

# TRANSLATION **BUILDER**

This newsletter is designed to provide a place for members of the APTC to share news, collaborate and network, and discover each other and the services we offer.



## Investigator's Corner

Kath Bogie, DPhil

Senior Research Scientist- Louis Stokes Cleveland VA Medical Center  
Associate Professor, Dept of Orthopaedics – Case Western Reserve University  
Director, Tissue Health Research Laboratory  
Director, Biocompatibility Testing Laboratory  
Director, Additive Manufacturing for Biofabrication Core Facility, CWRU  
APTC Research Area Lead: Health Monitoring & Maintenance

Dr. Kath Bogie's focus is on translational research, particularly to address the prevention and treatment of wounds. When the fear of developing a chronic non-healing wound is reduced, quality of life increases, and the individual can continue living life. Her overarching goal is primary and secondary prevention of chronic wounds. Active current projects include studies to determine why some people experience a continuous cycle of pressure injuries, together with development and implementation of interventions and technologies that will positively impact rehabilitation, healthcare, and overall quality of life for persons at risk, in particular Veterans with spinal cord injury (SCI).

## CURRENT RESEARCH

### Funding: Department of Veterans Affairs, Rehabilitation Research and Development: Merit Review

- ❖ Smart Personalized Electrotherapy for Enhanced Healing of Ischemic Wounds. This translational development study aims to develop the next-generation patented **smart Modular Adaptive Electrotherapy Delivery System** (*SmartMAEDS*) to enable safe and smart delivery of electrotherapy outside traditional clinical settings that is both personalized and adaptive.
- ❖ Development of Advanced Personalized Modular Pressure Relief Cushion Systems: Testing and User Evaluation. This study will develop the patent-pending **cost-effective modular wheelchair support cushion** using advanced dynamic materials, combining low-cost with high-performance. The support system can be customized for individual seating requirements, and repaired rather than replaced since components are removable, thus increasing durability.

**Funding: Department of Defense, Congressionally Directed Medical Research Program: Spinal Cord Injury Research Program**

- ✦ Development of the SCI Pressure Ulcer Management Bioinformatics Resource. This study is developing a **SCI pressure ulcer database** (SCIPUD+) that leverages clinical data from Veterans with SCI, along with our established noninvasive methodology for tissue health assessment - Tissue Health Evaluation Toolbox (THEToolbox). The extensive database includes over 36,500 Veterans with SCI and will enable personalized PU prevention planning tailored to the needs of each patient, thereby enhancing health status and quality of life, and reducing healthcare costs.
- ✦ Development of a flexible implanted stimulator for improved gluteal muscle quality and regular weight shifting. This study will develop *flex*GSTIM, a flexible novel implanted pattern generator to provide dynamic intermittent gluteal stimulation (iGSTIM). The fully implanted iGSTIM system will combine ***flex*STIM and intermuscular electrodes to bilaterally stimulate the gluteal muscle**, providing regular exercise and weight-shifting. iGSTIM will impact challenges in PrI prevention and musculoskeletal health for Veterans with SCI.

**Funding: Department of Defense, Congressionally Directed Medical Research Program: Spinal Cord Injury Research Program and the Craig H. Neilsen Foundation**

- ✦ Determination of Personalized Pressure Injury (PrI) Risk Based on Identification of Novel Biomarkers. Muscle quality critically impacts both safe sitting interface pressure levels and safe sitting times. This study will develop a reliable objective PrI risk assessment tool based on **muscle composition biomarkers** to enable clinicians to provide effective personalized primary prevention for Veterans with SCI. The original biomarker research was funded by both CDMRP (for acute SCI) and the Neilsen Foundation (for chronic SCI). Although funding ended for both studies in 2018, follow-up continues and further work is planned for this project.

## RECENT ACCOMPLISHMENTS

Dr. Bogie is an elected member of the **Board of Directors** for the Wound Healing Society (WHS) and continues to serve on the WHS **Education Committee**.

The National Pressure Ulcer Advisory Panel (NPUAP) invited Dr. Bogie to speak at their annual conference in St Louis this year for **Best Overall Contribution to the Field**. Her presentation was titled *Toward a better understanding of why pressure mapping alone cannot reliably predict pressure injury risk: investigation of underlying key factors*. Dr. Bogie was also elected to serve as the RESNA representative on the NPUAP Collaborating Organization Council and is a member of the NPUAP Education Committee.

Dr. Bogie was invited to join Rehabilitation Engineering and Assistive Technology Society of North America (**RESNA**) **Standards Committee on Wheelchair and Related Seating** (WRS) (ISO/TC 173/SC 1/WG 11 Wheelchair seating standards development) working group on Heat and Water Vapor Transfer. Dr. Bogie's work in an article titled *Development of a Sitting MicroEnvironment Simulator for Wheelchair Cushion Assessment*, published in the Journal of Tissue Viability, was recognized as leading to possible solutions to advance this standard.

In her career, Dr. Bogie has co-/authored 47 peer-reviewed **publications** and 9 **chapters** and holds two **patents** for wound healing technology. She has been invited to speak at numerous national and international conferences, has **reviewed manuscripts** for 30 scientific journals and serves on **Editorial Board** for the Journal of Tissue Viability and the Journal of Rehabilitation and Assistive Technologies Engineering. Dr. Bogie has also served a **consultant** for companies such as Sunrise Medical Ltd. (UK), Cleveland Medical Devices, Hill-Rom Medical, Guidepoint Global (Clinical Advisors) LLC, Neocure Group LLC, Avery Medical, and has been a grant

and/or peer **reviewer** for such agencies as the VA RR&D, National Medical Research Council (Singapore), Research Fund Secretariat (Hong Kong SAR), NSF, NIH, PVA, and CDMRP.

## LAB TEAM

Dr. Bogie's lab team includes Dr. Jacinta Seton (Research Nurse and Study Coordinator), Joseph Lerchbacker (Engineer), and Research Assistants David Lemmer, Katelyn Schwartz, and Jennifer Zindle. The team schlepps in the Biocompatibility Lab, a core resource within the Cleveland VA Medical Center focusing on pre-clinical testing and evaluation of biological materials for wound management, and the Tissue Health Research laboratory for clinical research and assessment related to the treatment and prevention of chronic wounds.



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## NEWS

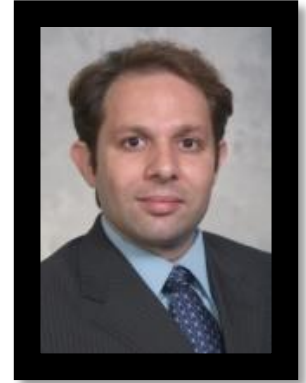
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Congratulations to PhD students [Cara Smith](#) and [Marina Yu](#) (mentored by Dr. Jeff Capadona), and [Kathleen Young](#) (mentored by Dr. Horst von Recum) on their **selection to the NSF Graduate Research Fellowship Program**. [Rebecca Haley](#) (von Recum) is an Honorable Mention recipient. This program recognizes and supports outstanding graduate students in NSF-supported STEM disciplines who are pursuing research-based master's and doctoral degrees at accredited US institutions. Fellows benefit from a 3-year annual stipend of \$34,000 along with a \$12,000 cost of education allowance for tuition and fees (paid to the institution), opportunities for international research and professional development, and the freedom to conduct their own research at any accredited US institution of graduate education they choose.





Congratulations to Jonathan Baskin, MD,  
the new Acting Chief of Surgery  
for the VA Northeast Ohio Health Care System.



Congratulations to Pedram Mohseni, PhD,  
the new Interim Co-Chair of Electrical Engineering and  
Computer Science at Case Western Reserve  
University.

## New Patent Awarded

### Integrated Surface Stimulation Device for Wound Therapy and Infection Control

**Inventors:** KM Bogie, SL Garverick, CA Zorman, DS Howe

**Date of Patent:** February 12, 2019

**Patent No:** US 10,201,703 B2

**Abstract:** The present invention provides a thin and flexible device and method of use thereof for wound treatment and infection control. The integrated surface stimulation device may comprise a complete wireless stimulation system in a disposable and / or reusable flexible device for widespread use in multiple therapeutic applications. The invention would be situated on the skin surface of a patient and would be activated so as to reduce the overall occurrence of infections and / or increase wound healing rates. As provided, the device will comprise an integrated power supply and pre-programmable stimulator / control system on a flexible polymeric substrate layer with areas of stimulating electrodes, applied using techniques such as those found in additive manufacturing processes. The device is especially valuable in treating biofilm-based infections.



## 2019 Faculty Distinguished Research Award

Congratulations to Roger Quinn, PhD who was honored with a 2019 **Faculty Distinguished Research Award** at CWRU's Research ShowCASE for his tremendous scholarly and research contributions.

Dr. Quinn has become an international **leader in robotics**, making seminal contributions to the fascinating and rapidly **emerging field of bio-robotics**. He has also guided graduate students, postdoctoral fellows and research associates in developing new designs and control theories based on biological principles for **improving robot performance**.

He has secured 8 **patents**; graduated 34 doctoral and 77 master's **students**; published more than 80 **papers** in international scientific journals; given more than 150 **scientific lectures** at national and international conferences; and won 11 Best Paper or Best Video Awards from leading international conferences in the fields of robotics, automation, and artificial intelligence.

Dr. Quinn is Director of the Biologically Inspired Robotics Laboratory and the Arthur P. Armington Professor of Engineering in the Department of Mechanical and Aerospace Engineering, Case School of Engineering. Visit the original story in the Daily for more details about Dr. Quinn and the other honorees: <https://thedaily.case.edu/five-honored-with-2019-faculty-distinguished-research-award/>



Congratulations to Ming-Chun Huang, PhD on being nominated for a **Graduate Teaching Award** from the Case School of Engineering. This award recognizes excellence in graduate-level education for faculty whose accomplishments as a teacher go beyond the standard expectation.

Dr. Huang is an associate professor in the Department of Electrical Engineering and Computer Science and was nominated for his development and innovation of the EECS 410 Mobile Health (mHealth) course. The course incorporates **research-based teaching modules** and emphasizes interdisciplinary areas, providing students with an **opportunity to conduct interdisciplinary research** and a mechanism to learn the fundamentals of technology opportunity assessment, inspiring them to become future “entrepreneurial” engineers. A student in the course says, *“Dr. Huang encouraged us to express ourselves in class. If we have some new ideas or different opinions, we could discuss with the professor and our classmates. We have the opportunity to introduce an idea about mobile health and do the experiment with the help of the equipment that this course provided.”*



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## The Motion Study Lab Receives a Visit from VA VHA and ORD

In February, **Dr. Carolyn Clancy**, Executive in Charge of Academic Affiliates, **Dr. Rachel Ramoni**, Chief R&D Officer, and **Dr. Michael Fallon**, Chief Veterinary Medical Officer visited the Louis Stokes Cleveland VA Medical Center to learn more about our research programs and conduct a Town Hall. They toured the MSL and met two of Dr. Ronald Triolo’s research subjects participating in his Lower Limb Sensory Restoration project and biking program. Below, **a biking subject demonstrates** the new part of the program – **exercising with an adapted rowing machine**.



## Invited Keynote Speaker at the 2019 Hangar Education Fair



Hanger, Inc.'s 2019 Education Fair featured a full day of keynote sessions focused on patient care and clinical outcomes, delivered by physicians, scientists, and therapists from major medical institutions across the U.S.

"The sessions offered attendees a unique opportunity to hear from some of the **most highly regarded medical professionals in fields related to O&P**, from rehabilitation to biomechanical engineering," stated Jim Campbell, PhD, Hanger's Senior Vice President and Chief Clinical Officer.

The keynote sessions on advances that are moving the field of O&P into the future included Dr. Ronald Triolo who **presented on neurally-integrated assistive technology**, specifically prostheses that restore motor and sensory function after paralysis or limb loss.

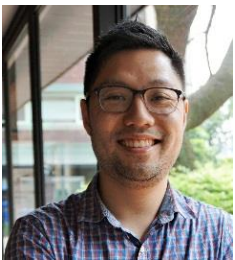
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## VA Service Awards

Congratulations to **Rudi Kobetic** and **John Schnellenberger** who reached their **40-year and 15-year mark**, respectively, with VANE OHS in April and received a pin in recognition of the occasion. As with all military branches, **service recognition** is an important part of the VA's employee recognition and awards program and celebrates the longevity of an employee. Service pins and certificates are available starting with 10 years of service through 50 years at 5-year intervals.

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## Welcome New APTC Staff!



James Huang, BS, *Software Engineer*

James has a BS in Electrical Engineering from the University of Michigan Ann Arbor. He has spent more than 10 years designing and architecting digital ASICs and FPGAs for the computer networking and industrial automation sectors and has significant industry experience in bringing large-scale digital products to market. At the APT Center, James is responsible for the prototyping of wireless systems, as well as introducing new human computer interface technologies to existing biomedical systems.



Emily Johnson, BS, *Research Coordinator*

Emily has a BS in Biotechnology from Kent State University. Previously, she worked at the Clinical Trials Unit in University Hospitals Seidman Cancer Center as part of the NCI-designated CASE Comprehensive Cancer Center as a Clinical Research Coordinator and Data Specialist. Emily provides support to the APT Center and Spinal Cord Injury unit. She is involved in several research projects using neuromuscular stimulation to help paralyzed individuals regain various functional abilities using neuroprosthetic devices.



Aarika Sheehan, DPT, *Physical Therapist*

Aarika has a DPT from Cleveland State University. She worked in multiple research settings as an undergraduate and in graduate school at the Cleveland VA helping to devise a research protocol to study the use of a self-leveling walker and its effect on stability when negotiating stairs. In the APTC, her primary focus is helping develop a home-going program for a sensory project aimed to help restore sensation in those who have had a lower limb amputation.

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## Did You Know?

The Louis Stokes Cleveland VA Medical Center has **NEW POLICIES ON NAME USAGE**. Please keep this in mind for all uses of the name, including in email signatures, grant applications, posters/presentations, and manuscript submissions.

Per VACO regulations, we are now the:

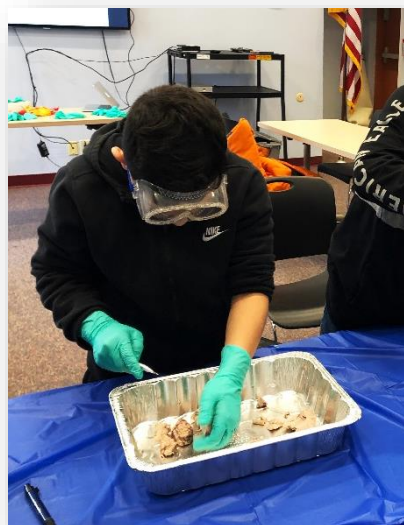
- ❖ **VA Northeast Ohio Healthcare System** - when referring to the entire system
  - **VA Northeast Ohio** upon second reference.
  - If you must abbreviate, use **VANEOHS**.
  
- ❖ **Louis Stokes Cleveland VA Medical Center** - when referring specifically to the main medical center on East Blvd (formerly known as Wade Park)
  - **Cleveland VA Medical Center** upon second reference.

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# OUTREACH

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The **Mean Green STEM Machine**, conducted in the Cleveland Public Library, is designed to provide Cleveland students in grades 2-7 with early exposure to a variety of STEM topics, build awareness of career opportunities in STEM, and introduce students to diverse STEM practitioners. In March, APTC grad students Bree Christie, Aidan Friederich, and Nabeel Chowdury **hosted a neuroscience session called Brains!**



## Take Your Child to Work Day

Each year, APTC engineers speak with **60 students aged 13-16 years** for the medical center's Take Your Child to Work Day. This year, 4 of our engineers spoke with the students about choosing an engineering career and their own future interests. Dr. Hamid Charkhkar spoke with half of the group about the **difficulty of walking with a prosthetic leg** and demonstrated the struggle with a **foam balance beam task**, while Ryan Reyes corraled the students who had completed the task and engaged them with some of the cool projects he is currently working on. Drs. Brooke Odle and Sandra Hnat taught the students about **muscle elasticity** using a **cup and rubber band activity**.



## Limb Loss Awareness Education Day

Every April, the Cleveland VA Amputation Care Team celebrates **Limb Loss Month** by hosting an **Education Day to raise awareness about limb loss and limb loss prevention**. Amputation care experts are on hand with prosthetic components, educational materials, recreation and sports equipment, and healthy snacks. The event is geared toward providers of the hospital as well as family members of Veterans, and community prosthetists. This year, staff from the Lower Extremity Sensorimotor Restoration Lab showcased their new promotional video, distributed recruitment flyers, and spoke with area prosthetists, Veterans, and clinicians about their project.





Two APTC research participants participated in the **Erg-a-thon** – [Case Western Reserve University Crew Team's](#) annual 24-hour fundraising event. Both are part of a **research project that stimulates their paralyzed leg muscles** and allows them to ride a bike and, more recently, use a rowing machine. Brett, a paralyzed United States Army Veteran, uses surface stimulation technology to stimulate the muscles in his legs, while Hanane, who has been living with a SCI for 7 years, has an implanted neuroprosthetic device that stimulates her muscles. They heard about the event from the crew team, who consulted on the rowing portion of this project, and rowed using standard rowing machines with an adapted back half.



On April 25th, months of work culminated as we kicked off [Makers For Veterans](#), a **three-day workshop** in which 7 teams worked to **create solutions** for military Veterans suffering from PTSD and immobility issues. [Watch here](#) as our Makers, Veterans and Challenge America staff work, including many researchers and staff from APTC, to create tech-based prototypes that have the power to change the lives of others facing similar challenges!

A project idea submitted by Brett, a research participant in our APTC biking program, was one of the challenges selected for the event and **voted Most Creative!** [Read more](#) about his idea and the team of subject matter experts that came together to help him. The international Veterans Makeathon Event is a partnership between the VA Northeast Ohio Healthcare System, Challenge America, Cleveland Clinic Innovations, HIMMS, and Saint Edwards High School.

**Challenge  America**  
**MAKERS ★ FOR ★ VETERANS**



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# RECENT PUBLICATIONS

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**Lindner SC, Yu M, Capadona JR, Shoffstall AJ**

*A graphical user interface to assess the neuroinflammatory response to intracortical microelectrodes*  
Journal of Neuroscience Methods

[Link to article](#)

**Beckler DT, Thumser ZC, Schofield JS, Marasco PD**

*Using sensory discrimination in a foraging-style task to evaluate human upper-limb sensorimotor performance*  
Scientific Reports

[Link to article](#)

**Capadona JR, Shoffstall AJ, Pancrazio JJ**

*Neuron-like neural probes*

Nature Materials

[Link to article](#)

**Odle BM, Lombardo LM, Audu ML, Triolo RJ**

*Experimental Implementation of Automatic Control of Posture-Dependent Stimulation in an Implanted Standing Neuroprosthesis*

Applied Bionics and Biomechanics

[Link to article](#)

Schofield JS, **Shell CE, Thumser ZC**, Beckler DT, Nataraj R, **Marasco PD**

*Characterization of the Sense of Agency over the Actions of Neural-machine Interface-operated Prostheses*  
Journal of Visualized Experiments

[Link to article](#)

VA Research Currents featuring Drs. **Paul Marasco, Matthew Schiefer, Ronald Triolo, and Dustin Tyler**  
*Study: Technology helps upper-limb amputees regain a sense of touch*

[Link to article](#)

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# UPCOMING GRANT DEADLINES

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- ✦ First of the month – CWRU CTSC [Core Utilization Pilot Grants](#)
- ✦ Rolling basis – Case-Coulter Translational Research Partnership (CCTRP) [Pilot Projects](#)
- ✦ May 6 – National MS Society [Pilot Research grants](#) (pre-appl; appl due May 8)
- ✦ May 29 – CDMRP [SCIRP Pre-Applications](#) (appl due Aug 27)
- ✦ June 5 – NIH R01, U01 New Applications
- ✦ June 12 – NIH K New Applications
- ✦ June 12 – VA HSRD Merit, CDA Applications
- ✦ June 12 – VA RRD Merit, RCS, CDA Applications
- ✦ June 16 – NIH R21 New Applications
- ✦ July 5 – NIH: R01, U01 Renewal, Resubmission, Revision Applications
- ✦ July 12 – NIH: K Renewal, Resubmission, Revision Applications
- ✦ July 16 – NIH: R21 Renewal, Resubmission, Revision Applications
- ✦ July 31 – National MS Society [Research grants](#) (pre-appl; appl due Aug 7)

## LINKS TO STANDARD ANNOUNCEMENTS

NIH - [https://grants.nih.gov/grants/guide/parent\\_announcements.htm](https://grants.nih.gov/grants/guide/parent_announcements.htm)

VA (intranet) - <http://vaww.research.va.gov/funding/rfa.cfm>

VA (external) - <https://www.research.va.gov/services/default.cfm>

CDMRP - <https://cdmrp.army.mil/funding/prgdefault>

## ADDITIONAL FUNDING OPPORTUNITIES

- ✦ National MS Society – [General deadlines for grant applications](#)
- ✦ Funding opportunities aggregated by CWRU: <https://case.edu/research/faculty-staff/funding-ops/>

APTC offers Business Plan templates to help with Transition Plans required in grant applications, such as the NIH. Contact Vi Huynh at [vi.huynh@va.gov](mailto:vi.huynh@va.gov) for more details.

Have something to share? Send YOUR good news and professional accomplishments to Rebecca Polito at [rpolito@aptcenter.org](mailto:rpolito@aptcenter.org) to include in a future Translation Builder.

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