FLC

FEDERAL LABORATORY CONSORTIUM

NATIONAL MEETING

2022 AWARDS

RESULTS POWERED BY RESILIENCE

2022 NATIONAL AWARD WINNERS

Excellence in Technology Transfer Awards

Get social with the 2022 FLC National Meeting Award Winners and post their success. Follow ***@federallabs*** *and join in by using* ***#FLCawards****.*

Individual and Team Awards

Interagency Partnership

State and Local Economic Development

Impact Award

Technology Transfer Innovation

Special Recognition

Rookie of the Year

Outstanding Technology Transfer Professional

Laboratory Director of the Year

Harold Metcalf Award for FLC Service

2021 Regional Award Winners

National Awards Judges

2023 FLC Awards Calendar

WELCOME TO THE 2022 FLC NATIONAL AWARDS

This year's National Awards submissions were so impressive that selecting the winners was more difficult than in recent memory. That's great news for the awards program, increasing the prestige associated with a win.

It's also good news for the tech transfer profession, especially after a year when COVID-19 pandemic restrictions were compounded by staffing shortages at many labs, agencies and partner organizations. In addition to technical excellence, this year's winners illustrate how creative and resilient federal technology transfer offices can be.

Also in the past year, federal pandemic response and recovery efforts continued. That's why, once again, this publication is using our COVID-19 Response Distinction seal to designate projects related to the pandemic.

We are honored to call these award winners our tech transfer colleagues, and we couldn't be more excited for the future of the profession. Thank you for your hard work, ingenuity and dedication to public service.

THE FLC 2022 NATIONAL AWARDS ARE PRESENTED IN THE FOLLOWING CATEGORIES:

EXCELLENCE IN TECHNOLOGY TRANSFER:
Recognizes employees of FLC member laboratories and non-laboratory staff who have accomplished outstanding work in the process of transferring federally developed technology.

INTERAGENCY PARTNERSHIP:
Recognizes agency and/or laboratory employees from at least two different agencies who have collaboratively accomplished outstanding work in transferring a technology.

STATE AND LOCAL ECONOMIC DEVELOPMENT:
Recognizes successful initiatives that involve partnership between state or local economic development groups and federal laboratories for economic benefit.

IMPACT:
Honors employees of FLC member laboratories and non-laboratory staff whose technology transfer efforts have made a tangible and lasting impact on the populace or marketplace ranging from a local to global scale.

TECHNOLOGY TRANSFER INNOVATION:
Recognizes federal laboratories that successfully implemented innovative or unconventional technology transfer approaches that resulted in a significant increase in technology transfer activities.

ROOKIE OF THE YEAR:
Recognizes the efforts of an FLC laboratory technology transfer professional with three years' experience or less who has demonstrated outstanding work transferring a technology in a manner significantly above and beyond what was called for in the normal course of their work.

OUTSTANDING TECHNOLOGY TRANSFER PROFESSIONAL:
Recognizes the efforts of an FLC laboratory technology transfer professional (or team) who has demonstrated outstanding work transferring a technology in a manner significantly above and beyond what was called for in the normal course of their work.

LABORATORY DIRECTOR OF THE YEAR:
Honors laboratory directors who have made maximum contributions to the overall enhancement of technology transfer for economic development.

HAROLD METCALF AWARD FOR FLC SERVICE:
Recognizes an FLC employee who has provided sustained significant service to the FLC as an organization.

The FLC Awards are a prestigious honor in the global technology transfer profession, with dozens of nominations submitted each year from more than 300 federal laboratories and their agencies. It is our great pleasure and privilege to present the recipients of the 2022 FLC National Awards.

Dr. Whitney Hastings

Dr. Whitney Hastings, Awards Subcommittee Co-Chair

Lisa Marianni

Lisa Marianni, Awards Subcommittee Co-Chair

2022 National Awards by the Numbers

NATIONAL AWARDS SUMMARY

9	64	25	8
Categories	Nominations	Winners	Agencies Represented

WINNERS BY REGION

Far West	2
Mid-Atlantic	11
Mid-Continent	4
Midwest	3
Northeast	3
Southeast	6

*Some categories include multiple agencies and regions, so the total will not match the number of winning nominations.

WINNERS BY AGENCY

USDA	DOE	EPA	NASA
2	11	1	2

DoD	DHS	HHS	VA
6	1	2	3

AWARDS

EXCELLENCE IN TECHNOLOGY TRANSFER

COMMERCIALIZATION IN VIETNAM POSITIONS ARS VACCINE TO HELP CONTROL AFRICAN SWINE FEVER PANDEMIC

USDA Agricultural Research Service, Plum Island Animal Disease Center

A vaccine developed by the U.S. Department of Agriculture's Agricultural Research Service (USDA ARS) and commercialized in Vietnam is uniquely positioned to help control the deadly African swine fever (ASF) pandemic in Southeast Asia and prevent it from spreading to the U.S.

ASF is a devastating, highly contagious viral disease of domestic and wild pigs, with mortality rates approaching 100%. At first localized to sub-Saharan Africa, since 2007 ASF has spread to Europe and Southeast Asia, creating a pandemic that decimated the world's pig population in 2019.

A new wave of ASF outbreaks that began in 2021 is again threatening food security and raising pork prices to historic highs worldwide. The potential introduction of ASF in the U.S. — the world's third-largest swine producer after Europe and China — is a serious concern for the nation's pork industry.

Researchers across the globe have tried unsuccessfully in the past 50 years to develop a safe and efficacious ASF vaccine. In 2008, scientists at the ARS Plum Island Animal Disease Center began a long, arduous genetic engineering process that ultimately led to the creation of an effective ASF vaccine, which was patented in 2019.

Realizing that preventing an ASF outbreak in the U.S. would require controlling the disease in endemic regions (where it already existed), the ARS researchers believed it was important to transfer the technology to a commercial partner in an ASF-endemic country. A commercial ASF vaccine has never been used to control and prevent the virus's spread in an endemic country.

A visit to Vietnam in February 2020 — despite the COVID-19 crisis — initiated discussions between ARS and the National Veterinary Joint Stock Company (NAVETCO). One of the biggest veterinary pharmaceutical companies

in Vietnam, NAVETCO had valuable experience conducting the clinical trials needed for approval from that country's regulatory authorities.

ARS scientists worked with NAVETCO to create a vaccine development plan and to help the company navigate the USDA technology transfer process. The ARS Office of Technology Transfer issued NAVETCO a Patent and Biological Material License Agreement on Aug. 7, 2020, and signed a collaborative Material Transfer Research Agreement less than three weeks later.

In September 2020, materials were shipped to NAVETCO — no small feat during a pandemic. The company produced the first batches of the vaccine, conducted clinical studies, and submitted the results to Vietnamese regulatory authorities in February 2021. ARS researchers are now working with NAVETCO to determine the safety and efficacy of the vaccine under commercial production conditions.

Since ASF has now spread to 15 countries in Asia, it may take some time before the virus is fully controlled, but the availability of a commercial vaccine is a key step toward preventing it from spreading to the U.S. and other regions.

ARS-ZOETIS PARTNERSHIP ENABLES U.S. TO MANUFACTURE ITS OWN VACCINES FOR FOOT AND MOUTH DISEASE

USDA Agricultural Research Service, Plum Island Animal Disease Center

For the first time in history, vaccines manufactured domestically will soon be able to protect U.S. livestock against foot and mouth disease (FMD), thanks to a collaboration between the U.S. Department of Agriculture's Agricultural Research Service (USDA ARS) and animal health company Zoetis.

The last FMD outbreak in the U.S. was in 1929, but as other countries have struggled with the highly infectious virus, American animal disease experts and farmers have wondered how the economy could withstand another wave without a means of domestically producing an FMD vaccine.

An FMD outbreak would devastate the trillion-dollar food and agricultural industry, which supports 11% of all American jobs. In the U.S., more than 90 million cattle and 70 million pigs are fully susceptible to FMD at any time. The USDA estimates that an FMD outbreak in the U.S. would cost the industry between $16 billion and $128 billion over 10 years.

In the absence of domestic vaccine manufacturing, U.S. vaccine banks would rely solely on foreign manufacturers. This means an FMD outbreak in the U.S. would not only require identification of the viral strain responsible for the outbreak and matching that strain to an antigen (the active ingredient in a vaccine) from a vaccine bank. It also would require shipping the antigen to a foreign manufacturer for formulation and waiting for the formulated vaccine to be shipped back to the U.S.

The long lead times associated with this process would prevent containment of a rapidly spreading outbreak and delay return to an FMD-free status. Furthermore, if simultaneous outbreaks occur in the U.S. and Europe, there is no guarantee that the U.S. will be a priority for vaccine distribution from overseas manufacturers.

Researchers at the ARS Plum Island Foreign Animal Disease Research Unit — the only U.S. site authorized to work with infectious FMD viruses — developed an attenuated (weakened) marker vaccine platform to safely manufacture FMD vaccines domestically. Marker vaccines allow vaccinated animals to be differentiated from infected animals using molecular analysis.

Vaccinations for pigs and other livestock will soon be able to provide protection against foot and mouth disease.

A three-pronged technology transfer approach of submitting an invention disclosure, filing a patent application and publishing on the invention allowed the ARS team to market the new vaccine platform technology for multiple vaccine manufacturers in the U.S. and overseas.

Under a 2011 Cooperative Research and Development Agreement (CRADA), ARS and Zoetis scientists have worked to develop and scale the technology and to clear regulatory hurdles needed to transition the project beyond Plum Island. In 2018, Zoetis also signed an income-bearing option agreement for two relevant ARS patents.

The success of this project has led Zoetis to construct a Transboundary and Emerging Disease Vaccine Development facility in College Station, Texas. In December 2020, the secretary of agriculture authorized the manufacture of the marker FMD vaccine on the U.S. mainland and stockpiling it for future use.

SOFTWARE DEVELOPED BY AFRL FOR MILITARY NOW HELPS MONITOR AND COMMUNICATE VITAL SIGNS IN ANIMALS

Air Force Research Laboratory, 711th Human Performance Wing

Health care information technology developed by the Air Force Research Laboratory (AFRL) for military use is making inroads into the veterinary health market after being commercialized by veteran-owned startup Animal Cloud Device Connectivity.

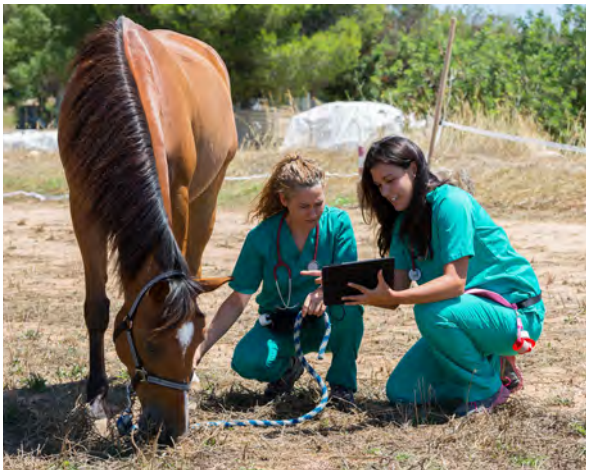
Historically, medics in combat situations have often lacked the ability to quickly relay information about injured warfighters to other medics, nurses and physicians. Critical details can get lost in the chaos, leading to inefficiencies and potentially even fatalities.

To address this need, scientists at AFRL's 711th Human Performance Wing, Airman Systems Directorate, led by Dr. Gregory Burnett, developed the Battlefield Assisted Trauma Distributed Observation Kit (BATDOK™) platform. BATDOK is a software tool that helps monitor vital signs of patients in the field and communicate a complete picture of their care with other clinicians.

BATDOK can handle as many as 64,000 patient records per day on just one smartphone and is compatible with a range of wireless sensors and protocols. The technology has been refined over time based on feedback received from medics in the field. In 2017, it was trademarked, the first patents were filed, and it became available for licensing.

Thanks to the efforts of Dr. James Kearns, technology transfer specialist for AFRL (Ret.), and Joan Wu-Singel, senior technology manager for partnership intermediary TechLink, nine companies have licensed BATDOK for commercial use. But Animal Cloud is the only one focusing on non-human applications — specifically, health monitoring for horses and dogs working with law enforcement officers. Tracking animals' health via mobile phone or smartwatch could help prevent a tragedy like the death by heat exhaustion of a K-9 dog in Arlington, Texas, during a high-level raid in which officers did not notice the animal's condition deteriorating.

Animal Cloud's licensing of BATDOK involved a new tech transfer mechanism called an Information Transfer Agreement, which allows potential collaborators to review and test a lab's software technologies before moving forward with a license.



Veterinarians monitor vital signs in the field.

Animal Cloud soon realized, however, that its customer base could be much broader. Veterinarians who treat horses also typically treat cattle and other farm animals, and veterinarians who care for K-9 dogs also care for companion dogs, cats, rabbits and other domestic animals. The company worked with Kearns on a modified patent license agreement in August 2021 to broaden Animal Cloud's fields of use for the BATDOK software.

Animal Cloud's plans include continued adaptation of off-the-shelf wearable sensors to measure animals' vital signs, partnering with the U.S. Department of Agriculture and the cattle industry to track bovine diseases, and ongoing efforts to protect all animals from communicable threats like COVID-19.

"We are now able to expedite the R&D on our product road map and accelerate our fundraising round, enabling increased market penetration across 250 million animals," said Animal Cloud co-founder Dylan Jones.

DEVCOM CBC AND PENDAR TEAM UP TO TAKE HAND-HELD CHEMICAL THREAT DETECTION TO THE NEXT LEVEL

U.S. Army Combat Capabilities Development Command, Chemical Biological Center

Above: The Pendar X10 owes its exceptional functionality to a CRADA between Pendar and DEVCOM CBC.

The individuals whose job involves keeping others safe from chemical threats now have some extra protection of their own, as the result of a partnership between the U.S. Army Combat Capabilities Development Command Chemical Biological Center (DEVCOM CBC) and chemical analysis company Pendar Technologies.

The Pendar X10 is a hand-held Raman spectrometer that detects and identifies explosives, hazardous materials, chemical warfare agents and narcotics with new levels of safety, accuracy and speed. Raman spectroscopy is a chemical analysis technique in which scattered light is used to measure the vibrational patterns of molecules within a sample.

Close contact can inadvertently expose an investigator who touches or inhales a toxic substance, which is a limitation of most hand-held devices that require being within a few inches of the sample. The Pendar X10 identifies substances from "standoff" distances up to three feet, and can "see" through transparent materials, such as a clear plastic bag or a window.

Other systems take minutes to identify fluorescent materials, such as colored explosives, narcotics and degraded chemicals. In comparison, the Pendar X10 takes 10 to 20 seconds and identifies many chemicals even faster.

Some chemicals ignite or explode when they get too hot, posing a safety hazard for a detection system that focuses a laser on one small spot. The Pendar X10 instead moves the laser across a larger sample area, preventing any single point from reaching the ignition threshold.

While Pendar developed the spectrometer device itself, DEVCOM CBC vastly expanded and customized the digital chemical threat library powering Pendar devices to include data for hundreds of chemicals of interest to the Department of Defense and the Department of Homeland Security.

DEVCOM CBC leveraged the Raman technology and the expanded chemical threat library for a Portable

The Pendar X10 reads and identifies a variety of hazardous threats.

Chemical Fingerprint Identification System (PCFIS), a device that is positioned over objects to identify trace chemicals. The PCFIS, more compact and affordable than stationary lab spectroscopic microscopes, is perfectly suited for fieldwork and mobile labs.

DEVCOM and Pendar entered into a Cooperative Research and Development Agreement (CRADA) in July 2017 for the enhanced chemical threat library. In December 2019, the CRADA was expanded to include a partnership with the Chemical Analysis and Physical Properties Branch at DEVCOM CBC to test infrared aerosol and gas sensors developed under a U.S. Army Small Business Innovation Research (SBIR) Phase II contract.

While the immediate impact of the technology is evident for military components, this dual-use technology also benefits the general public through its use in law enforcement, customs and border control, emergency response, and screening of travelers and postal mail. It could also be used for purely commercial purposes, such as analyzing plastic components for recycling applications, identifying minerals in soil and determining pigments for art conservation.

INDUSTRY PARTNERSHIP ACCESSES COMMERCIAL MARKET FOR NAVY'S EXPLOSIVES-NEUTRALIZING TECHNOLOGY

Naval Surface Warfare Center, Indian Head Division

A new technology developed by the Naval Surface Warfare Center, Indian Head Division (NSWC IHD), to neutralize homemade explosives (HMEs) is now commercially available for use by civilian public safety and law enforcement personnel as well as the military.

HMEs are a common and persistent problem for U.S. warfighters overseas and for emergency responders domestically. HMEs are extremely sensitive and unpredictable; a stray spark, a change in temperature, exposure to sunlight, or even an accidental bump can initiate a detonation.

Silent Spring shields volatile explosive materials from these potential triggers, enabling the military to safely clear an HME from a transit path, for example, or for civilian explosives technicians to safely move a device to another location for forensic analysis.

Silent Spring is a thick, semiliquid substance that is poured over an explosive device, desensitizing the energetic components by surrounding them with a rubbery material that minimizes the effects of external triggers. The technology gets its name from its ability to keep a volatile explosive device "silent," and the fact that the rubberlike material springs back to its original form after an impact.

Father-and-son entrepreneurs Stephen and Tommy Luginbill, who had previously licensed a chemical decontamination technology from a different Navy lab, founded a startup called Grey Ops in 2017 specifically to commercialize the Silent Spring technology.

The transfer involved a string of successful tech transfer mechanisms facilitated by Chris Wilhelm, the NSWC IHD Office of Research and Technology Applications manager (ORTA). A Cooperative Research and Development Agreement (CRADA), a license agreement and the lab's designation as a Center of Industrial and Technical Excellence all helped justify a special public-private partnership (P3) agreement. Signed in 2019, the P3 agreement established a unique relationship in which NSWC IHD would produce the Silent Spring material in bulk, maintaining quality control, and Grey Ops would package and sell the end product.

Treating triacetone triperoxide with Silent Spring prevents the violent reaction that would normally occur when a 1.8 kg steel ball is dropped 7 feet onto a 15 g sample of the explosive.

A Partnership Intermediary Agreement with NSWC IHD helped enlist support from the College of Southern Maryland. Finally, Grey Ops signed an agreement with Atlantic Diving Supply to distribute the product.

Silent Spring is now available commercially and is approved within the Department of Defense (DoD) to address the highest priority explosive ordnance disposal (EOD) threats. The partnership has already provided hundreds of product units to DoD EOD end users for demonstration and training and will shortly do the same for the civilian public safety and law enforcement communities.

Grey Ops is helping to attract other businesses to its location in Indian Head, Maryland — which has been designated by the state as an "opportunity zone" — to improve the economic conditions of this underserved community. The U.S. Bomb Technician Association, for example, has established two multiuse facilities for bomb disposal technology development, training and collaboration, as well as high-paying, technology-focused jobs in Indian Head.

ARGONNE SCIENTISTS EMPLOY MACHINE LEARNING TO ACCELERATE INDUSTRIAL DESIGN OPTIMIZATION PROCESS

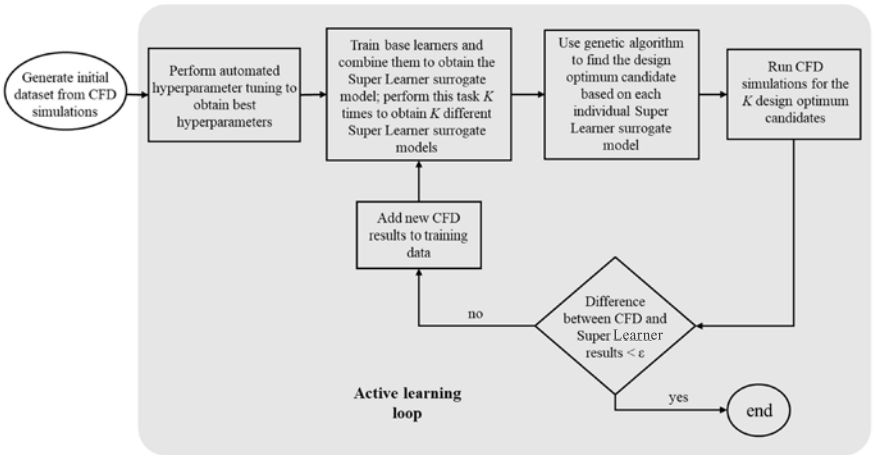
Argonne National Laboratory

Machine-learning technology from the Department of Energy's (DOE) Argonne National Laboratory can speed up the product development process, cutting months off the time it takes for products to reach consumers.

In manufacturing, the traditional approach to design optimization of a new product involves a lot of experimental testing, evaluating prototypes, and multiple design iterations. One popular optimization method involves genetic algorithms (GA), which use principles of natural selection to identify the design elements that will lead to the best results.

As the volume and complexity of data increase, industry increasingly relies on high-fidelity computer models as virtual representations of real-world devices during the optimization process. This strategy is faster than physical development and testing, but it still can require two to three months to arrive at an optimal design.

Argonne's innovation uses machine learning (ML) models as surrogates for the slower high-fidelity models to improve the GA design optimization process. It takes just days to optimize a design using Argonne's ML-GA method, rather than the months needed using current methods. Faster optimization, in turn, leads to faster technology development and faster delivery of advanced technologies to consumers.



The ML-GA technology was transferred in January 2021 to Parallel Works, an innovative startup in Chicago. The technology transfer allowed Parallel Works to integrate ML-GA into its commercial platform as a new add-on package called Learner Works.

This integrated platform has already attracted early adopters and evaluators from a wide range of manufacturing industries, including automotive, consumer goods packaging and hydrological engineering. In addition, Parallel Works is working with researchers at New York University to evaluate its use in the design of colloidal materials (those with another substance distributed throughout) and predicting biophysical properties of proteins.

The technology transfer process, coordinated by Argonne's Science and Technology Partnerships and Outreach directorate, involved two complementary mechanisms.

The first mechanism involved the DOE's Technology Commercialization Fund (TCF) program. Argonne and Parallel Works submitted a joint TCF proposal, which was selected for a funding award in 2018. The TCF program required Parallel Works to enter into a multiyear Cooperative Research and Development Agreement (CRADA) with Argonne to formalize the partnership and streamline the technology transfer process.

The second mechanism was a Technology License Agreement, which provided Parallel Works with rights to commercialize Argonne's copyrighted ML-GA software technology.

A schematic of Argonne National Laboratory's ML-GA optimization algorithm illustrates how machine learning improves upon a traditional computer model (in this case computational fluid dynamics, or CFD).
(Image courtesy of Argonne National Laboratory and Parallel Works)

ORNL MANUFACTURING PROCESS POSITIONS ATEIOS TO DEBUT ULTRA-THIN BATTERIES FOR MEDICAL WEARABLES

Oak Ridge National Laboratory

An Indiana startup is poised to transform the medical wearables market with its paper-thin, customizable lithium ion (Li-ion) batteries, thanks to an electrode manufacturing process developed by Oak Ridge National Laboratory (ORNL).

Compared with existing processes, the new method is more energy efficient and environmentally friendly, up to 10 times faster and five times less expensive, and it requires less battery processing space.

Startup Ateios Systems has licensed the technology to develop ultra-thin, stretchable, conformable batteries for wearable medical devices such as continuous glucose monitors and sleep trackers. The company expects a commercial rollout by 2023 with projected sales of 250,000 units per year, increasing to up to 50 million units per year by 2027.

In conventional Li-ion batteries, positive and negative electrodes are composed of lithium solid particles held to a thin metal sheet by a binding agent. Manufacturing these electrodes typically involves dispersing the particles and binder into a liquid to form a solvent, followed by a drying process.

Instead of solvents, ORNL's method includes mixing lithium compound particles (particles made up of lithium and another chemical) with radiation-curable resin precursors (chemicals used in making resins) and electrically conductive particles. This composite mixture is shaped, heated and pressed to melt the resin. Radiation is then applied to cure the composite electrode.

Ateios hoped that after incorporating the technology into its wearable devices, it could market the process for other applications, such as electric vehicles (EVs) and power grids. However, the company needed time to evaluate those markets.

ORNL's commercialization manager devised a strategic and flexible licensing agreement that essentially combined an exclusive commercial license for Ateios' initial market interests (wearable devices and asset tracking) and an R&D license with an option for a commercial license for secondary market interests (EVs and grids). The license agreement took effect June 7, 2021.

This image of an Ateios battery prototype illustrates the small scale and convenience of the company's innovation, which incorporates ORNL technology.

The initial market rollout for Ateios' products will require up to 20 new onsite engineers. The efficiencies afforded by ORNL's technology will support the company's plans to establish its own battery processing facility. The company expects this effort will expand its workforce by about 100 new employees by the time full production begins.

Ateios' longer-term goal of integrating ORNL's technology into battery products for EVs and power grid applications could address both U.S. and global greenhouse gas emissions. ORNL's technology could lower the cost of EV battery packs by more than 30%; since battery packs are the most expensive part of an EV, the savings should significantly reduce EV cost and increase their adoption.

The licensing agreement and discussions between Ateios and the research team at ORNL have generated about future collaboration. In particular, talks are in progress to support an upcoming project with the Department of Defense focused on production of energy-dense batteries for munitions.

WITH ORNL TECHNOLOGY, SCIEX SYSTEM CAN ANALYZE INDIVIDUAL CELLS FOR MORE PRECISE MEDICAL RESEARCH

Oak Ridge National Laboratory

Longtime partners Oak Ridge National Laboratory (ORNL) and SCIEX are taking their mass spectrometry (MS) collaboration to a new level, with the integration of ORNL's single-cell resolution technology into SCIEX's high-end MS analysis system.

Cells are naturally heterogeneous, exhibiting differences in chemistry due to their history, age and microenvironment, among other factors. Even cells generated from a single source develop variations in their composition over time.

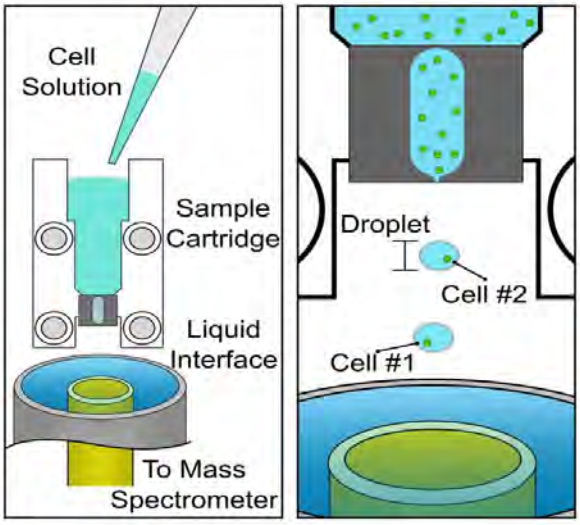
These variations contribute to the difficult-to-predict results of medical treatments, such as chemotherapy. Often a treatment will effectively kill only some tumor cells, while other cells are resistant. Because the unique chemical makeup of each individual cell cannot be generalized to the overall population of cells in a tumor, therapies must also be unique for maximum effectiveness.

Unfortunately, conventional measurements of cell chemistry fail to identify cellular variations by measuring cellular chemistry only across a population of cells. Researchers therefore have an urgent need to better understand this variability at a single-cell level.

CellSight is a method for measuring the composition of individual cells at unprecedented speeds using high-throughput MS, an analytical process able to detect, identify and quantify the chemical species in a sample. CellSight employs another ORNL innovation — the Open Port Sampling Interface (OPSI) — that simplifies the process of transferring samples to a mass spectrometer.

In addition to its technical benefits, CellSight represents a foray into continued ORNL-SCIEX collaborations to extend the capabilities of SCIEX's Echo® MS. Launched in 2020, this premium mass spectrometer system streamlines and simplifies laboratory workflows while providing ultra-fast sample analysis and unmatched data quality — thanks in part to ORNL's OPSI technology, which was integrated under a previous license.

Echo MS is expected to significantly reduce costs for biopharma companies and enable more comprehensive drug screening campaigns than were previously feasible, by quantifying drug uptake and metabolism



Rather than analyzing cellular chemistry across a population of cells in a sample, CellSight measures the composition of individual cells (right) for more accurate results. (Image courtesy of ORNL)

with single-cell resolution. This area of expanding R&D represents a multibillion-dollar opportunity across industries, including cancer diagnosis, pharmacokinetics, environmental monitoring and more.

ORNL and SCIEX have co-developed advances in mass spectroscopy for 25 years, starting with a Cooperative Research and Development Agreement (CRADA) issued in 1997. SCIEX signed a non-exclusive license for the CellSight technology in December 2020, and a new CRADA was signed in June 2021 to research potential market opportunities and customer requirements for an upgraded version of Echo MS featuring CellSight capabilities.

Licensed products developed under these agreements are expected to provide a significant impact to ORNL royalty revenues in the coming years. Sales from Echo MS are projected to exceed $100 million over the next decade, and royalties from the first year of sales have already come in. Importantly, these royalties funnel back into the lab to nurture the development of new innovations.

CREATIVE LICENSING BOOSTS ADOPTION OF ORNL'S AI-DRIVEN QUALITY ASSESSMENT SOFTWARE FOR 3D PRINTING

Oak Ridge National Laboratory

The technology transfer story of Peregrine software at Oak Ridge National Laboratory (ORNL) showcases innovation on two levels: the use of artificial intelligence (AI) to improve quality assessment for 3D-printed parts, and a licensing strategy designed to encourage broad adoption of the software by industry.

Peregrine emerged from a need to more efficiently analyze the quality of parts produced at the laboratory's Manufacturing Demonstration Facility (MDF), a busy "playground" facility where potential licensees can access more than 100 additive manufacturing (AM, also called 3D printing) machines that feature different ORNL technologies.

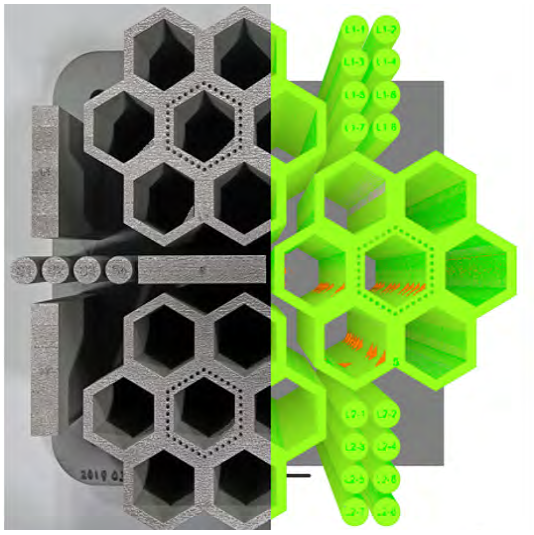
Unlike traditional manufacturing that starts with an amount of certified material that is shaped into a final product, AM continuously adds new "building blocks" of material to create a final design. This process generates a vast number of units of material, each with different properties that must be reviewed for potential defects. For this reason, using current material qualification processes for products made via AM is costly and time-consuming.

Named for the world's fastest animal, the peregrine falcon, ORNL's Peregrine software addresses this challenge by using AI to assess the quality of AM parts in real time, with no need to delay the manufacturing process for expensive post-build analysis.

Seeing Peregrine's ability to efficiently quality-check parts produced at the MDF and easily share those data with industry, ORNL's technical team and technology transfer office quickly recognized the potential for commercialization across a wide range of markets.

ORNL's ultimate aim is to make Peregrine an industry standard. The software's compatibility with a range of printers, cameras and materials will help achieve this goal, as will the lab's tech transfer approach. The technology has been offered broadly to the advanced manufacturing and AM community via a unique, low-cost non-exclusive licensing campaign, encouraging broad adoption by industry.

Peregrine's inventors and the ORNL tech transfer team have collaborated to rapidly negotiate short-form Cooperative Research and Development Agreements (CRADAs), allowing a wide variety of partners to begin using Peregrine at a low cost and provide ORNL with feedback that will inform further improvements. The lab is also pursuing both copyright and patent protection for the technology.



Peregrine detects anomalies in a component being additively manufactured on a powder bed printer, as shown by the orange flags in the figure on the right.

The short-form CRADAs are designed for easy conversion to commercial licenses. Since the technology was disclosed in 2019, ORNL has secured non-exclusive research licenses from five companies employing Peregrine for different applications:

Blue Origin, a commercial aerospace manufacturer and a suborbital spaceflight services company.

Cummins, which designs, manufactures and distributes engines, filtration and power generation products.

GE Additive, the dedicated AM division of General Electric.

Raytheon Technologies, an aerospace and defense company that provides advanced systems and services.

Ultra Safe Nuclear Corp., a nuclear power technology company and a global leader in the deployment of microreactors.

3D-PRINTING METHOD FROM ORNL PRODUCES PROTECTIVE FUEL PELLETS FOR USNC'S ULTRA-SAFE NUCLEAR REACTOR

Oak Ridge National Laboratory

A 3D-printing process tailored for nuclear energy applications, developed at Oak Ridge National Laboratory (ORNL), is helping industry partner Ultra Safe Nuclear Corp. (USNC) deliver safe, clean and cost-effective electricity and heat with its next-generation reactor.

Parts made using ORNL's method, which produces complicated shapes from materials that can withstand high temperatures, will enable USNC to optimize and commercially produce Fully Ceramic Microencapsulated (FCM®) fuel for its Micro Modular Reactor (MMR®).

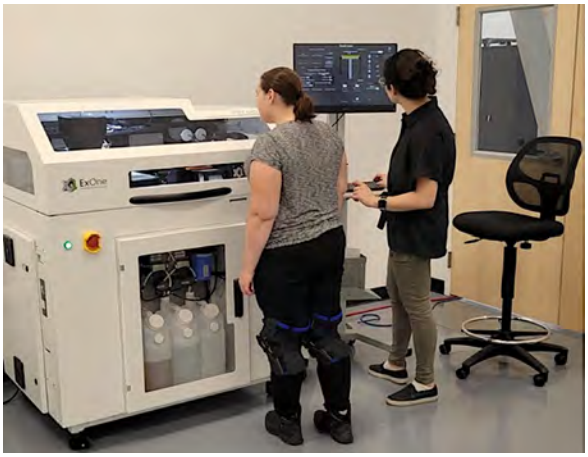
Nuclear energy systems convert heat to electricity through nuclear fission, a process in which large atoms split into smaller atoms, releasing energy. Maximum efficiency requires reactor components made from materials like ceramics that can withstand extremely high temperatures.

While it's possible to make simple shapes out of ceramic material, nuclear reactors require more complex parts that are not easily produced using conventional methods. ORNL's technology solved this problem by developing a unique additive manufacturing (3D printing) process to manufacture complex shapes out of silicon carbide (SiC), a type of ceramic material.

ORNL's method combines binder jet technology with chemical vapor infiltration (CVI). Binder jetting involves printing one layer at a time of powdered material, then drawing the powdered particles together using a binding agent before printing the next layer. CVI involves exposing the 3D-printed shape to a gas at extremely high heat, which increases the density of the ceramic material.

The finished product is ideal for nuclear energy applications because it can be printed in complex shapes, withstands extreme environments and does not degrade over time.

USNC's FCM fuel encases the nuclear fission process within SiC-based cylindrical pellets. Stacks of fuel pellets are placed into graphite blocks, which in turn make up the energy-generating core of the company's MMR. The multiple layers protect against environmental contamination,



Two USNC staff members operate a small-scale silicon carbide binder jet printing system at USNC's Advanced Ceramics Manufacturing facility in Salt Lake City.

and use of SiC for the fuel pellets provides additional safety as well as improved thermal efficiency.

ORNL and USNC signed an exclusive license for the technology, and USNC created its new Core division specifically to further develop and commercialize it. USNC had previously licensed technology from ORNL; their history built the strong loyalty and trust that helped make this transfer possible.

The technology transfer effort was supported by ORNL's entrepreneurial leave (EL) program, which allows staff to spend time with the licensee to help with commercialization. Three of the inventors left ORNL under the EL program to join the USNC Core division. Transferring the inventors along with the technology contributed to the collaboration's success.

At the time of award submission, USNC had already hired 20 new full-time staff and had invested more than $10 million in new manufacturing facilities in Salt Lake City and eastern Tennessee — bolstering those regional economies and helping to expand domestic nuclear energy production.

PNNL AND PARTNERS DEVELOP NEW, SIMPLER TREATMENT APPLICATION METHOD TO KEEP TREES SAFE FROM DISEASE

Pacific Northwest National Laboratory

A safer, simpler way of protecting trees from disease and pests, developed by Pacific Northwest National Laboratory and two industry partners, can help urban forests and commercial orchards thrive.

Insects, fungi, bacteria and other carriers of disease can cause extensive and expensive damage to trees across a range of environments. Cities where trees have been infested by the emerald ash borer, an invasive beetle species that has been detected in 35 states, can spend millions of dollars to remove and replace the affected trees. In agriculture, citrus greening disease has reduced Florida citrus production by 75% since 2005, while more than doubling the associated costs.

Chemical treatments can help control these pests and diseases, but existing application methods — which include aerial spraying and saturating the soil surrounding a tree — are often labor intensive, costly, hard to maintain and dangerous to other plants, animals and humans.

SymTREE Sciences, which is focused on urban forestry, and Elemental Enzymes, which serves the commercial agriculture industry, together approached PNNL to help develop a better solution. And because treatments can be applied only during certain periods of the growing cycle, it needed to happen fast.

"Clients were desperate for a new delivery system," said Terry Marie Braniecki, CEO and founder of SymTREE. "I could not lose a year, or I would lose the market."

The ready-to-use (RTU) tree micro-injector, now commercially available, was developed in less than two years.

Primarily made of polypropylene, an inexpensive plastic that is recyclable and can be used safely with most chemicals, the device is smaller than a shampoo bottle and resembles a laboratory syringe. Applying pressure releases a treatment solution from a prefilled pod into the tree through a small port drilled into the trunk.

The single-use, disposable pod can be prefilled with fertilizers, pesticides, fungicides or plant growth regulators. Most agricultural tree trunks are small, requiring only a single injector per tree, while larger urban forest trees average between five and 12 injectors.

PNNL developed a ready-to-use tree micro-injector to meet the demands of two distinct markets. Both the single-use (smaller in picture) and multi-ple-use (larger) versions have an external recyclable housing and internal pods made from polypropylene, along with an internal reusable steel spring to control the pressure and smooth compression of the pods.

The intellectual property aspect of this collaboration involved non-disclosure agreements, research agreements, patent applications, and ultimately licensing agreements. Documents and terms were needed to allow each company to separately commercialize the technology in its respective market.

The RTU tree micro-injector is available to select SymTREE distributors for protection against the emerald ash borer. Specialty nutrition, pesticide and fungicide formulations for commercial domestic and global urban forest use also are in the works. Elemental Enzymes' modified single-use RTU tree micro-injector prefilled with its citrus greening treatment is slated for release to the agricultural market in spring 2023.

"The fact that PNNL's expertise is available to help these businesses and support the U.S. economy is huge," said Allan Tuan, PNNL commercialization manager. "That's a big part of our mission and goals."

The tree micro-injector is easy to use. Because the pods are prefilled with plant health care formulations, field workers do not have to handle chemicals, protecting their health and the environment.

NIAID'S ANTIBODY-FOCUSED COLLABORATION WITH ABCELLERA PROVIDES FOUNDATION FOR COVID-19 THERAPY

National Institute of Allergy and Infectious Diseases

Originally established to study influenza, a partnership between the National Institute of Allergy and Infectious Diseases (NIAID) and biotechnology company AbCellera quickly pivoted to become a major player in the development of antibody-based COVID-19 therapies.

One of those therapies, bamlanivimab, has been authorized to treat mild to moderate COVID-19 symptoms in patients who are at risk for more severe disease, when combined with another antibody.

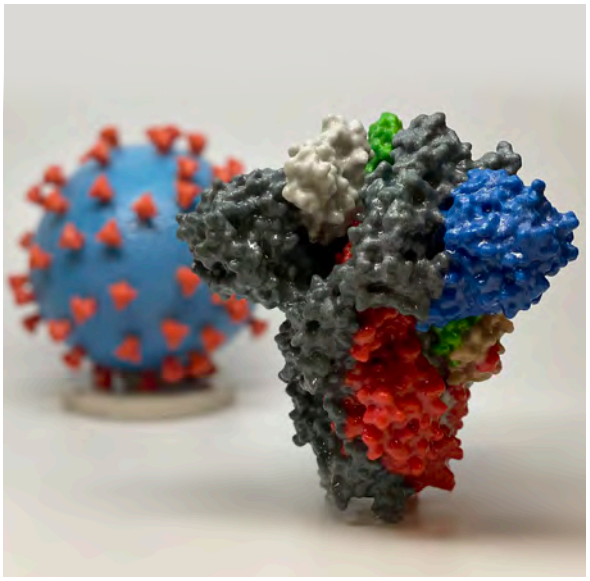
NIAID and AbCellera first joined forces in 2018, through a Research Collaboration Agreement (RCA) negotiated by NIAID's Technology Transfer and Intellectual Property Office (TTIPO) aimed at identifying and characterizing antibodies against the influenza virus. The relationship evolved to encompass methods for studying coronavirus antibodies, as well as developing coronavirus monoclonal antibodies that could be used for prevention or treatment.

This partnership, along with the coronavirus research it supported, paid huge dividends when the COVID-19 pandemic emerged just a few years later.

Like other coronaviruses, SARS-CoV-2, which causes COVID-19, is spherical and has proteins called spikes protruding from its surface. These spike proteins latch onto human cells and undergo a structural change that allows the viral membrane to fuse with the cell membrane. The resulting viral infection ultimately leads to COVID-19.

The pivotal collaboration used an engineered version of the SARS-CoV-2 spike protein as "bait" to search for antibody-producing cells (B-cells) that target this viral protein. This step was crucial, because live SARS-CoV-2 or isolated "natural" SARS-CoV-2 spike protein cannot be used effectively to identify and isolate neutralizing antibodies.

NIAID scientists engineered the spike protein based on their previous work with other types of coronaviruses. AbCellera then used its proprietary high-throughput, machine-based process — developed as part of the Defense Advanced Research Projects Agency's Pandemic Prevention Platform — to find the most potent antibodies among millions of antibody-producing cells from a patient who had recovered from COVID-19 infection.



Model of a SARS-CoV-2 spike protein, which is the target of monoclonal antibody therapies like bamlanivimab. A model of a SARS-CoV-2 virus is in the background.

NIAID exclusively licensed the intellectual property covering these antibodies to AbCellera to expedite development of antibodies for treatment and prevention. AbCellera further partnered with Eli Lilly, which had the capacity and resources to develop a therapeutic antibody to SARS-CoV-2.

One such antibody, bamlanivimab, was developed by NIAID and collaborators on an accelerated timetable beginning in January 2020, including a "first in human" trial initiated in June 2020. Preliminary clinical evidence led the Food and Drug Administration (FDA) to grant an Emergency Use Authorization (EUA) in February 2021 for bamlanivimab in combination with another antibody to treat mild to moderate COVID-19 symptoms in patients at risk of developing severe symptoms or death.

It remains unclear if significant vaccine hesitancy will persist in the population, which could lead to many more COVID-19 cases. For many patients, monoclonal antibodies like bamlanivimab offer one of the best therapeutic options to keep mild or moderate COVID-19 from becoming severe.

AWARDS

TEAM AWARDS

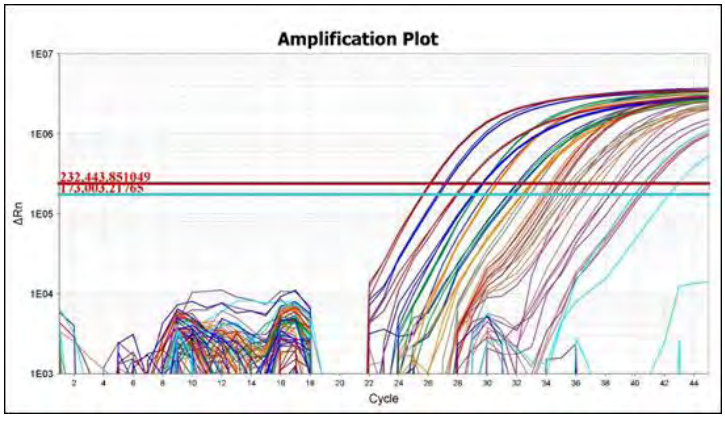
PANDEMIC PARTNERSHIP ESTABLISHES STRATEGIES TO NEUTRALIZE CURRENT AND FUTURE CHEM-BIO THREATS

U.S. Army Combat Capabilities Development Command Chemical Biological Center
Environmental Protection Agency

A partnership between the Army Combat Capabilities Development Command Chemical Biological Center (DEVCOM CBC) and the Environmental Protection Agency (EPA), formed in response to the COVID-19 pandemic, established strategies that can help protect the nation against future chemical and biological threats across multiple industry and service sectors.

The collaboration included the development of standardized viral sampling procedures and safe methods for testing the performance of decontamination products against highly infectious coronaviruses. During the presidential inauguration in January 2021, these processes were deployed to protect attendees from potential chemical and biological threats — an achievement that DEVCOM CBC Director Eric L. Moore hailed as a milestone for the partnership.

The new detection and disinfection protocols developed for emergency response situations also have wide-ranging government and civilian applications that can benefit hospitals and nursing homes, grocery chains, tourism, transportation, building maintenance and security, and delivery services.



Detection and confirmation of COVID-19 virus. The graph illustrates virus genome increase as a function of time (cycle number) using molecular techniques. The Y axis indicates the quantity of virus detected in a sample; a value greater than 100,000 (1E05) is a definitive indication of virus presence.

When the COVID-19 pandemic began unfolding in early 2020, the role of surface contamination in viral infection spread was unclear. Quantifying the risks associated with contaminated surfaces, and developing effective methods for decontaminating public, military and federal buildings — including the White House — were high priorities for government and military leaders.

Studies of SARS-CoV-2, the highly contagious virus that causes COVID-19, are restricted to high-containment labs that have special protections for scientists working with dangerous materials. But federal, state and private labs can develop diagnostic, detection and disinfection technologies for SARS-CoV-2 by studying closely related surrogates — coronaviruses that behave like SARS-CoV-2 but are less debilitating and infectious. The partnership between DEVCOM CBC and EPA filled that critical research need, identifying a low-risk coronavirus called HuCoV229E as a suitable viral surrogate.

DEVCOM CBC provided the design, supervision and reporting for sampling and assay protocols and validated the selection of effective antiviral and antibacterial technologies. EPA then made the test results available to inform emergency response decisions at federal, state and local levels using its Electronic Data Exchange and Evaluation System (EXES).

Two Interagency Agreements (IAA) made this collaboration possible. One allowed DEVCOM CBC to provide technical support and emergency response needs to EPA's Office of Emergency Management, including validation of EPA's environmental sampling and analysis procedures for SARS-CoV-2. This agreement took effect June 1, 2020, and runs through May 31, 2023.

The second IAA allowed EPA to request DEVCOM CBC's help in developing and verifying tests to assess how well pesticides and other decontamination products neutralize the threat of SARS-CoV-2 on surfaces. It took effect May 1, 2020, and runs through April 30, 2023. Under this IAA, DEVCOM CBC provided the technical expertise, personnel and testing facilities necessary, and EPA contributed funding, technical input, oversight and prioritization of the projects.

COLLABORATION AND CROWDSOURCING PROPEL HD-AIT AIRPORT SCREENING SYSTEM TO COMMERCIALIZATION

Department of Energy, Pacific Northwest National Laboratory and Sandia National Laboratories
Department of Homeland Security, Science and Technology Directorate and Transportation Security Administration
National Aeronautics and Space Administration, Center of Excellence for Collaborative Innovation

Imagine an airport security checkpoint where all travelers can keep their coats and shoes on. A technology recently licensed for commercialization will allow travelers to do just that, thanks to an innovative collaboration that involved three federal agencies, an industry partner and a $1.5 million crowdsourcing competition.

In March 2021, the Pacific Northwest National Laboratory (PNNL) of the Department of Energy (DOE) licensed the High Definition-Advanced Imaging Technology (HD-AIT) platform — including an on-person screening system and a shoe scanner — to Liberty Defense Holdings of Atlanta on behalf of the DOE and the Department of Homeland Security (DHS). The platform was developed as part of an interagency effort by PNNL and Sandia National Laboratories of DOE, the Science and Technology Directorate (S&T) and Transportation Security Administration (TSA) of DHS, and the National Aeronautics and Space Administration (NASA).

Liberty Defense intends to manufacture the platform in a way that seamlessly upgrades the HD-AIT platform, to not disrupt the current airport security footprint.

TSA screens about 824 million passengers each year through airport security systems. Yet current systems struggle to meet throughput speed requirements.

The DHS S&T's Screening at Speed Program, which facilitates the development and deployment of aviation security solutions, partnered with PNNL and funded the development of an improved on-person screening system and an accompanying scanner that could image through shoes. The PNNL team, which developed the original holographic millimeter wave system currently used at airports worldwide to detect threats hidden under clothing, was funded by DHS S&T to perform the research and development of the new HD-AIT system.

The HD-AIT system provides higher resolution images, improves detection, reduces false alarms and is built on a flexible, open architecture that aids rapid updates. The shoe scanner system is built on the same technology but is specifically configured to screen upward through a passenger's shoes. Both systems will reduce the need for people screened at airports and large public events to remove outerwear and shoes, which can make screening more efficient while remaining aligned with TSA requirements.

DHS, DOE's Pacific Northwest National Laboratory and Sandia National Laboratories, and NASA formed an innovative partnership to advance the commercialization and implementation of a high-definition advanced imaging system that can dramatically improve accuracy and efficiency of airport and large-event security screening.

Development of the new screening system was a collaborative process that included:

- Hardware and software maturation by PNNL.
- Development of an open platform for third-party software and algorithm integration by Sandia.
- Algorithms crowdsourced through a $1.5 million prize competition, which was funded by TSA and Screening at Speed and administered by NASA's Center of Excellence for Collaborative Innovation.
- Prototype testing and evaluation by the DHS S&T Transportation Security Laboratory.
- Commercialization efforts led by PNNL and Liberty Defense.

In January 2021, TSA, DOE and S&T collaborated to create a licensing agreement framework that was implemented by PNNL for the license with Liberty Defense. The agreement grants exclusivity for three years and requires that licensees build systems compliant with government-owned detection algorithms.

CAMPAIGNING BY ORNL AND PARTNERS BRINGS MORE THAN $8 BILLION TO TENNESSEE FOR EV BATTERY PRODUCTION

Oak Ridge National Laboratory

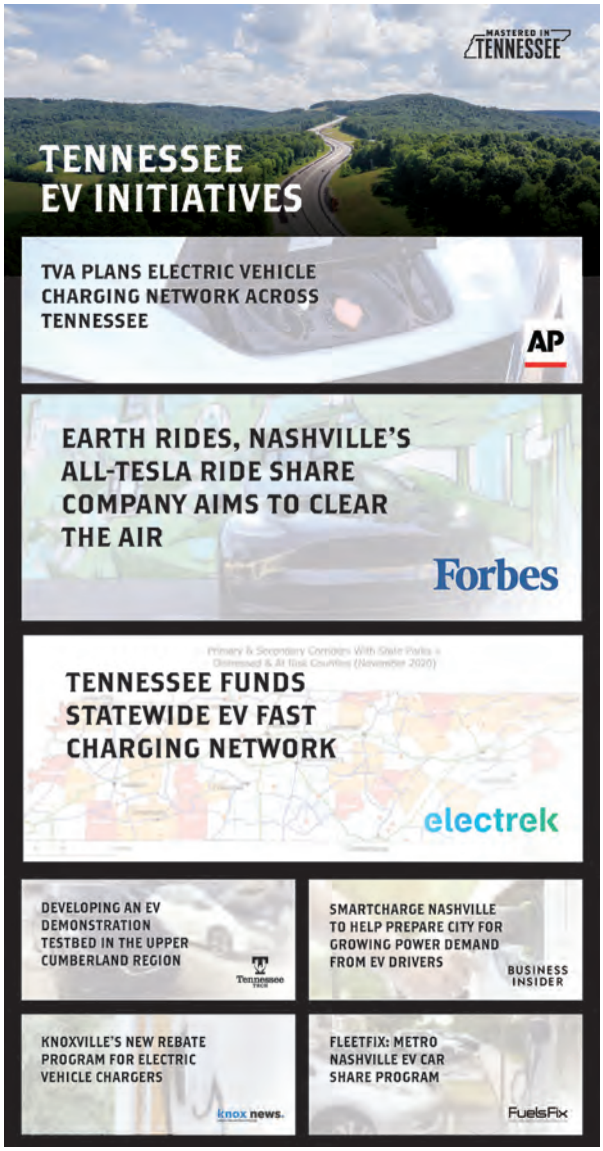
The collaborative efforts of Oak Ridge National Laboratory (ORNL) and two regional partners have resulted in more than $8 billion invested in the state of Tennessee by the electric vehicle (EV) industry since 2017, with 4,584 new EV-related jobs created.

ORNL, the Tennessee Valley Authority (TVA) and the Tennessee Department of Economic and Community Development (TNECD) collaborated to drive home why EV battery firms should locate their operations and innovate in Tennessee. The campaign supports Tennessee's goal to build, own and drive more EVs than any other state and to have 200,000 EVs on the road by 2028.

Perhaps the most impressive example — the largest single investment of economic activity in the state's history, according to its governor — involves Ultium Cells, a joint venture between General Motors (GM) and LG Energy Solution.

In April 2021, Ultium Cells committed more than $2 billion to build a battery cell plant in Spring Hill, Tennessee, which will support a nearby GM assembly plant now being transitioned into the automaker's third EV manufacturing site. The investment is expected to bring 1,300 new jobs to Tennessee.

The partners also leveraged RevV!, an innovation voucher program developed by ORNL to incentivize companies to work with the lab. Funded by the state, the voucher program serves three groups: new companies being recruited to Tennessee, existing companies of 10 or more employees looking to expand operations, and startups. The dollar value given to qualified firms varies depending on their category.



This image shows the first page of an interactive PDF that the team uses to encourage EV prospects to consider relocating to or expanding in Tennessee. Each section of the image links to an online news story.

SCORING TOOL DEVELOPED BY DOE LABS HELPS CONSUMERS UNDERSTAND THEIR HOMES' ENERGY EFFICIENCY

Pacific Northwest National Laboratory
Lawrence Berkeley National Laboratory
National Renewable Energy Laboratory

Like a miles-per-gallon rating for vehicles, a new scoring tool developed by three Department of Energy (DOE) national laboratories gives consumers a standardized, easy-to-understand assessment of home energy performance.

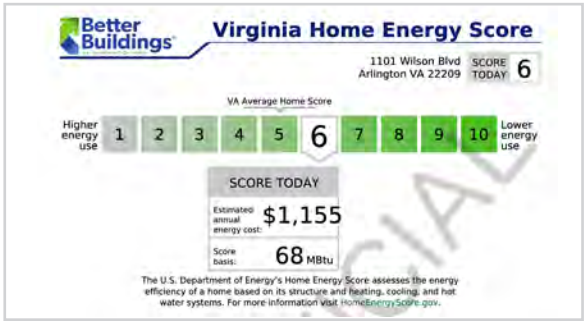
Home Energy Score™ (HEScore) is a suite of web-based services based on a computer simulation that calculates energy usage ratings for existing homes. The scoring tool translates facts about a home — such as square footage, number of rooms, and heating/cooling systems—into a numerical rating of its energy performance compared with other homes across the market.

Pacific Northwest National Laboratory (PNNL), Lawrence Berkeley National Laboratory (LBNL) and the National Renewable Energy Laboratory (NREL) collaboratively developed HEScore in response to a White House directive tasking DOE with creating a home energy rating system to motivate homeowner investment in energy-efficient improvements.

The technology's primary beneficiaries are homeowners, buyers and renters, who can use it to better understand their home energy use, prioritize cost-effective energy improvements, and project cost savings. The tool may suggest and quantify savings associated with replacing a cooling unit or water heater, for example, or upgrading insulation.

HEScore data also can help inform and influence public awareness and behaviors regarding home energy efficiency. For example, some cities now require HEScore ratings for homes listed for sale on their local Multiple Listing Service (MLS) and/or offer score-based incentives.

Scores are provided in a simple graphic and are based on a scale from 1 to 10, with 10 being most efficient, using a set of criteria that reliably characterize a home's energy footprint. The score reflects fixed home components rather than energy use characteristics that fluctuate with occupant behavior, such as thermostat settings.



HEScore label showing a home's final current rating and estimated annual energy cost.

A free web-based tool is available without license agreements but requires registration as an Energy Partner and training of certified assessors. Third-party application programming interface (API) access is also free, with validation by DOE required prior to software release.

Hundreds of HEScore-certified assessors have generated hundreds of thousands of Home Energy Scores nationwide. More than 160 companies — including sole proprietors, home inspectors and energy auditors — are providing scores as part of their services. In addition, 12 software developers offer HEScore in their products.

An initial version of HEScore was tested with early adopters beginning in 2012. Teams at PNNL, LBNL and NREL have continued to collaborate since then to make significant improvements. They recently replaced the underlying HEScore model with an advanced computer simulation framework that enhances capabilities and provides technical staying power in the market, and also added administrative and reporting features along with user-friendly graphic interfaces.

This work transformed HEScore into a commercial software solution package that supports broad market adoption and can maintain technical relevance as new technologies and methods emerge.

INDUSTRY PARTNERSHIPS FACILITATE NIAID TRIALS TO SUPPORT AUTHORIZATION OF COVID-19 VACCINE CANDIDATES

National Institute of Allergy and Infectious Diseases

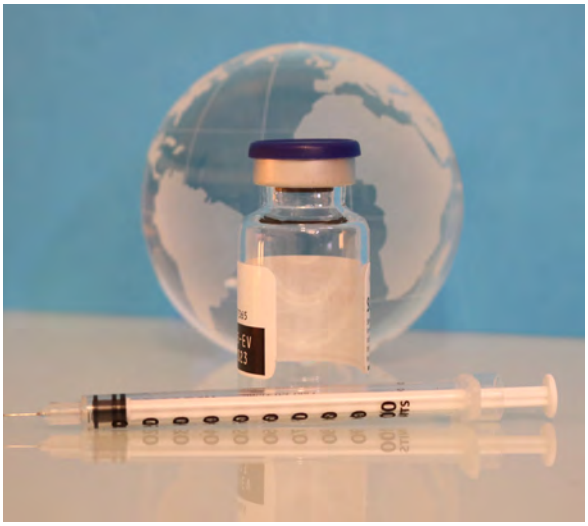
In response to the COVID-19 outbreak, researchers and technology transfer professionals at the National Institute of Allergy and Infectious Diseases (NIAID) accelerated collaborations with COVID-19 vaccine developers that enabled the rapid study, emergency authorization and public use of urgently needed vaccines.

The results of these efforts became evident between December 2020, when the COVID-19 vaccination campaign began, and April 2021, when the rate of dose administration peaked. During that period, the number of COVID-19 cases in the United States dropped precipitously. It is estimated that global vaccination against COVID-19 could prevent several trillion dollars per year in economic losses.

The technology transfer effort began shortly after the genetic sequence of Moderna's first vaccine candidate (mRNA-1273) was finalized and appropriate preclinical data had been obtained. NIAID's Division of Microbiology and Infectious Diseases (DMID) took the lead as the sponsor of the "first in human" clinical study of this experimental vaccine.

In parallel with development of the clinical study protocol, DMID and the NIAID Technology Transfer and Intellectual Property Office (TTIPO) rapidly negotiated a Clinical Trial Agreement (CTA) with Moderna to obtain mRNA-1273 for the study. The first Phase I trial participant was dosed on March 16, 2020 — just five days after the COVID-19 outbreak was declared a pandemic. Positive findings from this trial led to Phase II and Phase III trials that were supported by funding from the Biomedical Advanced Research and Development Authority (BARDA). The Phase III trial used NIAID's newly formed COVID-19 Prevention Trials Network (CoVPN).

Based on the outcomes of these trials, on Dec. 18, 2020, the Food and Drug Administration (FDA) granted mRNA-1273 Emergency Use Authorization (EUA) for the prevention of COVID-19 in individuals 18 years and older.



SARS-CoV-2 variants and pediatric populations represent two classes of indications that remain to be fully addressed. TTIPO negotiated an amendment to the CTA with Moderna that enabled evaluation of new vaccine candidates against COVID-19 variants. In addition, TTIPO negotiated a new CTA with Moderna to initiate a trial (the KidCOVE Study) of the company's original vaccine in children aged 6 months to 12 years.

DMID initiated another adaptive protocol for the "MixNMatch" vaccine trial to evaluate delayed doses (boosts) of a vaccine other than the one initially administered. TTIPO developed new agreements to cover the vaccine candidates included in this study.

If many of these clinical trials produce positive safety and efficacy results, a larger proportion of the US and global population could receive COVID-19 vaccines or booster shots to improve their collective immunity against SARS-CoV-2. These efforts, in part, could help end the COVID-19 pandemic.

EYE-MOVEMENT ANALYSIS TECHNOLOGY FROM VA AND VCU IMPROVES DIAGNOSIS OF NEUROLOGICAL CONDITIONS

Department of Veterans Affairs

Technology developed by researchers from the Department of Veterans Affairs (VA) and Virginia Commonwealth University (VCU) is allowing clinicians to quickly and accurately diagnose Parkinson's disease and other neurological conditions based on a detailed analysis of a patient's eye movements.

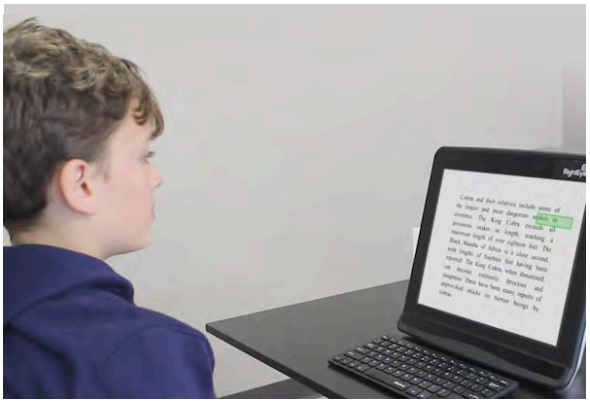
RightEye is a ruggedized, portable, battery-powered, tablet-like device that records and analyzes a patient's eye movement. Because certain types of abnormal eye movement are known to be associated with impaired function in specific areas of the brain, the detailed analysis provided by RightEye can significantly improve the accuracy of medical diagnoses related to brain function. For example, VA data suggest that the technology can diagnose Parkinson's disease at least seven years before outward symptoms manifest.

Since being licensed in 2016 to RightEye LLC, the device has been embraced by many different medical specialties, with more than 2,200 units sold in all 50 states and 25 countries. RightEye now holds the largest database of eye movements in the world, having tested more than 3.7 million individuals.

The VA was uniquely positioned to create this technology, since the Veterans Health Administration (VHA) has six centers around the country that specialize in treating Parkinson's disease and other disorders related to how the brain controls body movement.

Because traditional neurological exams are based primarily on observations rather than measurements and data, they are often inaccurate; 60% of movement disorder patients are misdiagnosed at least once using this method. This type of exam typically takes about a week and requires extensive experience, with only 32% accuracy among gerontologists compared with 80% accuracy among specialists.

The objective data provided by the RightEye device can accurately diagnose and differentiate nearly 30 neurological diseases with greater than 90% accuracy.



A student using RightEye for reading/learning.

The entire process takes less than five minutes, and the diagnostic report generated by the device does not require specialized knowledge to understand.

An Invention Management Agreement (IMA) allowed researchers at Richmond VA Medical Center to freely collaborate with VCU, its university affiliate, and develop jointly owned intellectual property. The VA often uses IMAs as master agreements to expedite the handling of jointly owned inventions. With all the main provisions in place in the IMA, the parties then use short IMA addenda for each specific case.

The RightEye technology was transferred via an exclusive license to Righteye LLC, a small business from Bethesda, Maryland. RightEye received Food and Drug Administration (FDA) clearance as a Class 2 medical device in 2018 and was granted FDA breakthrough designation for diagnosing Parkinson's disease at the end of 2019.

Although VA's primary focus initially was Parkinson's disease and neurological health, RightEye is also making an impact in other fields, including sports performance, reading and learning disabilities, and even personal injury law.

NREL AND SHELL LEVERAGE UNIQUE PARTNERSHIP AGREEMENT TO CREATE CLEAN-ENERGY ACCELERATOR

National Renewable Energy Laboratory

Clean-energy startups have raised more than $50 million and made significant progress toward commercializing their technologies thanks to a new type of partnership agreement implemented by the National Renewable Energy Laboratory (NREL).

The Shell GameChanger Accelerator Powered by NREL (GCxN) is a multimillion-dollar partnership between NREL and energy giant Shell that is managed under a Department of Energy (DOE) Agreement for Commercializing Technology (ACT) that was executed in 2018.

The DOE created the ACT pilot program to address industry concerns about partnering under Cooperative Research and Development Agreements (CRADAs) or Strategic Partnership Projects (SPPs). Whereas SPP agreements and CRADAs tend to be tailored for two-party agreements between one company and a lab, an ACT makes it easier to develop a multiparty research and development partnership and programs. Groups of companies, universities and other entities may come together with a laboratory to address complex technological challenges that are of mutual interest and privately funded.

The GCxN program is an example of how the ACT agreement option has helped NREL attract potential partners. The agreement has allowed NREL to expand its research activities with Shell while providing technical assistance to startups through the accelerator.

Instead of simply addressing a small problem with a one-off solution, NREL and Shell designed a system of solutions — a pipeline to address both partners' desire for energy-technology diversification.

GCxN searches for companies with early-stage energy innovations related to industry-focus themes. Past themes have included energy storage and grid integration, fast charging and grid integration, electrosynthesis for fuels and chemicals, and e-mobility and industrial electrification.

GCxN identifies promising startup companies through a Channel Partners ecosystem of clean-tech business incubators, accelerators and universities. Over 18 to 24 months, three to five invited companies per cohort receive up to

NREL materials scientist Dave Moore (right) works with BlueDot Photonics co-founders Jared Silvia (center) and Daniel Kroupa as part of the GCxN program. BlueDot Photonics, a member of the third GCxN cohort, is developing the next generation of solar panels made of perovskite materials. In 2021, the company raised more than $1 million in funding and added two members to the team. (Photo by Dennis Schroeder / NREL)

$250,000 in non-dilutive funding in the form of technical expertise and facilities to overcome barriers in moving a new energy technology from an idea on a chalkboard to a commercial product deployed in the marketplace.

Participating companies execute an Intellectual Property Agreement (IPA) with NREL that provides an option to secure rights to any subject intellectual property (IP) that may be developed by NREL while providing technical assistance to each company.

The first companies to complete their GCxN projects graduated from the program in 2021. Aggregate program benefits include more than $52 million raised by cohort companies at the time of award submission, which translates to about $21 raised for every dollar of Shell funding. Additionally, at least 51 new startup hires have occurred.

In addition, NREL anticipates the continued development of IP during the technical assistance process and has agreed to make this IP available for licensing to the GCxN companies.

NASA LaRC EVENT STRENGTHENS RELATIONSHIPS BY SHOWCASING ADVANCES MADE TO LICENSED TECHNOLOGIES

National Aeronautics and Space Administration, Langley Research Center

At the National Aeronautics and Space Administration's Langley Research Center (NASA LaRC), technology transfer is a gift that truly keeps on giving. A new technology fair specifically for previous licensees has led to new agreements, additional royalties and stronger relationships with the lab's industry partners.

In 2019, the NASA Spin-In Technology Fair was created in response to survey data collected from NASA LaRC licensees. The data indicated that most licensees had made advancements to their licensed technology that could be ready for NASA mission integration and were interested in sharing those advances with NASA LaRC subject matter experts (SMEs).

NASA LaRC has hosted three Spin-In fairs. The first was held face-to-face at NASA LaRC in Hampton, Virginia, in 2019. In 2020, NASA's inability to host events onsite because of the COVID-19 pandemic necessitated a virtual fair.

With success and lessons learned from previous fairs, NASA LaRC held its third Spin-In Fair virtually in fall 2021. The 2021 fair hosted more than 40 actively partnered companies, via the Small Business Innovation Research (SBIR) and NASA Tech Transfer programs, to present their technological advancements to NASA personnel for potential infusion opportunities, further collaboration and networking between NASA and other presenting companies.

Three of the 31 participating companies in prior Spin-Ins successfully executed a technology license or other partnership agreement with NASA the following year. Licenses are inherently beneficial to the program; they are the first step to commercializing patents. However, the primary byproducts of Spin-In events have been Space Act Agreements (SAAs).

A licensee can bring capabilities, needs or both to a NASA SME via an SAA. In return, the licensee will gain access to unique talents, knowledge, resources or equipment during the SAA that should help ready a licensed technology for commercialization.

An ancillary Spin-In program benefit is the opportunity for potential partner companies to engage with NASA SMEs regarding the technology transfer processes, SAAs and intellectual property rights.

The lab has received about $90,000 in new royalty fees from a partially exclusive license executed from the first Spin-In Technology Fair and expects growth as the licensee's business grows. These royalty funds enable the lab to protect future inventions via patenting, which will facilitate future partnerships and opportunities to commercialize those inventions to benefit society.

The SAAs provide different benefits to NASA and the participating companies. NASA was able to identify capabilities among existing partners for potential mission integration. Data from the research and NASA testing was shared with the partner companies, giving them a better idea of their products' strengths and areas for potential improvement. Other SAAs led to both parties exchanging technical information, samples and methods used in addition to the resulting data.

COVID-19 RESPONSE DISTINCTION

Federal laboratories' contributions to the fight against the COVID-19 pandemic extend beyond the official FLC National Award categories. The FLC extends its sincere thanks and appreciation to the following recipients of the 2022 COVID-19 Response Distinction.

DEPARTMENT OF ENERGY
Lawrence Livermore National Laboratory

ENVIRONMENTAL PROTECTION AGENCY

DEPARTMENT OF HOMELAND SECURITY
National Biodefense Analysis and Countermeasures Center

Transportation Security Administration

LLNL and EPA Develop Faster, More Accurate Method of Testing Surfaces for COVID-19

A rapid, sensitive method of detecting infectious coronavirus in surface samples, jointly developed by the Environmental Protection Agency (EPA) and Lawrence Livermore National Laboratory (LLNL), could serve as a model for developing rapid methods for other viruses of concern, including COVID-19 variants.

Although aerosol transmission is understood to be the primary route for transmission of SARS-CoV-2, the virus that causes COVID-19, it may also spread via surface contact. Traditional testing methods that rely on visual observation require several days to detect infectious forms of the virus.

The rapid viability-reverse transcriptase-polymerase chain reaction (RV-RT-PCR) method detects and distinguishes infectious from noninfectious SARS-CoV-2 from test samples in less than 17 hours (for a batch of 12 samples). Compared with conventional methods, RV-RT-PCR testing is also less expensive, easier to scale, and generates less biohazardous waste.

Environmental applications include contamination response, disinfection efficacy testing, fate and transport studies, and epidemiological investigations for COVID-19 spread in communities. The method could also be used for rapid antiviral drug testing, high-throughput screening of vaccines and therapies, and clinical sample analysis to provide data on viral infectivity.

Transfer of NBACC Disinfectant Testing Data Informs TSA Efforts to Keep Travelers Safe

During the COVID-19 pandemic, one of the key challenges faced by the transportation industry was how to effectively disinfect spaces and equipment to reduce the risk of virus transmission on airplanes, buses and trains. The transfer of a knowledge product from the National Biodefense Analysis and Countermeasures Center (NBACC) to the Transportation Security Administration (TSA)—both within the Department of Homeland Security—helped address this problem.

The knowledge product included findings from an NBACC analysis of six disinfectants for their ability to kill SARS-CoV-2, the virus that causes COVID-19, on surfaces. The specific products tested were selected because they had been previously identified as compatible with explosive trace detectors (ETDs) utilized at airport screening checkpoints, thus enabling operators to maintain mission-essential functions.

These data helped inform the use of ETD-compatible disinfectants at TSA airport passenger checkpoint locations, ensuring a safer environment for TSA personnel and the traveling public. As an extension of the surface disinfectant study, NBACC also showed that elevated temperatures could reduce the risk of live virus on hard surfaces inside buses and trains and helped create a web-based temperature, humidity and sunlight surface decay calculator for industry and general population use.

AWARDS

INDIVIDUAL AWARDS

KELLI HOWIE: IMPROVING DIVERSITY, EQUITY AND INCLUSION TO INCREASE TECHNOLOGY TRANSFER ENGAGEMENT

Sandia National Laboratories

Kelli Howie's contributions to Sandia National Laboratories go far beyond her work as a competitive intelligence specialist. Since joining Sandia in 2019, Howie has played a leading role in the lab's efforts to engage underrepresented employees in the technology transfer and commercialization process.

Howie's contributions to improved diversity, equity and inclusion (DEI) at Sandia not only have helped create a more supportive and collaborative workplace, but also have broadened the pool of lab employees with the potential to develop innovations with commercial applications.

"Kelli has taken the time to understand the many different facets of technology transfer, from development of IP [intellectual property] to the execution of agreements," said Joel Sikora, manager of technology partnership agreements, intellectual property, and business and competitive intelligence. "In her short time at Sandia, she has worked to increase the engagement of scientists in the disclosure process and has become a leading advocate at the DOE [Department of Energy] labs for increasing the involvement of women in innovation."

In 2020, Sandia and 11 other DOE national laboratories launched the Diversity and Inclusion in inVentorship and EntrepReneurship Strategies and Engagement – Women (DIVERSE-W) program to promote technology transfer and commercialization efforts in underrepresented segments of the national laboratories. Howie led a team in designing a two-week DIVERSE-W program that included training on Sandia's patenting process, effective engagement and customer discovery, entrepreneurial mindset, and how to build an effective network.

In summer 2021, Howie launched a virtual speaker series open to all DOE, lab and site employees. The series spotlighted women in academia, industry and other government agencies who have excelled in patenting, who have spun off their technologies into their own entrepreneurial ventures, or who run their own technology companies. Early feedback suggested successful results, with 96% of attendees reporting they found the events informative and engaging, 71% saying their knowledge of patenting increased following the events, and 65% reporting that they are more likely to pursue a patent after attending the events.

> "Inclusion and diversity are defining elements of Sandia, and Kelli is leading the charge to translate this common vision to new programs and technology areas."
>
> — David Kistin

Howie has also had an impact on DEI specifically in relation to quantum information science (QIS), through her involvement with the new DOE-funded Quantum Systems Accelerator (QSA). As lead of the QSA Inclusion, Diversity, Equity, Accountability, and Solutions (IDEAS) working group, she is helping to foster a more equitable approach to QIS innovation.

"Inclusion and diversity are defining elements of Sandia, and Kelli is leading the charge to translate this common vision to new programs and technology areas, like quantum," said David Kistin, manager of technology and economic development. "There is so much opportunity in this space, and we are very fortunate to have Kelli working with our teams to increase the positive impact of the labs."

PATRICIA CULLUM: CONVERTING EDUCATIONAL OPPORTUNITIES INTO IMPROVED TECHNOLOGY TRANSFER METRICS

Department of Veterans Affairs

Patricia (Pattie) Cullum ranks among the top technology transfer specialists at the Department of Veterans Affairs (VA) in terms of invention disclosures and other metrics. But her success in addressing educational gaps in the VA technology transfer process is what truly has set her apart.

Cullum came to the VA's Office of Research and Development in 2019 after 25 years in the biomedical and pharmaceuticals industry. Already armed with a master's degree in education, Cullum made it one of her first priorities upon joining the VA to obtain a Certificate of Graduate Studies in Advanced Studies in Technology Transfer through the Foundation for Advanced Education in the Sciences at the National Institutes of Health. She is the only technology transfer specialist (TTS) at the VA to have earned this certificate.

More than 50,000 employees have taken Cullum's updated VA Technology Transfer Program course over the past two years, reflecting the large impact she has had on the field of tech transfer.

Cullum's unique perspective helped her recognize a need to better educate researchers and administrators within the VA and its university affiliates about their roles as VA dual appointment personnel. At many of the affiliates Cullum had worked with, she had noticed, the idea of a joint appointment in relation to intellectual property (IP) was confusing and even intimidating. She proposed and implemented a multifaceted solution that included a presentation and handouts to help TTSs explain in plain language the federal rules and regulations that can be daunting to non-tech transfer professionals.

Cullum also advocated for a major update to a mandatory technology transfer course for VA employees. The course is now available through an interactive e-learning platform and provides more in-depth information, clearer explanations and more examples of inventions. More than 50,000 VA employees have taken the VA Technology Transfer Program eLearning over the past two years.

The qualitative benefits of Cullum's education-focused approach to technology transfer are supported by impressive performance metrics for the most recent fiscal year:

- 132 invention disclosures received in her region. This number — the highest among all 12 TTSs — represents an increase of 174% over the previous fiscal year for the region, and nearly 20% of the total received by all TTSs.
- 92 invention evaluations completed for her region. This number represents a year-over-year increase of 96% for the region, and 18% of the total completed by all 12 TTSs.
- One exclusive license secured, out of seven completed by all 12 TTSs.

Cullum's most recent education-related accomplishment is her selection to lead an educational session at the 2022 AUTM Annual Meeting on how government agencies work with dual appointment personnel and share IP ownership. This Annual Meeting opportunity — a first for the VA — reflects the large impact Cullum has had on the field of tech transfer, according to her supervisor, Dr. John Kaplan.

DR. JOHN KAPLAN: REESTABLISHING A TECHNOLOGY TRANSFER PROGRAM WORTHY OF REPRESENTING VA INNOVATION

Department of Veterans Affairs

As director of the Department of Veterans Affairs (VA) Technology Transfer Program, Dr. John Kaplan has rebuilt, restructured and transformed the program to more fully reflect the scope and life-changing potential of research conducted across the VA and its nationwide network of medical centers.

After his appointment in 2016, Kaplan's primary focus involved enforcing intellectual property (IP) rights and obligations for inventions and commercialized products developed with VA research resources. Since primary investigators typically hold dual appointments with a VA medical center and a nearby academic affiliate, some jointly developed inventions had been submitted to the academic affiliate but not to the VA — which lacked the ability to track activities across its research enterprise.

Kaplan and his team reviewed agreements with 80 VA academic partners and converted 78 of them to entirely new agreements that ensure more equitable sharing of responsibilities, revenues and expenses between the VA and its affiliates.

He also initiated the VA's first program to audit IP management by academic affiliates — a multiyear effort that identified hundreds of undisclosed projects conducted by dual-appointed researchers and supported by the VA. The audit recouped significant royalties for the VA from commercialized innovations, including the VA's largest-ever single royalty payment of more than $1 million.

Even as those efforts focused on previous work supported by the VA, Kaplan was also establishing programs to encourage future tech transfer (T2) successes.

The Technology Transfer Assistance Project (TTAP), which leverages the manufacturing capabilities at three VA medical centers to develop prototypes of VA innovations, enabled technology demonstrations for potential partners that can boost interest in commercialization. Innovations benefiting from the TTAP initiative have included a computer mouse designed for veterans who use prosthetic hooks, a cord organizer for use during surgery devised by a general surgeon, and an endoscopic catheter to collect bodily fluids without contamination, to name a few.

Kaplan initiated the VA's first program to audit IP management by academic affiliates, which recouped the VA's largest-ever single royalty payment of more than $1 million from commercialized innovations.

Recognizing that innovations can — and do — surface from departments other than research and development, Kaplan has expanded his staff's T2 education efforts to all VA employees. Employee-developed innovations that have received patents now include an improvement to custodial carts, proposed by a member of the housekeeping staff, that improved the ability to clean hospital floors, as well as a casket handling system developed by engineers from the National Cemetery Administration.

These and other initiatives have contributed to a dramatic increase in numbers of invention disclosures and patents. Annual invention disclosures more than doubled in Kaplan's first year, reached a record 724 in 2019, and at the time of this award submission were on track to break that record in fiscal 2021. The program also saw a record 61 U.S. patents issued and 71 licensing agreements in fiscal 2019, as well as a record $3 million in royalty revenue collected, up from $3,000 in fiscal 2016.

BARTLEY P. DURST: BRINGING EXPERIENCE AS AN INNOVATOR TO HIS SUPPORT FOR GSL TECHNOLOGY TRANSFER

U.S. Army Corps of Engineers, Engineer Research and Development Center, Geotechnical and Structures Laboratory

As a longtime researcher with the U.S. Army Corps of Engineers (USACE), Bartley P. Durst earned a reputation for innovation. Now, as director of the Geotechnical and Structures Laboratory (GSL) within the USACE Engineer Research and Development Center (ERDC), he's known for championing partnerships that turn innovations into impactful opportunities.

GSL tackles some of the world's toughest civil and military engineering challenges by developing technologies that prioritize structural resilience. Durst can relate: A USACE researcher since 1982, he holds more than 20 patents related to survivability and protective structures research.

That experience forms the foundation of Durst's commitment to technology transfer (T2).

"I'm very passionate about T2, not only for my own team, but also for those at other ERDC labs," Durst said. "It can be hard to let go of something you invented, nurtured, prototyped, tested and evaluated. At the same time, letting go is an essential step in moving the technology forward so that it can change lives."

In five years under Durst's leadership, GSL has nearly doubled the total number of licenses issued, more than doubled the number of Cooperative Research and Development Agreements (CRADAs) and nearly tripled the total number of patents issued.

Durst appreciates cross-pollination and collaboration outside ERDC's walls. The Soft Asset Protection in Critical Environments (SPICE) Initiative, established by GSL and ERDC in 2018 in partnership with the Department of Homeland Security and other federal agencies, continues to commercialize technologies aimed at protecting civilians from mass casualty attacks in public spaces.

Durst was a major player in two T2 agreements that have enabled the lab to engage with small businesses and other partners that are new to federal collaborations. ERDC's first-ever Partnership Intermediary Agreement (PIA) with DEFENSEWERX created ERDCWERX, an innovation hub that has connected ERDC technology with more than 10,000 companies in three years. ERDC's first Other Transaction Authority (OTA) mechanism facilitated its work with the System of Systems Consortium, which connects the GSL with more than 200 industry and academic partners.

The best testament to Durst's personal and professional commitment to leveraging T2 is the Modular Protective System (MPS). The MPS technology, and the strong interagency partnership with the U.S. Department of State associated with it, has led to multiple impactful spinoff technologies that protect U.S. soldiers and civilians from firearms, projectiles and blasts. MPS technologies include Ready Armor Protection Instant Deployment, patented in 2020, and the Expedient Retrofit for Existing Buildings, patented in 2021.

> "It can be hard to let go of some-thing you invented, nurtured, prototyped, tested and evaluated. At the same time, letting go is an essential step in moving the technology forward."
> — Bartley Durst

Thanks to Durst's efforts to transition MPS technologies out of the lab, these military innovations will be used in law enforcement, urban security and operations, crowd control, roadways, school security, embassies, ports, areas prone to natural disasters, and other civilian applications.

JOHN DEMENT: REJUVENATING THE FLC THROUGH POSITIVITY, PARTNERSHIP AND A STRATEGIC PLAN

Naval Surface Warfare Center, Crane Division

John Dement's ability to bring parties together in a friendly, collaborative manner and his dedicated advocacy for progress in technology transfer have benefited the FLC in numerous ways.

As chair of the FLC from 2017 to 2021, Dement guided the organization on a path of growth, capping off a career of service to the federal tech transfer community. Even while lobbying for evolution and change, Dement maintained the humble, down-to-earth friendliness he brings to everything he does.

Dement will long be remembered as the FLC chair who spearheaded a Strategic Plan for the FLC with a focus on three guiding principles (Promote, Educate and Facilitate) and opted to join forces with AUTM as a cooperative partner rather than continuing with the FLC's traditional organizational management model.

"John's many years of service to the FLC have significantly advanced the profession of technology transfer for all," said Paul Zielinski, FLC executive director. "As FLC chair, John charted a bold new course through a visionary strategic planning effort that rejuvenated the FLC and put it on a solid foundation for the future."

Dement is a tech transfer professional with the Department of Defense's Naval Surface Warfare Center, Crane Division. NSWC Crane has a reputation for delivering comprehensive, innovative solutions to the warfighter, and technology transfer is an integral part of its ability do so. The lab's positive technology transfer culture is something Dement brought to the FLC.

Dement became involved with the FLC many years ago and ran for office in 2008 to find more opportunities to contribute. He has been an active FLC volunteer on regional and national levels.

He served three terms as an FLC member-at-large (MAL), two terms as Midwest regional coordinator, and two terms as chair. As a member of the Education Committee, he led the updating of the FLC Desk Reference. Also, under an Intergovernmental Personnel Act (IPA) agreement with the state of Indiana, he proposed and developed an advanced training course on "Strategic T2: Engaging the Ecosystem" and has taught the course at FLC National Meetings.

> "John's many years of service to the FLC have significantly advanced the profession of technology transfer for all. As FLC chair, John charted a bold new course through a visionary strategic planning effort that rejuvenated the FLC and put it on a solid foundation for the future."
>
> —Paul Zielinski, FLC Executive Director

As chair, Dement led several initiatives to build the FLC's reputation as a resource for technology transfer professional development and as a wellspring of partnership opportunities for entrepreneurs and small businesses.

Dement oversaw many "firsts" for the FLC — starting with the first external study on the organization, which led to the Strategic Plan, the cooperative agreement with AUTM and the first full-time executive director position. These developments, along with restructuring of the FLC Executive Board and numerous updates to the organization's bylaws, have strengthened the FLC and allowed its Executive Board to become more strategic, agile and productive.

AWARDS

REGIONAL AWARDS

2021 REGIONAL AWARD WINNERS

Congratulations to the 2021 Regional Award winners, many of whom also won National Awards. In a new development, the 2023 FLC Awards program will feature a single call for submissions for both regional and national awards. That call for award submissions will be issued soon, so it's time to start thinking about the T2 success stories you plan to submit. *See page 39 for more information.*

FAR WEST

Outstanding Commercialization Success

USDA, Agricultural Research Service, Grain Legume Genetics and Physiology Research Unit
"ARS releases eight new dry-seed legumes for commercial use, including first-ever winter-hardy peas"

Outstanding Partnership

Lawrence Berkeley National Laboratory
"Public-private partnership including Berkeley Lab connects clean energy entrepreneurs with testing facilities"

Outstanding Technology Development

USDA, Agricultural Research Service, Pacific West Area
"ARS technology makes studying tick-borne diseases less expensive and less dependent on live animals"

Idaho National Laboratory
"OpDefender security system from INL protects computer controlled industrial networks from cyberattacks"

NASA Ames Research Center
"NASA technology minimizes weather-related flight delays, reducing costs and environmental impacts"

MID-ATLANTIC

Excellence in Technology Transfer

USDA, Agricultural Research Service, Plum Island Animal Disease Center
"Commercialization in Vietnam positions ARS vaccine to help control African swine fever pandemic"

Army Combat Capabilities Development Command (DEVCOM) Chemical Biological Center
"DEVCOM CBC and Pendar take hand-held chemical threat detection technology to the next level"

National Cancer Institute
"NIH partnership results in key FDA Orphan Drug Designation for rare respiratory disease therapy"

Interagency Partnership

Department of Homeland Security, ***Science and Technology Directorate (S&T) and Transportation Security Administration***
Department of Energy, ***Pacific Northwest National Laboratory and Sandia National Laboratories***
NASA Center of Excellence for Collaboration and Innovation
"Collaboration and crowdsourcing propel HD-AIT airport screening technology to commercialization"

Rookie of the Year

National Cancer Institute
"Dr. Suna Gulay French: From TTAP training to commercialization of innovative cancer treatments"

Outstanding Technology Transfer Professional of the Year

NASA Goddard Space Flight Center
"Eric McGill: Technology transfer contributions at Goddard that go above and beyond"

Laboratory Director of the Year

NASA Goddard Space Flight Center
"Dennis Andrucyk: Facilitating success by viewing his laboratory through a technology transfer lens"

MID-CONTINENT

Excellence in Technology Transfer

USDA, Agricultural Research Service, Plains Area
"VIPR System for Removing Plastic Contamination During Cotton Ginning Process"

Sandia National Laboratories
"Sandia's inverse approach to software design gives the optical metamaterials field a critical boost"

Notable Technology

Los Alamos National Laboratory
"Quantum encryption technology developed at LANL reinvents cybersecurity for electrical grids"

Los Alamos National Laboratory
"LANL moisture sensors work with partner's smart chutes to make biofuel production more efficient"

Sandia National Laboratories
"Sandia scientists' fabrication method could improve availability of large nanoparticle supercrystals"

Sandia National Laboratories
"Device from Sandia and Know Biological will warn people with epilepsy of oncoming seizures"

Partnership Award

U.S. Air Force, 59th Medical Wing Science & Technology
"By prioritizing partnership agreements, 59th Medical Wing ORTA makes a big impact in a short time"

National Renewable Energy Laboratory
"NREL and Shell Global create 'partnership for partnerships' to support clean energy startups"

Outstanding Technology Transfer Professional

U.S. Air Force, 67th Cyberspace Wing
"Eric Rosenberg: Making tech transfer history within the Air Force's information warfare entity"

National Renewable Energy Laboratory
"Jean Schulte: Capitalizing on copyright management to enhance tech transfer outcomes"

MIDWEST

Excellence in Technology Transfer

Argonne National Laboratory
"Argonne scientists employ machine learning to accelerate industrial design optimization process"

State and Local Economic Development Award

Naval Surface Warfare Center, Crane Division
"Indiana pitch competition showcases NSWC Crane's regional role as well as its intellectual property"

NORTHEAST

Excellence in Technology Transfer

MIT Lincoln Laboratory
"Industry partnership expands applications for MIT-LL's video surveillance analytics technology"

MIT Lincoln Laboratory
"Success of MIT-LL's cloud server security technology now includes endorsement from tech giant IBM"

SOUTHEAST

Excellence in Technology Transfer

USDA, Agricultural Research Service, U.S. Horticultural Research Laboratory
"ARS scientists enlist detector dogs to combat the disease threatening $3.35 billion citrus industry"

U.S. Army Engineer Research and Development Center, Environmental Laboratory
"ERDC wastewater treatment system slashes costs of removing 'forever chemicals' from environment"

Interagency Partnership Award

U.S. Army Engineer Research and Development Center
U.S. Air Force, Air Force Civil Engineer Center
"Longtime USACE-USAF partnership uses rapid heating to revolutionize pavement repair technology"

The FLC expresses its gratitude to the members of the Awards Subcommittee and other volunteer judges for their tireless efforts in making the 2022 National Awards program a success.

Whitney Hastings
National Institutes of Health
(Awards Subcommittee Co-Chair)

Lisa Marianni
Centers for Disease Control
and Prevention
(Awards Subcommittee Co-Chair)

Michelle Atchison
University of Texas San Antonio

Sharon Borland
U.S. Geological Survey

Shaniece Bowens
Food and Drug Administration

Victoria Brun
Frederick National Laboratory
for Cancer Research

Annie Bullock
Naval Surface Warfare
Center, Crane Division

Sabarni Chatterjee
National Institutes of Health

Aoife Cullen
Uniformed Services University
of the Health Sciences

Ryan Davis
Department of Veterans Affairs

Jenna Dix
Naval Surface Warfare
Center, Crane Division

Amy Elkavich
International Space Station

John Emond
NASA (retired)

Sevim Erhan
USDA Agricultural Research Service

Hannah Farquar
Lawrence Livermore
National Laboratory

Steve Ferguson
National Institutes of Health

Suzanne Frisbie
National Cancer Institute

Paige George
Naval Surface Warfare Center,
Panama City Division

Fizie Haleem
Montgomery College

Neche Harris
U.S. Army Medical Research
& Development Command

Lydia Hierl
National Security Agency

Amanda Horansky-McKinney
Naval Research Laboratory

Jackie Kerby Moore
Sandia National Laboratories (retired)

Marianne Lynch
Department of Energy

Terry Lynch
National Institute of Standards
and Technology

Jason Martinez
Sandia National Laboratories

David McCallum
Argonne National Laboratory

Chris Meyers
Los Alamos National Laboratory

Kimberly Minafra
NASA Ames Research Center

Andy Myers
Honeywell Federal Manufacturing
and Technologies

David Myers
Department of Energy

Michele Newton
National Cancer Institute

Jack Owsley
Air Force Research Laboratory

Dick Paul
National Advisory Council

Michael Pollack
National Institutes of Health

Dan Powers
CO-LABS

Elsie Quaite-Randall
Lawrence Livermore
National Laboratory

Maria Restrepo-Hartwig
USDA Agricultural Research Service

Holly Ricks-Laskoski
Naval Research Laboratory

Eric Rosenberg
U.S. Cyber Command

Michael Salgaller
National Institutes of Health

Jean Schulte
National Renewable Energy Laboratory

Susan Simpkins
SLAC National Accelerator Laboratory

Wayne Strickland
National Technical Information Service

Karen Surabian
National Institutes of Health

TWO AWARDS PROGRAMS, ONE TIMELINE

Applying for FLC Awards is about to get a whole lot easier. We've upgraded our submission platform and streamlined the process with a single timeline for both national and regional recognition. That means you can spend less time filling out forms and more time on award-worthy technology transfer.

Starting this summer, there will be only one submission period and only one judging period for all entries. Once the submissions have been judged and scored, the FLC will announce selections for National Award winners as well as "Best in Region" winners for select categories. All winners will be recognized at the FLC National Meeting, scheduled for March 28, 2023. The "Best in Region" winners will also be honored separately by their respective regions later in the year.

National Awards will be presented in these categories:

- Excellence in Technology Transfer
- Interagency Partnership
- State and Local Economic Development
- Technology Transfer Innovation
- Impact
- Rookie of the Year
- Outstanding Technology Transfer Professional
- Lab Director of the Year
- FLC Service

Remember: **The FLC's next call for award submissions will be the only one** — and it's right around the corner. So now is the time to start thinking about which of your lab's tech transfer successes are the best candidates for either national or regional recognition in 2023. And make sure you're subscribed to the FLC's mailing list to receive all the information you'll need to submit.

Contact **Jessica Znidarsic at jznidarsic@federallabs.org** for more information.

Exciting changes are coming to the FLC Awards Program this summer!

2023 FLC AWARDS PROGRAM TIMELINE

July – September 2022
Submission period.

October – November
Judging period.

December
Winners are selected and notified.

January 2023
Award winners review their profiles.

February
Award winners prepare posters and videos supporting their work and register for the FLC National Meeting.

March
Awards are presented at the National Meeting.

@federallabs #FLCawards