

PROGRAM SCHEDULE



MAY 20-24, 2024
GOLD COAST
AUSTRALIA

ICAR2024

37TH International Conference
on Antiviral Research (ICAR)

HOSTED BY International Society for Antiviral Research (ISAR)

Sunday, May 19, 2024

1:00 PM – 6:00 PM

Pre-Conference Symposium: An Australasian Virology Mini Symposium – Advancing Knowledge, Protecting People

GRIFFITH UNIVERSITY GOLD COAST CAMPUS

Separate registration required.

[Click here for more info](#)

Monday, May 20, 2024

12:00 PM – 1:45 PM

Special Event: Women in Science Roundtable

PHOENIX ROOM

Chaired by

Rhonda Carter

This event is at capacity.

If you have joined the waitlist, you will be notified if there are any openings.

2:00 PM – 4:15 PM

Opening Session and Plenary Session

NORFOLK BALLROOM

Chaired by

Luis Schang and **Kathie Seley-Radtke**

001. Virus Emergence at the Human-Animal Interface
Edward C. Holmes, FAA, FRS, The University of Sydney, Australia, Sydney, NSW, Australia

002. Therapeutic Drug Development For Acute Viral Diseases: Lessons Learned and Future Perspective from a Clinician-Scientist and Can We Do Better?
Jenny G. Low, MBBS, MPH, Singapore General Hospital, Duke NUS Medical School, Singapore, Singapore

4:15 PM – 4:30 PM

Break

NORFOLK FOYER

4:30 PM – 5:30 PM

Gertrude Elion Memorial Award Lecture

NORFOLK BALLROOM

Chaired by

Luis Schang and **Kathie Seley-Radtke**

- 003. My Battle Against Viruses**
Professor Johan Hendrik Neyts, *KU Leuven, Belgium*

5:30 PM – 6:30 PM

Opening Reception

RELISH GRILL AND BAR

Tuesday, May 21, 2024

8:30 AM – 9:15 AM

William Prusoff Memorial Award Lecture

NORFOLK BALLROOM

Chaired by

Luis Schang and **Kathie Seley-Radtke**

- 004. Viral Hemorrhagic Fevers: Challenges and Gains of Animal Model Research for Pre-Clinical Vaccine and Antiviral Screening**
Jessica R. Spengler, D.V.M., Ph.D, M.P.H., *US Centers for Disease Control and Prevention, Atlanta, GA, United States*

9:15 AM – 10:00 AM

Broad Spectrum Antiviral Drugs, Non-respiratory Biothreat Viruses, and Pandemic Preparedness

NORFOLK BALLROOM

Chaired by

John Bilello and **Subash Vasudevan**

- 005. Oral Pharmacokinetics and Efficacy of Modified Oral Lipid RVn Prodrugs Against SARS-CoV-2 in Mice**
Aaron F. Carlin, M.D. Ph.D, *Department of Pathology and Medicine, University of California at San Diego, La Jolla, California, United States*
- 006. Towards a Novel Host-Targeted Anti-Infective Strategy Against COVID-19 and Other Acute Respiratory Viral Diseases**
Stephan Ludwig, PhD, *Institute of Virology, Muenster, Germany*
- 007. Exploring Viral RNA Methyltransferases for Antiviral Drug Design**
Radim Nencka, Ph.D., *Institute of Organic Chemistry and Biochemistry, Czech Academy of Sciences, Prague, Czech Republic*
- 008. Targeting Host Kinases to Identify Novel Broad-Spectrum Antiviral Strategies**
Valeria Cagno, Ph.D., *Institute of Microbiology, Lausanne University Hospital, University of Lausanne, Lausanne, Vaud, Switzerland*

10:00 AM – 11:00 AM
NORFOLK BALLROOM

PechaKucha Competition

Chaired by
Kathie Seley-Radtke

11:00 AM – 11:15 AM

Break

NORFOLK FOYER

11:15 AM – 12:15 PM

Broad Spectrum Antiviral Drugs, Non-respiratory Biothreat Viruses, and Pandemic Preparedness *(continued)*

NORFOLK BALLROOM

Chaired by
John Bilello and **Subash Vasudevan**

- 009. UNAPP: A Unique Academic-Industrial Partnership for Antiviral Research in Pandemic Preparedness**
Xuping Xie, Ph.D., UTMB, Galveston, Texas, United States
- 010. Molnupiravir Extends its Broader Spectrum of Activity to Human Norovirus and Rotavirus in 3D Human Intestinal Enteroids**
Nanci Santos-Ferreira, KU Leuven, Rega Institute, Laboratory of Virology and Chemotherapy, Leuven, Belgium
- 011. Targeting mpox Virus Resolvase (Mpr): In Vitro Assay Development and Inhibitors**
Zhengqiang (ZQ) Wang, Ph.D., Center for Drug Design, College of Pharmacy, University of Minnesota, Minneapolis, Minnesota, United States
- 012. Potential Genetic Determinants Affecting Virulence of Heartland Bandavirus Infection in Mice and Therapeutic Intervention with the Ribonucleoside Analog, EIDD-2749**
Jonna B. Westover, Ph.D., Institute for Antiviral Research, Utah State University, Logan, Utah, United States

12:15 PM – 1:45 PM

Lunch

(included for all conference registrants)

RELISH GRILL AND BAR

12:30 PM – 1:30 PM

Special Event: Career Development Roundtable

PHOENIX ROOM

Chaired by
Leen Delang**This event is at capacity.***If you have joined the waitlist, you will be notified if there are any openings.*

1:45 PM – 2:30 PM

Diversity in Science and Excellence Award Lecture

NORFOLK BALLROOM

Chaired by
Victor Garcia-Martinez and **Luis Schang**

- 013.** **Chasing an HIV Cure: The Intersection of Biological Sex and Latency Reversal**
Nancie Marie Archin, PhD, *The University of North Carolina UNC HIV Cure Center, Chapel Hill, North Carolina, United States*

2:30 PM – 3:30 PM

Coronaviruses, Influenza, RSV, and Other Respiratory Viruses

NORFOLK BALLROOM

Chaired by
Rhonda Cardin and **Tim Sheahan**

- 014.** **Drug Discovery Efforts Towards Human Metapneumovirus**
Larissa Dirr, Ph.D., *Institute for Glycomics, Griffith University, Australia*
- 021.** **Nanobodies Against COVID-19 and Other Emerging Viruses**
Fang Li, Ph.D., *University of Minnesota, Minneapolis, MN, United States*
- 016.** **Activating the RIG-I Pathway by RNA Agonists or Small Molecule Drugs Triggers Innate Immune Programming to Control Infection by Influenza A virus and SARS-COV2**
Amina Negash, Ph.D., *Center for Innate Immunity and Immune Disease, Department of Immunology, University of Washington, Seattle, Washington, United States*
- 017.** **Understanding and Inhibiting SARS-CoV-2 NiRAN Domain Catalytic Activities Through Structural Studies and Large-Scale Docking**
Gabriel Small, *Laboratory of Molecular Biophysics at The Rockefeller University, New York, NY, United States*

3:30 PM – 3:45 PM

Break

NORFOLK FOYER

3:45 PM – 5:00 PM

Coronaviruses, Influenza, RSV, and Other Respiratory Viruses *(continued)*

NORFOLK BALLROOM

Chaired by

Rhonda Cardin and **Tim Sheahan**

- 018. Combating Emerging Henipaviruses**
Daniel Watterson, PhD, University of Queensland, Brisbane, Australia
- 019. Design of SARS-CoV-2 Papain-like Protease Inhibitor with Antiviral Efficacy in a Mouse Model**
Jun Wang, Rutgers, The State University of New Jersey, Piscataway, New Jersey, United States
- 020. Identification of Adenosine Analogues that Inhibit the N7 Methyltransferase Activity of SARS-CoV-2**
Adrien Delpal, Ph.D, AFMB, Marseille, France
- 015. Identification of Novel Small-Molecule Inhibitors of SARS-CoV-2 by Chemical Genetics**
Shuofeng Yuan, The University of Hong Kong, Hong Kong (SAR China)
- 022. Intranasal Administration of a Live Attenuated Vaccine Derived from NSP16-deficient SARS-CoV-2 Confers Sterilizing Immunity in Rodent Models**
Zi-Wei Ye, Ph.D., The University of Hong Kong, Hong Kong, Hong Kong (SAR China)

5:00 PM – 7:00 PM

Poster Session 1

MONACO AND SIFU

Light food and beverages provided.

5:00 PM – 6:00 PM

ODD numbered posters

6:00 PM – 7:00 PM

EVEN numbered posters

Wednesday, May 22, 2024

8:30 AM – 9:10 AM

**Chronic, Latent, and Persistent Viruses -
Retroviruses and Herpesviruses**

NORFOLK BALLROOM

Chaired by

Joy Feng and **Zlatko Janeba**

- 023. Development of Broad-Spectrum Antiviral Drugs**
Hong Liu, PhD, Shanghai Institute of Materia Medica, Chinese Academy of Sciences, Shanghai, China
- 024. Some Capsid/Core Assembly Modulators (CAMs) Can Induce an Inhibition of HBV RNA Biogenesis**
David Durantel, Ph.D., Equipe Hepvir, CIRI, Inserm U1111, CNRS UMR5308, ENS-Lyon, UCBL1, Lyon, France

9:10 AM – 10:30 AM

**Late-breaking Oral Presentations and
Hepatotropic and GI Viruses**

NORFOLK BALLROOM

Chaired by

Kara Carter and **David Durantel**

- 080. Design and Synthesis of Clickable Photoaffinity Probes for Binding Site Identification on Yellow Fever Virus NS4B Target Built upon a Benzodiazepine Antiviral**
Yanming Du, Baruch S. Blumberg Institute, Doylestown, PA, United States
- 081. Establishment of the First High-Throughput Screening Assay for Rhinovirus C Antiviral Drug Discovery**
Erion Lyoo, Ph.D., KU Leuven, Leuven, Belgium
- 082. Suppression of Hepatitis B Virus Replication and Protein Expression Using CRISPR-Cas13b – Pre-clinical Investigations of a New Antiviral Approach**
Margaret Littlejohn, Ph.D, VIDRL, Royal Melbourne Hospital at the Peter Doherty Institute for Infection and Immunity, Australia
- 083. The CD8+T Cells Response is Sufficient for Protection with a CCHFV M-segment Based DNA Vaccine and GP38 Enhances Vaccine Immunogenicity**
Aura Garrison, Ph.D., USAMRIID, Frederick, United States
- 084. Unveiling Host-cell Glycosylation Changes Upon Parainfluenza Virus Infection**
Plabon Kumar Das, M. S., Institute for Glycomics, Griffith University, Gold Coast Campus, Qld, Australia, Gold Coast Australia, Queensland, Australia
- 029. Advances Toward HBV Cure**
Margaret Littlejohn, Ph.D, VIDRL, Royal Melbourne Hospital at the Peter Doherty Institute for Infection and Immunity, Australia

10:30 AM – 10:45 AM

Break

NORFOLK FOYER

10:45 AM – 12:15 PM

Arboviruses

NORFOLK BALLROOM

Chaired by

Lara Herrero and **Dahai Luo**

- 030. Beyond Retroviruses: Restriction of Flavivirus Replication by TRIM5 α**
Sonja Marie Best, PhD, National Institute of Allergy and Infectious Diseases, National Institutes of Health, Hamilton, Montana, United States
- 031. Liver-targeted Therapeutic siRNAs Against Highly Conserved Yellow Fever Virus Genomic Sequences Effectively Limit Infection and Mortality in a Hamster Model**
Justin G. Julander, Ph.D., Institute for Antiviral Research, Utah State University, Logan, Utah, United States
- 032. Ingestion of the Antiviral Drug JNJ-A07 by Mosquitoes During Blood-feeding Significantly Reduced Dengue Virus Transmission**
Ana Lucia Rosales Rosas, KU Leuven, Leuven, Belgium
- 033. Structural Basis of Dengue and Zika Virus NS1 Multimerization and Antibody Recognition**
Alvin Bing Liang Chew, Nanyang Technological University, Singapore
- 034. Identification of mRNA Processing Machinery as Druggable Host Factor Targets for Dengue Virus Infection**
Min Jie Alvin Tan, Ph. D., Duke-NUS Medical School, Singapore
- 035. Discovery of Pan-flavivirus Protease Inhibitors**
Christoph Nitsche, Australian National University, Canberra, ACT, Australia
- 036. Combination Therapy of Approved Drugs Potentiates Broad-spectrum Antiviral Activity Against Alphaviruses in Human Skin Fibroblasts And Mice**
Leen Delang, PhD, KU Leuven, Leuven, Belgium

12:15 PM – 2:15 PM

Poster Session 2

MONACO AND SIFU

Lunch provided.

12:15 PM – 1:15 PM

EVEN numbered posters

2:15 PM – 3:15 PM

ODD numbered posters

Thursday, May 23, 2024

8:30 AM – 9:20 AM

**Machine Learning and Computational Approaches
for Antiviral Research**

NORFOLK BALLROOM

Chaired by

Alpha Lee and **Joshua Schiffer**

- 037. Accelerating Antiviral Discovery with Artificial Intelligence**
Alpha Lee, PostEra, Cambridge, MA, United States
- 038. Atomistic Model of the Coronavirus nsp3/nsp4 Double Membrane Vesicle Pore**
Jason K. Perry, Ph.D., Gilead Sciences, Inc., Foster City, CA, United States
- 039. Antiviral Therapy Optimization for SARS-CoV2: A Mathematical Modeling Approach**
Shadi Sadat Esmaeili-Wellman, Ph.D., Fred Hutch Cancer Center, Seattle, WA, United States

9:20 AM – 10:20 AM

Coronaviruses, Influenza, RSV, and Other Respiratory Viruses

NORFOLK BALLROOM

Chaired by

Larissa Dirr and **Mark von Itzstein**

- 040. Click Chemistry-based Rapid Identification and Crystallographic Studies of Novel 1,2,3-Triazole-bearing Diazabicyclooctane Derivatives as Non-Covalent SARS-CoV-2 Mpro Inhibitors with Potent Antiviral Activity and Improved Drug-resistance Profile**
Peng Zhan, Ph.D., Shandong University, Jinan, China
- 041. Identification of Small-Molecule Inhibitors of Coronaviruses by Targeting Protein-Protein Interactions in RNA-Dependent RNA Polymerase Complex**
Jeremy Blavier, MS, Viral Interactomes Laboratory, GIGA Institute, University of Liege, Liege, Belgium
- 042. A CRISPR/Cas9 Genetically Engineered Organoid Biobank To Study Coronavirus Host Factors**
Mart Matthias Lamers, Duke-NUS, Singapore

10:20 AM – 10:35 AM

Break

NORFOLK FOYER

10:35 AM – 11:25 AM

Coronaviruses, Influenza, RSV, and Other Respiratory Viruses *(continued)*

NORFOLK BALLROOM

Chaired by

Larissa Dirr and **Mark von Itzstein**

- 043. Identification of Novel Host Proteins that are Associated with Macrophage Control of Influenza A Virus Replication**
Sarah L. Londrigan, PhD, Department of Microbiology and Immunology, The University of Melbourne, Peter Doherty Institute, Melbourne, Victoria, Australia
- 044. A Mouse Model of Human Parainfluenza Virus Type 3 Infection to Study Prophylactic and Therapeutic Modalities**
Yuxia Lin, Ph.D, KU Leuven, Leuven, Belgium
- 045. Engineering Protease-resistant Peptides to Inhibit Human Parainfluenza Viral Respiratory Infection**
Anne Moscona, M.D., Columbia University Vagelos College of Physicians and Surgeons, New York, NY, United States
- 046. Aptamer-based Glycoprotein Broad-spectrum Blocking Strategy Inhibits Respiratory Syncytial Virus Infection**
Ge Yang, Institute of Medicinal Biotechnology, Chinese Academy of Medical Sciences and Peking Union Medical, Beijing, China
- 047. Inhibition of Rhinovirus Infection in Differentiated Primary Human Bronchial Epithelial Cells by Nanoparticle-Encapsulated Small Interfering RNA**
Nathan Bryant, University of Newcastle, Newcastle, NSW, Australia
- 048. Development of Small Molecule Entry Inhibitors as Novel Therapeutics against Influenza Viruses**
Lijun Rong, Ph.D., University of Illinois Chicago, Chicago, Illinois, United States; Chicago BioSolutions, Inc., Chicago, Illinois, United States

11:25 AM – 12:00 PM

Chronic, Latent, and Persistent Viruses – Retroviruses and Herpesviruses

NORFOLK BALLROOM

Chaired by

Gerald Kleymann and **Jennifer Moffat**

- 050. The B Cell Repertoire in Multiple Sclerosis Reveals Molecular Mimicry between EBV EBNA1 and GlialCAM**
Tobias V. Lanz, MD, Stanford University, Stanford, CA, United States

12:00 PM – 12:15 PM

ISAR Annual Business Meeting

NORFOLK BALLROOM

PRESIDENT: **Kathie Seley-Radtke**

TREASURER: **Brian Gowen**

SECRETARY: **Brian Gowen** on behalf of **Jinhong Chang**

12:15 PM – 1:45 PM

Lunch

(included for all conference registrants)

RELISH GRILL AND BAR

1:45 PM – 2:30 PM

Women in Science and Excellence Award Lecture

NORFOLK BALLROOM

Chaired by

Rhonda Cardin and **Kathie Seley-Radtke**

051. From Target to Treatment

Judith Breuer, MD, FRCPath, FMedSci, University College London and Great Ormond Street Hospitals, London, England, United Kingdom

2:30 PM – 3:30 PM

Arboviruses

NORFOLK BALLROOM

Chaired by

Lara Herrero and **Dahai Luo**

052. Medicinal Chemistry Optimization and Therapeutic Efficacy of 2-Pyrrolidinoquinazolinones in Lethal Murine Models of Venezuelan and Eastern Equine Encephalitis Viruses

Jennifer E. Golden, Ph.D., Division of Pharmaceutical Sciences, School of Pharmacy, University of Wisconsin-Madison, Madison, Wisconsin, United States

053. Design, Synthesis, and Lead Optimisation of Piperazinyl-Pyrimidine Analogues as Potent Small Molecules Inhibitors of Chikungunya Virus

Verena Battisti, Ph.D., University of Vienna, Vienna, Vienna, Austria

054. Suicidal Capsid Protease from O'nyong'nyong Virus: Unveiling the Inhibitory Potential of Indole Derivatives

Yuliya Chykunova, Virogenetics Laboratory of Virology, Malopolska Centre of Biotechnology, Jagiellonian University, Krakow, Poland

055. Treatment with 6MMPr Potentiates the Activity of Favipiravir in a Hamster Model of Yellow Fever

Justin G. Julander, Ph.D., Institute for Antiviral Research, Utah State University, Logan, Utah, United States

3:30 PM – 3:45 PM

Break

NORFOLK FOYER

3:45 PM – 4:45 PM

Broad Spectrum Antiviral Drugs, Non-respiratory Biothreat Viruses, and Pandemic Preparedness

NORFOLK BALLROOM

Chaired by

John Bilello and **Subash Vasudevan**

056. Cellular and Molecular Mechanisms of Arboviral Immunity

Lisa Ng, Ph.D., A*STAR Infectious Diseases Labs, Singapore

057. Development and Mechanism of Novel Diphyllin Derivatives Against Ebola Virus Infection

Patrick Keiser, PhD Candidate, NEIDL, Department of Virology, Immunology, and Microbiology, Boston University, Boston, MA, United States

058. Identification and Evaluation of Novel Lassa Virus Entry Inhibitors Using Computational Counter Screening And Chemical Informatics

Brianna Close, Boston University, Boston, Massachusetts, United States

059. Identification of a Macrocyclic Compound Targeting the Lassa Virus Polymerase

Mike J. Flint, Ph.D., Centers for Disease Control and Prevention, Atlanta, GA, United States

4:45 PM – 5:00 PM

Break

NORFOLK FOYER

5:00 PM – 6:00 PM

Broad Spectrum Antiviral Drugs, Non-respiratory Biothreat Viruses, and Pandemic Preparedness (continued)

NORFOLK BALLROOM

Chaired by

John Bilello and **Subash Vasudevan**

060. Tribbles Pseudokinase 3 Promotes Enterovirus A71 Infection via Dual Mechanisms

Huiqiang Wang, Institute of Medicinal Biotechnology, Chinese Academy of Medical Sciences, Beijing, China

061. Generation and Optimization of Bangladesh and Malaysian Recombinant Reporter Nipah Viruses for Antiviral Screening in vitro and Disease Modeling in vivo

Michael K. Lo, Ph.D., US Centers for Disease Control and Prevention, Atlanta, GA, United States

062. Intranasal Route to Immunity: Single Dose Mucosal Delivery of Viral Replicon Particle Vaccine Protects Uniformly Against Lethal Nipah Virus Challenge In African Green Monkeys

Stephen R. Welch, US Centers for Disease Control and Prevention, Atlanta, United States

- 063. Evaluation of Small Molecules as Promising Broad-Spectrum Anti-Filoviral Agents**
Jazmin Galvan Achi, *University of Illinois Chicago, Chicago, Illinois, United States*
- 064. Small Molecule Antiviral Candidates for Rift Valley Fever**
Wenjun Ma, *University of Missouri, Columbia, Missouri, United States*
- 065. In Silico Tools for Antiviral Research and Future Pandemic Forecasting**
Eugene Muratov, Ph.D., *University of North Carolina, Chapel Hill, North Carolina, United States*

7:00 PM – 10:00 PM

Closing Event

NORFOLK BALLROOM & POOLSIDE

Friday, May 24, 2024

9:00 AM – 10:20 AM

Hepatotropic and GI Viruses

NORFOLK BALLROOM

Chaired by

Kara Carter and **David Durantel**

- 066. Hepatitis B Virus cccDNA Biosynthesis, Epigenetics, and Antiviral Development**
Haitao Guo, Ph.D., *University of Pittsburgh, Pittsburgh, Pennsylvania, United States*
- 067. Discovery of a Pan-genotype Hepatitis E Virus Replication Inhibitor Exerting Potent in vivo Efficacy**
Suzanne Kaptein, Ph.D., *Rega Institute for Medical Research, KU Leuven, Leuven, Belgium*
- 068. Functional Evaluation and Mode of Action of a Novel Non-nucleoside Drug Inhibiting the Replication of Hepatitis Delta Virus**
David Durantel, Ph.D., *Equipe Hepvir, CIRI, Inserm U1111, CNRS UMR5308, ENS-Lyon, UCBL1, Lyon, France*
- 069. Discovery of First-in-Class Hydrophobic Tagging (HyT)-based Degradable HBV Core Protein**
Shujing Xu, Ph.D., *Department of Medicinal Chemistry, Key Laboratory of Chemical Biology (Ministry of Education), Jinan, Shandong Province, China*
- 070. Proof of Concept: Exploring the Therapeutic Potential of G3BP1 Targeted Degradation Against Norovirus Infection**
Liliana Echavarria Consuegra, Dr., *University of Cambridge, Cambridge, United Kingdom*
- 071. Protease Inhibitor Activity Varies Between Genogroup I and Genogroup II Noroviruses**
Alice M. McSweeney, *Otago University, New Zealand*

10:20 AM – 10:45 AM

Break

NORFOLK FOYER

10:45 AM – 11:15 AM

Shotgun Presentations

NORFOLK BALLROOM

Chaired by

Two Trainees TBD

11:15 AM – 12:30 PM

Chronic, Latent, and Persistent Viruses – Retroviruses and Herpesviruses

NORFOLK BALLROOM

Chaired by

Joy Feng, Zlatko Janeba, Jennifer Moffat, and Gerald Kleymann

- 072.** **Towards an HIV Cure: Novel Approaches to Reduce and Control the Reservoir**
Sharon R. Lewin, Ph.D., Department of Infectious Diseases, University of Melbourne, Doherty Institute, Melbourne, VIC, Australia
- 073.** **Antivirals Targeting the Conserved HIV-1 TIM-TAM Riboswitch Specifically Reactivate HIV-1 from Latency through Modulating Viral RNA-biology**
Damian FJ Purcell, Ph.D., Department of Microbiology and Immunology, University of Melbourne, Doherty Institute, Melbourne, VIC, Australia
- 074.** **Mechanisms of HIV-1 Hypersensitivity to Islatravir (4'-ethynyl-2-fluoro-2'-deoxyadeosine (EFdA))**
Alexa A. Snyder, Emory University School of Medicine, Atlanta, Georgia, United States
- 075.** **HSV-1 Latency is Established in Human Neurons in which Viral Genes are Expressed and Viral DNA is Replicated during the Acute Infection**
Arryn Owens, Cornell University, Ithaca, NY, United States
- 076.** **Evaluation and Pharmacokinetics of the POM-L-BH DU-MP Prodrug Against Varicella Zoster Virus and Herpes Simplex Virus 1 in vivo**
Jennifer F. Moffat, PhD, SUNY Upstate Medical University, Syracuse, NY, United States