics. Licensing these inventions to others willing to commercialize the technology fosters the development of the technology into a useful product.

The NIH Office of Technology Transfer (OTT) licenses technologies that are invented at NIH and works with the NCI Technology Transfer Center (TTC) to process patent applications on selected inventions. In addition, NCI TTC and NIH OTT work with outside partners using a

variety of mechanisms to facilitate the commercial development of NIH technologies.

Mechanisms to access NIH materials for research or commercial development, or to partner with NIH in a collaborative project may include Material Transfer Agreements (MTAs), Confidential Disclosure Agreements (CDAs), Cooperative Research and Development Agreements (CRADAs), other types of collaborative agreements, and licenses (non-exclusive and exclusive).

Patents Issued in 2012

Anti-viral griffithsin compounds, compositions, and methods of use. Inventors: Barry O'Keefe,* Toshiyuki Mori,* and James McMahon* (US 8,088,729; issued January 3)

Nitric oxide-releasing diazeniumdiolated compounds. Inventors: Joseph Hrabie,* Frank DeRosa,* and Larry Keefer* (US 8,093,343; issued January 10)

Human monoclonal antibodies that specifically bind IGF-II. Inventors: Dimiter Dimitrov* and Yang Feng* (US 8,105,598; issued January 31)

Human immunodeficiency virus type 1 (HIV-1)-neutralizing human single-chain antibodies with improved breadth and potency. Inventors: Dimiter Dimitrov* and Mei-Yun Zhang* (US 8,110,192; issued February 7)

continued on page 12

continued from page 11

Methods of gene therapy using nucleic acid sequences for ATP-binding cassette transporter. Inventors: Rando Allikmets,* Kent Anderson, Michael Dean,* Mark Leppert,* Richard Lewis, Yixin Li, James Lupski, Jeremy Nathans, Amir Rattner, Noah Shroyer, Nanda Singh, Philip Smallwood, and Hui Sun (US 8,129,353; issued March 6)

In situ assembling of protein microarrays. Inventors: Deb Chatterjee,* Kalavathy Sitaraman,* James Hartley,* Cassio Baptista,* and David Munroe* (US 8,148,302; issued April 3)

Potent combinations of mRNA transport elements. Inventors: Barbara Felber,* Sergey Smulevitch,* and George Pavlakis* (US 8,163,542; issued April 24)

Inactivators of 06-alkylguanine-DNA alkyltransferase. Inventors: Robert Moschel,* Matthew Karl Moschel (legal representative), Anthony Pegg, Sahar Javanmard,* Natalia Loktionova, and Gary Pauly* (US 8,188,055; issued May 29)

Smoothened polypeptides and methods of use. Inventors: Nadya Tarasova,* Michael Dean,* and Hong Lou* (US 8,198,402; issued June 12)

Inhibitor of DNA methylation. Inventors: Eric Selker, Cindy Matsen, Peter Jones, Jonathan Cheng, Sheldon Greer, and Victor Marquez* (US 8,207,142; issued June 26)

Method of treating pneumoconiosis with oligodeoxynucleotides. Inventors: Dennis Klinman* and Takashi Sato* (US 8,222,225; issued July 17)

HMGN polypeptides as immune enhancers and HMGN antagonists as immune suppressants. Inventors: De Yang,* Joost Oppenheim,* and Michael Bustin* (US 8,227,417; issued July 24)

Inhibitors of ubiquitin E1. Inventors: Allan Weissman,* Yili Yang,* and Jane Jensen* (US 8,242,160; issued August 14)

Fast electron paramagnetic resonance imaging (EPRI) in the CW EPR mode using rapid-scan in the presence of rotating gradients and direct detection with transmit/receive and data processing in a digital signal processing platform. Inventors: Sankaran Subramanian,# Nallathamby Devasahayam,# Janusz Koscielniak,* James Mitchell,# and Murali Krishna Cherukuri# (US 8,242,778; issued August 14)

Cellular and viral inactivation. Inventors: Yossef Raviv,* Mathias Viard,* and Robert Blumenthal* (US 8,268,602; issued September 18)

Fast electron paramagnetic resonance imaging (EPRI) using CW EPR spectrometer with sinusoidal rapid-scan and digital signal processing. Inventors: Sankaran Subramanian,# Nallathamby Devasahayam,# Janusz Koscielniak,* James Mitchell,# and Murali Krishna Cherukuri# (US 8,269,496; issued September 18)

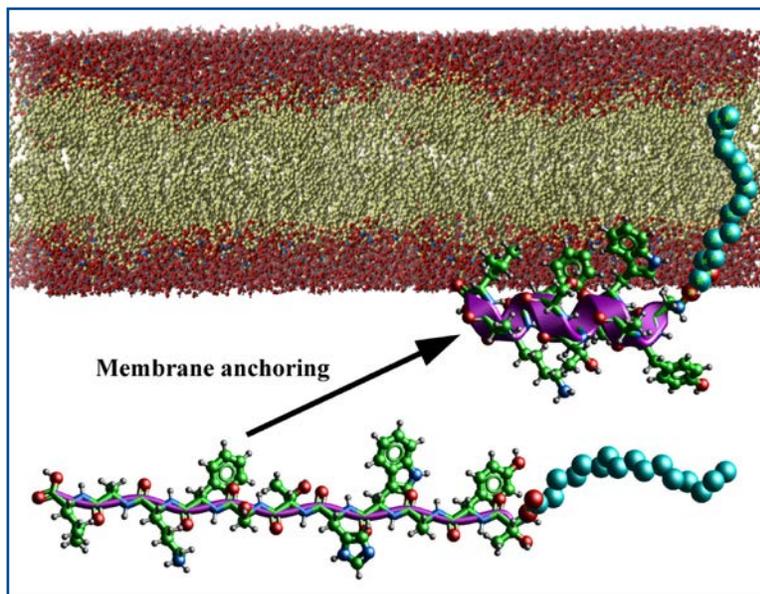
Treating renal cancer using 4-[bis] 2-[(methylsulfonyl) oxy] ethyl] amino]-2-methyl-benzaldehyde. Inventors: Susan Mertins,* Susan Bates,# David Covell,* Geoffrey Patton,* Melinda Hollingshead,* and Rao Vishnuvajjala# (US 8,273,797; issued September 25)

Inactivated influenza virus compositions. Yossef Raviv,* Mathias Viard,* Robert Blumenthal,* Robert Hogan, and Stephen Mark Tompkins (US 8,278,083; issued October 2)

Viral chemokine-antigen fusion proteins. Inventors: Larry Kwak* and Bira Arya* (US 8,318,177; issued November 27)

Marketing efforts for these technologies by NCI TTC and NIH OTT have led to many collaborations and licenses. For example, US Patent 8,198,402 (Smoothened polypeptides and methods of use; see figure) was licensed and is also part of a

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The figure, representing US Patent 8,198,402 (Smoothened polypeptides and methods of use), illustrates the design principle used for generating the Hedgehog pathway inhibitors disclosed in the patent: folding the inhibitors through an interaction with the cellular membrane. Membrane anchoring through lipidation allows the membrane to facilitate the folding of short protein fragments and the conversion of these fragments into potent inhibitors of the corresponding protein. Folding the inhibitors into the appropriate conformation is critical to their activity.

Career and Technology Center Honors Julie Hartman

By Carolynne Keenan, Contributing Writer

On May 7, Julie Hartman was honored by the Frederick County Career and Technology Center (CTC) for her support of the CTC's Biomedical Sciences Program. As an education program specialist for Outreach and Special Programs at NCI at Frederick, Hartman is responsible for NCI at Frederick's participation in the program, which is designed to offer Frederick County high school students hands-on, practical laboratory experience beyond the typical classroom setting.

Hartman brings together NCI at Frederick's scientists and high school students to provide high-level internships that give the next generation of scientists a glimpse into their future careers, and help expand their scientific knowledge base.

"She is an essential component in the students' success as she works behind the scenes to ensure that they are thriving in their new environment," noted Greg Solberg, CTC principal, during the honors ceremony.



Julie Hartman, right, with Kathy Koops, CTC biomedical sciences instructor, in front of the CTC facility, which is adjacent to Fort Detrick.

"NCI has been good to the BioMed Program," Solberg added in a recent e-mail. "But Julie Hartman has been the glue that makes a lot of it happen for our kids."

Graduates of the program are encouraged to continue building on their knowledge base by pursuing a science or health-oriented program in college.

Several graduates are currently in nursing or other health-related programs.

"I'm passionate about my commitment in helping the next generation of scientists gain the knowledge and experience to perform well in their future careers," Hartman said, adding that she was "very honored" to receive the award. ■

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CRADA with a start-up company to commercially develop the technology. In addition, the technology was part of a nomination entitled "Novel Protein-Like Therapeutics for the Treatment of Cancer," for which NCI researchers Nadya Tarasova, Ph.D., Synthetic Biologics and Drug Discovery Facility; Michael Dean, Ph.D., Laboratory of Experimental Immunology; and Sergei Tarasov, Ph.D., Structural Biophysics Laboratory; and former NCI researcher Hong Lou, Ph.D., received an award for excellence in technology transfer from the Federal Laboratory Consortium (FLC) Mid-Atlantic Region, and an honorable mention at the National 2011 FLC Awards.

*Denotes researchers who were with NCI at Frederick (NCI and SAIC-Frederick) at the time the patent was submitted.

#Denotes researchers who were with NCI Bethesda at the time the patent was submitted.

Special thanks to Mojdeh Bahar, J.D., M.A., CLP (chief, Cancer Branch, NIH OTT), Christopher Sappington (technology development administrative specialist, TTC, NCI), and Tere Diaz (technology development administrative specialist, TTC, NCI) for helping to compile the list of patents. ■



Science Skills Boot Camp Gets Interns Ready for Research

By Ashley DeVine, Staff Writer

Summer interns learned how to read a scientific paper, present a poster, maintain a laboratory notebook, and much more, at the Science Skills Boot Camp in June.

“It was a great experience, and it was a great opportunity to meet some of the other interns also working on the campus,” said Alyssa Klein, a Werner H. Kirsten student intern in the Cellular Immunology Group, Laboratory of Molecular Immunoregulation. “The boot camp covered many topics essential to being a good scientist and science researcher.”

The one-day training program, offered through the NIH Office of Intramural Training & Education (OITE), was designed to introduce interns with little or no research experience to the NIH research environment.

Klein was one of 46 interns who attended the boot camp, which included sessions on NIH and its research culture, NCI summer resources, science communication, research questions,



Rocio Benabentos, Ph.D., NIH Office of Intramural Training & Education, emphasized the importance of setting goals for the summer and provided a handout for students to write down their own goals.

and reading a scientific paper. Most of the sessions included a group activity, according to Rocio Benabentos, Ph.D.,

program manager of the boot camp and a postdoctoral fellow at the National Institute of Dental and Craniofacial Research, also working in the NIH OITE.

“We had a really positive response to the boot camp from the students,” Benabentos said. “The sessions on reading a scientific paper, presenting a poster, and keeping a lab notebook were particularly helpful to the students, as was the general advice. They also enjoyed meeting and networking with fellow summer interns.”

The group activities gave interns a chance to review and critique lab notebook entries, PowerPoint presentations, and scientific posters in groups, Benabentos said.

In addition to meeting other interns on campus, Monica Manam, a summer Cancer Research Training Award graduate student intern working in the NCI-CCRIFX Bioinformatics Core, wanted to learn more about NIH, which she calls her “dream institution.”

“Right from [the start of] my undergrad education, I was fascinated with the

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During one of the group activities, interns formed groups of seven or eight, and they were asked to brainstorm and present ideas about achieving an assigned summer goal.



One of the groups brainstormed about how to achieve the summer goal of gaining an understanding of the scientific method.

Science Skills Boot Camp



A group of interns presented their ideas for achieving the goal of building a professional network.



Walter Hubert, Ph.D., NCI Office of Scientific Operations, spoke about the NCI research culture, answered student questions, and gave career advice.



Rebecca Burgess, Ph.D., a postdoctoral fellow at NCI, reviewed posters with students and explained how to effectively design and present a poster.



Vijay Walia, Ph.D., a postdoctoral fellow at NCI at Frederick, presented sessions on reading a scientific paper and developing a good research question.

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amount of important and useful research NIH does,” Manam said. During the boot camp, she enjoyed “forming groups and learning things like writing titles to publications [and] understanding your goals.”

Katherine Goetz, a Werner H. Kirsten student intern with the Vaccine Branch, said her favorite part was learning about poster presentations. “The topic was one that I had heard a lot about; but before

the boot camp, it was one about which I knew very little.”

“A lot of the advice given to interns was general because each lab is different,” said Tina Ju, a high school intern through the Foundation for Advanced Education in the Sciences, who is working in the Protein Interaction Group, Center for Cancer Research Nanobiology Program. “It highlights how so many individuals work together to further the mission of NIH.”

Benabentos said the organizers of the boot camp hoped “to provide a foundation and a general understanding of important skills, such as reading a scientific paper or presenting a poster. Most importantly, we hope that the students realize that they have the power to succeed if they are proactive and take advantage of the wonderful resources and mentors around them.” ■

Incoming Werner H. Kirsten Student Interns

WHK Student Internship Enrollment, Mentor Participation Up More than 50 Percent

By Nancy Parrish, Staff Writer

The Werner H. Kirsten Student Internship Program (WHK SIP) has enrolled the largest class ever for the 2013–2014 academic year, with 66 students and 50 mentors. This enrollment reflects a 53 percent increase in students and a 56 percent increase in mentors, compared to 2012–2013 (43 students and 32 mentors), according to Julie Hartman, WHK SIP director.

Hartman attributes the increase in enrollment to several factors. The number of slots available is directly dependent

two also visited local high schools to encourage student participation in the program. “Generally, I think that recent ‘alums’ of the program tell their peers ... and it spreads through word-of-mouth,” Hartman added. “Parents at the NCI at Frederick also encourage their children to apply.”

Craig Reynolds, Ph.D., director, NCI Office of Scientific Operations, was pleased with the enrollment this year. “This increase reflects a positive outcome for our community—both in recruiting talented young people into careers in

summer following their junior year until the end of their senior year. The students are paid for eight weeks of work during the summer and receive four weighted credits towards the completion of their academic curriculum during the school year.

Mentors are generally seasoned laboratory researchers or principal investigators (PIs) from NCI at Frederick laboratories, according to Hartman. In general, she said, they sign up to encourage young people to pursue scientific careers and to train the next generation of researchers. In addition, she noted that “because the PIs have a dedicated and highly motivated student



With 66 students, the 2013–2014 incoming class of Werner H. Kirsten student interns is the largest ever.

on the number of mentors who sign up for the program, she said, and this year more mentors agreed to participate. That’s because of an aggressive campaign Hartman and James Cherry, Ph.D., scientific advisor to the program, launched to enroll more mentors. “We made several requests in person, over e-mail, and through public events to recruit mentors,” Hartman said.

Their campaign to increase enrollment didn’t stop with the mentors. The

science and in the strength of our staff for stepping up to the plate and providing a foundation on which students can pursue their interests,” he said. “I applaud the efforts of the staff at NCI at Frederick and the Frederick National Laboratory for Cancer Research. I look forward to next year’s WHK SIP class.”

Interested in the Program?

The WHK SIP is designed for high school seniors, extending from the

for a year to help with their research activities, many mentors find this experience to be a mutually beneficial and satisfying one.” The laboratory receives a small training budget for the student, she said.

To find out more about this program, visit https://ncifrederick.cancer.gov/careers/student_programs/internships/SIP/, or contact Julie Hartman at 301-846-7338, or hartmanjb@mail.nih.gov. ■

Frederick County Science Fair Awards

WHK Interns Sweep Entire Category at Frederick County Science Fair

By Nancy Parrish, Staff Writer

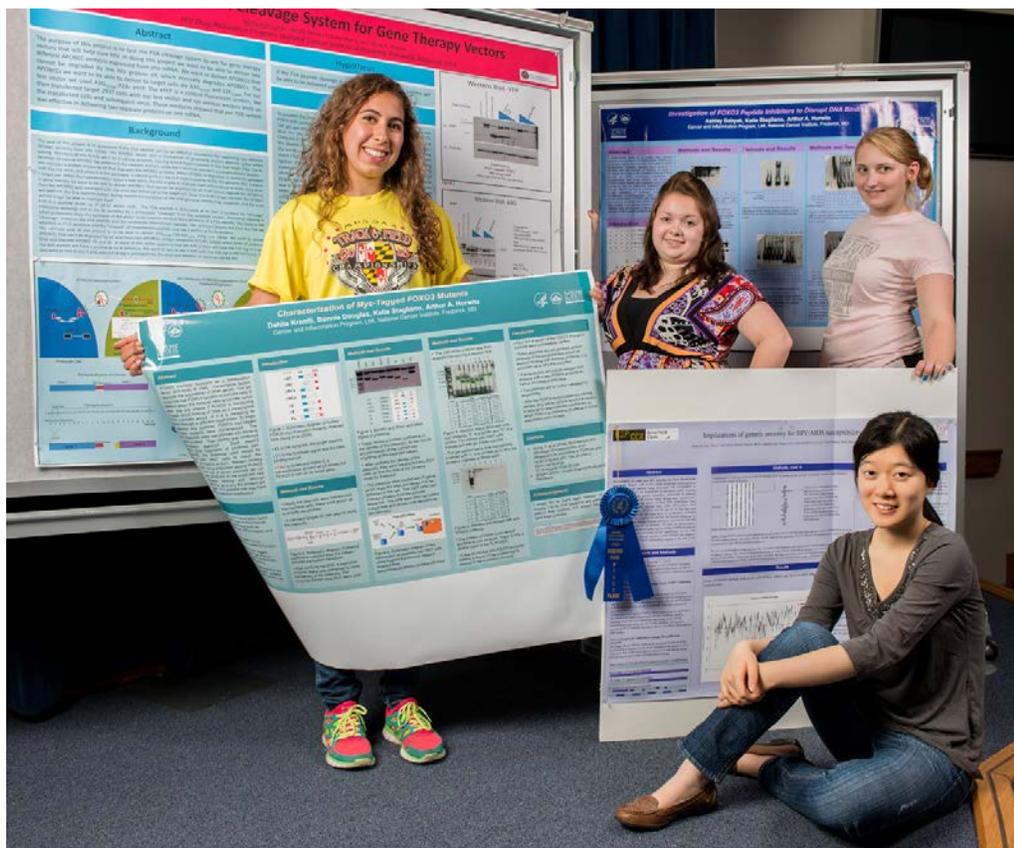
The competitors in the cellular and molecular biology category of the Frederick County Science and Engineering Fair on March 22–23 didn't stand a chance against the Werner H. Kirsten student interns at NCI at Frederick.

These interns swept the entire category, with Madelyne Xiao, a rising intern, winning first place; Maria Hamscher, second place; Ashley Babyak and Dahlia Kronfli tying for third place; and Maham Ahmed receiving an honorable mention.

Hamscher, who worked with mentor Krista Frankenberry, Ph.D., in the laboratory of Vinay Pathak, Ph.D., Viral Mutation Section of the HIV Drug Resistance Program, said her research focused on gene therapy vectors that could play a role in treating patients with HIV.

Babyak and Kronfli both worked with Katie Stagliano in the Laboratory of Molecular Immunoregulation, headed by Andy Hurwitz, Ph.D. Kronfli said her project was designed to “perform quality checks on truncation mutants of the FOXO3 protein to verify their identity so that they could be further used in functional studies.” Babyak also worked with FOXO3 proteins, she said, testing “the ability of FOXO3 peptide inhibitors to disrupt the binding of FOXO3 proteins to DNA. These peptide inhibitors are meant to disrupt the function of the FOXO3 transcription factor, which has been implicated in the development of cancer.”

Xiao, a rising high school senior at Urbana High School, works in the Basic Science Program CCR Genetics Core with mentors Bailey Kessing and Randall Johnson. Her project focused on the implications of genetic ancestry in HIV/AIDS susceptibility. “Knowing that certain genetic ancestries predispose individuals to infection with HIV and progression to AIDS, we identified areas of abnormally high African and European ancestry in admixed (mixed race) populations,” she said.



Werner H. Kirsten student interns display winning posters. Seated: Madelyne Xiao; standing, from left, Dahlia Kronfli, Maria Hamscher, and Ashley Babyak. Not pictured: Maham Ahmed, Hanna Perez, and Sam Pritt.

Other first-place winners included interns Hannah Perez, in the microbiology category, and Sam Pritt in the biochemistry category. Pritt also received the overall grand prize and went on to compete at the Intel International Science and Engineering Fair in Phoenix, Az., in May (see article on page 18).

Perez worked with mentor Vickie Marshall in the Viral Oncology Section, AIDS and Cancer Virus Program, headed by Denise Whitby, Ph.D. Her project focused on viruses that threaten exotic species of nonhuman primates. “Betaherpesviruses can cause severe disease in animals already stressed,” Perez explained, “and gammaherpesviruses are associated with many types of cancer in animals as well as humans” (see “Intern Places First in Microbiology at Frederick County Science Fair” on *Insite*.)

Pritt, who works in the Cancer and Inflammation Program with Nadya Tarasova, Ph.D., said the focus of his project was to “develop peptide drugs to inhibit the Wnt signaling pathway.” This pathway, he explained, plays a role in the development of a variety of different cancers.

Gaining Experiences to Take with Them

The reasons the interns appreciate their experiences at NCI at Frederick are as varied as the interns themselves.

Both Xiao and Pritt appreciate the opportunity to work with the scientists as well as with other students focused on science. “I’ve been able to collaborate with incredible thinkers and researchers,” Xiao said. “My mentors and the people in their labs have always been willing to

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Sam Pritt Wins Award at Intel International Science and Engineering Fair

By Ashley DeVine, Staff Writer

Out of the approximately 1,600 high school students from all over the world who competed in the Intel International Science and Engineering Fair (ISEF) in Phoenix, Az., in May, more than 500 received awards and prizes for their research.

Sam Pritt, then a Werner H. Kirsten student intern, was one of those award winners. He received a second award of \$1,500 in the biochemistry category for his project titled “Rationally Designed Beta-Catenin Inhibitors as Anti-Tumor Agents.”

Pritt’s project focused on “developing peptide drugs that interfere with beta-catenin and cause it to be degraded,” he said. Increased levels of beta-catenin due to mutations can activate the Wnt pathway in adult tissues. This pathway leads to tumor development, he explained.

“ISEF was an amazing experience,” Pritt said. “The best part was meeting so many brilliant students from all over the world.”

Pritt won a top regional prize last year at the Siemens Competition in Math, Science, and Technology in November, and was a national finalist in the Siemens Competition National Finals in December. He was also a first-place winner in biochemistry, as well as overall winner, at the Frederick County Science and Engineering Fair in March (see article on page 17). His achievement as overall winner earned him a place at the ISEF.

Pritt is currently an intern in the Cancer and Inflammation Program with mentor Nadya Tarasova, Ph.D. ■



Sam Pritt (right) stands with James Cherry, Ph.D., scientific advisor, NCI Office of Scientific Operations, after receiving a certificate for completing his 2012–2013 Werner H. Kirsten Student internship in May.

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discuss projects and answer questions. Not to mention the like-minded students I’ve met.” She hopes to continue her studies in a science-related field, possibly computer science.

Pritt, who plans to attend Princeton University, said he appreciates the opportunity “to conduct research and collaborate with other scientists.”

Hamscher is grateful to her mentor for making things “easy to understand” and was surprised at how much she learned while an intern. Frankenberry, she said, taught her “so much more than I ever thought I could learn as a high school student.” Hamscher plans to attend the University of Pittsburgh as a pre-med student, with the ultimate goal of becoming a surgeon.

Kronfli feels better prepared for college courses. “I have learned an incredible amount about biotechnology and research,” she said, and she is “excited to go to college with a basic understanding of molecular biology and knowledge of lab protocols.” This fall she will enter the Integrated Life Sciences Program at the University of Maryland, College Park.

Working in a research lab helped Babyak learn valuable skills and gain “real-life experience...in the world of science,” she said. Babyak will study biotechnology and chemistry at Stevenson University this fall.

Perez will study biology at St. Mary’s College of Maryland, and said she hopes to become a doctor of veterinary medicine. ■



FME Senior Project Managers: A Juggling Act of Multiple Projects

By Peggy Pearl, Contributing Writer

It was not until the 1950s that organizations in the United States began to apply project management tools and techniques to complex construction and engineering projects (http://en.m.wikipedia.org/wiki/Project_life_cycle).

Today, construction projects at NCI at Frederick are managed by Senior Project Managers (PMs) Bart Christy, Joe Hall,

projects is like a juggling act—and you don't want to drop any of the balls. "There are many tasks in motion at the same time that must be brought to a successful conclusion," Christy said.

The senior PMs are responsible for communicating with the project team, controlling and maintaining project scope, and coordinating the technical criteria necessary to successfully complete facility construction projects within budget and on schedule. The FME senior PM team works strictly on construction projects for the Frederick National Laboratory for Cancer Research (FNLCR). The team

Café was one of his favorite projects. He enjoys working on highly detailed architectural projects of significance. "There is no greater satisfaction than providing an aesthetically pleasing project that continues to be enjoyed by all," Christy said, adding that the café is one of the most visible projects that he has completed for the facility.

Hall, having worked in FME for over three years, said his favorite project so far was installing the new emergency generators in Building 539. While managing the project, Hall learned that the generators were different from others he had installed because they could operate with two different types of fuel: natural gas and diesel. "The Building 539 generator provides emergency power to one of the largest animal facilities on campus," Hall said.

Robillard noted that he is more of a "people person" type of PM. He prefers to work on projects where he can have a lot of interface with the requester(s). "An effective PM must master the art of managing expectations, behaviors, attitudes, and personalities, in addition to understanding and anticipating project metrics," Robillard said.

Khalil, recently promoted to manager of FME Project Operations, was the senior PM for the Advanced Technology Research Facility (ATRF). He said one of his greatest accomplishments was completing a preplanned project of this level of complexity on time and on budget, with "an excellent and highly responsive project team." The project/building size and the number of programs housed in the building, including research laboratories, the data center, and the conference center, were the reasons this project was more complex than others, according to Khalil. "The ATRF is the largest design/construction project ever undertaken by FNLCR," he said.

The FME senior PMs said they are proud to be part of a team of FME design and construction professionals dedicated to successfully completing projects that ultimately support the mission of NCI at Frederick. ■



The Facilities Maintenance and Engineering senior project managers (from left): Craig Robillard, Bruce Fernalld, Joe Hall, and Bart Christy, with Talal Khalil (far right), manager.

Bruce Fernalld, and Craig Robillard, in the Facilities Maintenance and Engineering (FME) Directorate. They are supervised by FME Project Operations Manager Talal Khalil.

A Day in the Life: Keeping "Many Tasks in Motion"

A typical day for a senior PM can be pretty tricky business, according to Robillard. The senior PMs could be working on an average of 15 different projects in various stages of design and construction, according to Hall. Christy and Hall both said that managing these

works closely with the FNLCR customer, outside contractors, engineers, designers, construction administrators, estimators, schedulers, cost analysts, shop personnel, construction contract personnel, and administrative staff on each project. These construction projects could cost anywhere from five thousand to millions of dollars, according to Fernalld.

Senior Project Managers Reflect on Favorite Projects

Christy, a 19-year veteran of the senior PM group, said that transforming the Building 549 cafeteria into the Discovery



Congratulations to the April 2013 Poster Puzzler winner!

Alan Brooks, research associate III, Basic Science Program, SAIC-Frederick, is pictured (right) with Melissa Porter, executive editor of the *Poster*. ■

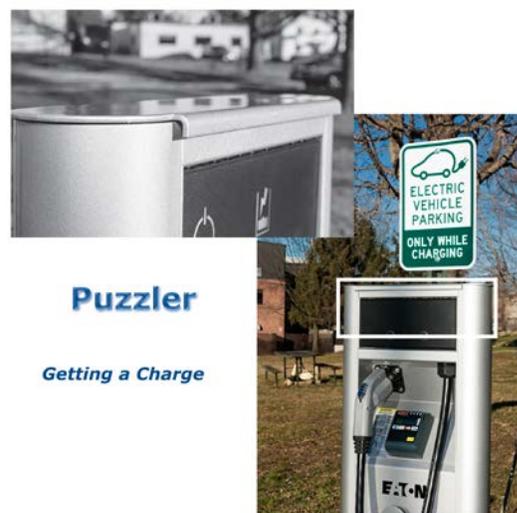
The Poster Puzzler:

Getting a Charge

By Ashley DeVine, Staff Writer

The April Puzzler is the top of an electric vehicle charging station that was installed on campus in January.

Facilities Maintenance and Engineering staff installed two of these 240-volt charging stations in the northwest corner of the Building 350 parking lot. ■



What Is It?

Where Is It?

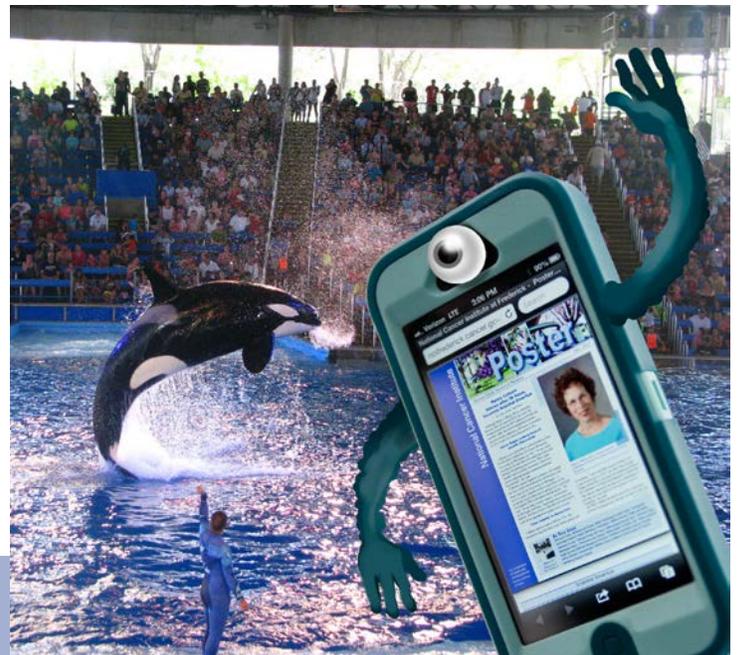
Your challenge, should you decide to accept it, is to correctly identify the item and its location from the picture to the right. Clue: It's somewhere at the NCI campus at Frederick or Fort Detrick. Win a framed photograph of the Poster Puzzler by e-mailing your guess, along with your name, e-mail address, and daytime phone number, to poster@mail.nih.gov. All entries must be received by **Friday, September 27, 2013**, and the winner will be drawn from all correct answers received by that date.

Good luck and good hunting! ■



Have Poster, Will Travel

Editor's note: Because the *Poster* is no longer being produced in hard copy, we invite you to bring it with you on your mobile device. Hold up your screen showing the front page of the *Poster*, have someone snap your photo, and send it to poster@mail.nih.gov. Meantime, on the next page you will find photos taken on the last of the paper *Poster's* travels.



Have Poster, Will Travel



The *Poster* Goes to Scotland...

Andrea Frydl, public affairs specialist, NCI Office of Scientific Operations, recently travelled to Scotland, where she is shown at left, at the Leuchars train station. This is the stop for Saint Andrews, Frydl said, which she and her husband wanted to visit because of its geographical beauty and rich history. Frydl mentioned that Saint Andrews is also known for its golfing and its university, “where Wills met Kate (Duke and Duchess of Cambridge).” In two weeks, they visited eight cities, including stops on the Orkney and Shetland islands, and were “fully exhausted” at the end of their trip, she said. But, she added, “I really had an amazing time!”



...and to Key West

The *Poster* went as far south in the continental United States as you can get, when Kathy Tokar, receptionist/secretary I, Office of Acquisitions, Treatment and Support Branch, took it to Key West, FL. “This is considered to be the most southern point of Florida, just 90 miles from Cuba,” Tokar said. “There is always a long line of people waiting to have their picture taken at this spot, too.”



...and to Dinosaur Land

Poster Executive Editor Melissa Porter enjoyed a day with her family last spring at Dinosaur Land in Winchester, Va. Her son is pictured here with one of the “creatures” sneaking up behind him. Dinosaur Land features replicas of more than 50 dinosaurs from the Mesozoic era, when dinosaurs were the only creatures roaming the earth, according to its website (<http://dinosaurland.com/>). ■

New PPE Policy Will Help Prevent Injuries

By Ashley Shoemaker, Guest Writer

In January 2013, a revised policy on personal protective equipment (PPE) was approved for all government and contractor employees at NCI at Frederick. This new policy was driven by a high number of eye injuries at NCI at Frederick (56 between 2007 and 2012) that were directly related to inadequate PPE.

The Occupational Safety and Health Act states that each employer is responsible for identifying hazards in the workplace and determining what kind of PPE is necessary.

Injury-tracking data collected by the Environment, Health, and Safety (EHS) Directorate during the past five years indicates that the eye was the second-most-injured body part. A majority of these injuries occurred in the laboratory, many of them with seemingly “innocuous” and “nonhazardous” liquids, such as buffers, media waste, isopropyl and ethyl alcohols, and various other aqueous solutions. The medical response of flushing this type of exposure often leads to irritation or corneal abrasion, requiring prescription treatment, which creates an Occupational Safety and Health Administration (OSHA)-recordable injury.

The Bureau of Labor and Statistics estimates that 90 percent of eye injuries can be prevented through the use of proper protective eyewear on the job (<http://ehs.okstate.edu/training/oshaye.htm>).

Quick Guide to the New Policy

The new policy states that if you work in a laboratory, animal facility, or GMP production area, you are required to wear, at minimum, a fully fastened lab coat (or facility clothing for animal facilities), safety glasses, appropriate gloves, and closed-toed shoes. This requirement also applies if you are observing an experiment or in the vicinity of another employee conducting work.

The only exception is for work that is purely administrative, such as using a computer, conversing with a colleague, or writing in a journal. When a hazard exists, you must don your PPE.



Lab coats must be fully fastened and appropriate for the work being conducted. Fire-resistant lab coats (marked “FR” on the



label) must be worn when working with pyrophoric liquids, highly reactive chemicals, open flame processes, or large volumes (greater than 500 ml) of flammable solvents.

Safety glasses must be ANSI Z87.1-approved, and the approval must be marked on the eyewear. If you require prescription eyewear, you may obtain prescription glasses

from the visiting optometrist, with a current (less than two years old) prescription. Prescription eyewear must also be ANSI Z87.1-approved and be equipped with approved side shields. You may wear a disposable face shield in conjunction with regular prescription glasses for operations that do not pose a flying object hazard.



A wide variety of gloves are available, depending on your particular needs. The amount of dexterity and the level of protection vary between gloves. Gloves must be selected to ensure adequate protection; however,



most gloves are not designed to be immersed in, or have prolonged contact with, chemicals. Change gloves as soon as you are aware that they have been contaminated.

Surgical or examination gloves provide an adequate barrier for some tasks; however, specialized nitrile,

butyl, or other types of gloves provide better protection when handling solvents, nonaqueous chemicals, and larger volumes. Latex gloves should be avoided, as they provide very limited chemical protection, and latex can cause sensitization and allergic response in the wearer.

No one glove will provide protection from all chemicals. You may consult the glove manufacturer’s recommendation charts via the Internet or call EHS for glove chemical compatibility.

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Supervisors Take Note

Supervisors are responsible for ensuring that all employees have and are using their required PPE properly. OSHA requires supervisors to train their employees in the following:

- How to use PPE properly
- When wearing PPE is necessary
- What kind of PPE is required
- What the limitations are for each article of PPE
- How to put on and take off the PPE
- How to maintain PPE and dispose of it properly

The newly simplified PPE policy helps supervisors by ensuring that the basic level of PPE is easily understood and easy to enforce. Supervisors need to determine, however, when elevating this basic level of PPE is necessary.

If you have any questions regarding the use or selection of PPE, please contact EHS at 301-846-1451.

Links to More Information

The updated PPE Policy:

[http://home.ncifcrf.gov/ehs/uploadedFiles/C-11%20Personal%20Protective%20Equip\(2\).pdf](http://home.ncifcrf.gov/ehs/uploadedFiles/C-11%20Personal%20Protective%20Equip(2).pdf)

OSHA's PPE Regulations:

<http://www.osha.gov/SLTC/personalprotectiveequipment/index.html>

For prescription eyewear:

<http://home.ncifcrf.gov/ehs/uploadedFiles/Eyewear%20schedule%20for%20CY12.pdf> ■

Ashley Shoemaker is an occupational safety specialist, Environment, Health, and Safety Directorate.

Farmers' Market

Farmers' Market Brings Fresh Produce and Products from Local Vendors

By Carolynne Keenan, Contributing Writer

Every summer, you can shop for fresh fruits, veggies, flowers, honey, and plenty of other homemade goodies at the NCI at Frederick Farmers' Market.

Buying at the Farmers' Market means you're supporting a local farmer, crafter, or other type of vendor. The products are brought to you, so you don't have to drive to get freshly picked produce and handmade products.

The Market Includes a Variety of Vendors

The Market includes vendors who have been attending for years as well as those who are in their inaugural year of participating.

Thurmont-based **Frugalbee**, owned by Bruce 'n' Kathy Fronek, has been coming to the Farmers' Market for more

than 10 years. Frugalbee offers a selection of honey, candles, and soap, all from their farm, Bruce explained, adding that their products are all completely chemical-free. This includes their new items for sale this summer: fresh potatoes. Frugalbee will be adding greeting cards to their product line in the fall.



Laurie Waltz, co-owner of the **Waltz Family Farm**, has been participating in the Farmers' Market for the last three years. "The market offers a wide variety of products by farmers and producers that sell what they grow/raise/make," she said in an e-mail.

The Waltz Family Farm raises cattle, sheep, and pigs in a free-range environment, Waltz explained. "People keep coming back to purchase our meats because of the quality and flavor."

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Farmers' Market

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Jennifer Ghanayem, of **Jennifer's Freedom Company**, is new to the Farmers' Market. Her company specializes in soy candles, made with 100 percent natural soy wax and hypoallergenic fragrance oils.

Soy candles "burn at a lower temperature and don't release harmful toxins in the air," Ghanayem said. Her candles, which burn for about 55 hours, are a couple of products in one,



Jennifer's Freedom Company

she explained. "As the soy wax softens, the candles can be used as body oil," which is great for dry skin, she said.



Handwoven Baskets and Florals

UnSuk "Sue" Gustafson, owner of **Handwoven Baskets and Florals**, is also new this year. She handcrafts baskets and offers floral arrangements. "My baskets are handwoven and all my crafts are of the highest quality," she said.



Dublin Roasters Coffee, Inc.

Serina Roy, owner/roaster of the Frederick-based **Dublin Roasters Coffee, Inc.**, has been coming to the market for the past five years. Her company buys green coffee from small farmers all over the globe, she explained in an e-mail, and helps the farmers get the best price for their quality coffee beans.

"We now have a busy café and store," Roy said. "We still attend this market because of the friendliness of the vendors and customers."

John Britt, owner of **Slice of Heaven Farm**, has been a market vendor for four years. As an employee of Frederick National Laboratory, he can easily bring his farm's poultry products to the market, he explained.

"Our children's 4-H projects expanded to where we had more than we needed, and Slice of Heaven Farm was born. We have eggs from happy chickens," Britt said, adding that Slice of Heaven Farm also sells duck eggs.



Slice of Heaven Farm

Jason Brusky, co-owner of **Pipeline Poultry and Meats**, is another first-time vendor this year. His company offers pesticide-free meats and grains. Brusky explained in an e-mail



Pipeline Poultry and Meats

that Pipeline Poultry and Meats is part of a 220-acre farm that grows all grains from previous years by harvesting the seeds. Those products are then fed to the animals. "Anyone looking for better health should try some of our products," Brusky said.

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Farmers' Market

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You will find these and many other vendors at the Farmers' Market every Tuesday from 11 a.m. to 1:30 p.m., in the parking lot of Building 549. ■



Rudy Medicus' Farm



Lewis Orchards



Two Girls Granola



Quilts of Valor



Better Choice Bakery



Two Acre Farm

R&W Club Frederick Seeks Volunteers to Plan Fun Activities

By Carolynne Keenan, Contributing Writer

Do you have ideas for events and/or fundraisers for the Recreation and Welfare (R&W) Club Frederick, a volunteer-run employee activities group?

Become a member and you can also volunteer to run events and fundraisers!

The R&W Club Frederick is a branch of the parent organization, R&W in Bethesda. But, unlike the parent organization, Club Frederick is made up entirely of volunteers.

To keep activities fresh, unique, and fun, the club is looking for more members who also want to volunteer. You can participate on any level—help out at an event or plan one entirely. The future of the club depends on its dedicated and creative members.

Plan a fun night at a sports event—like a night with the Frederick Keys. Schedule a fundraiser with a local restaurant, like Dining for Dollars at Glory Days Grill or the Pizza Hut events, in which a portion of sales receipts for an assigned day benefit the club. Or you may coordinate your own events around a hobby or interest, like the archeological dig hosted in May and June (see article on page 28) and the vineyard trip last fall.

“It’s a great way to build morale,” explained Roxanne Angell, the club’s president. “It unifies the Fort Detrick



R&W members Amy Blumhardt and Susie Culler serve ice cream at the Ice Cream Social held on June 21. The event was free for R&W members as a way to meet new people and celebrate the first day of summer.

community.” The R&W Club Frederick is open to all employees, as well as retirees, in the Fort Detrick and the NCI at Frederick communities.

Local and International Events Are Offered Year Round

The R&W Club Frederick was busy during the spring and early summer.

Some members took advantage of their membership by purchasing discounted tickets for “Rave On! The Buddy Holly Experience,” at the Weinberg Center in Frederick. Members also toured Washington, DC, on Segways during the Cherry Blossom Festival.

In addition, members are lining up for a Christmas markets trip during the holidays to Germany, Austria, and France, and more than 25 R&W Club Frederick members will head to the Galapagos Islands in March 2014.

This September, you can take part in the inaugural golf tournament at Clustered Spires Golf Course in Frederick. Tickets cost \$75 per person, which includes the greens fee, a golf cart, gift, continental breakfast, and lunch. Registration begins at 8 a.m. on September 23, with a shotgun start at 9 a.m. Mulligans and raffle tickets will be on sale that day, and prizes will be awarded in categories such as Longest Drive, Closest to Pin, and more. Interested? Want to volunteer at the event? E-mail Tanya Ransom at ransomt@mail.nih.gov.

Fundraising is heating up with the summer activities, too. Pizza Hut fundraisers will be scheduled throughout the summer, and fundraising efforts at other local restaurants are in the works. ■

Want to Get In On the Action?

The R&W Club Frederick is always ready to welcome new members. Membership costs \$9 a calendar year (from January to December, no prorating). Become a member to take advantage of exclusive discounts and deals from local businesses, participate in activities, go on trips around the world, and make new friends at NCI at Frederick.

Send an e-mail to RWClubFrederick@nih.gov, or call 301-846-7066. Visit the R&W Club Frederick website for more information on upcoming events and local discounts: <http://ncifrederick.cancer.gov/Staff/RecreationWelfare/Default.aspx>.

Recreation and Welfare Club Frederick

Digging Up Local History

By Carolynne Keenan, Contributing Writer

In the beginning weeks of summer, Recreation and Welfare (R&W) Club Frederick members experienced a once-in-a-lifetime activity: an archaeological dig in Walkersville, alongside Charlie Hall, Ph.D., Maryland state terrestrial archaeologist.

The dig took place over several days at the end of May and beginning of June. Dig participants could volunteer to work either half a day or the full day digging up the historical past at the site. Participants included R&W Club Frederick members as well as other volunteers from all over the state.

“It was a spectacular field session,” said Hall, adding that well over 150 volunteers contributed almost 500 work days, with as many as 64 volunteers on the site in one day.



Olga Nikolaitchik, Ph.D., biologist, HIV Drug Resistance Program, right, with husband, Alex, center, and Charlie Hall, Ph.D., Maryland state terrestrial archaeologist. *Photo courtesy of Olga Nikolaitchik.*

Susie Culler, treasurer of the R&W Club Frederick, coordinated the dig for club members, which took place on her parents' farm in Walkersville, off Biggs Ford Road.

Twenty-four volunteers represented R&W Club Frederick, and they joined participants who came from as far away as the Adirondack Mountains, in upstate New York.

Pre-dig Lecture Helped Volunteers Understand Site History

In early May, volunteers attended a lunchtime gathering at the Scientific Library, during which Hall explained the history of the archaeological dig site. The Walkersville site, he said, was once occupied by Native Americans known as the Woodland Indians or peoples of the Montgomery Complex (1000–1450 AD) and the Keyser Complex (1300–1500 AD).

Volunteers then applied knowledge learned from Hall's talk at the dig site in the early summer, joining Hall and other professional archaeologists. They found many artifacts using shaker screens to sift through the soil. Some of the items included quartz sherds, potsherd (or pieces of pottery), fire-cracked rock, a portion of a tobacco pipe (thought to be from Ohio-based tribes), and elk bone fragments, as well as trade beads, which were often used as currency in exchange for goods or services. One of the beads was found entirely intact; the beads are likely products of Italy, Hall explained.

Participants and archaeologists made a huge discovery, one Hall had hoped to find in the location: remnants of palisades that outlined the boundaries of a village on the property.

“We were able to excavate twenty-five 2x2-meter units ... including ‘the great pot lift’ and the discovery of a nearly complete deer antler rack on the last day,” Hall said.

The “great pot lift” refers to a pottery bowl that was found nearly intact during the dig. Hall and fellow archaeologists, with the help of volunteers, carefully



Volunteers listen to archaeologist Roy Brown discuss how to haft a rock by attaching a bone or stick to a rock, making a tool. Brown's talk was one of the lunchtime lectures held during the dig. *Photo courtesy of Susie Culler.*

excavated the bowl and sent it out for further analysis. Carbon dating techniques will be used to determine the age of the bowl.

R&W Club Frederick members also learned how to carefully wash and bag the artifacts for preservation. All the artifacts will be studied over the next few years in hopes of gaining additional knowledge around the Montgomery and Keyser Complex periods, Hall explained.

Archaeologists and other professionals



David Frederick, left, a volunteer, and Troy Nowak, an archaeologist, work on finding artifacts. *Photo courtesy of Susie Culler.*

provided lunchtime informational lectures throughout the dig to help participants understand the lifestyles of those who occupied this land many years ago.

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Recreation and Welfare Club Frederick



Matt McKnight, an archaeologist, excavates an almost-intact pot, in a find that volunteers and Charlie Hall, Ph.D., leader of the dig, referred to as “the great pot lift.” *Photo courtesy of Charlie Hall.*



Theodore Nikolaitchik, a Werner H. Kirsten student intern at NCI at Frederick, left, and his father, Alex Nikolaitchik, dig for artifacts. *Photo courtesy of Olga Nikolaitchik.*



Charlie Hall, Ph.D., talks to Billy Crum during the dig. Crum is the son of the landowners on which the dig was conducted. *Photo courtesy of Robin Winkler-Pickett.*



Volunteers till and prepare a section of land for excavation. *Photo courtesy of Robin Winkler-Pickett.*

Some of the findings at the archaeological dig included an antler and sherds, or pieces of pottery. *Photo courtesy of Charlie Hall.*



Volunteers sift soil in search of artifacts. *Photo courtesy of Robin Winkler-Pickett.*

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“The journey was full of richness, not only in the experience of understanding peoples of past generations, but also the new friendships made during the experience,” Culler said.

Hall enjoyed the experience as well. “This field session at the Biggs Ford

site was the best I have experienced (out of 14). From the weather to the crew, to the staff, to (and especially including) the site, this field session had it all,” he said.

For more information about the history of the Biggs Ford Road site, go to: <http://www.jefpat.org/nehweb/assets/>

[documents/findingaids/18FR14-%20Biggs%20Ford%20Finding%20Aid.htm](http://www.ncifrederick.cancer.gov/Staff/RecreationWelfare/Default.aspx).

For information on R&W Club Frederick, including how to join, visit: <http://ncifrederick.cancer.gov/Staff/RecreationWelfare/Default.aspx>. ■

Employee Diversity Team

Women of NCI at Frederick

By Andrea Frydl, Contributing Writer

Editor's note: This article has been updated since it was originally posted on August 22, 2013

Each year, the Employee Diversity Team (EDT) acknowledges a group of women for their great achievements and contributions towards the mission of the National Cancer Institute at Frederick. Details of their achievements and unique personalities were on display in Building 549 in March, and we present a brief summary of each below:

Sarah Hooper, R.N., M.S., Nurse Practitioner Manager Occupational Health Services, SAIC-Frederick



An integrated member of NCI at Frederick since 2007, Sarah Hooper ensures that Occupational Health Services (OHS) is helping employees stay safe and healthy.

She manages the day-to-day operations of the OHS clinic at the NCI campus at Frederick and at the Advanced Technology Research Facility (ATRF). "I am proud to work at NCI at Frederick. I am very fortunate to work with a dynamic OHS team of professional staff," she says.

When not ensuring the health of employees, Hooper volunteers her time at the Frederick County Career and Technology Center (CTC) Biomedical Advisory Board. The Frederick County CTC is known as a beacon for pre-professional learning and vocational training. "I serve on the advisory committee for biomedical sciences to provide feedback to CTC about the program's relevance and effectiveness," Hooper says.

The four objects that represent Hooper are sand, a rock, the sun, and water. "The sand represents me because I often have to flow with work, children, and life," she says. "The rock represents my work ethic, and the sun [represents] my belief in doing the right thing. The water represents my hobbies because it is fluid and can change shape to meet my schedule and life demands.

Lisa Sheffield, Secretary III Nanotechnology Characterization Laboratory, SAIC-Frederick

Lisa Sheffield worked for the Frederick National Laboratory for Cancer Research (FNLCR) for almost six years before leaving the facility in June, and she certainly made an impression during her time here. People would often see her walking down the halls of the Advanced Technology Research Facility (ATRF) with a bright smile on her face.

At FNLCR, Sheffield was very much the oil keeping the wheels of NCL moving. Her role was vast—from managing travel to maintaining employees' calendars. She also processed student records and proofread much of the great work leaving NCL's doors.

Sheffield takes God, volunteering, and nature (that's right) seriously. "I try very hard to stay centered in my faith, so when things get bad, I have something much stronger than me to lean on," she says. As for nature, Sheffield is an avid hawk fan. "Most folks that know me know I am a freak for nature and get the biggest joy out of seeing a hawk; they represent freedom and God to me," she says.



Lori Smith, Project Manager Purchasing Department, SAIC-Frederick



A 14-year veteran of SAIC-Frederick, Lori Smith is an integrated member of the community. Working in the Purchasing Department of the Contracts and Acquisitions Directorate, she is involved in new measures to make the Purchasing Department more streamlined and efficient. Smith says, "...I embrace the changes. It's an exciting time for the facility."

Smith is excited to be an employee of an organization that helps find treatments for cancer and AIDS. She is involved in several volunteer activities, including Take Your Child to Work Day and the Elementary Outreach Program. She loves to see young kids excited about science and finds it rewarding to give back to the community.

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Employee Diversity Team

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Smith enjoys flowers, the beach, and baseball. She says a chain, a scale, and the sky help define her. “The chain represents all of the different links of me. I am a wife, mother, daughter, sister, friend, and full-time employee. Everything just seems to come together like a chain,” she says. “The scale represents my work balance, right/wrong, justified, not one-sided. And my beliefs are the sky—endless and open.”

**Debbie Swing, Staff Scientist/
Transgenic Core Facility Head
Mouse Cancer Genetics Program,
Center for Cancer Research, NCI**



With 28 years at the Mouse Cancer Genetics Program, Debbie Swing has been through it all—working hard every day to further the mission of NCI. An expert in microinjecting, she is responsible for generating transgenic mice via pronuclear DNA microinjection for use in various projects.

Swing talks about the positive aspects of working in the Mouse Cancer Genetics Program. “I love working for the MCGP – the

science, the brilliant scientists like Neal Copeland and Nancy Jenkins, who I worked with for 23 years, as well as meeting other scientists from around the world.”

She also loves working with the staff of the 539-1CB animal facility, whom she describes as being “like family” to her. As the only staff scientist who works in the animal facility, she enjoys participating in the group’s annual collections of food, clothing, and other supplies for those in need in Frederick County. The animal caretakers, she said, are “always opening their pocketbooks to help those less fortunate...I feel honored to work with them.”

A microinjection scope, a rock, a camera, and a bird define Swing. She says, “The microinjection scope because microinjecting and making transgenic mouse models are what I love most about my job. A rock represents my conviction and the firm stand I will take to fight for what I believe in. A camera for my love of photographing nature, and a bird for the joy of the wilderness and all its wildlife.”

**Denise Whitby, Ph.D., Principal Investigator,
Viral Oncology Section
AIDS and Cancer Virus Program, SAIC-Frederick**

An employee of SAIC-Frederick for more than 14 years, Denise Whitby, originally from the UK, leads the Viral Oncology Section in the AIDS and Cancer Virus Program. The lab’s primary focus is on Kaposi’s sarcoma-associated herpesvirus, with emphasis on combining large epidemiological studies with basic molecular virology and translational research.

“I’m especially proud of our collaborative work with the MRC [Medical Research Council] HIV unit at the Uganda Virus Research Institute,” she says. “We’ve trained local researchers and transferred technology and skills to support our research on Kaposi’s sarcoma in a region where it is a major public health problem.”

Whiby’s lab loves to give back to the community and has hosted students through the Werner H. Kirsten Student Internship Program (SIP) for several years. “It is always a great pleasure to see how fast the students learn and how rewarding they find the time in the lab,” she says.

Whitby says that a teapot, an elegant hat, a set of secateurs (pruning clippers), and an elephant are on the list of the top four objects that define her. She’s an avid Earl Grey tea fan, and she likes to keep her ears warm on her walk to work with a stylish lady’s hat. Her English cottage-style garden has wisteria that needs regular trimming with secateurs, and her collection of the world’s elephants adds a touch of exoticism to her décor.

Nominate Someone You Know in 2014

If you know someone who you believe deserves to be honored as a Woman of NCI at Frederick, please nominate her in 2014. The call for nominations will come out in January 2014. ■



Find Out More about the Employee Diversity Team at NCI at Frederick

To learn more about the Employee Diversity Team, its activities, and its events, visit <http://diversity.ncifcrf.gov/>. If you or someone you know is interested in joining the EDT, please contact any EDT member, and they will be glad to tell you more about what they do and why it’s worth your time.

EDT Members: Andrea Frydl, chair • Laura Geil, past chair • Ethel Armstrong • Peter Boving • Deepti Dave • Myla Spencer • Molly Buehn

Green Team

Green Team Recognized with HHS Green Champion Award Honorable Mention

Courtesy of the NCI at Frederick Green Team

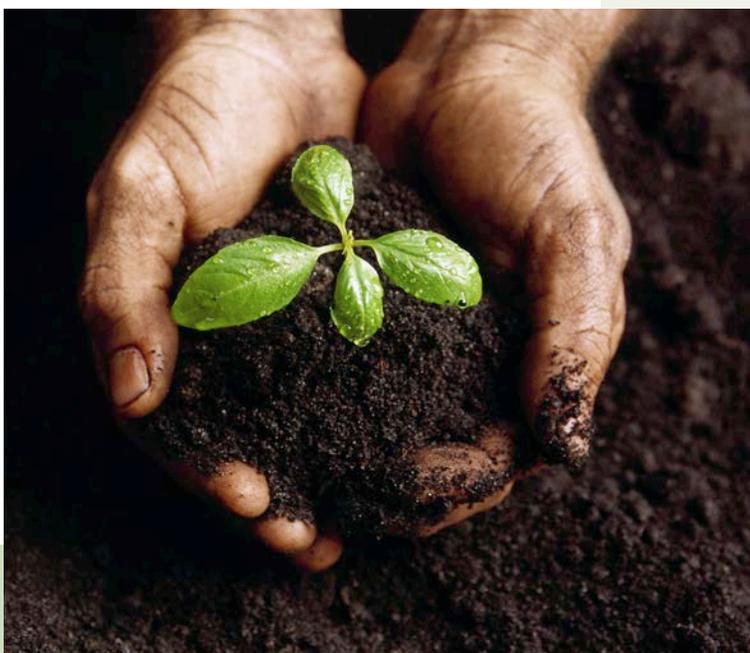
The NCI at Frederick Green Team received a Department of Health and Human Services (HHS) Green Champion Award honorable mention in June for the team's plant swap initiative, begun in October 2012.

"The Green Team has been doing a great job this past year, and it is wonderful that their efforts have been recognized by the HHS through the Green Champion Awards," said Craig Reynolds, Ph.D., director of the NCI Office of Scientific Operations (OSO).

The HHS Green Champion Awards were established in response to President Obama's Executive Order 13514, issued in October 2009, "challenging federal agencies to dramatically reduce greenhouse gas emissions, energy and water consumption, and pollution," according to the 2013 HHS Green Champion Awards Ceremony program (<http://www.nems.nih.gov/greening/Pages/GreenChampionsAwardsCeremony2013.aspx>). These awards recognize HHS employees for fiscal year 2012 sustainability efforts.



Several members of the NCI at Frederick Green Team holding their HHS Green Champion Award honorable mention certificates. Back row, from left, Dolores Winterstein, Melissa Porter, Denise Shelley, and Cheryl Bowman. Front row, from left, Linda Brandenburg and Eckart Bindewald. Not pictured: Thomas Schneider, Howard Young, and former members Chelsey Jahn and Melissa Lambert.



Plant Swap Held at Spring Research Festival

The Green Team held its second plant swap during the Spring Research Festival on May 8 and 9. It did not take long for word to spread about the plant swap. Each day, employees brought in excess plants from their gardens.

"We had a wide variety of plants available, and soon after the plants were dropped off, they were snatched up by others looking to expand their gardens at home," said Melissa Porter, administrative manager, NCI Office of Scientific Operations, and chair of the Green Team. "This is the purpose of the plant swap: instead of having perfectly good plants get tossed in the trash, they are recycled and benefit others."

The team is planning another plant swap in the fall. ■

OneSearch Gives You Access to More Than 7,000 Publishers and Content Providers

By Robin Meckley, Contributing Writer

OneSearch, an exciting new resource from the Scientific Library, is now available to the NCI at Frederick community. This new resource provides a quick and easy way to search multiple Scientific Library resources and collections using a single search box for journal articles, books, media, and more. A large central index is compiled from more than 7,000 publishers and content providers outside the library's holdings.

What You Will Find in OneSearch

- Most of the content available in PubMed, Web of Science, and Scopus.
- All the materials from the Scientific Library's catalog, such as books, videos, sound recordings, and more.
- A majority of the Scientific Library's online and print journal subscriptions.
- Full-text content of the Scientific Library's online book collections and Google Books.
- By default, OneSearch shows results available at the Scientific Library, but using "add results beyond your library" will locate publications from more than 7,000 publishers and other resources, which the library can then easily obtain.

What You Will Not Find in OneSearch:

- Although OneSearch contains information from most of the Scientific Library's databases, some information from specialized databases like MetaDrug and Reaxys is not included.
- Specialized or comprehensive research should be done using the Scientific Library's subject-specific databases, online journals, or online catalog.

Search Features of OneSearch

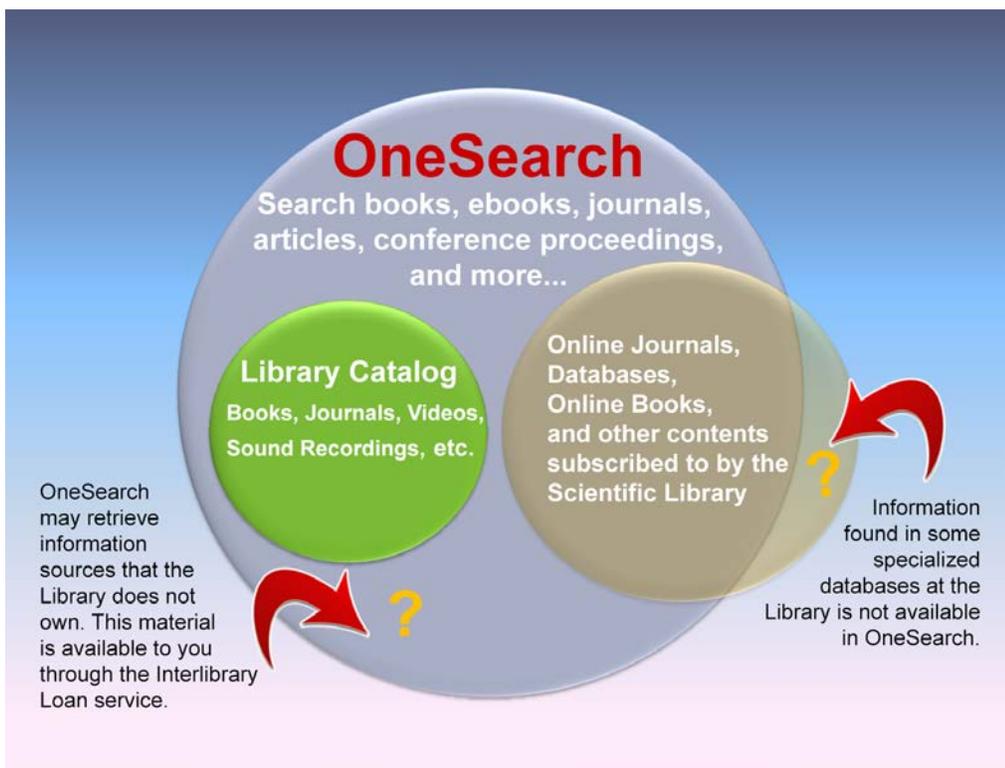
- A click or two accesses the full text of articles and online books, or shows

whether a print book is available on the shelf.

- Search results include citations of many kinds of sources: books, journal articles, newspaper articles, conference proceedings, dissertations, photos, multimedia, and more.
- Search results are sorted by relevance, along with a number of facets that

then subscribe to a feed to receive notification when new search results meet specified criteria.

- All users are able to access and search the OneSearch interface. However, access to full-text, subscribed resources requires users be on the campus network or to use the "off-site access" feature of the library's website.
 - A search interface optimized for smart phones is also available.
- Access to this comprehensive resource



OneSearch provides access to multiple Scientific Library resources and collections as well as to information from thousands of publishers and content providers outside the library's holdings.

may be used to refine the results, such as content type, subject terms, publication date, and language.

- The sort order can be changed to chronological or alphabetical.
- Citations in search results can be viewed in six commonly used citation formats (APA, AMA, MLA, Uniform, Chicago, and Harvard), exported to EndNote, e-mailed, and printed.
- RSS feeds are automatically created for any search. Users can

is available from the Scientific Library's website at <http://www-library.ncifcrf.gov>. Training classes and individualized instruction are also available by contacting the Scientific Library at NCIFredLibrary@mail.nih.gov. ■

Data Management Services (DMS)

Help Desk Assists with a Variety of Computer Problems

By Cathy McClintock, Contributing Writer

Computer users at NCI at Frederick may contact the Frederick Help Desk with IT-related requests for service and support, or with any computer-related questions, including:

- General desktop computer support
- Account password resets and e-mail assistance
- Support for applications, systems, and websites used at NCI at Frederick
- Assistance with suspected virus or IT security problems
- Assistance with purchasing IT equipment
- Access to site-licensed software
- Information regarding PIV cards and PIN resets

The Help Desk is staffed from 8 a.m. to 5 p.m., Monday through Friday, excluding holidays. Users can expect most desktop support requests to be addressed within five to seven working days; “urgent” requests are addressed within one working day.



The staff of the Frederick Computer Help Desk. From left, Michelle Short, Tyler Fullmer, Ted McCutchen, and Sherry Kienzle.

Personal Identity Verification (PIV) Cards

Personal Identity Verification (PIV) card PINs and digital certificates can be reset at any of the following three NCI at Frederick Lifecycle Workstation locations:

Fort Detrick Campus:

Building 426, room 159: call 301-846-4500 to schedule an appointment.

Building 362, room 40: call 301-846-1060 to schedule an appointment.

Advanced Technology Research Facility:

Wing E, room 2212: call 301-846-5566 to schedule an appointment.

To contact the Frederick Help Desk, call 301-846-5115, e-mail fredhelpdesk@nih.gov, or visit the website: <http://css.ncifcrf.gov/helpdesk>. ■



The staff of the NCI at Frederick Lifecycle Workstations. From left, Susan Koogle, Merrell Wilson, and Rick Klabansky.



The fingerprinting machine at one of the NCI at Frederick Lifecycle Workstations.

Take Your Child To Work Day

Kids' Day Brings Smiles, Laughs, and Cheers Despite the Heat

By Andrea Frydl, Contributing Writer

On July 17, more than 200 children attended the National Cancer Institute at Frederick and Fort Detrick 17th annual Take Your Child Work Day (TYCTWD), informally coined “Kids’ Day” by campus employees.

This year’s event had more than 40 different activities for kids to participate in—from writing their names in Braille, to hearing whether Goldilocks was guilty of breaking and entering in mock court, to learning how to make goo in a lab. Kids raved about seeing a protein in 3D imagery and learning how to unlock the mysteries of the brain in a neuroscience research activity. Near the registration tents, children could pet various animals like alpacas, horses, and dogs. Fort Detrick firefighters also made an appearance to show kids what the inside of a fire truck was like.

The day’s activities began at 8 a.m. with registration: children and their parents picked up name badges and other materials. The day ended at 3 p.m., when kids made their way through the 95-degree weather back to their parents’ cars or workplaces to cool off.

“We were really happy to see a successful event this year. We made sure we were prepared for the heat by having lots of water available and the cooling station, compliments of the Fort Detrick Fire Department,” said Melissa Porter, chair of the TYCTWD Planning Committee. “We’re really grateful for all the people who helped out to make this a great day for everyone involved. We couldn’t make this happen without the help of all our great volunteers.”

A cooling station with free water was placed at the Hub. In Building 549, Rita’s Italian Ice was available, and an episode of “The Magic School Bus” played on loop in the auditorium in case kids (or their parents) needed a rest from running around in the heat.

Children attending TYCTWD are between the ages of 6 and 13, and are chaperoned by employees of NCI at Frederick and Fort Detrick. Additionally, partners from both agencies volunteered their time at the event by acting as escorts and manning the moon bounce and other activities. These agencies also participated by bringing their own activities and sponsoring programs for the children.

Each year, activities feature a range of science, fun, and learning, to make it a worthwhile experience for the kids. Parents often bring their children back each year to partake in activities they may have missed the prior year. “It’s been really great to be a part of Kids’ Day year in and year out, especially now that my own kids can come and enjoy all the hard work we’ve done. It really makes it worthwhile,” said Julie Hartman, a member of the TYCTWD Planning Committee.

Every July, NCI at Frederick and Fort Detrick host TYCTWD. For more information, visit <http://ncifrederick.cancer.gov/Events/ChildrensDay/Default.aspx>. ■



Take Your Child To Work Day



Take Your Child To Work Day



Announcements

From the Executive Editor

Big Changes Are in Store for the Poster

The Poster is about to change, in some very significant ways.

First, as you can tell from this issue, we are no longer publishing a paper copy of the Poster.

This issue and the next one will be posted on the Frederick National Laboratory for Cancer Research (FNLCR) staff website – allowing you to see your favorite stories in color, and to link to other articles and websites of interest. It also saves money in the printing and delivery costs.

But more changes are in store, come next year.

In early 2014, we will launch the all-new, web-based Poster, linked from the FNLCR staff website. The new Poster will be fully interactive, with links to websites, videos, social media sites, and more. And the site will be updated regularly, so you'll find a steady stream of timely features, new discoveries, and important announcements.

We're still in the development stages, so look for more information in our next issue, scheduled to be posted to the FNLCR staff website in the fall.

Until then, we hope you enjoy this issue!

Melissa Porter, Executive Editor

Frederick National Laboratory Programs

Frederick National Laboratory and Ft. Detrick
Fitness Challenge 2013

<http://saic.ncifcrf.gov/fitnesschallenge/>

Frederick National Laboratory Suggestion Committees

<http://ncifrederick.cancer.gov/campus/committees/>

Upcoming Events and Dates to Note

Farmers' Market, every Tuesday through October 29,
11 a.m.–1:30 p.m., in front of Building 549

Labor Day, NCI at Frederick closed September 2

Poster Puzzler Entries Due September 27

Columbus Day, NCI at Frederick closed October 14

Veterans' Day, NCI at Frederick closed November 11

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Comments or suggestions for the *Poster* may be directed to poster@mail.nih.gov.

Need a large-print format of the *Poster*? Call 301-846-1055.

