



Grand Lodge of New York

CURRENTS

A Masonic Medical Research Institute Publication

**JASON MCCARTHY, PH.D.,
PUBLISHES BREAKTHROUGH
STUDY
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**2023 EMPLOYEE
OF THE YEAR
PAGE 7**

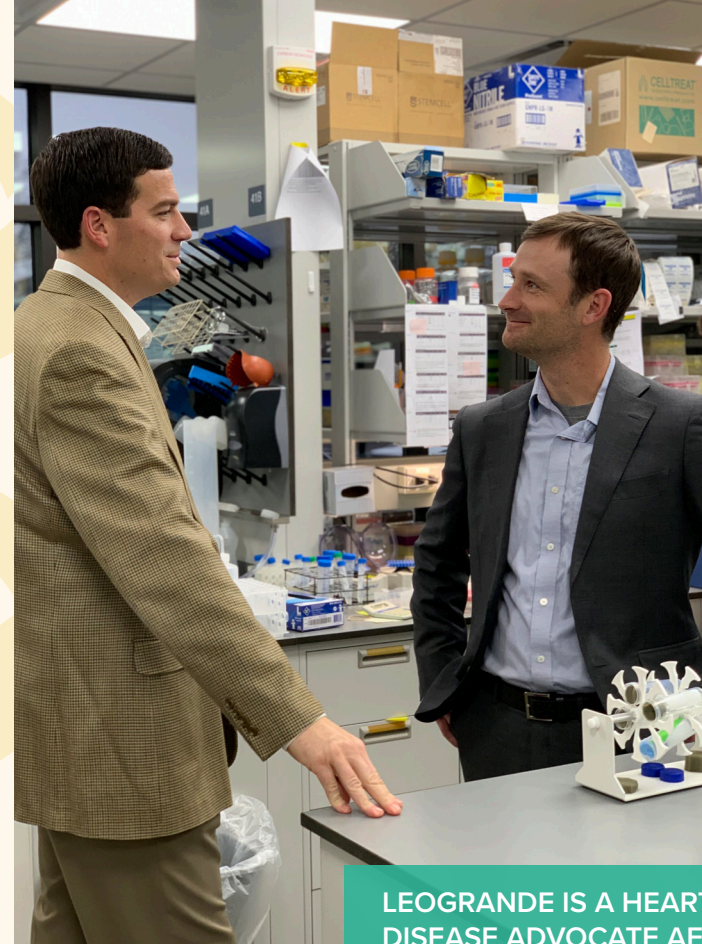
**KESSINGER LAB CONTINUES
TO PIONEER WORK ON
THROMBOSIS
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**SAVE THE DATE:
LUPUS WALK
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Spring 2024

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Ryan Leogrande Shares Gratitude for Scientific Innovation at MMRI

Each year, one in five deaths are related to heart disease (CDC). At MMRI, scientists like Nathan Tucker, Ph.D., assistant professor of biomedical research and translational medicine, and his team have made significant progress in the field of cardiovascular disease research, directly impacting heart disease survivors such as Ryan Leogrande.

LEOGRANDE IS A HEART DISEASE SURVIVOR AND CURRENT HEART DISEASE ADVOCATE AFTER EXPERIENCING A LIFE-CHANGING EVENT RELATED TO ATRIAL FIBRILLATION (AFIB).

Ryan Leogrande can attest to the importance of our cardiovascular research and how it has changed his life:

"I'm so thankful that there are scientists such as Dr. Nathan Tucker and the rest of the MMRI team whose research will help ensure that myself and other dads can be around to watch their children grow up," said Leogrande.



Nathan Tucker, Ph.D., was awarded the Innovative Project Award (IPA) in the amount of \$200,000 from the American Heart Association. The two-year award will allow Dr. Tucker and his research team to focus on the strong impact that genetics have on the risk of severe cardiovascular disease. Leogrande is excited about Dr. Tucker's research and is hopeful that the innovative work being conducted at MMRI will lead to medical breakthroughs.

Latest Science Publications

The 8th International RASopathies Symposium: Expanding research and care practice through global collaboration and advocacy.

Pierpont EI, Bennett AM, Schoyer L, Stronach B, Anschutz A, Borrie SC, Briggs B, Burkitt-Wright E, Castel P, Cirstea IC, Draaisma F, Ellis M, Fear VS, Frone MN, Flex E, Gelb BD, Green T, Gripp KW, Khoshkhoo S, Kieran MW, Kleemann K, Klein-Tasman BP, Kontaridis MI, Kruszka P, Leoni C, Liu CZ, Merchant N, Magoulas PL, Moertel C, Prada CE, Rauwen KA, Roelofs R, Rossignol R, Sevilla C, Sevilla G, Sheedy R, Stieglitz E, Sun D, Tiemens D, White F, Wingbermuehle E, Wolf C, Zenker M, Andelfinger G. *Am J Med Genet A*. 2023 Nov 15. doi: 10.1002/ajmg.a.63477. PMID: 37969032.

Biomimetic Nanomaterials for the Immunomodulation of the Cardiosplenic Axis Postmyocardial Infarction.

Bose RJ, Kessinger CW, Dhammu T, Singh T, Shealy MW, Ha K, Collandra R, Himbert S, Garcia FJ, Oleinik N, Xu B, Vikas, Kontaridis MI, Rheinstädter MC, Ogretmen B, Menick DR, McCarthy JR. *Adv Mater*. 2023 Nov 7:e2304615. doi: 10.1002/adma.202304615. PMID: 37934471.

Transcriptional profile of the rat cardiovascular system at single cell resolution.

Arduini A, Fleming SJ, Xiao L, Hall AW, Akkad AD, Chaffin M, Bendinelli KJ, Tucker NR, Papangeli I, Mantineo H, Babadi M, Stegmann CM, García-Cardeña G, Lindsay ME, Klattenhoff C, Ellinor PT. *bioRxiv [Preprint]*. 2023 Nov 16:2023.11.14.567085. doi: 10.1101/2023.11.14.567085. PMID: 38014050; PMCID: PMC10680727.

MMRI and AHA staff with Leogrande family.



MMRI Publishes Breakthrough Study

Detailing a Novel Approach to Minimize Damage After a Heart Attack in Prestigious Scientific Journal



JASON R. MCCARTHY, PH.D., associate professor of biomedical research and translational medicine and scientific operations director at MMRI, recently published an innovative manuscript titled, *Biomimetic Nanomaterials for the Immunomodulation of the Cardiosplenic Axis Post-Myocardial Infarction*.



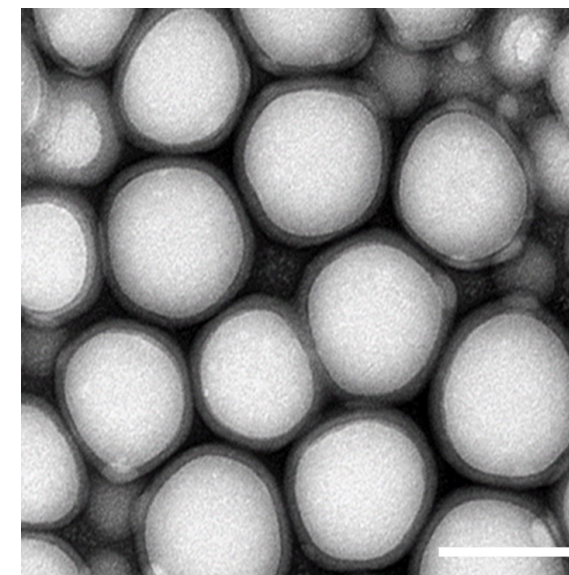
Dr. Jason McCarthy

The manuscript details how, when targeted specifically to the spleen, histone deacetylase (HDAC) inhibitors, chemical compounds that can be used to treat cancers and other diseases, have the potential to improve the healing response following a heart attack.

Normally after a heart attack, immune cells migrate from the spleen to the heart in response to injury. Here, Dr. McCarthy and his team found that they could design nanomaterials that mimic dead and dying red blood cells, causing them to be retained in the spleen and enabling them to deliver inhibitors that modulate the inflammatory response.

Notably, this targeting strategy results in a significant decrease in cardiac scar size and a preservation of heart function, even after just one dose, when given within two hours of heart attack injury.

As a result of Dr. McCarthy's findings, there is a potential for his strategy to be used more clinically, to significantly reduce cardiac damage and possibly prevent a second event or an arrhythmia following a heart attack.



Negatively stained transmission electron microscopy images of core-shell hybrid nanostructure of eSENTs (Scale bar 100 nm)

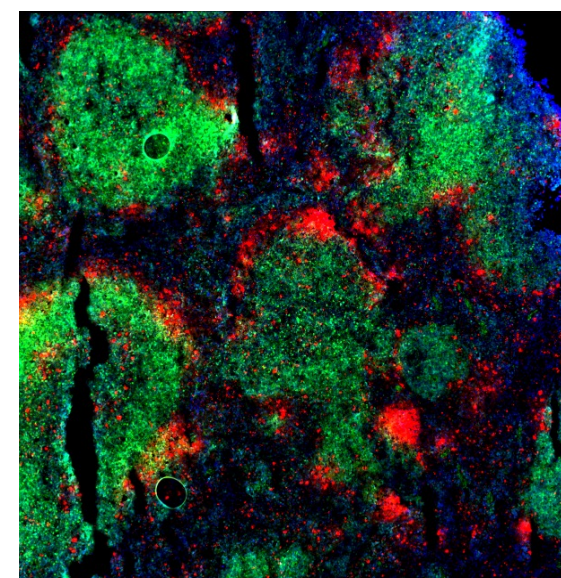
According to the CDC, heart disease is the leading cause of death in the United States, which affects approximately one in five Americans.

MMRI scientists who contributed to the study include Jason R. McCarthy, Ph.D., Rajendran JC Bose, Ph.D., Chase W. Kessinger, Ph.D., Khanh Ha, Ph.D., Bing Xu, Ph.D. and Maria I. Kontaridis, Ph.D. This work was a collaboration with scientists at the Medical University of South Carolina, Charleston, South Carolina; McMaster University, Hamilton, Ontario; the Ralph H. Johnson Veterans Affairs Medical Center, Charleston, South Carolina; and Stanford University School of Medicine, Stanford, California.

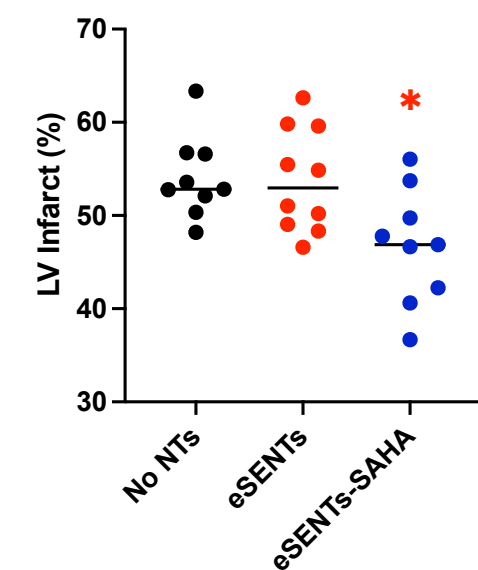
“We are thrilled to have our study published in *Advanced Materials*, one of the leading journals in this field of research,” said Dr. McCarthy. “This novel concept may have far-reaching applicability for the treatment of a number of both acute and chronic conditions where the spleen may be involved.”

Looking ahead, Dr. McCarthy and his team will use these findings to focus on the mechanisms leading to this therapeutic effect, as well as investigate these materials in several other diseases, such as lupus and pneumonia.

To learn more about Dr. McCarthy's research, visit mmri.edu/mccarthy-lab.



Immunofluorescence microscopy demonstrating nanoparticle localization within the marginal zone of the spleen (red). The B cells are stained in green.



Assessment of infarct area at 72 h post-myocardial infarction depicting a 14% decrease in infarct size in the treated group

Michelle Lance, Ph.D., Offers Insight Into Changes at the Cellular Level Affecting Heart Function



According to the CDC, one person dies every 33 seconds in the United States due to cardiovascular disease (CVD). This alarming statistic is what drives MMRI's Michelle Lance, Ph.D., associate computational biologist III, under Nathan Tucker, Ph.D., assistant professor of biomedical research and translational medicine at MMRI, to research the genetic contributions and treatments for the devastating disease.

As a computational biologist, Dr. Lance uses genome sequencing data to understand how the human heart responds in health, disease, or after a treatment. Each heart is comprised of millions of individual cells, each with their own role to play in heart function. Using single cell sequencing, Dr. Lance studies biological responses at this previously impossible resolution, examining the molecular decisions that each individual cell makes. This allows her to infer how cells communicate with each other to mount a coordinated response, and then determine how these factors combine to alter heart function.

Her latest project harnesses the power of natural variation in the human population in the form of single nucleotide polymorphisms, or SNPs, to identify genetic causes of cardiovascular disease. Combining this genetic information with data from her single cell analyses offers unprecedented opportunity to understand the individual nature of each person's heart function, define the genetic mechanisms underlying disease risk and identify targets for personalized therapeutic approaches.

"CVD is a very broad category of diseases with contributing factors stemming from both genetic and lifestyle components," said Dr. Lance. "Using genetics to study CVD can not only help us identify underlying risks of developing CVD, but can also help us understand the biological effects within the heart. Understanding how cells respond to different stressors can help guide future research into preventative steps and medical interventions."

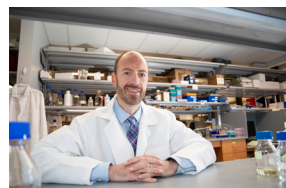
To learn more about Dr. Lance and the work being done in Dr. Tucker's lab, visit mmri.edu.

In The News



AMERICAN HEART ASSOCIATION INVESTS IN THE FUTURE AT MASONIC MEDICAL RESEARCH INSTITUTE

Covered by: *The Sentinel, WKTV and WIBX*



MMRI PUBLISHES BREAKTHROUGH STUDY DETAILING A NOVEL APPROACH TO MINIMIZE DAMAGE AFTER A HEART ATTACK IN PRESTIGIOUS SCIENTIFIC JOURNAL

Covered by: *EurekAlert!, Diagnostic and Interventional Cardiology, Phys.org, AP Newswire and National Nanotechnology Initiative*



MMRI SCIENTISTS VISIT UTICA ELEMENTARY SCHOOL IN HONOR OF NATIONAL CHEMISTRY WEEK

Covered by: *The Sentinel*

Keep up with all of our news coverage locally and nationally by visiting mmri.edu/news.

Jessica Densten



On Friday, December 15, 2023, at the annual holiday staff party, Dr. Maria Kontaridis, executive director, had the pleasure of announcing that this year's Employee of the Year title belonged to Jessica Densten, MMRI's grant administrator and faculty administrative assistant.

"Jessica has been an excellent addition to the MMRI team for more than three years," Dr. Kontaridis said. "Her service and commitment to our mission continues to grow to meet the challenges of our robust scientific endeavors."

"Jessica is the best team player, she is reliable and on point," said an anonymous employee. "She is someone who actively contributes to group projects in order to complete tasks, meet goals or manage projects."

Dedicated, top-notch, always willing to lend a helping hand, attitude is warm and bright, detail oriented and dependable are just a few of the attributions fellow co-workers associate with Jessica.

"Winning this award is such an honor as there is so much talent at MMRI," said Densten. "I am extremely appreciative to my colleagues that voted for me!"

Congratulations Jessica!



National Diabetes Month Puts Spotlight on MMRI Research

MMRI put a focus on its diabetes research this November for National Diabetes Month. Zhiqiang Lin, Ph.D., assistant professor of biomedical research and translational medicine is currently researching type 2 diabetes, with a focus on restoring the metabolic balance in patients with obesity.

Diabetes is a disease that occurs when your blood glucose, also called blood sugar, is too high. In fact, 1 in 10 adults worldwide have diabetes and more than 90 percent have type 2 diabetes (IDF). Diabetes can damage the eyes, kidneys, nerves and heart and it is linked to some types of cancer.

"Obesity is one of the leading triggers for developing type 2 diabetes," said Dr. Lin. "The goal of my research is to lower the risk of type 2 diabetes by reducing body weight. We believe that our research will yield new treatment schemes to improve the quality of life in patients with type 2 diabetes."

Dr. Lin has been awarded a patent for his work in helping to reduce body weight and is preparing to file another patent for treating non-alcoholic steatohepatitis (fatty liver disease), which is prevalent in 70 percent of patients with type 2 diabetes.



Leadership Donor Highlights

MMRI could not conduct its cutting-edge research without the support of our many donors. **Thank you!**



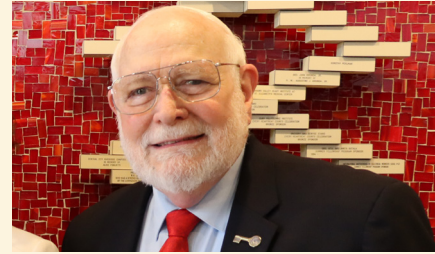
Adirondack Bank

Thank you to Adirondack Bank in Utica, New York, which graciously donated \$5,000 to MMRI's GivingTuesday campaign, which was doubled thanks to a generous anonymous donor.



The Battle Within Foundation

Thank you to The Battle Within Foundation for your continued support of MMRI's imperative research on Post Traumatic Stress Disorder (PTSD).



Sheldon Richman, MMRI Board Member

Thank you, MMRI board member Sheldon Richman, Esq., for your generous contributions to MMRI and our scientific endeavors. Your commitment to our mission is making a lasting impact on the future of medical research.

For more information or to discuss leadership and planned giving options, contact Principal Development Officer, Stephen Izzo at stephenizzo@mmri.edu.



Dr. Chennappan describing his latest research

Science Spotlight

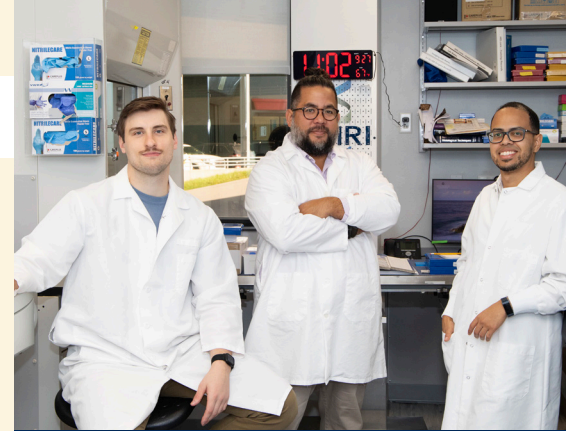
SARAVANAKKUMAR CHENNAPPAN

Saravanakkumar Chennappan, Ph.D., postdoctoral fellow under Maria Kontaridis, Ph.D., is focused on finding and understanding new changes in genes and proteins linked to a range of developmental issues. These changes impact a pathway in our body called Ras-MAPK, which has been conserved throughout evolution.

“RASopathy mutations affect one in every 2,000 live births worldwide and the phenotype varies from mild cranio-facial changes to life-threatening cardiac and neurological complications,” Dr. Chennappan said. “By studying the molecular and cellular mechanisms that are altered by these novel mutations, I want to identify new therapeutic targets that can reduce the pathological burden in RASopathy patients.”

Dr. Chennappan's research goal is to understand the fundamental biological processes in RASopathies and how they provide a unique opportunity to make discoveries that can not only benefit patients, but also shed light on broader medical and scientific questions.

To learn more about Dr. Kontaridis' lab and Dr. Chennappan, visit mmri.edu/kontaridis-lab.



Members of the Kessinger lab.

Kessinger Lab Continues Imperative Work in Thrombosis

Friday, October 13, 2023, was World Thrombosis Day which for Chase Kessinger, Ph.D., assistant professor of biomedical research and translational medicine, has even greater meaning as he and his laboratory are committed to finding a cure to the dangerous ailment.

Thrombosis is the formation or presence of a blood clot in a blood vessel in any vein or artery. For example, in a deep vein thrombosis or a coronary (artery) thrombosis, the clot itself is termed a thrombus. Venous thromboembolism (VTE) kills more people each year than breast cancer, automobile crashes and AIDS combined, making Dr. Kessinger's research critical to saving lives.

Dr. Kessinger's laboratory aims to integrate traditional molecular imaging techniques and novel diagnostic agents to treat VTE.

“My research goal is to design a cure that will help save thousands of lives each year,” said Dr. Kessinger. “My team and I work tirelessly to make that happen.”



SAVE THE DATE

MMRI is thrilled to announce the first annual Lupus Walk co-sponsored by the Lupus and Allied Diseases Association Inc. on **Saturday, May 18, 2024**.

This year's walk will have both a one-mile and 5K walk option hosted at the Masonic Care Community Campus. There will be a barbecue to follow. All proceeds benefit the MMRI Lupus Research Program.

Registration is \$25 and includes a Lupus Walk T-shirt. Tickets for the barbecue will be sold separately.

Visit mmri.edu/lupuswalk to register and for more information.



SAVE THE DATE

Join us for the second annual MMRI Golf Classic on **Monday, August 26, 2024**, at the Yahnundasis Golf Club in New Hartford, New York. Here is your chance to tee-off with MMRI

scientists and the leadership team. To learn more and register online, visit mmri.edu/golf.

Interested in playing or becoming a sponsor? Contact marketing at Millie Occhionero at mocchionero@mmri.edu.



Golfers gathering before tee-off.



Golfers putting at a hole.

Buffalo Golf Outing

JUNE 5 • LOCKPORT, NY

SAVE THE DATE

Calling all Western New Yorkers! Join us on **Wednesday, June 5, 2024**, for a golf outing at the Willowbrook Golf Course and Restaurant in Lockport, New York.

To learn more about the event, contact Nicole Knoblock at nknoblock@mmri.edu.

MMRI Scientists Inspire Young Students During National Chemistry Week

On October 15 to 21, 2023, MMRI celebrated National Chemistry Week by recognizing members of the team who practice chemistry, all of whom work under Jason McCarthy, Ph.D., associate professor of biomedical research and translational medicine and scientific operations director. Chemistry is unique because it is the study of matter, elements and compounds.



MMRI scientists with kindergarten class at Watson Williams Elementary School.



To bring their love of chemistry to young minds, Vikas, Ph.D., postdoctoral fellow, Yuriy Milobog, research assistant, Jeffrey Cheng, research assistant, Dasomie Kim, research assistant and Catherine Hagearty-Mattern, undergraduate researcher, visited a first-grade classroom at Watson Williams Elementary School, Utica, New York, to conduct a science experiment – for most it was their very first!

Vikas, Ph.D., and Milobog demonstrated that when dry ice is added to water, it sublimates to carbon dioxide, which the students observed in the form of colored bubbles thanks to a little soap and food coloring.

“This was one of the first introductions to chemistry for many of our first graders and they absolutely loved it,” said Isabella Mancuso, teacher at Watson Williams Elementary School. “It was a great way to get them excited about science and maybe even become a scientist at MMRI someday.”

MMRI’s core mission includes educating the future generations of science at all stages of life, including pre-k, elementary, high school, college and beyond.

MMRI Gives Back!

MMRI takes pride in giving back to our local community. This holiday season we had the pleasure of donating items to other local non profit organizations.

In October, our staff hosted a hygiene drive for the United Way of the Mohawk Valley. Staff donated items for ages newborn to adult including diapers, soaps, toothpaste, lotions and more!

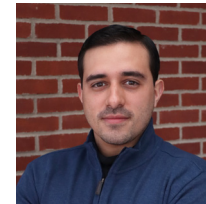
In November, staff donated canned food items to Feed Our Vets. We also provided staff with their choice of pie for Thanksgiving as a “thank you” for their dedication throughout the year.

In December, MMRI participated in Stuff the Bus, an annual toy drive, presented by our community sponsors, Human Technologies. Thanks to our generous staff, we were able to donate more than 50 toys!



MMRI staff donates to Stuff the Bus.

Welcome to the MMRI Team!



JUAN CARLOS GUTIERREZ SUAREZ, M.D., M.SC.

Postdoctoral Fellow under Maria Kontaridis, Ph.D., Executive Director.

In this role, Gutierrez Suarez will assist Dr. Kontaridis with carrying out research on novel mutations that may be linked to autism and congenital heart defects in addition to looking for potential targets for therapeutics.

“I am excited to work at MMRI since it is not just a workplace, it is a dynamic center for innovation and cooperation,” said Gutierrez Suarez.



TRAVIS THIBODEAUX

Procurement and Contracts Administrator

In this role, Thibodeaux assists the scientific and administrative staff with obtaining goods and services by acting as a liaison between internal departments and vendors. Thibodeaux will also oversee ensuring compliance with procurement policies.

“I am thrilled to be a part of the MMRI team. The comradery is unlike any company I have worked,” said Thibodeaux.



REBEKAH HEDEEN

Marketing Coordinator

Hedeem will assist the marketing and communications team in social media, writing and designing materials for communications.

“MMRI’s inclusivity and willingness to ensure growth on a professional level is outstanding,” said Hedeem. “I am delighted to be a part of such a brilliant team and cannot wait to see what we accomplish in the next year!”



Mayuri Desai, Vikas, Ph.D., and Varun Balaji gathered to sing “Jana Gana Mana,” the National Anthem of India.

India's Republic Day Celebrated at MMRI

On Friday, January 26, 2024, our employees gathered in the auditorium for our monthly all-staff meeting.

This day was special as it also marked the 75th Indian Republic Day! It was on this day in 1950 that the esteemed constitution came into effect and India was declared an independent republic country. Employees from India shared their pride for the country by singing “Jana Gana Mana,” the National Anthem of India.

Make a Plan to Support the Future of MMRI

Join the growing number of friends who invest now in the Institute’s future by including MMRI as a beneficiary of their wills, charitable trusts and retirement plans.

- Wills and Living Trusts
- Retirement Plans
- Charitable Gift Annuities
- Charitable Remainder Trusts
- Customizable Planned Giving Options

To learn more about these options and other ways to leave your legacy with MMRI contact us at development@mmri.edu or stephenizzo@mmri.edu.



Donate today by scanning this QR code or visit mmri.edu/giving



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We've been busy...

Catch the latest
news inside!

Cornerstone Society

What is the Cornerstone Society?

The MMRI Cornerstone Society allows you to be honored for any of your planned gifts now. We want the pleasure of honoring your legacy and thanking you for your generosity.

Why join the elite society?

Thoughtful planned gifts such as a bequest in a will or trust, retirement plan named beneficiaries, charitable gift annuities and others, demonstrate an outstanding commitment on the part of our supporters to the future of our scientific research. In addition, these gifts often provide significant tax advantages, while allowing MMRI to plan with confidence.

For more information or to discuss your planned giving options, contact Principal Development Officer, Stephen Izzo at stephenizzo@mmri.edu.

1958 Club

Have you joined our 1958 Club?

Your donation of \$19.58 per month can make a difference in the future of our research.

As a member of our exclusive donor club, you'll be honored with this fantastic one-of-a-kind pin!

Learn more at
mmri.edu/1958club.



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