

2019 NEWS

NAVAL MEDICAL RESEARCH UNIT DAYTON

YEAR IN REVIEW



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Who are Dayton's Navy Scientists?

Dr. Richard Arnold

#NAMRUDayton



DAYTON, Ohio -- Over the past several decades, aerospace medical research has evolved in a number of ways, and the Naval Medical Research Unit Dayton (NAMRU-Dayton) continues adapting to meet the growing needs of the fleet. Dr. Richard Arnold, Director of the Naval Aerospace Medical Research Laboratory, has helped navigate the changes during NAMRL's time as a standalone laboratory in Pensacola, Florida and after the 2010 formation of NAMRU-Dayton command at Wright-Patterson Air Force Base (WPAFB), Ohio.

As director, Arnold is responsible for executing NAMRL's research mission, which is to mitigate and prevent leading factors associate with aviation mishaps as well as to protect and enhance the health, readiness, and performance of aircrew. The lab's core research capabilities include altitude effects, fatigue assessment and mitigation, acceleration and motion effects, motion sickness countermeasures, spatial disorientation mitigation, aircrew neck/back pain and injury, vision standards and performance, and aviation personnel selection testing. His leadership plays an integral part of NAMRU-Dayton's emergence at the forefront of military aerospace medical research.

Initially attracted to a career in academia, Dr. Arnold's interest in history, particularly the historiography of psychology, led him to military research.

"I was getting my PhD in differential psychology, and psychological testing is a big part of that," explained Arnold. "I knew that the military, during WWI and WWII, had enlisted or conscripted psychologists to help with screening and selection testing for soldiers and sailors, generally, but in aviation specifically. One day I thought to myself, 'Maybe I'll see what the military is doing these days'."

His interest led him to a program with a six-month flight school component, and he commissioned in 1999 as a Naval Aerospace Experimental Psychologist.

"I was lucky enough that my first assignment at the Naval Aerospace Medicine Institute (NAMI) was in selection testing in which I had a good background," said Arnold, "but then I went to my second tour [which] was completely out of my field—it was simulators, simulation-based training research, it was very technical. I did not have much of a technical background at all, but you kind of adapt."

After leaving the military he ran a small consulting business specializing in aeromedical and human factors research. Arnold returned to the Navy as a civilian staff scientist at NAMRL, Pensacola and became the scientific director in 2010.

Under his leadership, NAMRL's research remained active up to and through the move despite the fact that some labs directed to move by the BRAC were closing down.

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“So much of our success is dependent on personalities, reputation, and output,” said Arnold. “If we had just closed down and then re-opened and started from scratch, no one would have known who we were. So we kept research programs and projects active. We identified spaces in Dayton, we identified collaborators....Everything remained in motion throughout the move so we stayed engaged with the sponsors.”

For Arnold, moving to WPAFB was a great opportunity for NAMRL. “We got moved to be co-located with USAFSAM [U.S. Air Force School of Aerospace Medicine], and we worked very closely with the Air Force aeromedical community.”

Attracting and retaining scientific talent is also important to a director and another advantage of moving the lab to WPAFB.

“We have the capability of recruiting scientists here. It’s night and day. It was very difficult to recruit [in Pensacola],” remarks Arnold. “The facilities here are fantastic. Not only our own facilities, but the facilities we have access to on base. It’s wonderful.”

Today, NAMRL houses an acceleration research facility that includes the world’s only Disorientation Research Device: the Kraken as well as various vestibular oriented research simulators. Additionally, NAMRL has an on-site fabrication shop.

As the lab continues to grow and become more established, Arnold is looking ahead at not only NAMRL’s scientific mission and strategic plan, but the scientific expertise of his staff and his supervisory responsibilities.

According to Arnold, the researchers are “the pointy end of the spear, and my job is just to help them get their jobs done.”

He is proud to have a hand in bringing together the group of NAMRL scientists who represent NAMRU-Dayton through their participation in annual scientific conferences such as the upcoming 90th Aerospace Medical Association Meeting (AsMA), May 5-9, and other activities that bring to light the command’s collective achievements.

“They’re a great group doing amazing research, and they’ve got a great reputation across the Department of Defense. I’m proud of the hand I had in bringing them here, helping them, match-making with sponsors and collaborators. But they make it all happen, I don’t,” said Arnold.

Arnold is an active member of AsMA and served as the 2017-2018 Chair of the DoD Human Factors Engineering Technical Advisory Group (DoD HFE TAG).



Who are Dayton's Navy Scientists?

Lt. Cmdr. Matt Shipman

#NAMRUDayton

DAYTON, Ohio -- A product of a military family himself, Lieutenant Commander Matt Shipman's Navy journey began when he made a change from academic research and identified a desire to fly - the U.S. Navy offered an opportunity for wings and research.

With an undergraduate degree in biology and a doctorate in biochemistry, Shipman was commissioned in the Navy and earned his wings as a Naval Aerospace and Operational Physiologist (AOP), joining a small group of aviation physiologists supporting the operational readiness of the Navy and Marine Corps warfighters.

During his first assignment Shipman operated with an attitude of "mission first" and that continues in his current role in support of the Naval Medical Research Unit Dayton (NAMRU-Dayton) today. As an AOP, Shipman works to bridge knowledge gaps between the aeromedical researchers and the line by participating in working groups focused on the research and development of techniques and tools for mitigating risk in the tactical aviation environment.

"I'm a flight physiologist by trade. I'm actually a biochemist by training; it's the reason I'm here," said Shipman.

As NAMRU-Dayton's Technical Research Support Department Head in the Environmental Health Effects Laboratory (EHEL) Shipman oversees aspects of research support for over 25 research studies that investigate health, performance and safety. For Shipman, his own research focus is primarily on investigations of microbiomics, small molecule physiology and systems biology related to questions of environmental toxicology and stressors.

"When it comes to environmental exposures and how the environment impacts our joint warfighters, I see NAMRU-Dayton as having a very big role in pushing the Navy's efforts forward," remarked Shipman.

Building and expanding these capabilities and capacities in his role as department head is a source of great pride for Shipman.

"We recently have taken delivery of several major pieces of capital equipment, including a quadrupole time-of-flight (Q-TOF) mass spectrometer," said Shipman, "which is pretty much the state-of-the-field to analyze small molecules these days. It is going to be a major benefit to us as we move forward. We've currently completed installation of the Q-TOF and are finishing initial method development."

Environmental Health Effects Lab is charged with assessing potential health effects associated with unique operational environments such as nuclear submarines and shipboard environments, and Shipman's department will be shaped by the emergence of new scientific approaches, instrumentation and warfighter environments.

"Our demand signal comes from what's happening on the fleet. Our umbrella covers anything that relates to environmental health effects" explained Shipman.

In midst of all his work with the technical research support department, Shipman remains focused on the unique contributions made by EHEL as a whole and the legacy he's been helping to expand and uphold.

Who are Dayton's Navy Scientists?

Dr. Karen Mumy

#NAMRUDayton



DAYTON, Ohio -- Dr. Karen Mumy, Naval Medical Research Unit Dayton's (NAMRU-Dayton) Director of the Environmental Health Effects Laboratory (EHEL), is a board-certified toxicologist with the American Board of Toxicology and a member of many scientific societies, including the Society of Toxicology and the American Society for Microbiology. Her areas of expertise include toxicology, chemical exposure, health effects of exposure, environmental exposures, microbiology, cellular biology, inflammation, and the microbiome. A member of the research team since 2009, she uses her multifaceted background to think outside the box and creatively tackle military research needs.

"Every day on the job is different and all of my professional efforts are ultimately channeled into ensuring that EHEL succeeds in its mission," said Mumy.

As EHEL director, Mumy leads the Navy's largest basic science research lab that focuses on exposure effects and toxicology. The lab is made up of over 40 active duty, civilian and contractor personnel who focus on deciphering and addressing the health effects of service members exposed to environmental stressors and hazards. While the lab's mission hasn't changed drastically since its inception in 1959, Mumy has seen it broaden due to the scientific advancements and methodologies allowing researchers to look at things now that were not possible even just ten years ago.

Despite the demands of high-level duties, she makes sure to commit time to advise her team.

"One of the parts of my job that I love [is that] I get to spend a lot of time with the scientists," said Mumy.

Interacting with her team strengthens Mumy's already strong appreciation of collaboration and the value of different perspectives and research backgrounds.

"Being a leader through this experience, one thing that I have always appreciated...is the diversity of the research team," said Mumy, "We've brought on so many people in the last year, and they all come from their own little niche areas. But, when you put them together with somebody else's niche, they can do things that you just would never see coming."

Further emphasizing, Mumy remarks, "You put brilliant minds with other brilliant minds, and the ideas that they come up with and the ways to answer a question...it's fascinating to watch". She adds, "As individuals-they're fantastic on their own-but you put them together and it's mind-blowing."

As a leader, Mumy spends a lot of time thinking not only about the present state of her laboratory, but also its future.

"EHEL is in a wonderful position right now because we have brought on so much talent and just flat-out genius. We have very, very talented researchers that are up-to-date on recent methodology and state-of-the art techniques, and we've worked hard to acquire the newest instrumentation to be able to answer questions," said Mumy.

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She sees the lab's ability to protect the warfighter not only from long-term or long-lasting effects, but also...

from short-term issues that could affect warfighter's quality of life or operational performance. This is key in a field that historically has focused more on long-term illnesses, such as cancer.

"Certainly we are aiming to protect against cancers, but we are also heavily focused on recognizing other risks associated with exposures, such as those that may lead to things like memory impairments, hearing loss, depression or anxiety," said Mumy, "These are such a big part of a service member's wellbeing when they come home, and these are just a few of the many areas that I'm very proud of."

In an effort to "maintain a pulse regarding what the up and coming issues are" Mumy and eleven scientists from the Environmental Health Effects Laboratory are attending the 58th Annual Society of Toxicology (SOT) meeting in Baltimore, March 10-14. SOT brings national and global scientists together to share influential research in the field of toxicology.

Naval Medical Research and Development's 2018 Junior Officer of the Year

06.07.2019 published, DVIDS



DAYTON, Ohio -- Lieutenant Commander Micah Kinney, Naval Aerospace Optometrist, was selected as the Naval Medical Research and Development Enterprise 2018 Junior Officer of the Year (JOOY). The Navy Surgeon General, Vice Admiral Forrest Faison presented the award to Lt. Cmdr. Kinney during a site visit to Naval Medical Research Unit Dayton.

The JOOY award recognizes junior officers who exhibit the highest of standards of professionalism, initiative, and dedication to performance of duty as a Naval Officer.

"Lt. Cmdr. Kinney has established himself as a Department of the Navy and Department of Defense leader in vision research," said Captain Matthew Hebert, Commanding Officer, Naval Medical Research Unit Dayton.

Lt. Cmdr. Kinney serves as the Department Head of the Naval Aerospace Medical Research Laboratory's Acceleration and Sensory Sciences Department at NAMRU-Dayton. He is responsible for directing the activities of 17 military researchers, civilian scientists, and contract personnel.

This past year he was competitively awarded \$1M in research funding to significantly advance DoD and NASA understanding of critical human performance challenges associated with mild vision loss, Spaceflight Associated Neuro-Optic Syndrome, and spatial disorientation.

"I feel like I have the best job in the U.S. Navy. My time at NAMRU-Dayton has been filled with incredible opportunities. I am planning on making a career out of the Navy and continuing to serve the warfighter," said Lt. Cmdr. Kinney.

Lt. Cmdr. Kinney has strong military roots - members of his family have served since World War II. In addition to his work at NAMRU-Dayton, he has trained more than 50 U.S. Air Force Optometrists and supported Naval Health Clinic (NHC) New England by providing over 100 clinical vision exams during a recent personnel shortage. As a volunteer reviewer for the Council on Optometric Practitioner Education, a National Board that certifies optometry continuing education (CE), he reviewed over 20 hours of CE courses during 2018.

"I am humbled to meet and work with our service members," said Lt. Cmdr. Kinney. "They keep me motivated. Listening to their needs and working on solutions helps me feel like I am doing my part to enhance their ability to do theirs."

Lt. Cmdr. Kinney is active in the community too. He volunteers as a Committee Member for Boy Scouts of America, supports youth groups, and volunteers at a local sports complex for 4th and 5th grade soccer teams.

Within the past year he was recognized as the 2018 Armed Forces Optometric Society (AFOS) Navy Junior Optometrist of the Year and received a Certificate of Appreciation from AFOS, "For significantly contributing to the advancement of our profession by participating in the Fall 2018 optometric continuing education program."

His extensive research portfolio includes vision science, aviation human factors, aviation vision standards and laser eye protection. His current research interests include color vision assessment for special-duty occupations, the impact of laser veiling glare on aviator human performance, return to duty guidance following reduced visual acuity, and human visual performance in chem-bio operating environments.

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After Faison's tour through the laboratories, he addressed the staff during an admiral's call where he presented Lt. Cmdr. Micah Kinney, Naval Aerospace optometrist, with the Research and Development Enterprise 2018 Junior Officer of the Year (JOOY) award. Kinney serves as the Department Head of the Naval Aerospace Medical Research Laboratory's Acceleration and Sensory Sciences Department at NAMRU-D.

Faison met Kinney earlier in the day while touring the vision science laboratory which evaluates and seeks to improve human system interactions with increasingly complex display technology used in aviation, shore, surface, and subsurface special-duty occupations.

Before leaving, Faison thanked Capt. Matthew Hebert, commanding officer, NAMRU-D, and the rest of the NAMRU-D team for their hospitality and reiterated the significance of the work being done.

"The privilege and honor has been all mine to meet the team here. The amazing work you are doing every single day benefits countless lives across the fleet and around the world. Their families sleep well at night knowing that you are here taking care of them. So, thank you," said Faison.

Navy Medicine is a global health care network of 63,000 personnel that provides health care support to the U.S. Navy, Marine Corps, their families and veterans in high operational tempo environments at expeditionary medical facilities, medical treatment facilities, hospitals, clinics, hospital ships and research units around the world.

U.S. NAVY MEDICAL RESEARCH LABORATORY

Naval research unit members participate in local science fairs

06.07.2019 published

WRIGHT-PATTERSON AIR FORCE BASE, Ohio -- Over the past school year, Naval Medical Research Unit-Dayton's (NAMRU-Dayton) military and civilian command members alike visited local science fairs in an effort to meet with talented students hoping to pursue careers in science, technology, engineering, and mathematics (STEM), and bring awareness to career opportunities in naval research.

"The students had the opportunity to not only demonstrate their basic scientific knowledge, but to practice presenting their work, responding to questions, and discussing real-world applications of their results," said Commander Tatana Olson, Naval Aerospace Experimental Psychologist and deputy director of NAMRU-Dayton's Naval Aerospace Medical Research Laboratory. "We also had the opportunity to discuss how they might improve their projects if they did them again," she remarked, speaking further about her experience as a judge with the Stivers School for the Arts in Dayton.

Senior research engineer, Dr. Barbara Shykoff was also involved, visiting Thurgood Marshall High and Trotwood Madison Middle school in addition to volunteering on Montgomery County Science Day.

"It was a delight to see that the science fairs were a stimulus for thought and an outlet for success for both academically-inclined students and for some who struggle with aspects of school," said Dr. Shykoff. "I enjoyed meeting the students, some of whom were excited to meet 'real scientists', and all of whom made a real effort to converse meaningfully with unknown adults."

The science fairs also offer an opportunity for command members to connect with educators and others who work in the STEM field. "My fellow judges and the teachers and organizers also were a pleasure to meet," said Dr. Shykoff.

Through participation in science fairs and other community efforts, NAMRU-Dayton hopes to encourage and inspire the next generation of scientists and engineers to join our mission of military support.

This summer, multiple student interns were accepted to participate in various internship programs with NAMRU-Dayton to gain educational experience and mentorship from expert scientists.

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STEM groups learn from Navy Scientists at WPAFB

07.12.2019 published, WPAFB Skywrighter



WRIGHT-PATTERSON AFB, OH – When school is out, Science, Technology, Engineering and Math (STEM) tours are in session at Naval Medical Research - Dayton. This year, the Dayton Regional STEM School and the Department of Defense's STEM awareness and outreach program, STARBASE visited the command to learn about potential careers in STEM fields, their application in the military, and different paths to pursuing military research.

Dayton Regional STEM School kicked off the summer tours by including NAMRU-Dayton as a stop on their slate of 10-day "STEMmersions". These programs allow students to spend an entire school day focused on a single topic, and their NAMRU-Dayton visit focused on "aviation". Over 30 middle school students toured the labs, learning how our host of advanced scientific equipment helps to improve warfighter safety and performance. Students visited our Reduced Oxygen Breathing Device Environment (ROBE), Vision Sciences Laboratory, Visual Vestibular Sphere Device, and the Disorientation Research Device – the Kraken™.

"The STEMmersion programs teaches science and math in ways that we wish we had the time, resources and expertise to do in the regular classroom," said Brittany Shores, a middle school teacher at the Dayton Regional STEM School. "It's experiential, exploratory learning".

Lieutenant Commander Matthew Doubrava, command flight surgeon and Biomedical Sciences Department Head, NAMRU-Dayton said, "It's important to get as much STEM-oriented teaching to young people as often as possible. We need a new generation of 'STEMennils'."

"Youth today are quite familiar with digital interfaces in the form of video games, and social media platforms," said research assistant Grant Roush, who demoed vision technologies for the students. "But when they get to see the realism of training simulators that combine the digital interface with applied technology, it gives them a real world perspective of advanced capabilities rather than just a gaming platform."

DoD STARBASE, a program which serves elementary students historically under-represented in STEM, was the next to visit. The program aims to engage students through the inquiry-based curriculum with its "hands-on, mind-on" experiential activities, and motivate them to explore STEM fields as they continue their education.

NAMRU-Dayton's military and civilian scientists and research personnel demonstrated and explained the importance of laboratory research to finding solutions for warfighter safety. Encouraging students to interact with different technologies and scientists, to offers a more concrete understanding on the use of STEM in different career paths.

Civilian scientist and senior research engineer, Dr. Barbara Shykoff, volunteered to lead the group for the first time and enjoyed sharing her passion for the work performed at NAMRU-Dayton. "It's fun to watch a member of a group of young people let genuine curiosity overcome the need to be silly with friends," said Shykoff.

Though the summer tours have ended, NAMRU-Dayton looks forward to continuing the partnership with the regional STEM exposure programs to promote the exploration of military and applied research opportunities.

Tri-Service research efforts seek to meet DoD needs

08.14.2019 published, DVIDS



DAYTON, Ohio – The recent Tri-Service Toxicology Consortium (TSTC) provided another opportunity for civilian and uniformed members of the Air Force, Army and Navy to discuss strategic planning and share updates regarding the state of toxicology research in the Department of Defense (DoD). During the August 6-7 bi-annual meeting, scientists from each branch informed the group of their latest projects, participated in brainstorming sessions, and held discussions on current and future DoD needs. Researchers from Naval Medical Research Unit-Dayton's (NAMRU-Dayton) Environmental Health Research Effects Laboratory (EHEL) attended to network with other service members and present updates on their own research.

"TSTC always offers a wonderful opportunity to connect with colleagues and stay abreast of the latest developments in our field," says Lt. Cmdr. Taj King, biochemist and Inhalation Toxicology Department Head. "It also allows great insights into the collaborative efforts we can pursue."

To give participants an idea of collaboration opportunities, EHEL Director, Dr. Karen Mummy, provided an overview of EHEL capabilities for the group. She also gave a presentation on behalf of EHEL research physiologist, Dr. Joyce Rohan, entitled, "Correlation of electrophysiological parameters with behavioral performance in an animal model using aluminum exposures". The talk gave insight into the work Rohan's team is doing to establish a correlation analysis between electrophysiological recordings and behavioral performance to assess the possibility of memory loss and other cognitive issues potentially faced by military personnel.

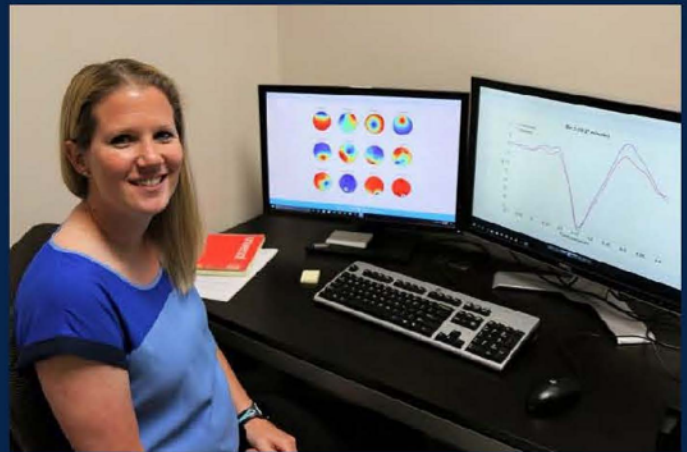
Lt. Dan Xu, biochemist and Occupational and Environmental Health Department Head, also represented the command with a brief entitled, "Evaluating whether dermal contact with air pollution can contribute to the development of asthma". The presentation highlighted the work cell biologist, Dr. David Wu, and other researchers are doing to understand the causes of increased respiratory complaints experienced by deployed service members.

"This meeting definitely helps keep the community up-to-date," says Lt. Cmdr. Matt Shipman, Naval Aerospace and Operational Physiologist and Department Head of Technical Research and Support at EHEL. "With the variety of projects we're all working on, it's certainly useful to come together and get the lay of the land".

The next scheduled TSTC meeting is tentatively planned for February 2020, and NAMRU-Dayton hopes to continue to support and contribute to the group's common goal of protecting human health and the environment for the DoD.

Innovative Research for Aircrew Safety

09.11.19 published



Dr. Kara Blacker, research psychologist in the Naval Aerospace Medical Research Laboratory at Naval Medical Research Unit Dayton (NAMRU-Dayton), uses recent advances in neuroscience to develop new methods for monitoring responses to physiological stress in a simulated operational environment.

DAYTON, Ohio -- The Naval Medical Research Unit Dayton's (NAMRU-Dayton) Naval Aerospace Medical Research Laboratory (NAMRL) continues to respond to the issue of physiological episodes with the goal of developing ways to keep aircrew safe. One line of research in these efforts is using electroencephalography (EEG) as a novel approach to detecting hypoxia, or low-oxygen condition.

Hypoxia is known to adversely affect a range of sensory and cognitive functions, such as reaction time and memory. However, symptoms of hypoxia vary widely among different individuals and some individuals do not experience any identifiable symptoms at all. Therefore, a reliable method for detecting hypoxia and the impending negative effects on cognition is needed.

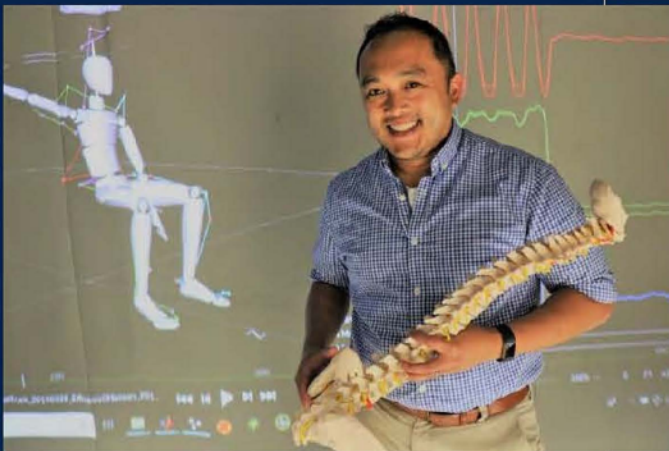
Dr. Kara Blacker, research psychologist, is testing the utility of EEG to detect hypoxia before symptoms occur. NAMRL's EEG Lab has a 64-channel Brain vision ActiCHamp EEG system that measures the electrical activity from the brain and can be used to assess sensory function. EEG is a non-invasive measure of brain activity that is recorded from electrodes placed on a person's scalp. In an ongoing series of studies, Dr. Blacker has found that an EEG signature, known as an event-related potential (ERP), is sensitive to hypoxia. By comparing the ERP response under normal conditions (i.e., normoxia) and a low-oxygen condition (i.e., hypoxia), the results show that the neural response is reduced under hypoxic conditions. Notably, this difference in the neural response occurred within the same timeframe that the participants began performing worse on a task under hypoxic conditions. These results suggest that EEG may be able to serve as an early detector of hypoxia.

Dr. Blacker and her team are currently working on refining this work to test whether ERPs can also serve to track recovery from a hypoxic exposure, which may inform return to duty practices. They are also developing methods to measure the ERP response faster and with less hardware, to make the process easier to use in an operational environment.

<https://www.namru.org/Research/EEG-Lab>

Research to Improve Spine Health among Aircrew

09.11.19 published



Dr. Peter Le, biomechanical engineer, leads research efforts to improve spine health in military aviators as a part of Naval Medical Research Unit Dayton's (NAMRU-Dayton) Spine Health Improvement Program lab (SHIP) housed in the Naval Aerospace Medical Research Laboratory at NAMRU-Dayton. Through basic and applied research targeting the mitigation of low back and neck disorders, research aims to address prevention and rehabilitation through a variety of methods.

DAYTON, Ohio -- The strenuous occupational demands endured by our military aircrew have resulted in a host of musculoskeletal disorders, with the highest reports related to low back pain (LBP) and neck pain (NP). These reports are associated with high medical costs, inability to fly, as well as reduced productivity and performance, thereby affecting operational readiness and effectiveness. Although a significant amount of research has attempted to reduce the risk of LBP/NP, the problem persists as causal pathways remain unclear. Survey data have provided knowledge on areas of concern (i.e., poor cockpit ergonomics, awkward postures, whole-body vibration, head-supported masses, etc.) and corrective interventions have been deployed as an immediate response, but many have failed because they have not targeted the underlying problem.

The Spine Health Improvement Program (SHIP) has several initiatives to understand and develop strategies to reduce LBP and NP among aircrew. These initiatives target causal mechanisms of injury, employ a 'systems-perspective' philosophy (interaction between physical loads, psychosocial/organizational factors, and individual differences), while developing approaches to streamline measurements in the field and track return-to-duty status. Dr. Peter Le, biomedical engineer and program lead for SHIP, is leading the effort in response to the National Defense Authorization Act (NDAA FY17), Sec. 750, a request to study the health of rotary-wing and tilt-rotor pilots and Joint Concept for Health Services (2015), required capability #5: medical mitigation of the environment. SHIP targets both prevention and return-to-duty, through quantifiable, biomechanical/physiological measures. These include measures of movement, muscle activity, force production, fluctuations in heart rate, and changes in muscle oxygenation, while integrating task performance as a factor to understand the mind-body interaction. These data allow us to explore possible links between biomechanical changes and human performance. While these measures may provide insight between testing conditions, the key lies within the interpretation of the measures to explore the causal pathways of injury.

Current funded efforts target three areas: 1) causal pathways of LBP and NP during prolonged seating (i.e., visual stressors, individual differences/cognitive workload and biomechanical effects), 2) development of analytical methods to quantitatively measure biomechanical functional status in the field, and 3) evaluation/validation of fielded motion tracking analytics systems. In addition to the target areas, the laboratory capabilities are designed with the intent to enhance collaborations and support multiple research groups needing quantitative biomechanics/ergonomics assessments. These currently include 1) assessments of industrial exoskeletons (USAF 711th HPW) and 2) movement differences from body-mounted sensors and equipment (Gallo and Warner).

Overall, the SHIP lab is developing capabilities to assess causal pathways for LBP/NP, design methods to assess those pathways, and evaluate currently fielded systems/interventions. In essence, the SHIP philosophy to reduce LBP and NP among our aircrew is to be Intervention-Oriented, Mechanism-Driven.

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Naval Research Internships Inspire Future Careers

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DAYTON, Ohio -- This summer, Naval Medical Research Unit Dayton (NAMRU-Dayton) welcomed a cohort of 13 students with science, technology, engineering, and math (STEM) backgrounds to intern at the command for a few weeks of scientific learning and exploration. The range of internship opportunities allowed students to shadow our staff in conventional scientific research fields as well as other STEM areas, including fabrication and engineering.

"The most surprising thing about NAMRU-Dayton was the amount of projects going on at once," said Natalie Gut, an intern at the Environmental Health Effects Research Laboratory (EHEL). "Everyone seems to have a hand in multiple projects. Every day is different for me."

Kasey Bernt, an intern for NAMRU-Dayton's Naval Aerospace Medical Research Laboratory (NAMRL) agreed, stating, "With all of the projects going on, the research and learning environment here has been full of opportunity."

Not only do these internships provide opportunities for students, but they also help our command continue to grow and innovate.

"These internships give NAMRU-Dayton access to young minds and current thinking which offers us a different perspective," said Dr. Lynn Caldwell, senior research psychologist at NAMRL. "It gives young students the opportunity to see how research is conducted in a real lab setting, equipping them with valuable skills to prepare them for professional challenges."

Along the way, each student had the guidance and support of a mentor invested in their personal and professional growth to face the challenges they experienced.

"Feeling like I can go to people and gain knowledge that I need not only for this job, but for furthering my own goals, has been a wonderful part of my time here," said Megan Boltz, an intern for fatigue studies at NAMRL. "It's great being part of a team."

Indeed, NAMRU-Dayton offered interns the ability to make meaningful contributions to our science and make their mark as valuable team members.

"Our interns have been extremely helpful in getting our projects finished," said Dr. F. Eric Robinson, research psychologist and mentor to two interns. "They help us prepare for projects, collect and organize data, and help with purchasing and setting up equipment. We couldn't have done the work we did this summer without their support."

Often, the ability to make a difference is often what keeps our interns coming back to the command, as in the case of returning research intern, Ashton Hughes.

"I chose to come back to NAMRU-Dayton because of the mission," says Hughes. "For example, right now, I'm working on a project focused on warfighter safety during critical care air transport. I feel great knowing that what I do will help someone."

Tyler LaBance, a fabrication intern who also returned for a second summer with the command, shares the similar sentiments.

"I enjoy feeling good about my work, and I was definitely excited to come back," said LaBance. "Where else can you work on something as unique as the Disorientation Research Device? Not only do we get to interface with interesting equipment, but we contribute to projects that help save lives."

Though the internships last just a few weeks, the experiences they offer can provide the basis for an entire career.

"This internship was an amazing way to gain more insight into the scientific world," said psychology intern, Marissa Tharp. "I feel more confident about pinpointing my research interest for when I pursue my masters degree."

As the interns move on to pursue their educational goals, NAMRU-Dayton hopes to continue its commitment to fostering an environment which encourages the professional development of STEM students. The command looks forward to welcoming new cohorts in the years to come.

<https://www.dvidshome.com/news/2019/09/11/091119-001>

Intergovernmental Personnel Act participants support Navy research unit

04.23.2019 published, DVIDS

DAYTON, Ohio – Naval Medical Research Unit Dayton (NAMRU-Dayton) research is executed by highly qualified individuals with unique capabilities and professional backgrounds, including Intergovernmental Personnel Act (IPA) participants supporting the command.

IPA participants occupy a unique space at NAMRU-Dayton, merging the resources, expertise, and experience of outside academic partners and collaborators with those of the Department of Defense (DoD). A unique aspect of IPAs is that they are permitted to serve as principal investigators (PIs) on scientific studies conducted at the command. Their roles allow them to manage projects as well as money, giving them a degree of autonomy that fosters a more seamless partnership between NAMRU-Dayton and our collaborators. Four of our researchers have IPA status and each have their own perspective on the value of the program.

Drs. Valarie Schroeder and Jeffrey Phillips were previously employed as government civilians at NAMRU-Dayton before accepting other positions. At present, both work with the command remotely, representing NAMRU-Dayton in their current workplaces and communities, while collaborating on projects that fall under the umbrella of our research mission.

At the Florida Institute for Human and Machine Cognition (IHMC), Dr. Phillips, a research psychologist, and NAMRU-Dayton plank owner, one of the original scientists who established the Naval Aerospace Medical Research Laboratory (NAMRL), sees tremendous value in his role as an IPA.

“Naval Air Station Pensacola is home to many of NAMRU-Dayton’s customers and stakeholders. NAMRU-Dayton’s location in Dayton, Ohio has established a productive link with the Air Force, but it has limited our interaction with these customers in Pensacola,” said Dr. Phillips. “The IPA allows me to represent NAMRU-Dayton to these customers. From this location, I get access and insight from operators, flight surgeons, operational physiologists, and other Navy personnel who serve Navy personnel.”

For Dr. Schroeder, who transitioned from government civilian to contractor with the Henry M. Jackson Foundation for the Advancement of Military Medicine to her current role as an IPA, the program and her time at NAMRU-Dayton are interconnected.

“The main opportunity offered to me as an IPA is the ability to be a principal investigator on a project. In our career, this is a great opportunity,” said Dr. Schroeder.

“I have had the wonderful opportunity to be mentored by two of NAMRU-Dayton’s senior research psychologists, Drs. Lynn Caldwell and Michael Reddix. Dr. Caldwell and Dr. Reddix have guided me in research design and execution as a junior psychologist. They have mentored me in all steps of the research process, from writing white papers and proposals, to protocol writing, financial management, and project execution and management,” said Dr. Schroeder.

The command’s additional IPAs, Drs. Daniel Merfeld, Elizabeth Damato and Michael Decker, join us from academic institutions.

Dr. Merfeld is a professor at The Ohio State University College of Medicine (OSU) in the department of Otolaryngology – Head and Neck Surgery and serves as the senior vestibular scientist at NAMRU-Dayton. The partnership between OSU and the command provides him access not only to world-class research facilities including the Disorientation Research Device (DRD), also known as the Kraken and the Visual Vestibular Spherical Device (VVSD), but to a different group of people as well.

“From strictly a utilitarian perspective, being an IPA participant opens funding opportunities that allow me to contribute my basic science skills and expertise to military problems,” said Dr. Merfeld. “I consider it an honor...to help the military save pilots’ lives by working to improve our understanding of spatial disorientation and its impact on aircraft accidents.”

Speaking on the opportunities the program provides, Dr. Merfeld remarks, “[Through the IPA program] I have had the unique opportunity to collaborate with outstanding NAMRU-Dayton scientists with broadly varying interests ranging from spatial disorientation to human performance.”

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For other IPAs, the program provides not only reciprocal access to different facilities and devices, but also the ability to share information with interested parties and compare and contrast different processes.

“My eyes were opened to a field of new opportunities,” said Dr. Damato, an associate professor at Case Western Reserve University School of Medicine and senior research physiologist at NAMRU-Dayton. “Although I was aware that the DoD funded external investigators, I was not aware of the fleet of scientists that were directly employed by the military as civilian scientists.”

She has leveraged her role as an IPA to pass along information to her students to help increase awareness of scientific opportunities at NAMRU-Dayton and propel the pipeline for qualified researchers to embark upon a career in military research.

“Our research also provides the vehicle to engage other university faculty members who are hoping to also support NAMRU-Dayton’s mission,” said Dr. Damato.

Dr. Decker, associate professor and colleague of Dr. Damato at Case Western Reserve University and neuroscientist supporting NAMRU-Dayton, also values the unique opportunities the IPA program provides.

“Our collaborations with aviators and personnel who work in extreme high altitude environments and visit our lab to participate in studies, provide unique insights into physiologic challenges imposed by austere environments,” said Dr. Decker. “Until joining NAMRU-Dayton, those collaborations did not exist.”

Whether they come from an academic or commercial background, the IPAs infuse new ideas and experiences into the military milieu while enjoying the opportunities that NAMRU-Dayton offers to implement those ideas within environments not typically accessible to non-DoD scientists. Though they make up a small percentage of the command, the IPA participants provide significant value to both NAMRU-Dayton and their home institutions, and each play a vital role in moving the command’s research mission forward.

Link to original story: <https://dvidshub.net/r/qvwwab>



Dr. Michael Decker is an associate professor at Case Western Reserve University School of Medicine and is a neuroscientist at NAMRU-Dayton in the neuroimaging lab.



Dr. Elizabeth Damato is an associate professor at Case Western Reserve University School of Medicine and a senior research physiologist at NAMRU-Dayton.

Dr. Valarie Schroeder is a cognitive psychologist with the Henry M. Jackson Foundation for the Advancement of Military Medicine and NAMRU-Dayton.



Dr. Jeffrey Phillips is a research psychologist with dual roles at Florida Institute for Human and Machine Cognition and NAMRU-Dayton.



Dr. Daniel Merfeld is a professor at The Ohio State University College of Medicine (OSU) in the department of Otolaryngology – Head and Neck Surgery and serves as the senior vestibular scientist at NAMRU-Dayton.