

# OCRID NEWS

December 2018

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## A Message from the Director

### Introducing the very first OCRID Newsletter!

We are introducing our OCRID Newsletter to keep you up to date with exciting events and news happening in the center. This issue is dedicated to recognizing the achievements of our investigators and welcoming new members.

OCRID recently received \$ 11.1 million Phase 2 CoBRE funding. I am extremely pleased that our CoBRE grant was able to transition to Phase 2 without any disruption, thanks to an incredible collaboration

from scientists across the state of Oklahoma. As we are moving into Phase 2, we want to be extraordinary by continuing to mentor junior faculty, building infrastructure and promoting collaboration and thus developing a sustainable center of research excellence.

### Happy Holiday!

Lin Liu, Ph.D.  
OCRID Director

## Pilot Project Award Winners

We had wonderful Pilot Project submissions this year and we are pleased to announce the winners!

### Karen Wozniak, Ph.D.—OSU

Assistant Professor  
Department of Microbiology and Molecular Genetics—College of Arts and Sciences  
*Interactions of Murine Pulmonary Macrophage Subsets with Cryptococcus Neoformans*

### Lucila Garcia-Contreras, Ph.D.-OUHSC

Assistant Professor  
Department of Pharmaceutical Sciences—College of Pharmacy  
*OHet72: A Potential New Drug in the Armamentarium Against TB and MDR-TB*

### Michael Davis, DVM, Ph.D.—OSU

Professor and Endowed Chair  
Physiological Sciences—Center for Veterinary Health Sciences  
*Effect of Airway Mucosal Cooling and Hyperosmolarity on Innate Immune Function*

### Susan Schroeder, Ph.D.—OU

Associate Professor  
Department of Microbiology & Plant Biology, Chemistry & Biochemistry— College of Arts and Sciences  
*Viral RNA Structures, Function, and Energetics*

### Yu Feng, Ph.D.—OSU

Assistant Professor  
Department of Chemical Engineering—College of Engineering, Architecture, and Technology  
*A Precise Scale-up Method from Mice to Men on the Infection of Influenza A Virus*

## New Faces!

A very warm welcome to our new OCRID investigators, IAC members, EAC member and mentors.

### Susan Schroeder, Ph.D-Investigator

Associate Professor  
Department of Chemistry and Biochemistry  
Department of Microbiology and Plant Biology  
College of Arts and Sciences  
Oklahoma University-Norman

### Chongle Pan, Ph.D-Investigator

Associate Professor  
School of Computer Science  
Department of Microbiology and Plant Biology  
College of Arts and Sciences  
University of Oklahoma-Norman

### Ronald Van Ben Bussche, Ph.D-IAC

Associate Vice President for Research  
Regents Professor  
Department of Integrative Biology  
College of Arts and Sciences  
Oklahoma State University

### Douglas Drevets, MD-IAC

Professor and Chief  
Section of Infectious Diseases  
Department of Internal Medicine  
College of Medicine  
University of Oklahoma Health Science Center

### Jian-Xing Ma, MD, Ph.D-IAC

Laureate Professor and Chairman  
Department of Physiology  
College of Medicine  
University of Oklahoma Health Science Center

### Bruce A. Stanton, Ph.D-EAC

Professor of Microbiology and Immunology  
Andrew C. Vail Professor  
Director of the Lung Biology Center  
Director of the Center for Environmental Health Sciences  
Department of Microbiology and Immunology  
Geisel School of Medicine  
Dartmouth College, New Hampshire

### Clinton Jones, Ph.D-Mentor

Sittington Professor of Infectious Diseases  
Department of Veterinary Pathobiology  
Center for Veterinary Health Sciences  
Oklahoma State University

### Rodney Tweten, Ph.D-Mentor

OU Presidential Professor  
George Lynn Cross Research Professor  
Department of Microbiology and Immunology  
College of Medicine  
University of Oklahoma Health Science Center

### Tyrrell Conway Ph.D-Mentor

Regents Professor and Head  
Department of Microbiology and Molecular Genetics  
College of Arts and Sciences  
Oklahoma State University

### Michael Franklin, Ph.D-Mentor

Professor  
Department of Microbiology & Immunology  
College of Arts and Sciences  
Montana State University

## Up Coming Meetings:

OCRID has finished up activities for this semester. We will start up again on January 23rd with a Seminar from Dr. John Alcorn from the University of Pittsburgh. We will finish up January with a Journal Club meeting with Dr. Veronique Lacombe on January 30th.

## 6th Annual OCRID Retreat:

Per the surveys we sent out earlier this year we have decided to hold next year's retreat on April 9th in Stillwater. It will be held at the Conoco-Phillips Alumni Center. We will have more information for you soon. In the meantime make your calendars for April 9th!

## OCRID Phase I Project Leader and Investigator Received Multiple PI NIH R01 Grant

Dr. Heather Fahlenkamp, Phase I project leader along with Dr. Susan Kovats, OCRID investigator received a multiple PI NIH R01 grant entitled "A 3D Human Tissue-Engineered Lung Model to Study Immune Responses to Respiratory Syncytial Virus". This is a 4-year funding with over 2 million. Dr. Fahlenkamp was Assistant Professor when OCRID started in 2013 and is now Full Professor in Chemical Engineering and Anadarko Petroleum Chair at the College of Engineering and Technology, OSU. She was recently appointed as Interim Head of School of Chemical Engineering. Dr. Kovats is Associate Member at the Oklahoma Medical Research Foundation. Dr. Bob Welliver (OCRID mentor) in the Department of Pediatrics and Dr. Jordan Metcalf (OCRID Co-Director) in the Department of Medicine, OUHSC serve as co-investigators. This project was initiated and further developed from one of the projects in a U19 multiple project grant submitted by OCRID in 2016. This is another successful example demonstrating the effectiveness in promoting collaborations on Respiratory and Infectious Diseases across the State of Oklahoma by OCRID.



Dr. Heather Fahlenkamp

## OCRID Phase II Project Leader, Dr. Li Received NIH R01 and R21 Grants, Totaling Over \$2.1 million

Shitao Li, PhD, Phase II project leader, received a \$1.7 million National Institutes of Health R01 grant, entitled "Role of FIP200 in RIG-I-mediated innate immunity." Li and his team will investigate the regulatory mechanisms for RIG-1-mediated innate immunity. The finding from this project will provide the insights needed to design therapies for influenza and other infectious and autoimmune diseases.

Dr. Li also received a R21 for over \$400,000 with Dr. Clint Jones as a co-Investigator. Titled, "Regulation of cGAS-Mediated Cytosolic DNA Sensing Pathway" seeks to identify a new self-regulatory mechanism in DNA-mediated immunity. Through the grant Dr. Li hopes to develop new therapeutics to prevent DNA virus infection and treatment of autoimmune diseases.

Dr. Li is currently an Assistant Professor in the Department of Physiological Sciences at Oklahoma State University-Stillwater.



Dr. Shitao Li

## OCRID Pilot Project Leader, Dr. Rybenkov Received NIH R21 Grant for Novel Antimicrobials for Infections

Valentin Rybenkov, PhD, OCRID pilot project leader, received \$388K from the National Eye Institute. His grant, titled Novel Antimicrobials for Eye Infections, seeks to provide urgently needed antibacterial compounds to combat bacterial eye infections that frequently arise as a complication of corrective surgery or contact lens use. Such infections often lead to irreversible eye damage due a growing number of such infections failing to respond to available antibiotics.

Dr. Rybenkov's project pursues the development of antimicrobials against a novel target, bacterial condensins. Condensins play a central roll in global chromosome organization and contribute to faithful segregation of genetic information in diverse organisms.

Dr. Rybenkov is currently an Associate Professor in the Department of Chemistry and Biochemistry in the College of Arts and Sciences at the University of Oklahoma-Norman.



Dr. Valentin Rybenkov

## OCRID Investigator, Dr. Rice Received NIH R03 Grant for Antibiotic Research Targeting MRSA and MRSE

Charles Rice, PhD, OCRID investigator, received over \$140,000 from the National Institute of Allergy and Infectious Diseases. His grant, titled Antibiotic Potentiators Targeting Biofilms of MRSA and MRSE, is looking at the Staphylococcus aureus (MRSA) and Staphylococcus epidermidis (MRSE) and it's resistance to antibiotics that continue to cause deadly hospital-acquired infections.

MRSA and MRSE have a high morbidity rate. However, in Dr. Rice's lab they have discovered that  $\beta$ -lactam antibiotics that kill methicillin-susceptible *S. aureus* also prevent the growth of methicillin-resistant *S. aureus* (MRSA) if administered with methicillin-binding protein 2 (BPEI). The  $\beta$ -lactam + BPEI combinations are also effective against exopolymers surround MRSE bacteria. It is Dr. Rice's long term goal to kill bacterial pathogens and their associated biofilms.

Dr. Rice is currently an Associate Professor in the Department of Chemistry and Biochemistry in the College of Arts and Sciences at the University of Oklahoma-Norman.



Dr. Charles V. Rice

## OCRID Investigator, Dr. Jiang Received NIH R01 Grant for Key Serine Proteases in Insect Immunity

Haobo Jiang, PhD, OCRID investigator, received a NIH R01 (~ 1.8 million) entitled " Function and Regulation of Two key Serine Proteases in Insect Immunity". Dr. Jiang is a Regents Professor in the Department of Entomology and Plant Pathology, Division of Agricultural Sciences and Natural Resources, OSU.

Dr. Jiang has been working since 1999 in the hopes of gaining an improved understanding of insect immunity at a biochemical level and stimulate related research in vector species.

Dr. Jiang is a Regents Professor in the Department of Entomology and Plant Pathology in the Division of Agricultural Sciences and Natural Resources at Oklahoma State University-Stillwater.



Dr. Haobo Jiang