

HONORING INDIVIDUALS FOR NEW INVENTIONS, PATENTS, & LICENSED TECHNOLOGIES



THURSDAY OCTOBER 25 TRUHLSEN CAMPUS EVENTS CENTER 5:00 PM



MESSAGE FROM MICHAEL DIXON



On behalf of UNMC and UNO leadership and UNeMed staff, we welcome you to the 2018 Research Innovation Awards Banquet 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, ad*vancing 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 27 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 successfully licensed a technology. We will also look to the future by recognizing a new technology with strong potential, and honor UNO's Biomechanics Department as the 2018 Innovator of the Year. In addition, the University's new accelerator program, UNeTech, will present its first-ever award for Startup of the Year.

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

Opening Remarks

Innovation Rewind: The Year in Review

Presentation of Awards:

- New Inventions
- Issued Patents
- Licensed Technology

Special Awards:

- UNeTech: Startup of the Year
- Most Promising New Invention
- Innovator of the Year

Closing Remarks

Michael Dixon, Ph.D. President and CEO, 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. Interim Director of Licensing, UNeMed

Rod Markin, M.D. Director, UNeTech

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



INNOVATION AWARDS 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, M.D.—transformed the 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. This year, the awards will finally include all UNO inventors as a part of a new services agreement. And, for the first time, UNeTech, the University's new incubator and accelerator program, will present the Startup of the Year award.

Innovation Week is now about far more than recognizing a handful of UNMC scientists who secure 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 the least-known 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 combines the best elements of the Awards program and the annual Shareholder Meeting.

Last year, the collaborative work of Mark Carlson, M.D., Jingwei Xie, Ph.D., and Shixuan Chen, Ph.D., was featured as the most promising new invention. UNeMed named Donny Suh, M.D., the 2017 Emerging Inventor.

Dr. Carlson, a professor in the Department

Dr. Carlson

Dr. Xie

Dr. Chen

of Surgery; Dr. Xie, an assistant professor in regenerative medicine; and Dr. Chen, a research associate in regenerative medicine, were honored for their nanofiber sponges. The sponges absorb more fluid—and at faster rates—than traditional gauze and sponge-based products now on the market. An undisclosed industrial partner licensed the innovation back in January 2018, proving the technology's potential.



Dr. Suh

Dr. Suh, an associate professor in the Department of Ophthalmology & Visual Sciences and Chief of Pediatric Ophthalmology and Strabismus at Children's Hospital and Medical Center, was named the 2017 Emerging Inventor. He was recognized for producing five new inventions in the the fiscal year ending in 2017—all related to improving pediatric ophthalmology.

Among his inventions is the Precision Injection Syringe Plunger, which facilitates secure, onehanded injections when absolute precision and control are paramount to the patient's safety, such as intravitreal injections.

He also developed the Strabismus Needle Holder, the Muscle Injection Forceps, a smartphone camera adapter for medical imaging, and a new design for more ergonomic surgical loupes.



NEW INVENTION NOTIFICATION CONTRIBUTORS





Dennis Alexander Mona Al-Mugotir Catalina Amador **Prokopios Antonellis** Majid Asawaeer Janina Baranowska-Kortylewicz **Dhundy Bastola** Surinder Batra **Betsy Becker** Tadayoshi Bessho Laura Bilek Sunil Kumar Boda Gloria Borgstahl Bryce Bott Jennifer Bredehoft* Holly Britton **Deborah Brown** Kyle Brozek* **Russell Buffum*** James Campbell* W. Scott Campbell* Adam Case* Ioannis Chatzizisis* Sujata Suresh Chaudhari Shixuan Chen **Christopher Collins** Trevor Craig Justin Cramer Lou Cubrich **Christine Cutucache*** Paul Davis* Paul Deegan Anastasia Desyatova Punita Dhawan Kim Duncan Benson Edagwa* Kelly Emrick **Christopher Erickson** Shan Fan Wei Fan Shane Farritor*

Daniel Firestone Corv Frederick **Jeffrey French** Jered Garrison **Catherine Gebhart** Howard Gendelman* **Deepta Ghate* Neal Grandgenett*** Vikas Gulati* Channabasavaiah Gurumurthy* James Hammel **Robert Harms** Shane Havens **Breanna Hetland Steven Hinrichs** Corey Hopkins* Nathaniel Hunt Ali Ibrahimiye Javeed lobal* Jason Johanning* Alexey Kamenskiy* Raniana Kanchan Sachin Kedar* Victoria Kennel Varun Kesherwani Bhavesh Kevadiva Ryan King **Brian Knarr*** Zbigniew Kortylewicz Alexey Krasnoslobodtsev Rongshi Li Shea Lundeby* Jason MacTaggart* Sidharth Mahapatra Philippe Malcolm Kaspars Maleckis Nicholas Markin Joseph John McBride Travis McCumber Ellie Miller Mohd Wasim Nasser Carl Nelson*

New Inventions: Continued on next page

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NEW INVENTION NOTIFICATION CONTRIBUTORS

Platt Niebur **Jacob Nosal** Dmitry Oleynikov David Oupicky Jason Palmowski Jav Pedersen Peter Pellegrino Naveen Kumar Perumal Thomas Petro James Pierce* Anthony Podany Daniel Podany Aaron Priluck Mark Reichenbach Corbin Rasmussen **Jacob Robinson*** Adam Rosen Tony Rost Sunandita Sarker Nora Sarvetnick Alicia Schiller Mason Schleu* Steve Schreiner Nancy Schulte Ahmed Selim **Derek Shafer** Amar Singh* Ka-Chun Siu Anne Skinner

Seth Stauffer Nicholas Stergiou* Kaihong Su Donny Suh Kota Takahashi James Talmadoe William Tapprich* Benjamin Terry Vinai Chittezham Thomas Mvron Toews Srijayaprakash Uppada Anish Vadukoot Travis Vanderheyden* Dawn Venema Jonathan Vennerstrom* Andrew Walski Dong Wang Hanjun Wang Jing (Jenny) Wang Jingwei Xie* Yangsheng Yu Fei Yu Wenting Zhang Ling Zhang **Qiuming Zhu** Irving Zucker Craig Zuhlke Jorge Zuniga*

CREATORS OF LICENSED TECHNOLOGY

Surinder Batra Holly Britton James Campbell W. Scott Campbell Shixuan Chen Mark Carlson Channabasavaiah Gurumurthy Jiang Jiang Keith Johnson Angie Rizzino Stephen Salzbrenner Donny Suh James Talmadge James Wahl Jingwei Xie Steve Schreiner

*Multiple



MOST PROMISING NEW INVENTION



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INNOVATION

AWARDS

Catherine Gebhart, Ph.D. Associate Professor, Department of Pathology and Microbiology, University of Nebraska Medical Center



Varun Kesharwani, Ph.D. Senior Scientist, Department of Pathology and Microbiology, University of Nebraska Medical Center

Multiplex Assay for Rapid Detection of HSV1, HSV2, EBV and CMV by qPCR

Catherine Gebhart, Ph.D., and Varun Kesharwani, Ph.D., have developed a multiplex assay that effectively detects four types of human herpes viruses. This assay employs a dual target approach for each viral genome, minimizing the risk of false negatives due to viral mutation.

HSV1, HSV2, EBV and CMV1 are the opportunistic viruses that become symptomatic in immunocompromised patients causing high morbidity. Currently, separate PCR reactions detect each virus, which is time consuming. Dr. Gebhart's and Dr. Kesharwani's assay includes two sets of primers and probes, each targeting two unique regions of each of the four viruses.

These primers and probes were developed through a sponsored research agreement with Streck, Inc., an Omaha biotech company that develops diagnostic products. (Sponsored research agreements are contracts between a commercial entity and the University that provide funds to develop and commercialize new technologies.) Streck provided financial support, and upon completion of the work, has been negotiating with UNeMed to license the technology, which is expected to hit the market soon.

Dr. Gebhart received her Ph.D. in 1998 from UNMC's Department of Pathology and Microbiology and then joined the same department as an associate professor. She also serves as the Director of the Histocompatibility Laboratory.

Dr. Kesharwani received his Ph.D. in 2010 from Banaras Hindu University in India and joined UNMC in 2009. He is the senior scientist that worked on this project in Dr. Gebhart's laboratory.

Find event photos on UNeMed's Flickr page: http://bit.ly/UNePics

INNOVATOR OF THE YEAR



Department of Biomechanics University of Nebraska at Omaha

Biomechanics is a window into the once-hidden secrets of what it is to be alive and healthy.

The University of Nebraska at Omaha's Department of Biomechanics opened some of those windows, and that's why the entire department is our 2018 Innovator of the Year. Led by recognized world expert and founding chair, Nicholas Stergiou, Ph.D., the department has taken the study of how humans move, and pushed it into realms where biomechanics can predict disease and improve health.

Dr. Stergiou, along with his collaborator Philippe Malcom, Ph.D., partnered with J. Brasch Co., a Nebraska-based elder care company, to develop a next-generation gait analysis platform. For a fraction of the cost, their device can detect and analyze human gait as precisely as current state-of-the-art machines. One day, UNO's device may provide hospitals an objective and measurable way to assess the risk of falls for their elderly and other frail patients.

Biomechanics might also hold answers to traumatic brain injury, including concussions. An Omaha startup company is putting together a working prototype for a device that can detect when an athlete has suffered—and then later fully recovered from—a concussion. Such a device could improve the way concussions are treated, and finally go beyond guesswork to determine when it's truly safe for athletes to return to action.

Biomechanics also uses human motion to replace human limbs. Jorge Zuniga, Ph.D., 3D prints prosthetic hands for children, and continues work on cybernetic limbs that can have a dramatic impact throughout the world.

Another biomechanical advance uses human motion to discover the unknowns about Chronic Obstructive Pulmonary Disorder, the fifth-leading cause of death worldwide. COPD strikes with little or no warning in sudden attacks where patients can no longer breathe. Working with Dr. Stergiou and Stephen Rennard, Ph.D., biomechanics researcher Jenna Yentes, Ph.D., intends to expose the warning signs that lay hidden in the subtle ways people move.

Biomechanics provides a new perspective for greater insights into human health. It can predict risk of falling, indicate neurologic problems, make better prosthetics for children,

and perhaps even discover hidden markers essential to the management of terrible, chronic diseases.



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STARTUP OF THE YEAR

A little more than a year ago, the University's startup incubator and accelerator, UNeTech, selected its first four startups, beginning its mission of nurturing early-stage companies that have ties to the University.



Centese, Inc. Evan Luxon , Co-Founder & CEO

Starting this year, UNeTech will honor one of its incubator companies "in recognition of outstanding achievement to translate innovation into vital new products."

The first "Startup of the Year" award goes to Centese, Inc., formerly known as Esculon.

Nebraska native Evan Luxon co-founded Centese, which capitalizes on Luxon's experience as a medical device developer. Centese is developing "Thoragaurd," a chest tube that automatically clears blockages. Blockages in chest tubes prevent drainage, and are responsible for a high rate of complications associated with the placement of chest tubes.

Final FDA approval is pending, and Centese hopes to have Thoragaurd on the market soon.

TECHNOLOGIES LICENSED

Research antibodies	•	Keith Johnson James Wahl
Anti-PD2 antibody	٠	Surinder Batra
Customizations for Salesforce CRM	٠	Steve Schreiner
Easi-CRISPR	٠	Channabasavaiah Gurumurthy
Ergonomic surgical loupes head strap	٠	Donny Suh
Nanofiber-based hemostatic bandages	• • •	Shixuan Chen Jingwei Xie Mark Carlson Jiang Jiang
NR-6-R cells	•	Angie Rizzino
Ozonated water	•	Holly Britton James Talmadge
SNOMED-CT pathology enhancements	•	James Campbell W. Scott Campbell
Prior authorization software	•	Stephen Salzbrenner

INVENTORS WITH ISSUED PATENTS

Vimla Band Hamid Band Shane Farritor* Marius Florescu Tom Frederick* Howard Gendelman* Alexey Kamenskiv Tammy Kielian Amy Lehman* Amy Mantz

Jason MacTaggart Thomas McDonald Sameer Mirza R. Lee Mosley Nicholas Phillips Sam Sanderson Max Twedt Jonathan Vennerstrom Hanjun Wang Irving Zucker

PATENTS ISSUED

- 1. "Small Molecule RNASE Inhibitors and Methods of Use" U.S. Patent No. 9,693,999 - issued July 4, 2017
 - Paul Dunman Patrick Olson
- Wavne Childers
- 2. "Shielding Device and Method"

U.S. Patent No. 9,697,920 - issued July 4, 2017

- Gregory Gordon
- Douglas Scott Wahnscheffe

3. "Methods, Systems, and Devices Related to Robotic Surgical Devices, End Effectors and Controllers"

U.S. Patent No. 9,743,987 - issued August 29, 2017

- Shane Farritor
- Eric Markvicka
- Tom Frederick
- Jack Mondry
- Joe Bartels
- 4. "Methods, Systems, and Devices Relating to Surgical End Effectors"
 - U.S. Patent No. 9,757,187 issued September 12, 2017
 - Shane Farritor Tom Frederick
- Joe Bartels
- 5. "Robotic Surgical Devices, Systems, and Related Methods"

U.S. Patent No. 9,770,305 - issued September 26, 2017

- Shane Farritor
- Philip Chu
- Nishant Kumar
- Erik Mumm
- Jason Dumpert
- Yutaka Tsutano
- 6. "Hemodialysis Catheter With Displaceable Lumens To Disrupt A Fibrous Sheet"
 - U.S. Patent No. 9,775,941 issued October 3, 2017
 - Marius Florescu

Patents Issued: Continued on next page



*Multiple

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INNOVATION

AWARDS

Continued from previous page

PATENTS ISSUED

- 7. "Fluid Jet Arterial Surgical Device"
 - U.S. Patent No. 9.782.195 issued October 10. 2017
 - Alexey Kamenskiy
- Amy Mantz
- Jason MacTaggart
- Nicholas Phillips
- 8. "Methods and Compositions for Inhibiting Diseases of the Central Nervous System"
 - U.S. Patent No. 9,782,464 issued October 10, 2017
 - Howard Gendelman Ashley Reynolds Helseth
 - R. Lee Moslev

9. "Compositions and Methods for Gene Therapy"

- U.S. Patent No. 9,789,205 issued October 17, 2017 Alexander Kabanov
 - Elena Batrakova Mathew Haney
- Vivek Mahajan
- 10. "Compositions and Methods for the Delivery of Therapeutics" U.S. Patent No. 9,808,428 - issued November 7, 2017
 - Howard Gendelman
 - Xinming Liu
- 11. "Creatine Ester Anti-Inflammatory Compounds and Formulations" U.S. Patent No. 9,833,427 - issued December 5, 2017
 - Thomas McDonald
- Dennis Robinson Jon Wagner
- Samuel Augustine
- Donald Miller
- 12. "Cancer Biomarkers and Methods of Use Thereof"
 - U.S. Patent No. 9,850,313 issued December 26, 2017
 - Vimla Band
- Sameer Mirza
- Hamid Band
- 13. "Multifunctional Operational Component for Robotic Devices" U.S. Patent No. 9,883,911 - issued February 6, 2018
 - Shane Farritor
- Mark Rentschler
- Amy Lehman

14. "Methods, Systems and Devices Relating to Force Control Surgical Svstems"

U.S. Patent No. 9,888,966 — issued February 13, 2018

- Shane Farritor
- Jacob Greenburg Kearney Lackas
- Tom Frederick
- Joe Bartels

Patents Issued: Continued on next page

Continued from previous page **PATENTS** ISSUED

- 15. "System and Method for Monitoring Pleural Fluid"
 - U.S. Patent No. 9,888,870 issued February 13, 2018
 - Dimitrios Miserlis
 - Max Twedt
 - Kim Cluff
- Suzanne HigginsAbby Kelly
- 16. "Analogs of C5a and Methods of Using Same"
 - U.S. Patent No. 9,895,411 issued February 20, 2018
 - Tammy Kielian
- Joy PhillipsTamsin Sheen
- Sam Sanderson
- Kelly Doran
- Mark Hanke
- Edward Morgan
- Marilyn Thoman
- Libby Virts
- **17. "Methods, Systems and Devices for Surgical Access and Procedures"** U.S. Patent No. 9,956,043 — issued May 1, 2018
 - Shane Farritor
- Stephen Platt
- Amy Lehman
- Mark Rentschler
- Jeff Andrew Hawks
- 18. "Methods for Administration and Methods for Treating Cardiovascular Diseases with Resiniferatoxin"
 - U.S. Patent No. 9,956,166 issued May 1, 2018
 - Hanjun Wang
 - Irving Zucker
- **19. "Creatine Oral Supplementation Using Creatine Hydrochloride Salt"** U.S. Patent No. 9,962,352 — issued May 8, 2018
 - Jonathan Vennerstrom Mark Faulkner
 - Donald Miller
- 20. "Survival Predictor For Diffuse Large B Cell Lymphoma"

U.S. Patent No. 9,970,059 — issued May 15, 2018

- Wing (John) Chan
- Dennis Weisenburger

21. "Protein-poly (2-oxazoline) Conjugates for Enhanced Cellular Delivery and Transport Across Biological Barriers"

U.S. Patent No. 9,974,866 - issued May 22, 2018

- Alexander Kabanov
- Jing Tong





INNOVATION AWARDS

AWARD WINNERS

Most Promising New Invention				
2018	Catherine Gebhart, Ph.D. Varun Kesharwani, Ph.D.	<i>Multiplex Assay for Rapid Detection of HSV1, HSV2, EBV and CMV by qPCR</i>		
2017	Jingwei Xie, Ph.D. Shixuan Chen, Ph.D. Mark Carlson, M.D.	Nanofiber Sponges for Hemostasis		
2016	Joyce Solheim, Ph.D. Tatiana Bronich, Ph.D.	Compositions for Modulated Release of Proteins and Methods of Use Thereof		
2015	Michael Wadman, M.D., F.A.S.E.P. Thang Nguyen, M.S.N., A.P.R.N., F.N.PC.	Emergency Medicine Care Portfolio: Wound Irrigation System & Oral Airway Management		
2014	Jason MacTaggart, M.D.	Orthagonal AquaBlade		
2013	Keshore Bidasee, Ph.D.	Targeted Glyoxalase-1 Gene Transfer to Prevent Cardiovascular and End-Organ Complications in Diabetes		
2012	Gregory Oakley, Ph.D.	Small Molecule in Vivo Inhibitors of the N-Terminal Protein Interacting Domain of RPA1		
2011	Babu Padanilam, Ph.D.	Novel Target for the Treatment of Renal Fibrosis		
2010	Stephen Bonasera, M.D., Ph.D.	Noninvasive Monitoring of Functional Behaviors in Ambulatory Human Populations		
2009	Paul Dunman, Ph.D.	Novel Antibiotic Compounds		
2008*	Guangshun (Gus) Wang, Ph.D.	Anti-HIV Peptides and Methods of Use Thereof		
2008*	Janina Baranowska-Kortylewicz, Ph.D.	Sex Hormone Binding Globulin: New Target for Cancer Therapy		

Special Awards

2018	Biomechanics Dept UNO	Innovator of the Year
2010	Contono Inc	LINIaTach Startup fo the Veer
2010	Centese, Inc.	One rech Startup to the real
2017	Donny Suh, M.D.	Emerging Inventor
2016	Irving Zucker, Ph.D.	Innovator of the Year
2015	Tammy Kielian, Ph.D.	Innovator of the Year
2014	Marius Florescu, M.D.	Emerging Inventor
2013	Howard Gendelman, M.D.	Innovator of the Year
2012	Tammy Kielian, Ph.D.	Emerging Inventor
2011	Jonathan Vennerstrom, Ph.D	Lifetime Achievement
2010	Amarnath Natarajan, Ph.D.	Emerging Inventor
2009	Rodney Markin, M.D., Ph.D.	Lifetime Achievement
2008	Dong Wang, Ph.D.	Emerging Inventor
2007	Robert LeVeen, M.D.	Lifetime Achievement

UNEMED STAFF



Jeff Andersen

Contracts Manager

J.D., Creighton University School of Law

Joined UNeMed: 2015



Matthew Boehm

Ph.D., Cancer Biology, University of Nebraska Medical Center

Joined UNeMed: 2009



Michael Dixon

Ph.D., 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 & Web Content Specialist M.A., Journalism, University of Nebraska-Lincoln

University of Nebraska-Lin
Joined UNeMed: 2013

Joined Unewied: 201





Licensing Specialist

Ph.D., Cancer Biology, University of Nebraska Medical Center

Joined UNeMed: 2016



Jason T. Nickla

Vice President & Director of Intellectual Property

- J.D., Creighton University School of Law
- LL.M., International Intellectual Property Law, Chicago-Kent College of Law
- Joined UNeMed: 2009



Joe Runge

Business Development Manager

- M.S., Molecular Biology, University of Iowa
- J.D., University of Iowa
- Joined UNeMed: 2005



Tyler Scherr

Licensing Associate

- Ph.D., Biomedical Research, University of Nebraska Medical Center
 Joined UNeMed: 2016

Mindy Ware Paralegal

Joined UNeMed: 2010





