News and Breakthroughs from Lovelace Respiratory Research Institute

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Making a Difference Melanie Doyle-Eisele, Ph.D.

Lovelace Researches a Popular New Nicotine Delivery System Benjamin Moeller, Ph.D.

New Approaches to Treat Asthma Ted Barrett, Ph.D.



From the President

This issue of *Breathe* highlights some of our young scientists undertaking unique and nationally important biomedical research that bridges the gap between the immediate national defense and public health needs of the country "all the way" to the understanding of fundamental mechanisms of disease at the cellular level. One area that has received much attention has been in drug development. We have created two spin-off companies that focus on a number of aspects of respiratory inflammatory disease. LRRI now has a new approach to our mission statement: utilizing our intellectual property (either home grown or as licensed from our partners) to commercialize products designed to rapidly improve public health. At a cost of over a billion dollars per drug, this drug development effort is not a process that we can undertake alone, and we have identified numerous partners to work with in this endeavor. Our goal is to more directly meet our mission of improving the public health while supplementing our revenue during a prolonged period of reduced federal biomedical research funding.

Over the past year we have seen further rapid expansion of our interaction with the Mind Research Network (part of the Lovelace family of companies), which undertakes basic and applied research into the mechanisms, diagnostics and treatment of traumatic brain injury. In addition, MRN's technology is being used to diagnose in real-time subtle changing patterns of lung injury using magnetic resonance imaging (MRI). In a new twist, LRRI has also entered into a partnership with the National Institutes of Health and Brigham and Women's Hospital to undertake complex evaluative studies of our New Mexico Smokers Cohort with the goal of identifying unique biomarkers of COPD, lung cancer and fibrotic disease in their various manifestations. Treating these complex diseases will require personalized medicine, which compels the health care professional to know not only what specific disease the person has, but what stage a particular patient is experiencing. LRRI and its family of companies and partners work to find molecular, cellular and imaging "biomarkers" to accomplish these tasks.

Another new development for the Institute has been the restructuring of our operations and scientific staff. Dr. Jake McDonald has assumed the role of Vice President of Applied Sciences and has rapidly reoriented the duties of numerous scientists and scientific staff centered at our South Campus. Drs. Doyle-Eisele, Kuehl and Cawthon have all assumed new oversight duties and streamlined our contract-oriented infrastructure. Ms. Shannon Toma, our new Chief Operating Officer, has

reorganized our operations on the administrative side. In all cases, the organization is headed toward a better managed, more efficient and more interactive place. This is a good thing considering our plans to advance a number of our own therapeutics, which will be undertaken on top of our normal grant and contract workload.

As is the case for most biomedical research institutes in the United States, we face ever rising challenges in finding the resources to support our mission and to advance the science we are so dedicated to. Perhaps the most apparent theme is partnership. We have chosen to work with many universities, biotech and pharma companies and even banks to reach our goals. This year we have consolidated our debts and extended our credit in order to undertake new projects designed to advance the Institute and its affiliates and create new long-term funding sources. The economy is improving and so are our horizons. Each year brings new challenges and opportunities, and as long as we continue to innovate, create new knowledge and advance public health, we will have done our job. We thank all of our supporters and partners for the wonderful interaction you all continue to have with us, and I especially salute our employees who have weathered some complex economic times with a positive attitude and a willingness to change and work hard to meet our goals.

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Robert W. Rubin, Ph.D. President and Chief Executive Officer



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Who We Are

The Lovelace Respiratory Research Institute (LRRI) is a private, biomedical research organization dedicated to improving public health through research on the prevention, treatment, and cure of respiratory disease. LRRI is committed to curing respiratory diseases through research aimed at understanding their causes and biological mechanisms; assessing and eliminating exposures to respiratory health hazards; and developing improved therapeutics, vaccines, and diagnostics.

LRRI, based in Albuquerque, New Mexico, employs 811 people, 120 Ph.D.s. and is a \$92 million company.



MAKING A DIFFERENCE

In 2007, the year after earning a doctorate in environmental sciences and engineering at the University of North Carolina (UNC) in Chapel Hill, Dr. Doyle-Eisele moved to New Mexico to work here at the Lovelace Respiratory Research Institute. Her research on the health effects of inhaled atmospheric pollutants as a graduate student made her a perfect fit for the multidisciplinary research that is conducted at LRRI. Due to her interest in the breadth of research at LRRI, and the opportunity to learn new things, in just seven years after joining the team she is now one of the Institute's leading researchers and was recently appointed Director of Life Sciences.

and after she completed her bachelor's degree, she decided to continue on to earn her Ph.D. at UNC. "I didn't have this all planned out-I just followed my interests," she explained. "UNC seemed a logical place to go because it's an excellent school, and I really liked the multidisciplinary education I could attain that had practical application to my future." "Melanie took on a major role in advancing the capabilities at UNC in linking toxicology with atmospheric processing," said Ilona Jaspers, Director of the Curriculum in Toxicology at UNC and one of her mentors.

Dr. Doyle-Eisele came to LRRI in 2007. "When I visited LRRI for my interview and seminar presentation, I received a tour of the Applied Science Facility and had a chance to meet the colleagues I would be working with."

"I was impressed with the unique facilities that allow LRRI to make important contributions that otherwise would be limited."

Dr. Doyle-Eisele has always been an

overachiever, and she had an early

interest in science. As a young girl

she, at various times, wanted to be

both an astronaut and a veterinarian.

Although her "dream career" choices

changed as she grew up, her interest

first college-level courses in biology

in science never wavered. She took her

and chemistry while still in high school.

She excelled in other areas as well as

three-sport athlete in addition to her

academic achievements at her rural

academics. She was a verv successful

Pennsylvania high school. She excelled

in basketball, track and field hockey and

went on to play Lacrosse in college at the University of South Carolina (USC).

"The funny thing was I used to turn

my nose up at any sport that required

wearing a skirt, and then I went on to

At USC, Dr. Doyle-Eisele's interest

in science continued to grow, and

in biology and mathematics. Her

enthusiasm grew along with her

accomplishments in the sciences,

she majored in chemistry with minors

jokes Dr. Doyle-Eisele.

play a college sport that required one,"

"However, what I really loved were the people I met with: Dr. Rubin's (President and CEO) perspective on the research contributions LRRI makes and the opportunity for me to help develop this new program from scratch-I was hooked."

The first time she got off the plane, arriving from the East Coast, she found the New Mexico landscape to be guite a contrast to the Carolinas, with Albuquerque's brown buildings and sand with desert vegetation. However, like many who come to appreciate the landscapes and culture of New Mexico, she has learned to love the Southwest.

"It didn't take long before we fell in love with the beautiful sunsets and night skies, which now are something my husband and I miss any time we are away from home," she said.

She continues to find her work at LRRI fascinating. She loves the many opportunities to be part of so many integral programs developing respiratory therapeutics or mitigation agents for various chemical, biological, radiological

and nuclear threats. "I enjoy the diversity of the work we do and the fact that I know the work will make a difference in people's lives," she said.

Jake McDonald, Ph.D., Vice President of Applied Science at LRRI, has only praise for Dr. Doyle-Eisele's work. "Melanie has had a huge impact on the research and staff at LRRI. She is a unique leader with a style that has earned her the respect of the staff, and as a result has had a positive impact on the culture as well as the science of the institute."

"As part of her new role as Director of Life Sciences, she has taken on the responsibility of restructuring the Study Directors and technical staff to ensure the groups meet her high standards of operation and accountability," says Dr. McDonald. "We know she will continue to do great things for LRRI in her new role," he added.

Dr. Doyle-Eisele is a natural leader and loves working in a team environment. "It has been amazing being part of the teams at LRRI," she said.

LRRI's scientific progress is accomplished by diverse research that helps develop therapeutics, evaluate the behavior of material in the environment, and aid development of novel pharmacology models that advance science. Dr. Doyle-Eisele has no problem explaining what LRRI does. "A few years ago, I went to a middle school to describe what I do for a living," she said. "The first thing I asked was who had asthma or had a family member who smokes and coughs all the time.

As part of her new role as Director of Life Sciences, Dr. Doyle-Eisele has taken on the responsibility of restructuring the Study Directors and technical staff to ensure the groups meet her high standards of operation and accountability.



"Over the past few years, I've been able to test therapeutics being considered by the FDA for use as front-line mitigation therapies combating the effects of radiation and at the same time testing therapeutics targeting increased respiratory function for those with chronic pulmonary diseases."

> This was the best way to begin talking to them about testing and developing new drugs that can save lives."

Among her many collaborations, Dr. Doyle-Eisele's work as the primary Study Director makes a difference and impacts human health in a number of tangible and important ways. She has been a leader in support of the nonclinical development of some pharmaceutical company's drug platforms for many new and exciting treatments for COPD and asthma. "These medications have the potential to provide major health benefits to the millions who suffer from these diseases, and LRRI has made an

(continued on page 15)





NICOTINE DELIVERY SYSTEM

Lovelace Respiratory Research Institute (LRRI) is already a leader in the science of tobacco and nicotine products, their composition and related health risks. That makes its researchers uniquely well-positioned to investigate the newest device in nicotine delivery—the electronic cigarette also known as a personal vaporizer or e-cig.

Scientists at LRRI are examining the potential health risks of e-cig use or "vaping" as well as the risks associated with other emerging tobacco products. Additional research will be needed to better characterize the chemical composition and health impacts of e-cigs before definitive claims about their safety can be made.



SOME ESTIMATES STATE THAT E-CIGS WILL OUTSELL CONVENTIONAL CIGARETTES BY THE YEAR 2023.





E-cigs work using a heated nebulizer to deliver nicotine to the user. Nicotine is dissolved into a solution with cosolvents (propylene glycol/glycerin) and placed inside the device. An electronic heater heats the solution and generates an aerosol that is composed of both gaseous and particulate fractions that are inhaled

as a vapor or mist by the user.

The study of e-cigs is particularly considering the sharp increase in young adults turning to e-cigarettes for their nicotine instead of traditional cigarettes. Some estimates state that e-cigs will outsell conventional cigarettes by the year 2023.

While much is still unknown about e-cigarettes, the American Heart Association's policy statement about e-cigs states that e-cigs are dangerous because they target young people, can keep people addicted to nicotine and threaten to renormalize tobacco use.

Benjamin Moeller, Ph.D., is a research scientist at LRRI. He explains that "we already have existing expertise in the characterization of various aerosols such as cigarette smoke, which made this a natural extension. There is very little information on the potential harm or benefits associated with e-cigarette usage. The large increase in usage without an understanding of the potential health risks is of great concern." Dr. Moeller is part of a group of our scientists interested in developing biomarkers of exposure to quantify the highly toxic compounds that may be present in e-cigarettes and other products. LRRI is also examining "side-stream emissions" or the second-hand "smoke" generated when users puff on their e-cigs.

Researchers at LRRI have already discovered valuable information. Electronic cigarettes, they've found, are good at delivering nicotine to users accurately. "These findings are based on both the particle sizes that the device delivers and the specific properties of nicotine," Dr. Moeller said. "The primary components of the aerosol are nicotine and other excipients used in the formulation of the nicotine, inside of the device."

Compared to traditional smoking, vaping involves lower levels of carcinogens and toxic compounds. "This is primarily due to the lack of combustion byproducts of the organic material found in tobacco and from the decreased formation of nitrosamines during the tobacco curing process," Dr. Moeller stated.

But that doesn't necessarily mean vaping is entirely safe. The liquid inside the e-cig is still heated to generate the aerosol. "We have found the aerosol can generate highly reactive aldehydes, including formaldehyde." He added that reactive aldehydes, including formaldehyde, are highly cytotoxic (toxic to cells) and are listed as carcinogens. Additionally, nitrosamines, while at lower levels as compared to traditional tobacco products, are still present in e-cigs. Tobacco-specific nitrosamines are a group of carcinogens that are present in tobacco and tobacco smoke. They are formed from nicotine and related tobacco alkaloids. Two of the nicotine-derived nitrosamines are strong carcinogens in laboratory animals. The long-term health effects of vaping are unclear, but there's some indication it is safer than traditional cigarettes. "I believe that e-cigs may offer a potentially safer alternative to traditional cigarettes," Dr. Moeller stated. "E-cigs are certainly not a safe product without health effects,

but may offer a safer alternative to

continued use of traditional tobacco

products due to the reduced number of toxic chemicals found in the aerosol. Dr. Moeller has a background in toxicology and pharmacology with a focus on analytical chemistry. The diverse nature of the work conducted at LRRI drew him to the Institute. "There are only a few places in the world where you can work one day on developing a new pharmaceutical for the treatment of COPD and the next day be working on characterization of e-cigarettes and other tobacco products," he remarked.

The Institute, he believes, is an ideal place for studying e-cigarettes and other emerging nicotine products. "Our team here at LRRI has a vast array of expertise in aerosol generation and characterization along with understanding the potential adverse health impacts associated with various compounds," he said. "LRRI has been a leader in tobacco and nicotine research for several decades and has the unique capabilities to determine the potential adverse health impacts associated with those compounds," Dr. Moeller added.

The American Heart Association issued a policy statement in the association's journal *Circulation* in August of last year stating that battery-powered e-cigs contain nicotine and should be subject to all the laws that apply to nicotine-containing products.

LRRI HAS BEEN A LEADER IN TOBACCO AND NICOTINE RESEARCH FOR SEVERAL DECADES AND HAS THE UNIQUE CAPABILITIES TO DETERMINE THE POTENTIAL ADVERSE HEALTH IMPACTS ASSOCIATED WITH THOSE COMPOUNDS. Further, the AHA policy statement recommends there should be strong new regulations to prevent access, sales and marketing to youth, as well as more research into the health impacts of using e-cigs.

LRRI Research Scientist Philip Kuehl, Ph.D., who is part of the tobacco research team at LRRI, notes effective marketing aimed at young users is already being employed. For example, there is a type of e-cig that has a GPS device in the pack that lights up and vibrates when other users are within 50 feet. It also has a feature that vibrates the pack when a retailer that sells the e-cig is nearby.

There are also ads that use celebrities and enticing flavors to make e-cigs more attractive to young users. THERE IS VERY LITTLE INFORMATION ON THE POTENTIAL HARM OR BENEFITS ASSOCIATED WITH E-CIGARETTE USAGE. THE LARGE INCREASE IN USAGE WITHOUT AN UNDERSTANDING OF THE POTENTIAL HEALTH RISKS IS OF GREAT CONCERN.



Philip Kuehl, Ph.D. LRRI Tobacco Research Team

A recent *Pediatrics* study showed youth exposure to e-cig advertising skyrocketed over 250 percent from 2011 to 2013, effectively reaching 240 million young people.

Dr. Kuehl says there is a current estimate of between \$1.5 and \$3.0 billion in revenue per year for e-cig makers worldwide. Three years ago, the estimate was \$100,000 per year.

APPROACHES

TO TREAT ASTHMA



Approximately 5-10% of asthmatic patients have severe disease that cannot be adequately controlled with standard therapy comprised of high doses of inhaled corticosteroids plus long-acting b2-agonists and oral corticosteroids. Severe asthmatics experience frequent exacerbations, asthma symptoms, persistent airflow obstruction with air trapping, increased medication use, high health care utilization, and a high incidence of sinus disease and gastroesophageal reflux.

Ted Barrett, Ph.D., senior scientist and Director of Translational Research at LRRI

Furthermore, severe asthmatics drive most of the health care costs related to the disease, as the expense of caring for these individuals is more than double that of those with well-controlled disease. Therefore, the development of new treatments for severe asthma would represent a major public health advance.

Scientists at Lovelace Respiratory Research Institute are taking the lead in telling the complicated story of asthma and in developing novel approaches to control it-both through their own research and in collaboration with colleagues at Harvard's Brigham and Women's Hospital (BWH) and pharmaceutical companies such as Radikal Therapeutics.

Ted Barrett, Ph.D., a senior scientist and Director of Translational Research at LRRI, has spent most of his career in studying the underlying cellular and molecular mechanisms that mediate the genetic and environmental factors that contribute to the development and exacerbation of asthma and in developing new ways to treat severe asthma.

"We believe that it would be a major breakthrough to have additional treatment options for severe asthma that are safe, efficacious and easy to administer (i.e., do not require parenteral administration such as intramuscular or intravenous. or invasive procedures)," he stated.

One new approach to the asthma puzzle involves a joint collaboration with Radikal Therapeutics and LRRI through the formation of a new company called Respirometics. By in-licensing a revolutionary compound, originally discovered by colleagues at Harvard's Brigham and Women's Hospital (BWH). Respirometics plans to develop a first-in-class, naturally occurring pro-resolution mediator of inflammation called resolvin (RvE1). "We hypothesize that stimulating the body's own endogenous regulators of inflammation and resolution may

inflammation.

prove to have a more significant impact on overall disease, not just in asthma but in other respiratory diseases such as COPD, fibrosis, acute lung injury and infections." Dr. Barrett stated. He is cautiously optimistic about the approach and the team is actively seeking both grant and venture capital funding.

"Our approach is to actually look back at that biology and try to understand what's deficient in the body where the disease state has 'turned off' pathways that are normally active in controlling inflammation. As part of this effort we are continually trying to develop new laboratory models that are based on our understanding of the disease in humans. One exciting area where we have made significant advances is in the understanding of virally induced



Where steroids don't work, those people need new therapies.



Our approach is to actually look back at that biology and try to understand what's deficient in the body where the disease state has "turned off" pathways that are normally active in controlling

> asthma exacerbations. Viral exacerbation plays a significant role in the worsening of asthma symptoms and the progression of the disease to a more severe 'treatment resistant state,' Dr. Barrett said. In partnership with one of our commercial sponsors, Merck, we have developed a unique mouse model where we have shown that seasonal influenza can significantly exacerbate pre-existing asthma. We are now actively using this model in collaboration with one of our colleagues at BWH, Bruce Levy, as part of a recently funded NIH grant, to better understand the role of other pro-resolution lipid mediators (e.g., similar to ones being developed by Respirometics) in severe asthma exacerbation.

> > (continued on page 15)



A New View on Preventing Crime proves that a picture may mean many lives saved.

A picture is worth a thousand words. Sometimes it's worth much more. Kent Kiehl's ongoing research on brain images of incarcerated youth

"We're trying to use state-ofthe-art imaging science to study very complex, very dangerous conditions, with the ultimate goal of eventually preventing them."

- Dr. Kent A. Kiehl



As Executive Science Officer and Director of the Mobile MRI Core at The Mind Research Network, Kiehl completed a study of the brains of 155 incarcerated young men in New Mexico. Twenty of them committed homicide, 135 committed other violent crimes. In a paper published in *Neuroimage Clinical* in 2014, Kiehl reported that brain structural MRI density analyses could predict, with almost 85% accuracy, the youth who committed homicide versus incarcerated youth who had not committed homicide. "This is the first study ever to show that there are gray matter abnormalities in such a population," explains Kiehl.

He says imaging data could be used by the judicial system when deciding how to handle the highest risk juvenile offenders. "The kids that didn't commit homicide are probably good risks for release because they're unlikely to commit that type of violent crime in the future," he says. "Kids who committed homicide will likely need different treatment in order to minimize the chances they'll commit such crimes again."

Kiehl says findings from his research are shaping more effective treatments. A Wisconsin juvenile detention center has shown a 50% reduction in recidivism in high-risk kids by using a cognitive-based treatment that eschews punishment and rewards good behavior. Kiehl and his team are scanning the brains of the kids in the program in hopes of learning how the treatment helps their brains change.

The MRN team collects images using the MRN Mobile MRI, a customized MRI system integrated into a semitrailer. "It's the most advanced scanner that's ever been put in a trailer," says Kiehl. "It has functional MRI capabilities, including the ability to present high-definition video to the participant while they're in the scanner so you can study their brain activity."

Millions of genetic markers and thousands of brain scans from hundreds of patients with different mental illnesses. How do you combine all of that data into meaningful information that can be used to better understand mental disorders?

Getting a Better Picture of Mental Illness



"You need to know what you're treating in order to treat it. We're trying to get to a point where we can actually use brain imaging to inform decisions about how to help patients."

The Mind Research Network (MRN) is finding answers. Vince Calhoun, Ph.D. Executive Science Officer at MRN and Distinguished Professor of **Electrical and Computer Engineering** at the University of New Mexico, leads a research partnership between the two organizations to gain insight into a spectrum of mental illnesses using multi-modal imaging. The scientists are using MRI, fMRI, structural MRI, diffusion imaging, spectroscopy and MEG to study the brains of people with bipolar disorder, several types of schizophrenia, and major depression.

Since Dr. Calhoun started the research, funded by a Center for Biomedical Research Excellence (COBRE) grant from the National Institutes of Health, he and his team have launched several projects to develop new clinical assessment procedures, image collection techniques, and processes for handling large data sets.

In one research effort the team is combining data on brain function, brain structure, and brain connectivity to get a better understanding of how the brains of people with mental illness are different. Dr. Calhoun says the process leverages the strength of each imaging technique to create a single analysis



that might reveal hidden connections. "One of the interesting things is that these cognitive measures map in quite an interesting way to some of the brain patterns that we're finding in both functional connectivity and structural connectivity," says Dr. Calhoun. "This may give us clues that help refine how we classify mental illness, which is currently mainly based on symptoms and not biology."

The research supports the National Institute of Mental Health's initiative encouraging more research into the cause of mental disorders, which moves beyond a single disease to look across multiple diseases including schizophrenia and bipolar disorder.



- Vince Calhoun, Ph.D. Executive Science Officer, MRN



Christopher Tudan, Ph.D.

Christopher Tudan, Ph.D., is the new

Associate Director of Core Sciences.

development and validation of regulated

impacted departmental processes are

current with industry and regulatory

expectations. He uses his expertise

to provide expert scientific support in

methods and projects associated with

bioanalysis, immunology, virology and

assumes Study Director responsibilities

as needed. One of the things that drew

with how LRRI Chemistry labs are not

only considered an extension to the

of all decisions. He feels that this is

Sponsor's project, but the interest of

the sponsor is always the driving force

unique in this industry. Dr. Tudan finds

his work days at LRRI challenging and

rewarding. Upon his arrival at LRRI, he

was immediately immersed in assisting

methods, supporting research programs

at the bench, assisting in revising SOPs,

collaborations, developing biological

and functioning as a bioanalytical PI.

complexity of the associated science

make every day exciting, challenging

and yes, fun," he says.

"The diversity of all of the work and

with a federal proposal, building

cell-based methodologies; he also

him to LRRI was being impressed

Dr. Tudan advises and directs the

and is responsible for ensuring all

analytical method and studies,

"The diversity of all of the work and complexity of the associated science make every day exciting, challenging and yes, fun."

- Christopher Tudan, Ph.D.



Drew Cawthon, Ph.D.

Drew Cawthon, Ph.D., finds working at LRRI sweeter the second time around. Dr. Cawthon originally worked at LRRI as the Director of Preclinical Microbiology and Immunotoxicology as well as the ABSL 3 Facility Manager, where he was responsible for the performance, management, and operation of the ABSL 3 facilities and related studies. He left to work for a company that acquired, produced, characterized, and distributed biological standards and services to support scientific research. Dr. Cawthon came back to LRRI because he "missed the diversity of working with multiple animal models to evaluate different countermeasures affecting public health." My decision to come back was strongly influenced by the prospect of returning to the type of work I'm most drawn to, my familiarity and history with LRRI and the opportunity to work with people that I knew and respected. Dr. Cawthon's current appointment is Clinical Support Director; as Director he manages human, capital and fiscal resources of the Comparative Medicine and Pathology Departments. In addition, he is IACUC Chair and Deputy Institutional Official; in this capacity Dr. Cawthon works with the Attending Veterinarian and Institutional Official to ensure regulatory compliance and to represent the Institution favorably.

Making a Difference Melanie Doyle-Eisele, Ph.D.



important contribution to these efforts," she says. These are just some of the accomplishments that inspire her to continue to find new discoveries and carry out vital research at LRRI.

In addition to studies on respiratory diseases, Dr. Doyle-Eisele conducts unique research in the development of radiation-based pharmacology models for radiation therapeutics. As she explains the work, before the mitigation agents are tested, the scientists need "well-characterized models of disease." The specialized nature of this work and the history of similar research at LRRI make it a world leader for research in this area. "Melanie's specialty has been working with veterinary staff and collaborators on novel models of combined injuries and depleted immune systems to enable drug evaluation," Dr. McDonald explained.

New Approaches to Treat Asthma Ted Barrett, Ph.D.



"Historically the approach for developing new therapeutics for asthma has been to identify a specific biological pathway and block it singly. What we've been finding is, asthma is so heterogeneous and complex, just knocking out one pathway is not going to have a dramatic effect on an individual's symptoms because there are so many overlapping pathways involved. If you knock one out, there are compensatory pathways that are still active, and so you don't get a lot of bang for your buck just knocking one down," he explained.

"That's why steroids have worked so well for many asthmatics with more mild-to-moderate disease is that they target the immune system more globally. Unfortunately, there are those populations where steroids don't work, and they're the real patients who have the unmet clinical need. Where steroids don't work, those people need new therapies," Dr. Barrett said.

(continued from page 5)

"Radiation syndrome is a wellorchestrated cellular breakdown that occurs within the body and involves multiple organ systems," Dr. Doyle-Eisele said. "We have spent the last few years developing large animal models of external radiation exposure and various treatment strategies that the government has the ability to add to the National Stockpile through the BioShield legislation," she adds.

Dr. Doyle-Eisele has enjoyed success in many of her endeavors at LRRI. She isn't the type that revels in the spotlight, however. She just enjoys the diversity of the science and the people. "Where else could I get to work in very different worlds-however focused on the same ultimate goal-making a difference and saving lives."

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"We think that the proposed approaches we are taking with respect to Respirometics and our recently funded grants are a more useful approach-trying to bolster what our bodies should already be doingrather than trying to block a pathway here and a pathway there. Also, while blocking some paths can be a successful approach, they can also lead to unintended consequences, which make the therapeutic approach less safe for the patient," he said.

Dr. Barrett summed it up by saying, "that's the story and approach we're talking about is a more natural host defense approach, if you will. And then we're taking the biology we understand with our collaborators at Harvard and actually trying to develop new therapies ourselves."

Mauderly Receives American Thoracic Society (ATS) Award

Dr. Joe L. Mauderly, DVM, Senior Scientist Emeritus of LRRI, received the American

Thoracic Society's Assembly on Environmental & Occupational Health Val Vallyathan Senior Investigator Award last May in San Diego, California. This award recognizes individuals who have provided outstanding contributions to basic and translational science in environmental or occupational respiratory diseases. The award was presented at the annual 2014 ATS International Conference. ATS has over 15,000 members. The award was created in honor of Val Vallyathan, world-renowned research pathologist who studied occupational lung disease at the NIOSH for over 30 years.

40 Under 40 Award to Shannon Toma

Our Executive Vice President and Chief Operating Officer/Acting CFO, Shannon Toma, was named a member of the **2014 "40 Under 40,"** which is sponsored by *Albuquerque Business First*, a business publication for the Albuquerque business community. Three judges, all 40 Under 40 alumni, evaluated over 950 applicants based on their professional achievements, their leadership and their community involvement.

Lovelace Scientific and Technical Services Receives Exceptional and Very Good Rating

LSTS received "Exceptional and Very Good" on its annual Contractor Performance Assessment Report for the work it has been performing in a Case Management Support Services contract that supports the Navy's Bureau of Medicine and Surgery. The work is to evaluate the Navy's ability to perform Case Management (CM). The Navy offers CM services for service members and their families including recovering wounded, ill and injured (WII) members of the Armed Forces at CONUS and OCONUS locations. All members/beneficiaries of the Armed Forces who come to a Navy military treatment facility (MTF) or clinic are eligible for CM services. CM enhances clinical and resource efficiency, improves quality of care, and supports the integration of health resources, care coordination and continuity of care.



Amounts in 000s

Assets

Current assets: Cash and equivalents Receivables Marketable securities Other current assets Total current assets Property, plant and equipment, net Other noncurrent assets Total assets Total current assets

Liabilities and Net Assets

Current liabilities:

Lines of credit

Current installment of long-term debt

Accounts payable

Accrued expenses

Deferred revenue

Total current liabilities

Long-term debt, excluding current installments Total liabilities

Net assets:

Unrestricted

Total liabilities and net assets

Selected Contracts

Safer Ways to Evacuate Military Combat Casualties

A Department of Defense test track at the LRRI South Campus in Albuquerque was recently completed. The test track was designed based on data collected from military ground evacuation vehicles in theater, and was built in conjunction with the Aberdeen Proving Grounds. This test track represents a joint collaboration between USAARL, MRN and LRRI, with the ultimate goal of providing safer methods for evacuating military combat casualties. It specifically provides expanded capabilities to research development of en-route care translational models as well as development of traumatic brain injury and spinal cord models.

Gates Foundation Grant Examines the Effect of Wood Smoke on Existing Bacterial Infections

LRRI was awarded a grant from the GATES Foundation to examine the effects of wood smoke on existing bacterial infections in humans. Volunteers had their nose and throat swabbed for the presence of bacteria and those who were found positive for harboring bacteria participated in a study that exposed them to hardwood smoke generated from a conventional woodstove versus plain air. Following exposure the colonization of the bacteria was reassessed in the nose and throat. The results will assess whether hardwood smoke is detrimental to people with existing bacterial infections.

Other Recent Contract Awards

Program to Develop Countermeasures Against a Chemical Agent

Program to Develop Countermeasures Against Acute Radiation Syndrome

Project to Inform Tobacco Policy

Project to Evaluate Synergistic Effect of HIV on COPD

5-Year Analysis of Revenue from All Sources

(in thousands)



** Includes \$65,291 for DOE Campus Acquisition

financial report

	2014		2013
\$	1,112 13,811 47,327 1,405	\$	592 19,766 45,429 2,101
	63,655		67,888
	100,461 2,799		105,692 3,937
\$ \$	103,260 166,915	\$ \$	109,629 177,517
	2014		2013
\$	4,366 2,932 2,948 10,064	\$	7,133 3,257 3,858 7,637
	5,012		4,050
	25,322 7,665		25,935 10,367
	32,987		36,302
	133,928		141,215
\$	166,915	\$	177,517



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William Randolph Lovelace II (with his back to the camera) shares a joke with four of the Mercury astronauts.

Left to right: Donald K. "Deke" Slayton; Virgil "Gus" Grissom; John Glenn; and Alan Shepard.

Astronay

In 1958, the Lovelace Foundation developed an extensive series of rigorous tests designed to judge the fitness of candidates for the NASA Space Travel Program. From a group of 33 military pilots, the seven Project Mercury astronauts were selected to be the first Americans in space.

President Lyndon Johnson appointed Randy Lovelace Director of Space Medicine for NASA on April 21, 1964. Not long thereafter, Randy and his wife, Mary, died in a plane crash while returning home from Aspen, Colorado on December 12, 1965. Soon after Randy's death, NASA announced that a crater on the moon had been named in honor of William Randolph Lovelace II, a man who had done so much to advance space medicine.

> The seven Mercury astronauts (vetted by the Lovelace Foundation) sent this photo to Randy Lovelace with their best wishes.

Left to right: Scott Carpenter, Leroy Cooper, John Glenn, Virgil "Gus" Grissom, Walter Schirra; Alan Shepard, and Donald "Deke" Slayton.