



Sharing the stories that bring clinical
laboratory medicine to life.

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ARUP's Medical Experts Assist Clinicians in Selecting Laboratory Tests to Diagnose Autoimmune Neurologic Disorders

The first tremor was innocuous, akin to shivering from the cold. It seemed odd, but J. Lowe Barton, a law enforcement professional who was working on restoring a classic vehicle, didn't pay too much attention at the time. The tremors became harder to ignore, though, as they increased in regularity over the next few weeks.

Six weeks later, the tremors were occurring every four to five minutes and resembling seizures. If Barton was unlucky enough to be holding a soda can when one hit, his muscles would involuntarily contract and cause him to squeeze the can, spilling liquid over himself and anyone else nearby. Sleeping became next to impossible, and he would wake with blood on his face where he had scratched himself with

his ring at night during an episode. He and his wife, Kathy, sought answers from doctors in southern Utah, where they live, but the clinicians weren't able to provide any answers. Barton was otherwise in good health, and his magnetic resonance imaging (MRI) scans and infectious disease workups were unremarkable.

At the behest of his concerned daughter, Barton and his wife eventually made their way to the University of Utah's Autoimmune Neurology Clinic, established by Stacey Clardy, MD, PhD, FAAN. By this time, Barton was also exhibiting faciobrachial dystonic seizures and short-term memory loss, both clinical manifestations of autoimmune encephalitis (AE).



Antibodies are part of the body's defense system against infections and cancer, but in autoimmune diseases, antibodies can mistakenly attack healthy cells. This image shows cortical neuron cultures stained with MAP-2 (green), propidium iodide (blue), and FcRn (red). (Image courtesy of Noel Carlson)

Early recognition and treatment of AE are crucial for patients like Barton, but diagnosis can be challenging and time consuming. Fortunately, the synergistic relationship between ARUP Laboratories and the U enables clinicians to stay abreast of rapidly changing diagnostic approaches and work closely with ARUP medical directors to understand test results, ultimately improving patients' lives.

AE comprises a group of noninfectious, immune-mediated inflammatory disorders of the brain. Some onconeural antibodies, such as antibodies that target antineuronal nuclear antibody (ANNA)-1 (also known as anti-Hu), have

been implicated in AE for years and are classically associated with tumors. In recent years, though, antibodies such as N-methyl-D-aspartate receptor (NMDAR) and leucine-rich glioma-inactivated 1 (LG1) antibodies, which target the neuronal surface or synaptic antigens, have been identified and may develop with or without a cancer association.

Although antibody testing alone cannot provide a definitive diagnosis of AE, paraneoplastic syndromes, or any related autoimmune neurologic conditions, the detection of autoantibodies in the appropriate clinical setting can help distinguish between similar disorders and

inform further testing or medical management, said Lisa Peterson, PhD, D(ABMLI), medical director of Immunology at ARUP and assistant professor at the University of Utah School of Medicine.

Because the field is expanding so rapidly, general clinicians—often the first-line providers a patient like Barton might see—can't be expected to stay abreast of

developments in laboratory testing, Peterson said. "There are new antibodies described every few months. It's impractical to expect general clinicians to stay up to speed on these."

To assist clinicians in identifying the autoantibody testing that is most likely to yield positive results in their patients, Peterson and her team at ARUP developed a multitude of testing options, ranging from comprehensive panels, to cost-effective, disease-directed panels, to single autoantibody tests that can be used for monitoring treatment and disease course.

Peterson routinely consults with clinical pathologists about this topic but felt that it was equally important that ARUP bring on board an autoimmune neurologist who could serve as a clinical consultant. She envisioned this person as having an understanding of how the tests are performed and their limitations, as well as the ability to help clients interpret the tests and guide them toward next steps.



Lisa Peterson, PhD, D(ABMLI), medical director of Immunology at ARUP, completed her clinical immunology fellowship at the University of Utah and ARUP. Her research interests include cellular immunology and autoimmune immunology with a focus on autoimmune neurology.



Peterson and Tammy Smith, MD, PhD, review immunostaining of organotypic slice cultures in the lab. Smith said that her work with ARUP informs her research laboratory work at the VA Salt Lake City Healthcare System, where she uses animal models to study the mechanisms by which antineuronal antibodies mediate neurologic disease.

That's where Tammy Smith, MD, PhD, comes into the picture. Smith joined ARUP in April 2022 as a clinically trained, board-certified neurologist. During Smith's time at the University of Utah's Autoimmune Neurology Clinic, where Barton was treated, she appreciated the unique relationship shared by ARUP and the U. "As physicians, we really relied on our relationship with ARUP and Dr. Peterson to help us better understand the testing options that were available to us and to discuss clinical testing in challenging cases," Smith said.

During her time as an autoimmune neurology fellow at the Mayo Clinic, Clardy experienced firsthand the benefit of having a neurology clinic closely associated with a clinical reference laboratory. "Simply put, when I started the U's clinic, not many neurology departments had the vision to understand how [this relationship] could be successful, but the U did," said Clardy. "Having a close partnership with ARUP allows us to diagnose our patients much faster and more efficiently than most any other location in the country."

While Smith was an autoimmune neurology fellow in Clardy's program, she rotated with Peterson at ARUP. "Many physicians don't have the opportunity to see how clinical laboratory testing is done," explained Smith. "Because of my PhD in microbiology and immunology, I was familiar with a lot of the techniques, but I was just very interested in seeing how clinical laboratory testing happens."

Smith's interest in continuing to do basic science research and see patients was intriguing to Peterson, who sees Smith as uniquely situated to bridge the gap between clinical practice and the laboratory. "She brings in the experience of having seen patients, of determining the appropriate tests to order, and of being able to understand and interpret results in a clinical setting," Peterson said.

Because the majority of autoantibodies are extremely rare, most have low positivity rates. Therefore, reliable autoantibody identification is highly dependent on determining the likelihood that a patient will test positive for any given antibodies. To obtain the most actionable information from autoantibody testing, it makes the most

sense to order a targeted panel based on the clinical presentation of the patient, Peterson said. "If you consider how the patient presented, their history, and their clinical and imaging exams, you can start to parse out which tests are most likely to be positive."

Moreover, if there is a high pretest probability of a known syndrome, Smith said, waiting for the results of antibody testing should not delay treatment. Some antibody-mediated disorders can be severe and even life-threatening, but may be reversible with prompt and appropriate treatment. Even so, the results of antibody testing help support clinical decision-making when it comes time to consider long-term management options and prognosis, explained Smith.

Fortunately, Barton's condition was one that responded to treatment. Barton was diagnosed with LGI1 antibody encephalitis, a form of AE for which early treatment may prevent long-term cognitive deficits and reduce seizure activity over time.

Kathy Barton recalls the neurologist at the U telling her that they were fortunate to have gotten her husband in when they did. "They told me that if J.'s illness had persisted much longer, he may not have recognized me in a few months' time," she said. It took many years of immunosuppressive therapy to treat his illness, but today, Barton has completed his treatment plan and lives a full and happy life with Kathy.

"Dr. Peterson and her team are devoted to this patient population and care deeply. They never fail to bring all of the resources ARUP has available to benefit our patients," said Clardy. "Our patients benefit despite never knowing what's required behind the scenes to make it happen."

Stories like Barton's keep Peterson and Smith focused on ways they can continue to advance patient care. Importantly, Peterson and Smith will work with Clardy's autoimmune neurology fellows during their rotation at ARUP in an ongoing effort to share knowledge about the intricacies of neural antibody testing.

"An autoimmune neurologist needs to understand the details of this testing to avoid misdiagnosis and misinterpretation of low-positive results," said Clardy. "Understanding which test results are relevant in each given clinical context is essential to know when to utilize—and importantly, when not to utilize—available therapies," said Clardy.



The Bartons enjoyed a cruise to the Dominican Republic in March of this year. They live a life full of adventure, thanks in large part to the timely diagnosis and treatment he received.

For her part, Peterson said that she is always collecting positive samples for new antibodies and plans to validate several to add to ARUP's test menu in the coming year.

"ARUP was one of the first laboratories in the country to offer testing for NMDAR antibodies. I want to continue on that path of identifying new antibodies and understanding the pathogenesis behind these diseases because that will ultimately inform and improve therapies for patients," Peterson said.

Smith plans to continue to conduct basic science research at the VA Salt Lake City Healthcare System to study the mechanisms behind paraneoplastic syndromes and neurologic disease. She and Peterson are also collaborating on a study to determine the value in testing for autoantibodies in both serum and cerebrospinal fluid (CSF).

"There's so much room in this field to improve patients' lives," Smith said. "We're still in the infancy of understanding these diseases, how we test for them, and how we treat them. In five years, the story we tell will be different from the one we tell today." ■

ARUP's New Autoimmune Neurologist Adds Unique Experience to Advance Understanding of Immune-Mediated Neurologic Diseases

As a child growing up on her family's vegetable farm, Tammy Smith, MD, PhD, spent a lot of time thinking about the rhythm of an ecosystem.

"You've got precipitation, soil, sun, nutrients, invasive species," she said. "You've got all these things interacting, so how do you ensure they work well together?"

Now a neurologist, Smith thinks about the body in much the same way.

"The nervous system, digestive system, heart, lungs, kidneys ... these function as discrete organs but have to work together for the organism to survive," said Smith, whose love of science eventually took her from the farm just north of New York City to medical school. "The human body is like an ecosystem on an individual scale, and the immune system carries information throughout the body to make sure all of the parts communicate with each other."



Autoimmune neurologist Tammy Smith, MD, PhD, grew up on vegetable farm in New York. Her love of science led her to medical school and a career in research and clinical care of patients with paraneoplastic neurologic syndromes (PNSs).

Smith's subspecialty is autoimmune neurology, the study of antibody-associated diseases that affect the nervous system. It's a perfect pairing of her natural interests in immunology and neurology. She was drawn to neurology by the many unanswered questions in that field and the opportunity to collaborate across medical specialties to provide patient care.

"When you have a chronic neurologic disease, such as multiple sclerosis, a stroke, or Parkinson's disease, your neurologist becomes an essential member of your healthcare team. I love that neurology provides an opportunity to have an ongoing relationship with my patients."

Smith completed a fellowship in autoimmune neurology, during which she cared for patients with multiple sclerosis, paraneoplastic neurologic syndromes (PNSs), and autoimmune encephalitis. Her research focuses on the mechanisms that lead to the development of PNSs, a group of conditions that affect the nervous system—brain, spinal cord, nerves, and/or muscles—and are frequently associated with cancer.

She joined ARUP Laboratories in April 2022 as a clinical consultant in autoimmune neurology, becoming part of a team run by Lisa Peterson, PhD, D(ABMLI), medical director of Immunology. The group is working to advance the scientific understanding of immune-mediated neurologic diseases and improve patient testing and treatment outcomes. "I'm really excited to be joining this team and to be working with Dr. Peterson," Smith said.

Smith has lived in Salt Lake City on and off since 2001, when she first moved to Utah with her husband to enjoy skiing "The Greatest Snow on Earth." From 2006 to 2015, she attended the University of Utah, earning a combined MD/PhD degree with an emphasis in microbiology and immunology. She spent four years in Chicago at Rush University Medical Center, completing her internal medicine internship and neurology residency. She returned to Salt Lake City, and the "academic powerhouse" of the U, for an autoimmunology fellowship, which included a month-long, laboratory-intensive rotation at ARUP.

That's where Smith met Peterson, who helped launch and oversee the laboratory portion of the fellowship program. Peterson said she was immediately impressed by Smith and felt a kinship with her.

"We share similar goals in terms of what we want to do to expand tests and what we are trying to do for patients," said Peterson, who was already hoping to add a neurologist with clinical experience to her team to help with a growing demand for test consultations.

Smith's desire to pair basic science research with patient care made her a perfect fit, Peterson said.

In an email to ARUP leadership, Peterson made her pitch, saying Smith would be an incredible asset: She could help grow the reference laboratory's test, educational, and consultative offerings, as well as facilitate research that could lead to the discovery of novel antibodies associated with neuronal diseases.

"I really see the two of us being able to have a great synergism; she can help us here, and we can help identify and provide samples that can then be used in her research lab to really study these diseases," Peterson wrote. "Her work can also inform how we better perform testing as well as other aspects of patient management."

Clinicians and patients will see an immediate benefit from Smith's expertise as they look for answers to important and daunting medical questions.

"I have the experience to speak to ordering clinicians and share my understanding of how the assays are being done, as well as their limitations, sensitivity, specificity, and the pretest probabilities," Smith said. "My clinical training allows



Smith, an autoimmune neurologist whose research and clinical work focuses on patients with PNSs, joined ARUP in April 2022. She works with Lisa Peterson, PhD, D(ABMLI), medical director of Immunology, to advance scientific understanding of antibody-mediated neurologic diseases.

A Passion for Pathology: Former ARUP Fellow Uses Next Generation Sequencing to Improve Patient Care

Eric Duncavage, MD, has a passion for pathology that thrives in the space between technology and the possibilities for its use to improve patient care.

“The idea that you can take new technologies and bring them into the clinical laboratory and apply them to questions in medicine is exciting,” said Duncavage, section head of molecular oncology at Washington University School of Medicine in St. Louis, where he also heads the Translational Research Laboratory.

“You can really work on the cutting edge of transforming care, not just by doing research experiments, but by taking what you’ve learned and putting it in the clinical environment,” the molecular hematopathologist added. “In pathology, you’re really solving the problems—or at least coming very close.”

Duncavage’s path to a career in technology-driven translational medicine ran through ARUP Laboratories. In 2009 and 2010, he was an ARUP hematopathology fellow with a front-row seat as ARUP researchers worked to revolutionize genetic testing and disease diagnosis.

“Back then, next generation sequencing was limited to large retrospective research studies, and it was unclear whether it would actually make it into the clinical mainstream,” Duncavage said. “Now we’re sequencing specimens from patients every day.”

Duncavage’s ARUP fellowship served as a springboard to success, and in 2011, he began working at Washington University, where he made an immediate impact. He was part of the team that established the first next generation sequencing-based oncology diagnostics laboratory at an academic medical center.

“We had to write the rules of the road because no one had ever done it before.”



Describing their work, which ranged from assay design to informatics and analysis software development, he said, “We had to write the rules of the road because no one had ever done it before.”

Today, Duncavage is an internationally recognized leader in sequencing-based diagnostics for myelodysplastic syndromes (MDSs) and other myeloid malignancies. His laboratory research focuses on developing new methods for detecting and monitoring small clonal populations in cancer, including minimal residual disease. His clinical work, focused on the diagnosis and pathogenesis of MDSs, is aimed at improving the accessibility of clinical sequencing-based diagnostics.

A graduate of the University of Tennessee College of Medicine, Duncavage had gone on to a residency and molecular genetic pathology fellowship at Washington University. At the time, he didn’t know much about ARUP, but decided to apply for a fellowship there after a former colleague said it was an amazing place to practice pathology.

ARUP’s high-volume academic reference laboratory status was a big draw when he was looking for fellowship opportunities, and the fact that it also provided rich mentorship opportunities was the icing on the cake.

me to help them interpret the tests and hopefully guide them to the next steps for diagnosis and treatment.”

Peterson believes those same insights will be invaluable as she and her team consider how to prioritize next steps in research and test development to advance patient care.

“I have this list of tests that we want to validate,” Peterson said. “And I can look at frequencies in the literature and make assumptions, or I can even do retrospective evaluations of frequencies to help drive those decisions. What Tammy can do is provide perspective about which of these options she finds most clinically valuable.”

Smith also brings her own network of resources and relationships to the table, connections that may expand ARUP’s opportunities for new collaborations, Peterson said.

It is an exciting time to be working on the challenges of immune-mediated neurologic diseases, Smith said. New antibodies targeting the nervous system are identified every year, and these discoveries have allowed researchers to characterize the syndromes these antibodies cause. That’s good news for patients and families who are struggling to understand their symptoms and looking for answers, she said.

One example of such a finding is the identification of antibodies to aquaporin-4, which are associated with a disease called neuromyelitis optica (NMO). Before the discovery, patients were often diagnosed with multiple sclerosis (MS), Smith said, but many treatments for MS can actually worsen NMO. With the discovery of new antibodies and the development of tests specific to them, patients with NMO can be clearly identified and grouped for clinical trials. During the past three years, breakthroughs like these have led the U.S. Food and Drug Administration (FDA) to approve three new medications for the treatment of NMO.

Such advancements promise to provide future patients diagnosed with immune-mediated neurologic disorders with targeted treatments that are more effective and have fewer side effects.

“We are still in the infancy of understanding these diseases—how to appropriately test for antibody-mediated neurologic diseases and how to appropriately treat them,” Smith said. “I am excited to see what we will learn going forward to improve the lives of patients.” ■



Former ARUP fellow Eric Duncavage, MD (right), and his colleague Matthew Walter, MD (left), work in the lab at the Washington University School of Medicine in St. Louis. Their work has shown that DNA sequencing of blood cells soon after a patient receives a stem cell transplant to treat myelodysplastic syndrome (MDS) can predict whether the patient has a high risk of disease recurrence. (Photo courtesy of Washington University School of Medicine)

Weekly, Duncavage and other fellows met with ARUP cofounder and then-CEO Carl Kjeldsberg, MD, to review cases and discuss the key advancements and discoveries that shaped modern hematopathology. One such lesson, Duncavage recalled, was on Burkitt lymphoma, a form of non-Hodgkin lymphoma in B cells that is fatal if left untreated.

"Hearing about the history of how these different diagnostic entities came to be defined was just fascinating," said Duncavage. "And to meet with [Kjeldsberg] to work through challenging cases was very helpful."

Sherrie L. Perkins, MD, PhD, a former ARUP CEO and an international expert in pediatric lymphoma, was another close mentor. At the time, Perkins, also a Washington University pathology graduate, served as the hematology and oncology fellowship director while also running her own basic science lab.

"Getting her ideas and opinions about how to start a research lab and how to apply for grants was very helpful," said Duncavage, who is board certified in anatomic pathology, clinical pathology, molecular pathology, hematopathology, and clinical informatics. "She was a huge influence in helping me get started in research and has remained a mentor and friend for many years."

From high-quality assay design and scaling up test volumes to meet test demands, to basic specimen management and the careful drafting of test validations, the laboratory Duncavage's career—as did the knowledgeable mentors.

"The fellowship set me up with a solid foundation for studying hematologic malignancies and a better understanding of laboratory testing," he said. "It's a foundational experience and education that is woven into the work I do every day." ■

ARUP invites all former fellows to share their stories with Magnify: The Art and Science of Diagnostic Medicine. We want to hear about your successes and the ways in which you are building on your ARUP experience to advance clinical laboratory science and improve patient care. To share your story, please contact us at media@aruplab.com.

PEOPLE PROUD

ARUP Awards and Recognition

Every day at ARUP, our employees work to better the world around them through contributions to clinical pathology, education, and communication. We are proud of our staff members for their accomplishments and are pleased to recognize their dedication and skill. Below is a sample of recent achievements that demonstrate ARUP's dedication to continuous improvement as an academic reference laboratory and employer.

Academic and Research Awards and Achievements



Tracy George, MD, President and Chief Scientific Officer

ARUP President and Chief Scientific Officer **Tracy George, MD,** cofounded the American Initiative in Mast Cell Diseases (AIM) with the goal of creating a platform for interdisciplinary research on mastocytosis and related mast cell diseases. In May 2022, AIM held its annual Physician and Investigator Conference in Salt Lake City, Utah. George played an integral role by hosting events at ARUP and offering a premeeting lab workshop to educate participants on testing for mast cell disorders.



Sandy Richman, MBA, C(ASCP), AHAS Director

Sandy Richman, MBA, C(ASCP), director of ARUP Healthcare Advisory Services (AHAS), accepted the 2021 Choosing Wisely Champion Award on behalf of the AHAS team. AHAS developed AnalyticsDx™ dashboards, which help clients choose holistic laboratory testing for their patients while eliminating duplicate or unnecessary tests. These dashboards are consistently used by healthcare facilities to optimize care and reduce costs for patients. During the past three years, the AHAS team has completed more than a dozen consulting projects, helping healthcare facilities save more than \$700,000 annually.



Dave Shiembob, MBA, C(ASCP)CM, AHAS Supervisor



Kelly Doyle, PhD, DABCC, FAACC, Medical Director of Special Chemistry and Endocrinology

Kelly Doyle, PhD, DABCC, FAACC, medical director of Special Chemistry and Endocrinology, and **Mark Kushnir, PhD,** scientific director of R&D Mass Spectrometry (MS), were awarded the American Association for Clinical Chemistry (AACC) Endocrinology Division Abstract Award based on the abstract for their poster entitled, "Free or Total Testosterone? Assessment of Androgens Status in Reproductive Age Females." They will present the poster at the annual AACC conference in late July.



Mark Kushnir, PhD, Scientific Director of Research and Development (R&D) Mass Spectrometry (MS)

Kushnir was also awarded the 2021 Al Yergey Mass Spectrometry Scientist Award from the American Society for Mass Spectrometry for his leadership in adopting tandem MS. He has developed numerous MS clinical assays, including a novel assay for 25-hydroxy vitamin D. Over the course of his distinguished career, he has published more than 100 papers, collaborated with other researchers, and acted as a member of various editorial boards.



Tom Martins, MS, Lead Scientist in the R&D Immunology Group

Tom Martins, MS, lead scientist in the R&D Immunology Group, was awarded the Paul E. Strandjord Young Investigator Award from the Academy of Clinical Laboratory Physicians and Scientists (ACLPS). ACLPS chose Martins based on his authorship of the abstract entitled, "Development of an Automated Complement C5 Functional Assay for Personalized Monitoring of Patients on C5 Inhibitors," which will be published in the American Journal of Clinical Pathology.



Karen A. Moser, MD, Medical Director of the Hemostasis/Thrombosis Laboratory

Karen A. Moser, MD, medical director of the Hemostasis/Thrombosis Laboratory, was awarded the 2021 Joseph A. Knight Award for Excellence in Education from the University of Utah Department of Pathology for her outstanding contributions to medical education at the U. In her time as a U faculty member, Moser has served as a course director for first-year medical students, a leader in medical school curriculum development, and director of an elective clinical pathology rotation for third- and fourth-year medical students.



Jonathan Genzen, MD, PhD, Chief Medical Officer



Chérie Petersen, Distance Education Program Lead, ARUP Institute for Learning



Matt Pool, Education and Event Lead, ARUP Institute for Learning

ARUP was awarded two Gold Viddy Awards for educational videos developed and narrated by **Jonathan Genzen, MD, PhD,** chief medical officer. The videos were filmed and edited by **Matt Pool,** education and event lead in ARUP's Institute for Learning, and produced by **Chérie Petersen.** In the videos, Genzen explains how Moderna, Pfizer BioNTech, Johnson & Johnson, and AstraZeneca COVID-19 vaccines work, with the timely goal of educating the public about COVID-19 vaccines.

Marketing and Communications Awards



Lisa Carricaburu, MBA, Director of Marketing Communications and Clinical Decision Support

Lisa Carricaburu, MBA, director of Marketing Communications and Clinical Decision Support, was recognized as a Bridge Builder in Ragan's Top Women in Communications Awards for 2022 for her integral role in communications during the pandemic. Carricaburu managed the production of crucial, time-sensitive COVID-19 content, including 15 podcasts, more than 50 articles, and 11 educational webinars. She also undertook a large-scale initiative to improve perceptions of ARUP's leadership internally by establishing weekly communications from the CEO and a feedback portal for employees.



Julio Delgado, MD, MS, Executive Vice President

ARUP won a Gold Viddy Award for a LabMind podcast episode dedicated to laboratory leadership, which features a conversation between **Julio Delgado, MD, MS,** executive vice president, and podcast host **Brian Jackson, MD, MS,** medical director of Support Services, IT, and Business Development. In the podcast, produced by **Chérie Petersen,** distance education program lead for ARUP's Institute for Learning, the discussion between Jackson and Delgado highlights various struggles faced by the laboratory industry during the early months of the pandemic, with the goal of emphasizing the importance of laboratory medicine to a general audience.



Brian Jackson, MD, MS, Medical Director of Support Services, IT, and Business Development

Company Awards

- ARUP won an honorable mention in the national **Employee Communications Awards** presented by **Ragan Communications.** ARUP earned recognition in the contest's COVID-19 Communication category for messaging delivered early in the pandemic. Ragan recognized ARUP for introducing a daily CEO email to update employees on operations, safety, and health resources. The honorable mention also was based on the COVID-19 pages created and updated repeatedly on Nucleus and the COVID-19 Exposure/Symptom Reporting Tool built to help the Family Health Clinic monitor employees' health.
- ARUP ranked second on **Forbes' list of America's Best Employers by State for 2021,** competing with all other Utah businesses with 500 or more employees.
- ARUP was featured on **Forbes' list of America's Best Employers for Diversity for 2022.** ARUP persistently advocates for diversity, inclusion, and belonging in the workplace by regularly launching new diversity initiatives, including the recently implemented employee engagement groups.
- ARUP made **Forbes' list of America's Best Midsize Employers for 2022.** This ranking is earned on the basis of employee surveys that ask respondents to rate how likely they are to recommend their employer to others.



- For four consecutive years, ARUP has won **Utah Business magazine's Best Companies to Work For Award** based on employee responses to an anonymous survey. The survey takes into account benefits and pay, fairness and opportunities, corporate culture, internal communication, and employee pride.
- ARUP earned the **2021 Thomas A. Martin Business Recycler of the Year Award** from the Recycling Coalition of Utah (RCU). The award recognized the company's recycling program efforts, which keep about 300 tons of material out of Utah landfills annually. In a year's time, ARUP recycled 78.5 tons of Styrofoam, cardboard, and plastics, 52 tons of comingled waste, 50 tons of metals, 30 tons of food waste, 26 tons of electronic waste, and 25 tons of glass.
- Utah Construction & Design magazine recognized ARUP's new state-of-the-art building with the **Most Outstanding Laboratory/Research Project award** for 2021 based on its extremely efficient heating, ventilation, and air-conditioning (HVAC) system, among other features.

This publication contains
excerpts from ARUP'S
digital magazine, Magnify:
The Art and Science of
Diagnostic Medicine.



aruplab.com/magnify-summer22

ARUP LABORATORIES

500 Chipeta Way
Salt Lake City, UT 84108-1221
Phone: 800-522-2787
Fax: 801-583-2712
aruplab.com

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and its Department of Pathology.*

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