

## 2020 OLLI COURSE

### The Genome and Health

Genomic biology combines information about genes and their functions and unique methodologies to develop a predictive understanding of biological systems and behavior relevant to solving medical, energy and environmental challenges. This course will introduce learners to genes and genomes and explore technological advances in genome research and how these advances are impacting health and society. Faculty instructors are from the Carl R. Woese Institute for Genomic Biology (IGB), one of the premier institutes of its kind in the country.

#### Schedule:

#### *The Genome and Health OLLI Course, Fall-2020*

September 2<sup>nd</sup>, 9am-10:30am – Erik Nelson

Intro to course, genes, regulation and phenotype, followed by: *Cholesterol, Regulation of Genes and Cancer*

September 9<sup>th</sup>, 9am-10:30am – Thomas E. Kehl-Fie

*You are what you don't eat: How pathogens overcome starvation to cause disease*

September 16<sup>th</sup>, 9am-10:30am – Huimin Zhao

*A brief history of genetic engineering*

September 23<sup>rd</sup>, 9am-10:30am – Jodi Flaws

*Effect of the environment on reproductive health*

September 30<sup>th</sup>, 9am-10:30am – Marni Boppart

*Design of novel therapeutics to enhance skeletal muscle mass and strength*

October 7<sup>th</sup>, 9am-10:30am – Collin Kieffer

*Still here after all these years: The continuing HIV/AIDS epidemic and new approaches to understand and cure a global killer.*

October 14<sup>th</sup>, 9am-10:30am – Auinash Kalsotra

*RNA and Disease*

October 21<sup>st</sup>, 9am-10:30am – Hannah D. Holscher

*Microbes Matter: Eating for Trillions*

## About the Presenters:

### 1. **Erik R. Nelson**, Assistant Professor of Molecular and Integrative Physiology

Title of Lecture: Cholesterol, Regulation of Genes and Cancer

Biography of Speaker: Dr. Nelson is an assistant professor in the department of Molecular and Integrative Physiology. He is also a member of the Cancer Center at Illinois. Dr. Nelson received his PhD in Endocrinology from the University of Calgary, and specialized in Cancer Biology and Pharmacology at Duke University. In 2014, he was recruited to the University of Illinois to investigate how cholesterol and its metabolites impact breast and ovarian cancer.

Description of Lecture Topic: Cancer continues to be a major clinical and societal problem. This lecture will describe how cholesterol is involved in helping cancer grow, and how we might use this knowledge to develop better therapeutic strategies.

### 2. **Thomas E. Kehl-Fie**, Assistant Professor of Microbiology

Title of Lecture: You are what you don't eat: How pathogens overcome starvation to cause disease

Biography of Speaker: Dr. Kehl-Fie is an assistant professor in the department of microbiology, whose laboratory is working to elucidate the molecular mechanisms used by *Staphylococcus aureus* and other pathogens to subvert host defenses and cause infection. Before joining the University of Illinois, he completed his graduate training at Washington University in St. Louis in molecular microbiology and microbial pathogenesis and a postdoctoral fellowship at Vanderbilt University Medical Center

Description of Lecture Topic: During infection humans and other vertebrates starve invading organisms for essential nutrients, a defense known as nutritional immunity. This lecture will focus on the strategies used by pathogens to overcome this host-defense.

### 3. **Huimin Zhao**, Professor of Chemical and Biomolecular Engineering, Chemistry, Biochemistry, and Bioengineering. [Dr. Zhao is replacing Dr. Perez-Pinera]

Title of Lecture: A brief history of genetic engineering.

Biography of Speaker: Dr. Zhao is a Professor and holds the Steven L. Miller Chair in Departments of Chemical and Biomolecular Engineering, and is cross-appointed

to the departments of Chemistry, Biochemistry and Bioengineering. His laboratory uses synthetic biology approaches to engineer functionally improved or novel proteins, pathways, and genomes.

Description of Lecture Topic: This lecture will describe some of the recent developments in the field of genetic engineering; developments that are poised to fundamentally transform biomedicine and biotechnology.

#### **4. Jodi Flaws, Professor of Comparative Biosciences**

Title of Lecture: Effect of the environment on reproductive health

Biography of Speaker: Dr. Jodi Flaws is a Professor in the Department of Comparative Biosciences at the College of Veterinary Medicine. Her laboratory studies the effects of environmental chemical exposures on the female reproductive system

Description of Lecture Topic: The lecture will focus on which types of environmental chemical exposures impact female reproductive health. It will also focus on the mechanisms by which environmental chemicals damage the reproductive system.

#### **5. Marni Boppart, Associate Professor of Kinesiology & Community Health**

Title of Lecture: Design of novel therapeutics to enhance skeletal muscle mass and strength

Biography of Speaker: Marni Boppart, Department of Kinesiology and Community Health, is the head of the Molecular Muscle Physiology Lab at the Beckman Institute for Advanced Science and Technology. She also holds appointments in the Department of Cell and Developmental Biology and the Carle Illinois College of Medicine. She has studied skeletal muscle for the last 25 years and funded by the National Institutes of Health to improve muscle health in context of disuse and aging.

Description of Lecture Topic: This lecture will focus on how the muscle responds to the process of aging and current research focused on the prevention or recovery of age-related muscle loss.

#### **6. Collin Kieffer, Assistant Professor of Microbiology**

Title of Lecture: Still here after all these years: The continuing HIV/AIDS epidemic and new approaches to understand and cure a global killer.

Biography of Speaker: Dr. Kieffer was born and raised in the midwest and obtained his undergraduate degree at the University of Wisconsin-Madison, with a double-major in bacteriology and genetics, and a minor in art. He conducted his PhD in Biochemistry at the University of Utah and postdoc in Biology and Biological Engineering at Caltech before returning to the midwest as an assistant professor in the Department of Microbiology at the University of Illinois.

Description of Lecture Topic: In this lecture we will cover the history of the HIV epidemic and delve into aspects of the virus life-cycle that allow the virus to remain dormant within infected individuals which necessitates lifelong treatment to keep the virus suppressed. We will then discuss how advanced 3D imaging is illuminating our understanding of the virus in tissues from animal models and human patients with the goal of identifying new virus weaknesses and patient responses to novel treatments.

## **7. Auinash Kalsotra, Associate Professor of Biochemistry**

Title of Lecture: RNA and Disease

Biography of Speaker: Auinash Kalsotra is an associate professor of biochemistry, a Beckman fellow, and a member of the Carl R. Woese Institute of Genomic Biology, and the Cancer Center at Illinois. Kalsotra received his Ph.D. in biochemistry and molecular biology from the University of Texas MD Anderson Cancer Center at Houston TX, where he studied the role of lipid mediators in progression and resolution of inflammation. During his postdoctoral work at Baylor College of Medicine in Houston TX, he investigated the mechanisms and roles of RNA processing in heart development and disease.

Description of Lecture Topic: In this seminar, I will introduce an RNA-mediated muscle disease, explain its underlying pathogenic mechanism(s), and discuss our recent efforts to develop therapeutic approaches for treating it.

## **8. Hannah D. Holscher, Assistant Professor of Nutrition**

Title of Lecture: Microbes Matter: Eating for Trillions

Biography of Speaker: Dr. Hannah Holscher is an assistant professor of nutrition and a registered dietitian. She studies how food influences gut microbes and human health. Her work is important because it informs dietary recommendations to improve health and well-being.

Description of Lecture Topic: There is a microbial 'organ' that resides inside each of us and contributes to our health and well-being. Consuming a diet rich in plant foods, like fruits, vegetables, nuts, whole grains, and legumes helps to support your health, as well as the health of your trillion little friends.

