Some of the nation’s most esteemed scientists, physicians and patient advocates and organ procurement organizations met at Philadelphia’s Logan Hotel on Nov. 18, 2016, for NDRI’s 2016 Scientific Symposium: From Donation to Discovery – Unlocking the Mysteries of Brain Injury, Neurological Disease and Pain through Research with Human Biospecimens. Gary Stix, senior editor for Scientific American, moderated informative and engaging panel discussions on the role of human tissue in two key research areas: pain and brain injury. The keynote speaker was Dr. Bennet Omalu, a pioneer in brain injury research.

Relief: The Role of Human Tissue in Pain Research

More than 100 million American adults experience chronic pain, according to the National Academy of Medicine (NAM). NAM estimates that pain costs the U.S. as much as $645 billion annually, and a lack of understanding of the mechanisms involved makes it difficult to treat clinically. Failed clinical trials based on animal models seem to point to the need for studies with human tissues and cells.

“The value of human tissue samples is really being able to directly ask the question, how similar are these model organisms that we use for so much of our discovery research, to the physiology of humans?” said panelist Robert Gereau, PhD, director of the Washington University Pain Center. "When you actually start looking at the quantitative details, the little differences between the species, that’s where we run into trouble, especially if we’re trying to design drugs. Because these

For a full list of panelists, see the symposium recap insert in this issue.

University Pain Center. “The use of human tissue in experiments is the first step in taking things from an animal model to people and, to me, tissue is an invaluable resource.”

Andre Ghetti, PhD, chief executive officer of AnaBios Corporation, agreed. “When you actually start looking at the quantitative details, the little differences between the species, that’s where we run into trouble, especially if we’re trying to design drugs. Because these

continued on page 8
With new leadership in Washington, DC, a palpable level of uncertainty abounds across the nation and within the biomedical research community. It is unclear whether the priority assigned to investment in research by the new administration and congress will align with the high priority assigned by the public. Some ominous early actions by the president and administration have alarmed scientific communities and stakeholders in science, which, when you think about, includes all of us. A first ever “March for Science” will take place in Washington, DC and in a variety of cities across the country on April 22. The march will service as a celebration of the nation’s passion for science and a call to support and safeguard the scientific community. More information on the march can be found at www.marchforscience.com.

A new Secretary of Health and Human Services (HHS), Dr. Tom Price, will oversee the National Institutes of Health (NIH), Centers for Disease Control and Prevention (CDC), the Food and Drug Administration (FDA) and other health-related federal research agencies. Dr. Francis Collins, Director of the NIH, has been asked to remain in his position. It is reassuring to the scientific and patient communities that he remains positioned to offer strategic counsel on what is needed to propel the nation’s biomedical research engine.

With federal budget conversations well underway, it is shaping up to be potentially the most challenging environment for science funding in several years. The administration has communicated that an initial blueprint of the president’s 2018 budget will be released in mid-March. At the same time, discussion of policy changes tackling excessive regulation are being vetted by pharmaceutical and biotechnology companies and patient advocacy organizations. All stakeholders are optimistic that streamlined regulation could spur greater investment in research and speedier translation of research to cures and treatments for disease.

Amidst this uncertainty, we at NDRI know that the essential role and value of human tissue to advance research remains unchanged. We are privileged to work closely with scientists supported by federal research agencies, pharmaceutical and biotechnology companies, patient advocacy organizations and private foundations. The full spectrum of disease is represented by the scientists that we serve and the research they work to advance.

Scientists participating in NDRI’s 2016 Scientific Symposium discussed in detail, the role of human tissue in research exploring pain and a range of neurological diseases. See the cover story on page 1 of this newsletter and the recap insert to learn how human tissue is essential to responding to the challenges of this research. Video recaps capturing highlights of our symposium can be accessed via our website at www.ndriresource.org.

In closing, I want to salute my staff colleagues for their exceptional work which has contributed to NDRI’s receipt of College of American Pathologists (CAP) accreditation. Information on this milestone achievement can be found on page 3.

We look forward to opportunities to support your research!

Bill Leinweber
President & CEO
National Disease Research Interchange
NDRI proudly announces that it received Biorepository Accreditation from the College of American Pathologists (CAP) in September 2016. The CAP Accreditation Committee awards accreditation based on the results of a rigorous process that includes on-site inspections every three years, desk review, educational modules and gap assessment. According to CAP, the U.S. government recognizes the CAP Laboratory Accreditation Program, established in the early 1960s, as equal to or more stringent than the federal inspection program.

“NDRI is proud to have earned CAP accreditation”, said Bill Leinweber, president and CEO of NDRI. “This accreditation is a testament to the dedication and shared commitment of all of our staff to assuring that the gifts with which we are entrusted to advance biomedical research are managed with the highest scientific standards.”

Accreditation was first evaluated in late 2014, when NDRI staff initiated feasibility studies to assess the organization’s ability to adhere to more than 300 CAP requirements. Bernadette Mestichelli, MBA, NDRI’s quality assurance director, and Gene Kopen, PhD, senior vice president, business development, led a team that updated policies and processes to comply with CAP’s exacting requirements. Team members included Randi Tobin, quality assurance specialist, and Randall Sassaman, senior manager, logistics management.

NDRI Launches Partnership with Bay Area Lyme Foundation and Lyme Disease Biobank

Beginning in 2017, the Bay Area Lyme Foundation and Lyme Disease Biobank (LDBB) are partnering with NDRI to build a mechanism to collect, bank and make a diverse group of tissues available to the Lyme disease research community. A primary focus of the project is to collect tissues from donors infected with *Borrelia* bacteria and annotate those tissues with extensive clinical data. Biospecimens collected for this project will help scientists understand how the *Borrelia* bacteria multiplies throughout the body, causing symptoms that affect the joints and the nervous and cardiovascular systems. NDRI completed the first successful recovery of tissues from a donor referred by the Lyme Disease Biobank in August 2016.

**Contributing special expertise to collaboration**

Drawing on its expertise in using researcher-driven post mortem human tissue donation programs and its established national biospecimen recovery network, NDRI will work with the Lyme Disease Biobank leadership on a collaborative plan to collect authorized tissues after death. This collaboration will focus on establishing best practices to uniformly identify, authorize, recover, store and ship these important research biospecimens across multiple collaborating institutions. NDRI’s collaboration will supplement the Lyme Disease Biobank’s current blood and blood product biospecimen collection program which launched in 2014. Samples collected during this pilot phase will be available in 2017.

Biospecimens collected via NDRI’s network will be banked at the LDBB, and made available to investigators conducting various research programs including genomic studies and investigation of co-infection variables. Researchers will examine patients’ medical histories to understand the disease progression and the specific effects the bacteria has on variety of tissue types. Lyme Disease Biobank will store biospecimens and distribute them to Lyme disease researchers.

Liz Horn PhD, MBI, Principal Investigator, Lyme Disease Biobank shared “We are thrilled to partner with NDRI to create an opportunity for people with Lyme disease to donate important biospecimens that will further our understanding of the diagnosis, treatment and pathogenesis of this complex disease. This will be a tremendous resource for Lyme disease research.”

For more information on this initiative, visit: http://www.bayarealyme.org/our-research/national-lyme-biorepository/

To learn more about how you could support this effort, please contact Alisa McDonald at amcdonald@ndriresource.org.
Chronic pain is a major health issue in the United States. It is estimated to affect the lives of 100 million Americans, so it is critical to understand pain biology. Much has been learned from animal models, but the search for effective therapies relies on human tissue. NDRI works with an impressive network of investigators, including those advancing pain research, like Ru-Rong Ji, PhD, distinguished professor in the Department of Anesthesiology and professor in the Department of Neurology at Duke University Medical Center.

NDRI’s dorsal root ganglia (DRG) Program provides human tissue essential for researchers like Dr. Ji, who are studying the mechanisms underlying chronic pain. DRGs are clusters of sensory nerve cell bodies whose processes relay information from peripheral nerves to the spinal cord. They are key to understanding how pain is processed by the nervous system.

Dr. Ji and his team are studying the mechanisms underlying chronic pain using both animal models and human DRGs. Dr. Ji’s lab conducts molecular, cellular and electrophysiological studies in human DRG neurons to study gene expression and test novel pain therapeutics. Two recent publications, summarized here, highlight the groundbreaking work that Dr. Ji and his group have done to identify targets for future chronic pain treatments using tissue provided by NDRI.

“NDRI has greatly increased the translational potential of my research,” Dr. Ji says.

Individuals with neuropathic pain often experience mechanical allodynia, a condition in which a low-threshold stimulus, such as the touch of fabric, produces pain. The team studied a means of blocking large, myelinated group A nerve fibers, specifically Aβ fibers, as a target for the treatment of neuropathic pain. Activation of Toll-like receptor 5 (TLR5), along with application of sodium channel-blockers in sensory neurons led to effective silencing of Aβ fibers and suppression of mechanical allodynia.


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Understanding pain and autism


Pain dysregulation occurs in a large proportion of individuals with autism spectrum disorders (ASD), but it is unclear what causes altered pain perception in ASD. Dr. Ji’s group investigated pain sensitivity and sensory neuron function in both an animal model of ASD and a human DRG culture model. The protein product of an identified causative ASD mutation, SHANK3, was found to interact with heat-sensing TRPV1 ion channels in sensory neurons to regulate their function and alter responsiveness to pain. The link between an ASD gene and sensory neuron function provides a potential mechanism for reduced pain perception in ASD, which opens up exciting new lines of investigation for both ASD and chronic pain.

The November 2016 edition of Biopreservation and Biobanking, the official journal of the International Society for Biological and Environmental Repositories (ISBER) featured NDRI’s work in an article titled “The National Disease Research Interchange and Collaborators on: What Are the Major Hurdles to the Recovery of Human Tissue to Advance Research?” The “Experts Speak” piece identifies two approaches for human tissue acquisition programs: recovery network of organ procurement organizations (OPOs) and tissue banks, and a private donor registry for rare disease. The article highlights several NDRI neurologic tissue programs, including The National ALS Biorepository and the Children’s Tumor Foundation, as well as the NIH NeuroBioBank.

Contributors to the articles were:

NDRI
- Jeffrey Thomas
  Vice President, Strategic Initiatives
- Melissa VonDran, PhD
  Director, Scientific Services
- Michelle P. Freund, PhD
  Program Officer

McKing Consulting Corporation
- Maggie Ritsick, MPH
  Vice President, Director of Atlanta Operations
- Wendy E. Kaye, PhD
  Senior Scientist

Agency for Toxic Substances and Disease Registry
- Maureen Orr, MS
  Surveillance Team Lead, Agency for Toxic Substances and Disease Registry

Children’s Tumor Foundation
- Annette Bakker, PhD
  President & Chief Scientific Officer
- Pamela Knight, MS
  Clinical Program Director
Autism spectrum disorder (ASD) can cause repetitive behaviors that can’t be controlled, as well as problems with delayed development and trouble communicating. Researchers are studying the cause of ASD-related behaviors. Since 2015, NDRI has partnered with the National Institute of Mental Health (NIMH) to collaborate on the development of a donation program to acquire non-diseased and autistic human brains to advance research into ASD.

To support this project, NDRI established an organ procurement organization network of 10 tissue source sites (TSS) dedicated to collecting brains for this research. This multi-site network has been a key strategy for the NDRI/ NIMH partnership. Following recovery, neurologic tissues are sent to the University of Maryland Brain and Tissue Bank for processing, distribution and storage. The facility is part of the National Institutes of Health (NIH) NeuroBioBank, a network of six brain banks across the nation, funded by NIH, NIMH, National Institute of Neurological Disorders and Stroke (NINDS) and the Eunice Kennedy Shriver National Institute of Child Health and Human Development (NICHD).

"Because NDRI has such a broad network of contacts, they are able to supply the NIH NeuroBioBank with brain tissue from rare donors such as children and individuals with autism,” said Ronald Zelke, PhD, director of the University of Maryland Brain and Tissue Bank.

In the first year of the program, which ran from July 2015 to July 2016, NDRI subcontracted TSS to identify donors, obtain donation authorization and collect brains. This network of TSS identified 10 autistic and 10 non-diseased control donors. Ultimately they recovered brains from five individuals with a history of ASD and three unaffected control donors ranging from 2 to 18 years of age. Already in the program year beginning July 2016, there have been a total of five recoveries: four donors with ASD and one control donor. This has been one of the more challenging tissue recovery programs for NDRI. Individuals with ASD don’t succumb to the condition, and so eligible donors are rarely presented. Young control donors are also rare, most young individuals are healthy, and

NDRI ASD Tissue Source Sites
- Center for Organ Recovery and Education (CORE), Pittsburgh, PA
- Dakota Lions Sight and Health, Sioux Falls, SD
- Gift of Life Donor Program, Philadelphia, PA
- LifeGift, Houston, TX
- LifeLink of Florida, Tampa, FL
- LifeLink of Georgia, Atlanta, FL
- LifeNet Health, Virginia Beach, VA
- Mid-America Transplant Services, St. Louis, MO
- Unyts, Buffalo, NY
- Washington Regional Transplant Community (WRTC), Annandale, VA
“Because NDRI has such a broad network of contacts, they are able to supply the NIH NeuroBioBank with brain tissue from rare donors such as children and individuals with autism.”

– Dr. Ronald Zielke, University of Maryland Brain and Tissue Bank

Unyts is among the leading procurement organizations in the United States — and a long-time partner for NDRI. Headquartered in downtown Buffalo, New York, Unyts operates as a non-profit serving the eight counties of Western New York and works to assist donor families, coordinate the donation process and increase the community’s knowledge and awareness of transplantation. Unyts was founded in 1981 as the Organ Procurement Agency of Western New York (OPAWNY), and expanded via a merger with the Buffalo Eye Bank in 1993. Today, Unyts is one of only eight centers nationwide to house organ, tissue and eye procurement in one location.

Due to its commitment to helping donors and their families leave a meaningful legacy through donation to advance biomedical research, Unyts has been a leading NDRI partner for more than 20 years. Over the course of our partnership, Unyts has recovered more than 20,000 biospecimens for hundreds of research projects encompassing every system in the human body and covering a diverse range of scientific disciplines. From donor screening teams to recovery teams, the skilled staff at Unyts consistently provides the expertise necessary to obtain numerous project-specific human biospecimens from healthy donors, as well as those with common or rare diseases, in order to advance medical breakthroughs.

Thomas J. Bell, MS, PhD, NDRI’s vice president of operations, credits Jason Bridge, vice president, eye and tissue services, for leading the charge at Unyts to meet the growing needs of the scientific research community.

“Jason and his team have become our go-to partner for many of NDRI’s special projects and initiatives due to their highly collaborative and proactive nature,” Dr. Bell says.

Unyts has played a major role in supporting most of NDRI’s programs, including the neurological research programs, which carries the challenge of identifying donors with neurological disorders such as autism spectrum disorder. NDRI looks forward to their continued enthusiasm and support toward advancing discovery through human tissue research.

www.ndriresource.org
tiny differences can actually translate into a drug being very effective in a rat and completely ineffective or even toxic in a human. And this is essentially the problem that the pharmaceutical and biotech industries have run into,” Ghetti said.

According to Jon Levine, MD, PhD, of the University of California, San Francisco, “It is going to require cells from patients with specific conditions that can be optimized and studied to understand the pathobiology of the pain in particular conditions. I think our ability to really drill down and do very precise and controlled experiments on cells from patients with particular conditions is really the missing link to making progress in pain research.”

Dorsal root ganglia research and reproducibility

In the same panel, Sulayman Dib-Hajj, PhD, of the Center for Neuroscience and Regenerative Medicine at the Yale School of Medicine, talked about his research with dorsal root ganglia (DRGs) — the tissue next to the spinal cord. The cells in DRGs, or primary afferent neurons, send fibers to the top of the fingers or toes and terminate in the spinal cord. The signal travels from the periphery to the spine to the brain.

Human DRG tissue is not easily available. In 2013 Dr. Dib-Hajj’s lab was able to acquire DRGs by working with NDRI. “The reliable availability of DRGs through NDRI has made it possible, in a predictable fashion, to plan experiments knowing roughly when you will receive your sample and you can get the tissue more than once,” he said. “It’s not enough to get it once or twice – you have to make sure that any data that comes out from these experiments is reproducible.”

Dr. Ghetti also addressed the importance of standardizing tissue procurement and preservation methods. Adult neurons don’t replicate. After a few days, researchers need a new supply.

Ru-Rong Ji, PhD, of the Duke University School of Medicine, pointed to a significant difference between primary sensory neurons like DRG neurons and brain neurons. “An advantage of human primary sensory neurons is that they can survive for a long time after the donor passes,” he said. “Normally after 48 hours they’re still alive because they are from the peripheral nervous system. Cortical neurons — those from the brain — will die within a few hours.”

Health histories and donor education

Penney Cowan, founder and CEO of the American Chronic Pain Association, urged the panelists to make the need for human tissue to advance pain research more widely known. “There has been no real communication between the scientists and the general population, and we need to change that,” she said. “Unless we make our needs known they are not going to be met.”
Panelists also discussed the need to collect more donor health history in order to identify different underlying pathologies — an issue that was raised again during the question-and-answer portion of the discussion. In response, Howard Nathan, president and CEO of the Gift of Life Donor Program in Philadelphia, and a member of the NDRI Board of Directors, reminded participants that Organ Procurement Organizations (OPOs) obtain signed consent forms from family members to release health information because the information is necessary for organ transplants. If the family has also signed a consent form for research, de-identified donor medical history information can be released. He urged the scientists to ask for this information from whomever they are working with to acquire their research tissue. In his experience, he said, families who donate are willing to do anything if they can possibly help someone else.

Impact: Brain Tissue as the Fuel for Scientific Discovery

More than 600 known neurological disorders and conditions affect the human nervous system. For many, treatments are limited, if they exist at all. The day’s second panel addressed the value of human tissue in advancing research across the multitude of neurological diseases and disorders, including traumatic brain injury, autism and Alzheimer’s disease.

Animal trials don’t always translate

Like earlier panelists, the brain researchers stressed the importance of the human model. Trials of 31 compounds that showed benefit in animal models failed when translated to human models, according to Alvaro Pascual-Leone, MD, PhD, of Harvard Medical School and Beth Israel Deaconess Medical Center.

“There is no other way to get at the details of what translatable components would be other than through identification of cells or tissue systems and samples of cells, or the facility of tissue,” he said.

Direct tissue examination through autopsy remains one of the medicine’s most powerful tools, according to Bennet Omalu, MD, MBA, MPH, the noted forensic pathologist and neuropathologist who identified chronic brain encephalopathy (CTE). He lamented Medicare’s removal of autopsy as a billable medical item and its profound impact on biomedical research.

“Why I have succeeded is because I had access to brains. I had hardcore, indisputable, physical evidence to conduct analysis of human tissue,” he said, adding, “The laws that establish the autopsy actually state that the autopsy is a tool for the advancement of medical science.”

Omalu explained why this access is so important. “When you suffer a concussion and I look at your brain microscopically, you suffer vascular injury, axonal injury and membrane injury. Radiologically, your brain will appear normal, but not on a cellular level,” he said. “We have a long way to go and tissue analysis plays a very critical role.”

“All over our country we have people dying from CTE, and no one is really looking for it,” said Karen Kinzle Zegel, president of the Patrick Risha CTE Awareness Foundation. “And if you don’t look for it, and you don’t have the tissue to study it, you can’t solve it.”

“I think our ability to really drill down and do very precise and controlled experiments on cells from patients with particular conditions is really the missing link to making progress in pain research.”

– Jon Levine, MD, PhD
“We also want access to people while they are alive,” added Louis Reichardt, PhD, director of the Autism Research Initiative with The Simons Foundation. “We need to know as much about their functioning as possible to test hypotheses. We would also like their brain afterwards.”

Researchers should use living brains for everything that technology will allow, Dr. Reichardt noted. “There is a level of anatomy and analysis, which is now possible, both in terms of fine synaptic and connection structure, gene expression and so on, where technology has made incredible advances, where one simply needs large amounts of post-mortem materials from a wide range of individuals,” he said.

Dr. Reichardt also talked about the need to standardize tissue collection and preservation methods. “Brains can only be shared productively when they’ve all been collected and stored in the same way,” he said. “How do you best treat this valuable material in a way that it’s most useful for a wide variety of technologies now available and that may become available in the future?”

As the panel concluded, Julian Bailes, MD, of the NorthShore University Health System and the University of Chicago Pritzker School of Medicine, said that Dr. Omalu’s discovery of CTE has “really led to an explosion of interest in getting brain specimens, and along those lines, ultimately all tissue. There’s been a marked increase in the public’s understanding of why we need an organ such as the brain – why the brain could be important after death for us to learn. These are very exciting times and hopefully this interest and appreciation by the public will continue to grow.”
Keynote Address:
Bennet Omalu, MD, MBA, MPH

As chronicled in the 2015 book and movie “Concussion,” Dr. Omalu made a breakthrough in 2002 when he identified chronic brain damage as a major factor in the deaths of several professional athletes. He called the disease Chronic Traumatic Encephalopathy (CTE). This discovery was an outcome of his autopsy on Mike Webster, one of the best centers in NFL history. Within five years, Dr. Omalu identified CTE in eight more deceased NFL players.

In his keynote address Dr. Omalu shared his story including how events early in his life shaped his passion and commitment to faith, truth and science.

“One thing that I agree with the NFL on is when they define me or describe me as a no-name Nigerian doctor. I am as ordinary as anybody in here,” he said.

Born in Nigeria in 1968 during the Nigerian Biafra War, the sixth of seven children, Omalu suffered malnutrition in his early years. He had a difficult childhood, had low self-esteem and struggled with depression.

“But in the misery of my darkness, I discovered the power of education. The power of knowledge,” he said. Although he struggled emotionally, he was intellectually gifted. He began grade school at age 3, was accepted to medical school at 15 and became a physician at 21.

Growing up, he said, “I saw America as a land as closest to what God wants us to be as his sons and daughters. A place where you could be whatever you want to be. A place where I could finally be myself.”

Dr. Omalu’s guiding force has always been to advance science to serve mankind, rather than just for the sake of science. When he first published on CTE, “Omalu became the voodoo doctor – the dangerous doctor,” he said. While many point to his challenges in dealing with the NFL, “my biggest problem in America wasn’t the NFL, it was with my fellow doctors, my fellow physicians. I was dismissed and ridiculed.”

Why a fresh perspective is rejected

Dr. Omalu also talked about conformational intelligence — the idea that cultural and societal norms determine one’s thoughts and attitudes without the person’s awareness. That explains why it took a foreigner to discover CTE. He suggested that Americans have a confirmed cast of mind about football. Presented with objective evidence, like tissue evidence, showing that “America’s game” contributes to CTE, their natural reaction is to reject, deny and even ridicule the evidence.

Throughout his address Dr. Omalu stressed that he did not set out to make sports the focus of his life’s work. “Concussion costs the American economy $1.1 trillion annually because of lost productivity due to exposure to blunt force trauma to the head in whatever human activity,” he said.

In telling his story, Dr. Omalu repeatedly returned to “the power of human tissue as evidence — that was what made me, or made CTE, survive,” he said. “Who knew that something as humble as an autopsy, in a dilapidated autopsy room in Pittsburgh, Pennsylvania, would change the sports world as we know it? This all began with tissue analysis of a human being’s brain.”

“There’s been a marked increase in the public’s understanding of why we need an organ such as the brain – why the brain could be important after death for us to learn.”

– Julian Bailes, MD
Intern program opens up new career opportunities

An internship program at NDRI introduces college students to the world of organ and tissue donation and expands their career horizons.

“My experience at NDRI has been extremely valuable,” says Sarah Ritter, a recent intern. “It has been very rewarding to intern at a company that places such a high value on improving lives through scientific advancement.”

Since 2013, NDRI has trained 15 undergraduate students from Philadelphia universities, including Drexel, Temple and Arcadia. Students participated in six-month rotations to learn more about NDRI’s mission and operational functions. The program exposes participants to multiple functional areas within NDRI including fulfillment, site management, scientific services, logistics, strategic initiatives, partnership development and quality assurance. Interns work side-by-side with NDRI staff and become fully integrated into the day-to-day operations of NDRI. They attend on-site and off-site meetings, generate reports, analyze data and give presentations.

“The opportunity to work in various departments has given me insight into the complexities of organ and tissue donation for research and has allowed me to see the impact that NDRI makes by placing these tissues,” Ritter says.

Each class of interns brings a unique perspective to the program and makes contributions towards NDRI’s mission. The internship program within NDRI serves as an essential support system for the organization as a whole.

Strengthening the value of the program is the fact that four former interns are now full-time members of the Fulfillment staff at NDRI. These include 2014 interns Judy Huang and Charis Laude, both of Drexel University, and David Battistelli of Arcadia University, and 2015 intern Krystle Mishra, of Drexel.

“I applied to NDRI after the intern program because I really liked NDRI’s mission of enhancing biomedical research with human tissues and wanted to be a direct part of that process,” Mishra says.

By hiring these exemplary previous interns, NDRI has been able to build upon the training and successes started during the internship to facilitate continued contributions as full-time employees. NDRI takes great effort in providing interns with a stimulating working environment that opens their eyes to the unique career opportunities this line of work has to offer.

For more information, or to apply for an internship with NDRI, email Melissa VonDran, PhD, director, scientific services, at mvondran@ndriresource.org.
NDRI on the scene in 2017!

NDRI has established a robust schedule of events this year as a way to reinforce our leadership in scientific outreach and site partnership. We will exhibit and highlight our research programs and service options at scientific events across the country. In addition, we will attend partnership and professional development conferences, which provide opportunities to build and expand current relationships with key industry leaders. We will also take part in key industry symposia to help promote best practices and help shape new policies that have input into regulatory development. We hope to see you at some of these events in 2017!

**SCHEDULE**

- Conference on Retroviruses and Opportunistic Infections (CROI)  
  Feb. 13–16; Seattle, Washington
- Military Medicine Partnership Conference & Expo  
  Mar. 6–8; Ellicott City, MD
- Society of Toxicology (SoT) ToxExpo  
  Mar. 12–15; Baltimore, MD
- American Association for Cancer Research (AACR)  
  April 1–5 Washington, DC
- Association for Research in Vision and Ophthalmology (ARVO)  
  May 7–11; Baltimore, MD
- American Pain Society Annual Meeting  
  May 17–20, Pittsburgh, PA
- American Thoracic Society (ATS);  
  May 19–24; Washington, DC
- ARM Cell & Gene Exchange  
  May 22–23; Washington, DC
- International Society for Stem Cell Research (ISSCR)  
  June 14–17; Boston, MA
- Association of Organ Procurement Organizations (AOPO)  
  June 19–22; Orlando, FL
- LAM Foundation LAMPosium  
  June 22–25; Washington, DC
- National Neurotrauma Society Symposium  
  July 9–12; Snowbird, UT
- NATCO – The Organization for Transplant Professionals  
  Aug. 2–5; St. Louis, MO
- NIH Research Festival  
  September 14–15; Bethesda, MD
- American Association of Tissue Banks (AATB) Annual Meeting  
  Oct. 3–6; Orlando, FL
- National Association of Medical Examiners (NAME)  
  Oct. 13–17; Scottsdale, AZ
- Society for Neuroscience (SfN)  
  Nov. 11–15; Washington, DC
- Biorepositories & Sample Management Summit  
  Date TBA; Boston, MA
- FSH Society International Research Consortium Workshop  
  Date and location TBA
- The Practice of Transplant Administration Workshop  
  Date TBA; Coronado, CA

New website at ndriresource.org

NDRI is pleased to announce the launch of its new website at the same URL: ndriresource.org. The new site is designed to provide visitors with a clear understanding of NDRI’s mission: To provide human biospecimens to advance biomedical/bioscience research and development worldwide.

“Whether you are a researcher who is currently using or interested in learning more about our services, or you are a source partner or a donor, we are confident that you will find our new interactive design engaging and informative,” says Kerri Harvey, who led the website redesign project for NDRI.

NDRI will continue to update site content with information about its latest programmatic initiatives, news articles, outreach plans and a complete overview of the organization’s services and capabilities to fulfill the needs of the nation’s cutting edge researchers.

For questions or comments about the new website, please contact Kerri Harvey, executive assistant at 215-557-7361, ext. 216, or kharvey@ndriresource.org.
Targeted tissues include:
- Lymph node
- Spleen
- Brain
- Tonsil
- Heart
- Liver
- Pancreas
- Kidney
- Whole blood
- Cerebro-spinal fluid (CSF)
- Each segment of the gastrointestinal (GI) tract

To learn more about how you could support this effort, please contact Alisa McDonald at amcdonald@ndriresource.org.
2017 Board of Directors

Mary J.C. Hendrix, PhD  
Chair of the Board, NDRI  
President  
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