

# HONORING INDIVIDUALS FOR NEW INVENTIONS, PATENTS, & LICENSED TECHNOLOGIES



THURSDAY OCTOBER 29

## MESSAGE FROM MICHAEL DIXON



On behalf of UNMC and UNO leadership and UNeMed staff, we welcome you to the virtual 2020 Research Innovation Awards ceremony as we celebrate all those who make our continued existence possible: You, the innovative UNMC and UNO faculty, staff and students who we honor today.

UNeMed's mission is simple: Improve healthcare by fostering innovation, advancing biomedical research and engaging entrepreneurs and industry to commercialize novel technologies.

Innovations all have the same humble beginning—an idea or a hypothesis. The path for an idea to become a product that improves the lives of millions is a daunting and perilous journey fraught with many obstacles. That is why UNeMed was created 29 years ago. We are here to help provide the advice, pathways and connections for your idea to grow and make the world a better place.

The Innovation Awards represent the culmination of Innovation Week as we celebrate the creators of novel technologies. Today, we will recognize the inventors who have submitted new inventions, received issued U.S. patents, and had a technology successfully licensed. We will also look to the future by recognizing a promising new invention from Joseph McMordie, MD, and Daniel Surdell, MD, and we'll honor as our Innovators of the Year all those who contributed new ideas and better ways to help fight the COVID-19 pandemic. In addition, the University's accelerator program, UNeTech, will present its Startup of the Year award.

The UNeMed staff is committed to helping you develop your new inventions and make vital connections with industry. Please draw upon our expertise, and visit us at 4460 Farnam Street (Annex 14 on the campus map). Our goal is to help you create relationships that will enable your work to benefit the lives of people throughout Nebraska and around the world.

Sincerely,

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Michael Dixon, Ph.D. President and CEO, UNeMed



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# INNOVATION AWARDS SCHEDULE

Welcome

Michael Dixon, Ph.D. President and CEO, UNeMed

**Opening Remarks** 

Innovation Rewind: The Year in Review

### Presentation of Awards:

- New Inventions
- Issued Patents
- Licensed Technology
- UNeTech: Startup of the Year
- Most Promising New Invention
- Innovators of the Year

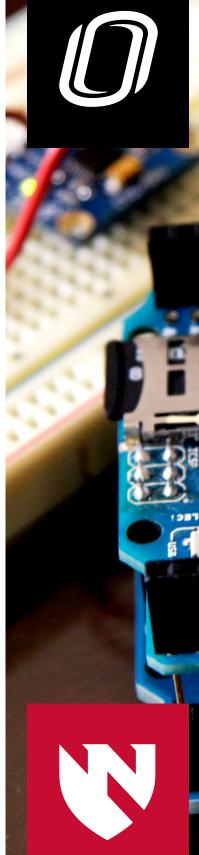
UNeMed Jeffrey Gold, M.D. Chancellor, University of Nebraska Medical Center

University of Nebraska at Omaha

Michael Dixon, Ph.D. President and CEO, UNeMed

Matt Boehm, Ph.D. Director of Licensing, UNeMed





## NEW INVENTION NOTIFICATION CONTRIBUTORS



INNOVATION AWARDS

Chandran Achutan **Rizwan Ahmad** Cody Anderson **David Anderson** Walker Arce\* Chandrakanth Are Michael Ash Christie Barnes Surinder Batra\* Kenneth Bayles **Gregory Bennett\*** Nathan Bills Wilson Blomberg Gloria Borgstahl **David Brett-Major** Mara Jana Broadhurst\* Tatiana Bronich Kyle Brozek Russell Buffum\* **Christopher Burcal\*** Siddappa Byrareddy\* Mark Carlson\* Adam Case Meng Chen Shixuan Chen\* Pi-Wan Cheng Jung Chien Rao Chundury Jesse Cox Hannah Creager **Christine Cutucache** Kaustubh Datta Punita Dhawan Keristiena Dodge Jayme Dowdall Bin Duan\* Samikshan Dutta Alex Dzewaltowski Benson Edagwa Paul Fev **Daniel Firestone** Zachary Fowler Howard Gendelman\* **Deepta Ghate** Neal Grandgenett

Chittibabu (Babu) Guda Vikas Gulati Venugopal Gunda Channabasavaiah Gurumurthy Hani Haider\* Matthew Halanski Luke Handke Mahmudul Hasan\* Jonathan Herskovitz\* **Riley Hester\*** Steven Hinrichs **Corev Hopkins** Nathaniel Hunt **Bader Huwaimel** Ridwan Islam Maneesh Jain Parker Jensen\* Jiang Jiang Xiping Jiang Jason Johanning\* Perry Johnson Sachin Kedar Ellen Kerns Deepak Khazanchi Tammy Kielian **Brian Knarr\*** Prakash Kshirsagar **Balawant Kumar** Mitchell Kuss James Lawler\* Derek Leas Cui Li Xiaowei Li James Linder\* Steven Lisco\* Xiaoyan Liu John-Martin Lowe Yuri Lyubchenko Nicholas Markin\* Eric Markvicka Wayne Mathews Michael Mazgaj Alec McCarthy **Russel McCulloh** Joseph McMordie

### NEW INVENTION NOTIFICATION CONTRIBUTORS

**Brad Miller** Ellie Miller Aaron Mohs Ahmed Morsy **R. Lee Mosley** Sakthivel Muniyan Sara Myers\* Jayaram Lakshmaiah Narayana Amarnath Natarajan\* Thang Nguyen\* **Heather Nichols** Rebecca Oberley-Deegan Katherine Olson Madeline Olson **Michel Ouellette** Chitra Palanivel Samuel Pate Sachin Pawaskar **Gurudutt Pendyala\*** James Pierce\* Iraklis Pipinos Scott Poulin Fric Psota **Rolen Quadros** Satvanaravana Rachagani Prakash Radhakrishnan Eric Rasmussen Corbin Rasmussen Patrick Rault **Risto Rautiainen Owen Redwood\*** St Patrick Reid\* Satish Sagar Stephen Salzbrenner Joshua Santarpia

Thomas Schulte Parthasarathy Seshacharyulu\* Wen Shi Surendra Shukla Aleem Siddique Amar Singh Ka-Chun Siu Marcus Snow\* **Benjamin Stobbe** Philipp Streubel Kaihong Su Donny Suh Daniel Surdell **Tiffany Tanner** Matthew Tao William Tapprich Orly Tauil Ian Trent\* Paul Trippier\* Travis Vanderheyden\* Jonathan Vennerstrom Michael Wadman\* Andrew Walski Guangshun Wang\* Elizabeth Wellsandt Michael Wilev Eric Wright\* Jingwei Xie\* Sowmya Yelamanchili\* Yangsheng Yu Karen Zagorski Wesley Zeger\* Siwei Zhao Matthew Zimmerman

## **CREATORS** OF LICENSED TECHNOLOGY

Walker Arce Jesse Cox Channabasavaiah Gurumurthy Corey Hopkins Zhenshan Jia James Linder Steven Lisco Nicholas Markin James Pierce Rongguo Ren Tyler Scherr Donny Suh\* Dong Wang Xin Wei Jorge Zuniga









# **INVENTORS** WITH ISSUED PATENTS

**Daniel Anderson** James Armitage **Kenneth Bayles Michael Duryee** Marius Florescu\* Kai Fu\* Howard Gendelman **Gregory Gordon Timothy Greiner\*** Zhenshan Jia Jason Johanning Tammy Kielian Rongshi Li Yan Liu Thang Nguyen Sam Sanderson **Geoffrey Thiele** Jonathan Vennerstrom\* Julie Vose Michael Wadman Dong Wang

# PATENTS ISSUED

- 1. "Creatine Oral Supplementation Using Creatine Hydrochloride Salt" U.S. Patent No. 10,342,771 — issued July 9, 2019
  - Jonathan Vennerstrom
- Donald Miller

Mark Faulkner

Celso Bagaoisan

Suresh Subraya Pai

- 2. "Method and Apparatus for Fibrin Sheath Disruption" U.S. Patent No. 10,357,601 — issued July 23, 2019
  - Marius Florescu
  - Maurino Flora
  - David Black
- 3. "Analogs of C5A and Methods of Using Same"
  - U.S. Patent No. 10,363,282 issued July 30, 2019
    - Sam Sanderson
    - Tammy Kielian
    - Mark Hanke
    - Edward Morgan
    - Marilyn Thoman
- 4. "Medical Irrigation System"

U.S. Patent No. 10,398,811 — issued September 3, 2019

- Thang Nguyen
- Michael Wadman

- Tamsin Sheen
- Kelly Doran
- Joy Phillips
- Elizabeth Virts
- Vincent MorrisRichard Morris

## **PATENTS** ISSUED

- 5. "Pyrrolomycins and Methods of Using the Same"
  - U.S. Patent No. 10,414,725 issued September 17, 2019
    - Kenneth Bayles
      - Rongshi Li

- Yan Liu

### 6. "Platform Device and Method of Use to Assist in Anastomosis Formation"

- U.S. Patent No. 10,433,847 issued October 8, 2019 Marius Florescu
- 7. "Mixed Lineage Kinase Inhibitors for HIV/AIDS Therapies" U.S. Patent No. 10,485,800 - issued November 26, 2019
  - Howard Gendelman Stephen Dewhurst
    - Harris Gelbard

8. "Polyethylene Glycol-Conjugated Glucocorticoid Prodrugs and Compositions and Methods Thereof"

U.S. Patent No. 10,485,809 — issued November 26, 2019

Dong Wang

- Xiaobei Wang
- Zhenshan Jia

Fang Yuan

### 9. "Sheath"

U.S. Patent No. 10,507,305 – issued December 17, 2019 Gregory Gordon

### 10. "Creatine Ester Pronutrient Compounds and Formulations" U.S. Patent No. 10,531,680 - issued January 14, 2020

Jonathan Vennerstrom Donald Miller

### 11. "Multifunctional Assessment System for Assessing Muscle Strength, Mobility and Frailty"

U.S. Patent No. 10,568,547 – issued February 25, 2020

Jason Johanning

### 12. "Circulating Antibodies Against MAA Adducts as Biomarker for Coronary Artery Disease"

- U.S. Patent No. 10,591,468 issued March 17, 2020
  - Daniel Anderson
- Geoffrey Thiele

Michael Durvee

### 13. "Method for Subtyping Lymphoma Types by Means of **Expression Profilina**"

- U.S. Patent No. 10,607,717 issued March 31, 2020
  - Kai Fu
  - Timothy Greiner

- Wing Chan Dennis Weisenburger
- 14. "Methods for Identifying, Diagnosing, and Predicting Survival of Lymphomas"
  - U.S. Patent No. 10,697,975 issued June 30, 2020
    - James Armitage
    - Wing Chan
    - Kai Fu

- Timothy Greiner
- Julie Vose
- Dennis Weisenburger

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INNOVATION

AWARDS

# **INNOVATORS** OF THE YEAR

### **COVID-19** Inventors

University of Nebraska Medical Center & University of Nebraska at Omaha

For just the second time in the Innovation Awards' 14-year history, UNeMed has found it necessary to recognize a group as its Innovator of the Year.

In a remarkable show of creativity, ingenuity and collaborative cooperation, UNMC and UNO clinicians, faculty, staff and students responded to the COVID-19 pandemic with a breathtaking flurry of innovation. In just a few months, 44 University inventors combined their expertise and experience to create 28 new inventions related to the pandemic.

Most innovations focused on helping protect healthcare providers, and a few of those were fast-tracked to market. For example, UNMC inventors created an intubation shield that was purchased by several hospitals and care facilities throughout the United States. Another device, an infectious disease filter adapter for air masks, sold in bulk quantities to the U.S. Air Force.

Other innovations included mobile applications to help track or screen the pandemic; new mouse models and assays to help improve the study of the novel coronavirus responsible for the pandemic; solutions to personal protective equipment shortages; and solutions to limit the spread of infectious disease. In addition, there were other innovations that weren't technically "inventions" but nonetheless helped the nation's fight against the pandemic, including a protocol for using ultraviolet light to sanitize equipment and an early clinical study of Remdesivir.

The combined effort of UNMC & UNO innovators remains one of the few bright spots during the pandemic, and rightly deserves UNeMed's highest honor of achievement and appreciation.

3D Printed Nasopharyngeal Swab (JC Swab)	Jesse Cox
Ceramic Air Filter	James Linder
Cough Collector	David Brett-Major, Mara Jana Broadhurst, James Lawler, John- Martin Lowe, Joshua Santarpia
COVID19 Screener	Thang Nguyen, Michael Wadman, Wesley Zeger
Lung Derived Extracelluar Vesicles	Gurudutt Pendyala, Sowmya Yelamanchili
Genetically Engineered Mouse Models (GEMs) to Help Fight COVID-19	Channabasavaiah Gurumurthy, Rolen Quadros
Hand Guard Slit Lamp Shield	Rao Chundury
Home Specimen Collection Kit for Viral Panels	Thang Nguyen, Michael Wadman, Wesley Zeger

# **INNOVATORS** OF THE YEAR

Infectious Aerosol Capture Device	Steven Lisco, Nicholas Markin, James Linder
Infectious Aerosol Capture Device Adapter	Steven Lisco, Nicholas Markin
Infectious Aerosol Capture Device Filter Housing	Steven Lisco, Nicholas Markin, James Linder
Infectious Aerosol Capture Mask (IACM) Single Piece Design	Steven Lisco, Nicholas Markin
Intubation Box	Michael Ash, Thomas Schulte
Intubation Box Vacuum Adaption	James Linder
KeepAway	Michael Mazgaj
Magnetic Face Shield	Thang Nguyen
Method of Fabricating Nanofiber Swabs	Jingwei Xie, Mark Carlson, Shixuan Chen, Alec McCarthy
Modular Electronic Decision Support Builder	Ellen Kerns, Russel McCulloh
Modular Vaccine Platform	Yuri Lyubchenko, Karen Zagorski
Naso/Oropharyngeal Swab Specimen Trainer	Christie Barnes, Jayme Dowdall, Samuel Pate, Benjamin Stobbe
Prodrug Formulations	Benson Edagwa, Howard Gendelman, St Patrick Reid
PAPR Adapter	Nicholas Markin, Jerald Farke
Portable Negative Air Pressure Patient Room	Mara Jana Broadhurst, James Linder
Real-Time Reverse Transcription PCR Assay for 2019-nCoV	Mara Jana Broadhurst, Hannah Creager, Paul Fey, Luke Handke
SARS-CoV-2 Antigen Design, Production and Testing	Ken Bayles, Gloria Borgstahl, Siddappa Byrareddy, Chittibabu Guda, St Patrick Reid
Therapeutic Impact of Digoxin on COVID-19 Induced Pathophysiology	Surendra Shukla
Transesophageal Echocardiography Probe Clean Sheath	Nicholas Markin
Z Filter Device	Thang Nguyen, Heather Nichols, Michael Wadman, Wesley Zeger



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Joseph McMordie, MD Chief Resident, Department of Neurosurgery, College of Medicine University of Nebraska Medical Center



Daniel Surdell, MD Associate Professor, Department of Neurosurgery, College of Medicine, University of Nebraska Medical Center

### Anterior Cervical Space Spreader

The most promising new invention of 2020 is an exciting new development in the field of neurosurgery that Joseph McCordie, MD, and Daniel Surdell, MD, developed at the University of Nebraska Medical Center.

Drs. McMordie and Surdell reengineered the approach to c-spine retractors, a tool that enables neurosurgeons to space the vertebra of the neck in order to perform spinal surgeries.

Their prototype shows great promise in significantly improving the surgical working space during cervical spine surgeries, allowing superior physician access during complicated neurosurgical procedures.

Drs. McMordie and Surdell have been evaluating the numerous benefits of this device in cadaver studies, and they are working toward a clinically approved version in the near future. This invention is already generating interest among medical device companies producing similar equipment.

Dr. McMordie is the Chief Resident for the UNMC College of Medicine's Department of Neurosurgery. He received his medical degree from Texas Tech University Health Sciences Center School of Medicine in 2014 where he was a member the Alpha Omega Alpha Medical Honor Society. He joined UNMC in 2014.

Dr. Surdell is an associate professor of neurosurgey in the College of Medicine. He earned his medical degree from the University of Nebraska Medical Center and completed his residency at the University of Oklahoma Health Science Center. He also completed fellowships in neuroendovascular and cerebrovascular surgery at Northwestern University's Feinberg School of Medicine.



INNOVATION

# **STARTUP** OF THE YEAR

UNeTech is the University of Nebraska's startup incubator and accelerator in Omaha, nurturing early-stage companies that have ties to the University.



Stephen Salzbrenner, MD BreezMed

This year UNeTech honors one of its incubator companies "in recognition of outstanding achievement to translate innovation into vital new products."

The "Startup of the Year" award goes to BreezMed.

Founded by Stephen Salzbrenner, MD, Breezmed is a provider-oriented software solution that increases the speed at which patients can get their prescriptions.

BreezMed helps doctors and pharmacists navigate the red tape of insurance companies.

BreezMed was also recently awarded a Phase I STTR grant from the National Institutes of Health, and could soon revolutionize how doctors manage prior authorizations.

TECHNOLOGIES LICENSED	
3D Printed Nasopharyngeal Swabs	Jesse Cox
Ergonomic Surgical Loupes Head Strap	Donny Suh
Genome Editing Technology	<ul> <li>Channabasavaiah Gurumurthy</li> </ul>
Infectious Aerosol Capture Device, Housing, and Adapters	<ul><li>Steven Lisco</li><li>Nicholas Markin</li><li>James Linder</li></ul>
PDE4B Selective Inhibitors	Corey Hopkins
Upper Limb Prosthetics	<ul><li>Jorge Zuniga</li><li>Walker Arce</li><li>James Pierce</li></ul>
Suh Precision Injection Syringe	<ul><li>Donny Suh</li><li>Tyler Scherr</li></ul>
Thermosensitive Prodrug Formulation	<ul><li>Dong Wang</li><li>Rongguo Ren</li><li>Zhenshan Jia</li><li>Xin Wei</li></ul>



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INNOVATION

AWARDS

# **INNOVATION WEEK HISTORY**

Innovation Week dates back to 1998 when UNeMed and the Intellectual Property Office began hosting the Inventor's Recognition Reception, specifically tailored to honor UNMC researchers who had applied for or received patents in the previous year.

In 2007, UNMC restructured its technology transfer efforts into one organization, merging UNeMed with the Intellectual Property Office. UNeMed—under the leadership of then-CEO, James Linder, MD—transformed the Inventor's Recognition Reception into the Research Innovation Awards.

The awards ceremony was the final event in a week of activities that celebrated the research and innovation at UNMC. In addition to recognizing researchers who secured intellectual property rights. UNeMed also added emerging

inventor and lifetime achievement awards. In 2008 it also added the "Most Promising New Invention" as an annual award. In 2013, UNeMed presented for the first time ever, an "Innovator of the Year" Award. In 2018, another distinction was added when UNeTech—the University's new incubator and accelerator program—presented its first Startup of the Year award.

Dr. Hopkins

Innovation Week is now about far more than recognizing a handful of UNMC scientists with issued patents. It's a celebration that recognizes, rewards and encourages innovative thoughts and ideas, whether they come from the most seasoned and esteemed researcher or a first-year student who might know a better way. The program has grown into the Research Innovation Awards Banquet, an exclusive, invitation-only event that brings together innovators and leadership from two different campuses.

Last year, the Most Promising New Invention was a novel series of inihibitors from the lab of Corey Hopkins, PhD. The inhibitors target phosphodiesterase 4 and show great promise as treatments for several inflammatory diseases. An undisclosed industrial partner has already licensed the technology for further development.

The 2019 UNeTech Startup of the Year award went to Jason Johanning, MD, and his startup FutureAssure. Dr. Johanning is developing a device that will help measure a patient's risk before surgery.

Finally, UNMC researcher Benson Edagwa, PhD, was UNeMed's 2019 Emerging Inventor in recognition of his contributions to innovation in the development of long-acting antiretroviral therapies.

Most of his work centers on improvements to treating HIV and Hepatitis B, and is a key inventor of LASER ART (long acting slow effective antiretroviral therapy). LASER ART shows great promise as a treatment that could be given to HIV patients once every six months or even just once a year. LASER ART was also a key component in a study that appeared to eradicate HIV from mice—a scientific first.



Dr. Johanning



Dr. Edagwa

## INNOVATION WEEK HISTORY: AWARDEES

#### **Most Promising New Inventions** Joseph McMordie, MD 2020 Anterior Cervicial Space Spreader Daniel Surdell, MD 2019 PDE4B Selective Inhibitors Corey Hopkins, PhD Multiplex Assay for Rapid Detection of Catherine Gebhart, PhD 2018 HSV1, HSV2, EBV and CMV by qPCR Varun Kesharwani, PhD Jingwei Xie, PhD 2017 Nanofiber Sponges for Hemostasis Shixuan Chen, PhD Mark Carlson, MD Joyce Solheim, PhD Compositions for Modulated Release 2016 Tatiana Bronich, PhD of Proteins and Methods of Use Thereof Michael Wadman, MD, Emergency Medicine Care FASEP 2015 Portfolio: Wound Irrigation • Thang Nguyen, MSN, System & Oral Airway Management APRN, FNP-C 2014 Orthagonal AquaBlade Jason MacTaggart, MD Targeted Glyoxalase-1 Gene Transfer 2013 to Prevent Cardiovascular and Keshore Bidasee, PhD End-Organ Complications in Diabetes Small Molecule in Vivo 2012 Inhibitors of the N-Terminal Gregory Oakley, PhD Protein Interacting Domain of RPA1 Novel Target for the 2011 Babu Padanilam, PhD Treatment of Renal Fibrosis Noninvasive Monitoring of Stephen Bonasera, MD, 2010 Functional Behaviors in PhD Ambulatory Human Populations 2009 Novel Antibiotic Compounds Paul Dunman, PhD 2008\* Anti-HIV Peptides and · Guangshun (Gus) Wang, Methods of Use Thereof PhD 2008\* Sex Hormone Binding Globulin: Janina Baranowska-New Target for Cancer Therapy Kortvlewicz, PhD

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\*In 2008 the Most Promising New Invention award was shared.

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# INNOVATION WEEK HISTORY: AWARDEES

Spec	cial Awards	
2020	COVID-19 Inventors	Innovators of the Year
2020	BreezMed	UNeTech Startup of the Year
2019	Benson Edagwa, PhD	Emerging Inventor
2019	FutureAssure.	UNeTech Startup of the Year
2018	Biomechanics Dept., UNO	Innovator of the Year
2018	Centese, Inc.	UNeTech Startup of the Year
2017	Donny Suh, MD.	Emerging Inventor
2016	Irving Zucker, PhD	Innovator of the Year
2015	Tammy Kielian, PhD	Innovator of the Year
2014	Marius Florescu, MD	Emerging Inventor
2013	Howard Gendelman, MD	Innovator of the Year
2012	Tammy Kielian, PhD	Emerging Inventor
2011	Jonathan Vennerstrom, PhD	Lifetime Achievement
2010	Amarnath Natarajan, PhD	Emerging Inventor
2009	Rodney Markin, MD, PhD	Lifetime Achievement
2008	Dong Wang, PhD	Emerging Inventor
2007	Robert LeVeen, MD	Lifetime Achievement



# UNEMED STAFF



### Jeff Andersen

Contracts Manager

JD, Creighton University School of Law

Joined UNeMed: 2015



## **Catherine Murari-Kanti**

Licensing Specialist PhD, Cancer Biology, University of Nebraska Medical Center

Joined UNeMed: 2016

Vice President & Director of Intellectual Property JD, Creighton University School of Law LLM. International Intellectual Property Law, Chicago-Kent College of Law





### Matthew Boehm Director of Licensing

PhD, Cancer Biology, University of Nebraska Medical Center

Joined UNeMed: 2009



### Michael Dixon President & CEO

PhD, Molecular Genetics, University of Nebraska Medical Center Joined UNeMed: 2003



Valerie Gunderson Office Manager Joined UNeMed: 2007

Cori Harsh Accountant Joined UNeMed: 2009



Charlie Litton Marketing & Communications Manager MA, Journalism, University of Nebraska-Lincoln

Joined UNeMed: 2013



# **Tyler Scherr**

Licensing Associate

- PhD, Biomedical Research, University of Nebraska Medical Center
- Joined UNeMed: 2016



### Mindy Ware Paralegal

Joined UNeMed: 2010

BACK COVER: Illustration created at the Centers for Disease Control and Prevention reveals ultrastructural morphology exhibited by coronaviruses. Note the spikes that adorn the outer surface of the virus, which impart the look of a corona surrounding the virion, when viewed electron microscopically.





#### Joe Runge Business Development Manager

- MS, Molecular Biology, University of Iowa
- JD, University of Iowa

Jason T. Nickla

Joined UNeMed: 2009

Joined UNeMed: 2005







