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the pulse

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Learning to Care for Those in Harm's Way

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On the cover

Ensign Rachel A. Cline, from Hummelstown, Pa., teaches a group of corpsman how to conduct an orthopedic test for the knee aboard amphibious assault ship USS Makin Island (LHD 8). Ensign Cline attends the Uniformed Services University of the Health Sciences medical school in Bethesda, Md and is the first medical student to do a clerkship aboard Makin Island. See story on page 4. (photo by MC3 Class Robin W. Peak)

Students plunge into cold water physiology

By MC3 Laura Bailey

Students from the F. Edward Hébert School of Medicine at the Uniformed Services University participated in the War Fighter in the Environment Lab, part of the Department of Military and Emergency Medicine curriculum that exposes students to physiological effects of extreme temperatures and environments, including cold water.

Included in the exercise are various stations – including a controlled hypothermia simulation pool and a cold water motor skills test. The exercise provides students with an experiential learning environment that will help them to better relate to their future patients exhibiting symptoms of hypothermia. Additionally, students will hopefully be able to quickly recognize and treat hypothermia.

The simulation pool, perhaps the most challenging station, allows students to safely experience hypothermia symptoms within a controlled environment as they are submerged up to their shoulders in ice water. Students take turns in the simulation pool while their blood pressure and body temperatures are closely monitored by trained USU medical staff.

"The worst part is the first two minutes," said Hospital Corpsman 2nd Class Thong Nguyen, an instructor in the department of Military Emergency Medicine at USU. He participated in the simulation pool and was submerged for more than ten minutes. "The extreme cold shocks your body at first, but then you don't feel it. That's why hypothermia is so dangerous. It sneaks up on you after the initial shock. You might even start to feel fine. That's a sign that hypothermia is setting in. Safety is very important and we make sure to monitor the students closely at all times."

Another station allows students to experience the effects of extreme cold on human motor skills.

First, students submerge their hands in a bucket of warm water. With their hands submerged they must locate a large screw and two bolts in the bucket of water and assemble the parts according to the diagram as quickly and as accurately as possible without looking in the bucket. Next, students repeat the process while their hands are submerged in ice water. Both events are timed and recorded so that a comparison can be made.

What was a seemingly simple task in the warm water bucket became much more difficult and time consuming for students in the cold water bucket.

On average, it took students approximately a full minute or longer to assemble the parts when their hands were cold. In stark contrast, these same students could assemble the parts in 20 seconds or less when their hands were warm.

Overall, the dive lab accomplished exactly what it is intended to, said Hospital Corpsman Senior Chief William Dow, the non-commissioned officer in charge of the Diving Physiology and Cold Water Immersion Laboratory. Students are getting a hands-on learning experience that is preparing and equipping them for their futures as military medical officers. The lab gets them out of the classroom, it's fun, but mainly students are learning through an actual safe, but very realistic simulation.

First-year medical students from the F. Edward Hébert School of Medicine at the Uniformed Services University sit in an ice water bath at the Naval Support Activity Bethesda pool, May 13. The ice water bath is part of the Warfighter In the Environment Lab for students to experience the physiological effects different temperatures of water has on the human body. (Photo by MC3 Laura Bailey)

USU graduates more than 250 during 36th Commencement Exercise

By Eric D. Ritter

More than 250 students crossed the stage to receive their diplomas that included master or doctoral degrees in biomedical sciences, clinical psychology, nursing, medicine, oral biology or public health during the 36th Uniformed Services University of the Health Sciences Commencement Exercise, May 16, 2015.

The USU Commencement, which took place at the Daughters of the American Revolution Constitution Hall in Washington, D.C., and is held annually on Armed Forces Day, is both a military and academic ceremony. "The President's Own" United States Marine Band performed throughout the ceremony, the USU Color Guard carried symbols of the University, the Services and the United States, degrees were conferred and awards were presented. In addition, medical student graduates recited the Hippocratic Oath, which swears them to maintaining honor, loyalty and professionalism in medicine, and took the Oath of Office as they transitioned from students to physicians and were promoted to their next rank.

This year's Commencement Speaker, Air Force Lt. Gen. (Dr.) Thomas W. Travis, Surgeon General of the United States Air Force and a graduate of USU's F. Edward Hébert School of Medicine class of 1986, told students they would be joining some of the military's finest and most battle-proven teams in the world.

"You have joined a team that has proven to be magnificent in the face of the war," he said. "You have joined a team that has attained the lowest died-of-wounds rate, the highest survival rate and the lowest disease and non-battle injury rate in history. We did it together as an interoperable and interdependent team of medics from the Army, Navy and the Air Force—each bringing what we do best."

Travis ended his speech by reflecting on his military career as he focuses on his upcoming retirement.

"I look back now with so many great memories of a medical career that started right [here] today," he exclaimed. "Since this commencement is one of my last public official duties, this is where my career effectively comes to a close. How fitting—and what a blessing."

USU also recognized Dr. Donald A.B. Lindberg, director emeritus of the National Library of Medicine, with an honorary degree. Lindberg is a scientist credited as being a pioneer in applying computer and communications technology to biomedical research, health care, and the delivery of health information, beginning in 1960 at the University of Missouri. Much of today's medical computing technology is rooted in his early computer research.

USU's Daniel K. Inouye Graduate School of Nursing awarded its first Doctor of Nursing Practice degrees this year to 11 Family Nurse Practitioners and nine Psychiatric Mental Health Nurse Practitioners.

"This was my 10th opportunity to confer degrees on our graduates and it is always a thrill to be able to do so. To see the joy (and in some cases, relief) on the faces of our graduates and their families is enormously gratifying. And I know the faculty, staff and Board of Regents feel the same pride that I do. As always, the staff who work behind the scenes to pull off this very visible and complex event did an amazing job," said USU President Charles L. Rice, M.D.

Graduates raise their hand to swear the Hippocratic Oath just prior to receiving their diplomas. (Photo by MC3 Laura Bailey)

Air Force Lt. Gen. (Dr.) Thomas W. Travis, Surgeon General of the United States Air Force delivered the commencement address. (Photo by Tom Balfour)

LHD 8 medical department hosts first medical student

By Mass Communication Specialist 3rd Class Robin W. Peak

USS Makin Island (LHD 8) is hosting its first medical student from the Uniformed Services University of the Health Sciences (USU) in Bethesda, Maryland.

The LHD amphibious assault ship's medical department already boasts the largest and most capable medical facility in the fleet, aside from the hospital ships USNS Mercy (T-AH 19) and USNS Comfort (T-AH 20), making this interaction another step in allowing Navy Medicine to train personnel in different environments.

Retired Navy Capt. (Dr.) Tom Miller, associate professor in the Department of Family Medicine at USU said, "The USU Family Medicine department sponsors a number of operational medicine rotations with family physicians in a variety of operational settings. The Makin Island experience is the first of its kind."

Ens. Rachel A. Cline, a 2011 graduate of the University of Pittsburgh (PITT), is finishing her second year at USU and is the medical student aboard Makin Island completing her third clinical clerkship.

"The fact that I get to work here and be the first student to do a clerkship here is phenomenal," said Cline.

She went on to say, "It's a great experience to see how the medical team works on board; but also how the ship operates as a whole."

After graduating from PITT, Cline took a few years off from school and worked in a laboratory setting where she was published in various research articles before making the decision to attend medical school.

"Working in labs was great, and I've always had a passion for the sciences," said Cline, "but I'm also a people person, so I wanted to do something to work with people and ensure they live the best lives possible."

She applied and was accepted to a myriad of medical schools and ultimately chose USU.

"The military, in particular the Navy, has always been something that I thought I would want to do, and when I finally decided that I was going to join, USU was the best choice for my career," said Cline.

She went on to say, "USU has the best military physician training program along with a great medical program, and financially, the military takes care of all the costs whereas I would have had to take out vast amounts in loans at a civilian school."

The program, as with all medical programs, is four years and involves two years of classroom study and two years of clinical clerkships. Clerkships are a part of the student's curriculum and rotate through the different medical specialties.

Cline said, "Typically the clerkships offered are in specialties such as family medicine, surgery, pediatrics, anesthesiology and a multitude of others."

Predominantly, the clerkships are offered at military hospitals and military treatment facilities such as the Walter Reed National Military Medical Center in Bethesda and, Cline said, "This clerkship is unique in that I'm actually on a war-fighting ship."

"Roughly 20,000 doctors are made each year, and only several hundred of them are military. Very few get the opportunity to go on a ship underway as a student and see the unique challenges of the embarked medical providers; Ens. Cline is experiencing it first hand," said Lt. Cmdr. (Dr.) Matthew S. Bidlack, senior medical officer aboard Makin Island.

"She's getting to know the jobs these Sailors are doing and the dangerous environment that they are working in," Bidlack added, "so in the future when she is treating a boatswain's mate, she has a practical understanding of that Sailor and the specific hazards associated with his or her job. That understanding will enable her to better treat patients."

Cline's primary tasks involve shadowing the medical providers on board as well as seeing patients and coming up with differential diagnoses that she will present to one of the staff.

"Basically, I see a patient and come up with what I think is going on with them and also a list of other possibilities that it could be," said Cline. "I then present those findings to the medical staff with a plan for treatment."

Cline has seen patients for many ailments including orthopedic and respiratory problems, given various injections and has even assisted in a mole removal.

"To have this kind of experience is priceless," she said enthusiastically. "Everybody from the doctors to the corpsmen has different experiences and knowledge to offer, and I have learned so much from them."

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Ensign Rachel A. Cline, from Hummelstown, Pa., teaches a group of corpsman how to conduct an orthopaedic exam for the knee aboard amphibious assault ship USS Makin Island (LHD 8). Ensign Cline attends the Uniformed Services University of the Health Sciences medical school in Bethesda, Md. and is the first medical student to do a clerkship aboard Makin Island. (U.S. Navy photo by MC3 Robin W. Peak)

USU scientist receives 2015 Dermatology Foundation career development award

by Sharon Holland

Rajesh Thangapazham, Ph.D., a research assistant professor in the F. Edward Hébert School of Medicine's Department of Dermatology, USU, was recently selected as a recipient of a 2015 Dermatology Foundation Research Award.

Dr. Rajesh Thangapazham research assistant professor in the F. Edward Hébert School of Medicine's Department of Dermatology, USU, was recently selected as a recipient of a 2015 Dermatology Foundation Research Award. (courtesy photo)

Thangapazham will receive the Foundation's Women's Health Career Development Award for his project, "Genes Regulating Hair Follicle Neogenesis, Growth, and Development."

"His selection is a tribute to his innovative research proposal and outstanding record of publications and presentations in recent years," said Thomas Darling, M.D., Ph.D., dermatology department chair. "Rajesh is well-deserving of this recognition from the dermatology community for his vital contributions to science."

According to the Dermatology Foundation's website, the Career Development Awards are "intended to advance the early academic careers and research efforts of physicians and scientists in dermatology and cutaneous biology. An emphasis is placed on supporting research that benefits the dermatology community at large and has significant potential to advance patient care." The Foundation further states that it expects Foundation awards recipients to "be tomorrow's expert teachers, innovative investigators and master clinicians in dermatology."

The intent of the Women's Health Career Development Award is to focus on women's health issues where further research is needed. Women suffer as do men from appearance-related disorders such as hair loss and scarring due to skin disease, burns, or trauma. Thangapazham's goal is to help patients who have critical areas of their body covered by scar tissue. Currently available skin substitutes may improve wound healing yet lack the ability to regenerate hair. Thangapazham and colleagues have shown de novo hair follicle neogenesis in skin substitutes made entirely with cultured human cells. In his proposed work, Thangapazham will investigate molecules hypothesized to enhance the induction of human hair follicles to restore skin function and appearance. This major advance in skin regeneration is predicted to improve skin stability, healing and ultimately lead to a viable clinical strategy for restoring hair.

"I am very excited and pleased to be selected for this award. I am very thankful to my mentor, Dr. Darling, for his unwavering support and guidance, and to the Dermatology Foundation for the recognition. I am grateful for the assistance I receive from our University, dermatology department, the Henry M. Jackson Foundation, my lab colleagues and family for my career advancement. I sincerely hope that the results of this proposal will be beneficial for people suffering from scarring or hair loss," Thangapazham said.

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Bidlack added, "Medical students are like sponges for knowledge. She is extremely eager to learn about her job and the ship."

He continued to say, "Here we are in the Navy continuing the centuries-old practice of medicine-at-sea on the Makin Island in the most capable medical facility in the fleet, and she truly recognizes the uniqueness of what's happening."

Cline's eagerness to learn her job is also coupled with her desire to be a Sailor.

When asked how she was enjoying being on the Makin Island she smiled and said, "I like the ship life. The Navy was always my choice of branches. My grandfather, Nicholas Pestrock, was a machinist's mate third class on board the USS Leedstown (APA-56) during World War II. He always told me that when he was in the Navy those were the best years of his life, and that really stuck with me."

With a big, bright smile on her face, she continued, "And when I commissioned he told me that he wished he was younger so he could do it with me. Then he stood at attention and saluted me."

Cline will have been on board the Makin Island for four weeks when her clerkship is finished and said that the biggest thing she has learned on board hasn't been in the medical department.

"I've really come to know how vastly different every Sailor's life is in the Navy," said Cline. "They come from different backgrounds all over the U.S. and various parts of the world, and I feel that the more I can learn about the Sailors, and not only their jobs but their lives, the better I will be able to treat them."

Cline will also be talking to Sailors aboard Makin Island about the various paths in to Navy medicine during a Career in Navy Medicine Interest Group that was created by Bidlack.

"I feel that anybody can succeed in this field," said Cline, "so I want people to know that they shouldn't let any fears they have about going this route get in the way of their dreams. If you have a passion, you should go for it."

When Cline finishes her clerkship on the Makin Island, she will have a little more than two years left in her program and is slated to graduate from USU in May of 2017.

Though Cline is the first medical student to do a clerkship on board Makin Island, she will not be the last. Two other students will be doing clerkships aboard Makin Island later this year, and Bidlack anticipates that this will be a positive learning experience for them and encourages more students in the future to seek out these unique educational experiences.

Human clinical trials begin for deadly Hendra virus therapy

by Sharon Holland

The world's first human clinical trials for a treatment against Hendra virus, a rare but deadly viral disease, have just begun in Australia, using a human monoclonal antibody discovered by Federal scientists at the Uniformed Services University of the Health Sciences (USU) and the National Cancer Institute (NCI) in Bethesda, Md.

Earlier work led by Christopher Broder, Ph.D., at USU, and Dimitar Dimitrov, Ph.D., at NCI, supported by the National Institute of Allergy and Infectious Diseases, isolated and characterized the monoclonal antibody known as m102.4. Antibodies – proteins found in blood or other bodily fluids of vertebrates – are used by the immune system to recognize and neutralize viruses and bacteria. The m102.4 antibody attacks a critical component of Hendra virus and blocks its ability to infect cells. It was the world's first antibody administered to humans as a treatment against the Hendra virus infection, and was later also used by Zoetis, Inc. (formerly Pfizer Animal Health) working in conjunction with the CSIRO Australian Animal Health Lab, to characterize a successful vaccine against Hendra for animals.

The Hendra virus is a member of the paramyxovirus family, and is a highly infectious agent that emerged from large bats commonly called fruit bats or flying foxes, in the 1990s to cause serious disease outbreaks in humans and livestock in Australia. Although not currently found in the U.S., there have been 52 recorded incidents of Hendra virus in horses in Australia since 1994, with 14 in New South Wales and 38 in Queensland. Ninety horses have died from the virus. There have been seven human cases of Hendra (including four fatalities) recorded in Australia, all in Queensland. Experiments have shown that the antibody therapy is also effective against Nipah virus, a related deadly virus that emerged in 1998 and has caused numerous outbreaks in Bangladesh, India, Malaysia and Singapore. To date, m 102.4 has been successfully administered to 10 individuals (nine in Australia and one in the U.S.), on a compassionate use basis, as an experimental human monoclonal antibody therapy to individuals with significant exposure risk for Hendra or Nipah virus.

The Queensland Health department contracted the University of Queensland Australian Institute for Bioengeering and Nanotechnology, under director Professor Peter Gray, to manufacture the antibody for emergency stockpiles and for recently-started human clinical trials. AIBN has developed a way to produce large quantities of m102.4 without having to replicate any portion of the Hendra virus.

"Quite a number of people over the last several years have worked on the development of this antibody therapy – truly a successful team effort. To see basic science research on important emerging pathogens like Hendra and Nipah lead to a therapy that is now being taken to this stage of human testing and evaluation is an incredibly rewarding experience," said Broder.

TSNRP executive director appointed to the National Advisory Council for Nursing Research (NACNR)

Courtesy article

Col. Michael Schlicher, Executive Director of the TriService Nursing Research Program (TSNRP), was recently appointed by the Assistant Secretary of Defense for Health Affairs (ASDHA) to represent DoD interest on the National Advisory Council for Nursing Research (NACNR). The National Advisory Council for Nursing Research (NACNR) consists of six members (or their designees): the Secretary, Health and Human Services; the Director, National Institutes of Health (NIH); the Director, National Institute of Nursing Research (NINR); the Chief Nursing Officer of the Department of Veterans Affairs; ASDHA; and the Director, Division of Nursing, Health Resources and Services Administration. Schlicher will represent the ASDHA's position on the Council. The Council provides the second level of review of grant applications, and recommends to the NIH Director which applications should be approved and considered for funding. In addition, the Council reviews the Institute's extramural programs and also makes recommendations about its intramural research activities.

Col. Michael Schlicher (courtesy photo)

National Center for Disaster Medicine and Public Health receives MRC national partner award

by Sharon Holland

The Uniformed Services University's National Center for Disaster Medicine and Public Health was presented with the 2015 Medical Reserve Corps (MRC) National Partner Recognition Award, April 7. The award is given annually by the Division of the Civilian Volunteer Medical Reserve Corps to highlight the success and impact of the MRC network, their housing organizations, partners, leaders and volunteers. The Division of the Civilian Volunteer Medical Reserve Corps (DCVMRC) is the national program office of the MRC and is housed within the Assistant Secretary for Preparedness and Response's Office of Emergency Management in the Department of Health and Human Services.

The MRC is a national network of volunteers, organized locally to improve the health and safety of their communities. The MRC network comprises 993 community-based units and 207,783 volunteers located throughout the United States and its territories.

"As an exemplary partner in our mission and endeavors, you have played a significant role in helping to raise MRC awareness, strengthen, update, and inform our core competencies, engage and embolden the importance of youth engagement in volunteerism and preparedness, as well as support our work in relation to the National Health Security Strategy and Implementation Plan," said U.S. Public Health Service Capt. Robert Tosatto, director of DCVMRC. "We are grateful for the willingness of your staff to collaborate and offer expertise with the MRC network, and for the tremendous assistance and resources all of you have provided over the years. Your work has proven to be invaluable to the MRC network. I extend our sincere appreciation for the work and effort you and the NCDMPH have afforded us. We are honored to be your partner and to work with you.

"Our Center has long valued the contributions of the MRC to community health sector preparedness, response, and recovery," said Dr. Kenneth Schor, acting director of NCDMPH. "I think this award helps to demonstrate how the Center is succeeding in creating valued national educational resources for the full-time and volunteer health professions workforce. We are thrilled and gratefully accept this award while resolving to enhance our support of the MRC."

The DCVMRC supports the MRC network by providing technical assistance, coordination, communications, strategy and policy development, grants and contract oversight, training and other associated services. It functions as a clearinghouse for information and best practices to help communities establish, implement, and maintain MRC units in order to achieve their local visions for public health and emergency preparedness. The DCVMRC also oversees the 11 MRC Regional Coordinators that represent the 10 MRC regions across the United States and its territories.

MRC volunteers include medical and public health professionals, as well as other community members without healthcare backgrounds. MRC units engage these volunteers to strengthen public health, improve emergency response capabilities and build community resiliency. They prepare for and respond to natural disasters, such as wildfires, hurricanes, tornados, blizzards, and floods, as well as other emergencies affecting public health, such as disease outbreaks.

GHI group looking for volunteers for next Emory University competition

by Robin Miller

Emerging Infectious Diseases Graduate Student

The Uniformed Services University's Global Health Interest group is currently looking for volunteers for next year's International Emory Global Health Case Competition.

The competition is an opportunity for undergraduate and graduate students to work across disciplines to solve complex and critical global health problems. USU sent a team of six students to Emory University in Atlanta in March to compete with 140 students representing 24 universities from across the U.S. and around the world. The USU team members included Kalpana Parvathaneni (team leader and 2nd-year Molecular and Cell Biology graduate student), Navy Ens. Holly Berkley (class of 2018) Navy Ens., Kristin Wertin (Class of 2018), Army 2nd Lt. Asad Moten (Class of 2018), Army 2nd Lt. Rayad Barakat (Class of 2018), and Robin Miller (5th year Emerging Infectious Diseases graduate student). Dr. Edwin Burkett, director of the USU Global Health Working Group, mentored the USU student team.

To prepare for these competitions, students spent months reading old cases and attending lectures from the many global health experts at USU. The 2015 case, which was released only a week before the actual competition, was titled "¡Alto a la Violencia! Reducing Gun Violence in Honduras." The 2015 case centered around a hypothetical letter from President Juan Orlando Hernández Alvarado requesting a multidisciplinary and evidence-based approach to reduce gun violence in Honduras. They spent the next week researching successful anti-violence campaigns, the history of gangs and gang violence in Honduras, grass-roots approaches to reduce violence, and the impact of violence on mental health. In the end, they developed a comprehensive program called "Somos Honduras", which aims to reduce gun violence based on three strategic goals: promoting a culture of nonviolence, increasing economic opportunity, and building trust in public institutions.

At Emory University, the team unveiled the "Somos Honduras" program in a 15-minute presentation to a panel of expert judges followed by a 10-minute question-and-answer session. Although the USU team did not advance to the competition finals, they took away valuable skills such as developing a strategic plan to tackle a difficult global health problem, identifying measurable outcomes, and planning for potential pitfalls that they will use at future competitions.

To help spread the word of the team in the competition, the International Emory Global Health Competition was featured on NPR. Students interested in competing in the next competition or contacting the Global Health Interest group, please email ghig@usuhs.edu.

2015 Commencement

USU graduate students receive their traditional "hood" during the process of receiving their diploma. The color of the hood indicates which field of study they pursued. (Photo by Tom Balfour)

A USU medical student is all smiles after receiving her diploma from the F. Edward Hébert School of Medicine at this year's Commencement Exercise, Armed Forces Day, May 16. (Photo by MC3 Laura Bailey)

F. Edward Hébert School of Medicine Dean Dr. Arthur Kellermann congratulates a Ph.D. program graduate as she walks across the stage at DAR Constitution Hall. (Photo by MC3 Laura Bailey)

The USU Color Guard displays the colors as the United States Marine Corps Band performs the National Anthem. (Photo by Tom Balfour)

Commencement Sergeant-at-Arms, Tech Sgt. Rondricueas Barlow carrys the USU mace to lead the 2015 Commencement procession. (Photo by Tom Balfour)

Deans from USU's three schools join the Board of Regents chair on stage at this year's Commencement Exercise. From left to right: Dr. Ronald Blanck, chair, USU Board of Regents; Dr. Arthur Kellermann, dean, F. Edward Hebert School of Medicine; Dr. Carol Romano, dean, Daniel K. Inouye Graduate School of Nursing; and Dr. Thomas Schneid, executive dean, Postgraduate Dental College. (Photo by Tom Balfour)

USU Research Days 2015

Celebrating excellence in research

The Uniformed Services University annual Research Days delivered another successful event May 12 and 13 on the USU campus.

The 2015 USU Research Days was designed to promote research by faculty, staff and students at USU and its affiliate institutions and provide opportunities for interdisciplinary collaboration. It also helped to facilitate communication among USU graduate students and faculty.

"Celebrating Excellence in Research" reflected the complementary roles that nursing, public health, behavioral science, basic science, and medicine play in health promotion. The poster presentations, invited speakers, and panels demonstrated USU's special role in civilian, public health, and military research initiatives across the health sciences.

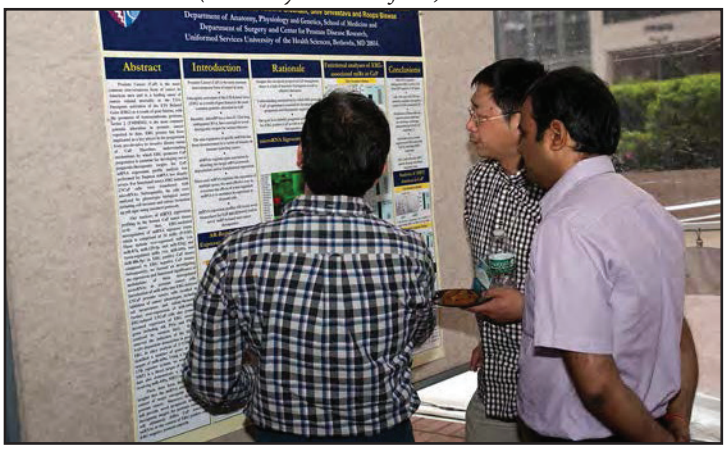
The annual two-day event formally encompassed four events:

- The Graduate School of Nursing (GSN) Research Colloquium, which brought together GSN faculty and students to present and discuss nursing-specific research findings
- The Graduate Student Colloquium, which highlighted the research interests and accomplishments of graduate students in the School of Medicine
- The Postdoctoral Fellows Symposium and Faculty Senate Research Day, which drew the entire USU community to share research achievements, foster collaborations, and stimulate intellectual exchange.

Together, they served to inform the local scientific community, collaborative institutions, and other federal agencies about significant research projects conducted across the health sciences at USU and its affiliates.

The event was also a chance for graduate students to compete during the Graduate Student Colloquium to highlight the skills and expertise they have learned at USU. This year's winners were Emerging Infectious Disease (EID) graduate student, Army 2nd Lt. Emily Parsons (oral presentation), EID graduate student Eric Laing (poster presentation), and receiving the Emma Bockman Award were EID graduate students, Ryan Johnson and Stephanie Servetas.

Dr. Francis S. Collins, Director, National Institutes of Health (NIH), delivers the Presidential Lecture: Exceptional Opportunities in Biomedical Research. (Photo by Tom Balfour)



Among the research posters displayed were those by USU graduate students from their respective fields of study. The posters were judged during the Graduate Student Colloquium for content and creativity. (Photo by Tom Balfour)

This year's Wu Award winner, Dr. Michael J. Daly, a professor with the USU Department of Pathology, delivers his presentation, "A Revolutionary Approach to Vaccine Development: Deinococcus radiodurans Mn Antioxidants". (Photo by Tom Balfour)

The lecture hall was packed with Research Days attendees to hear Bruce Alberts, Ph.D., Chair in Biochemistry and Biophysics for Science and Education from the University of California, San Francisco, deliver the Bullard Lecture: The Future of Biology: Keeping Science Healthy. (Photo by Tom Balfour)

Air Force Maj. Cubby Gardner (center) explains his poster about the usability of electronic devices to collect heart failure information to GSN associate professor Army Col. Paul Lewis (left) during the Research Days poster session. (Photo by Tom Balfour)

Army Capt.. Paul Joseph Crites, Postgraduate Dental College, delivers the Dental Award Lecture during Research Days. (Photo by Tom Balfour)

Final Frame

A first-year medical student from the F. Edward Hébert School of Medicine at USU reacts to submerging his hands in ice water at the Naval Support Activity Bethesda pool, May 13. The ice water submersion is part of the Department of Military and Emergency Medicine's Warfighter In the Environment Lab for students to experience the physiological effects of extreme temperatures. (Photo by MC3 Laura Bailey)