

# *Opportunities for Rapid Advancement of Limb Regeneration: From Animal Models to Humans*

**February 17-18, 2021**

Virtual (All times Eastern)

## **Day 1: February 17, 2021**

**10:00-10:10am**      **Welcome and Introduction**

NIH staff

**10:10-10:25am**      **Introductory Remarks**

Alison Cernich, PhD, Deputy Director, NICHD

## **KEYNOTE**

**10:25-10:55am**      *Historical perspective on limb regeneration research*

Ken Muneoka, PhD, Texas A&M University

## **Session 1: Limb regeneration response and blastema in lower vertebrates**

**11:00-11:15am**      *Overview of limb regeneration in lower vertebrate systems and the role of blastema*

Jessica Whited, PhD, Harvard University

**11:15-11:30pm**      *How are tissue patterning and tissue scale coordinated during limb regeneration?*

Deneen Wellik, PhD, University of Wisconsin

**11:30-11:45pm**      *How are genetic programs coordinated throughout limb regeneration?*

Kenneth Poss, PhD, Duke University

**11:45-12:00pm**      *How does limb regeneration recapitulate and differ from initial limb development?*

Ashley Seifert, PhD, University of Kentucky

**12:00-1:00pm**      **Panel Discussion**

*Lessons learned from limb regeneration in lower vertebrates*

**Panelists**

Chair: Susan Mackem, PhD, NCI

Catherine McCusker, PhD, University of Massachusetts Boston

James Monaghan, PhD, Northeastern University

Sandra Rieger, PhD, University of Miami

**1:00-1:30pm**      **Lunch**

**Session 2: Potential for limb regeneration in higher vertebrates**

**1:30-1:45pm**      *What is the evidence for tissue and organ regenerative potential in higher vertebrates?*

Mayumi Ito, PhD, New York University

**1:45-2:00pm**      *What is the role of the regenerative response after amputation in humans?*

Paul Marasco, PhD, Cleveland Clinic

**2:00-2:15pm**      *Strategies to reactivate regenerative potential in higher vertebrates: potential for stem cells for repair and regeneration of limb tissue*

Caroline Dealy, PhD, University of Connecticut Health

**2:15-2:30pm**      *What is the role of mechanical loading in muscle regeneration and repair?*

Lisa Larkin, PhD, University of Michigan

**2:30-3:30pm**      **Panel Discussion**

*Potential for mammalian limb regeneration*

**Panelists**

Chair: Luis Garza, MD, PhD, Johns Hopkins University

Erica Crespi, PhD, Washington State University

Jianjun Guan, PhD, Washington University in St. Louis

Jessica Lehoczky, PhD, Brigham and Women's Hospital

Mimi Sammarco, PhD, Tulane University

**3:35pm**      **End Day 1**

## **Day 2: February 18, 2021**

**10:30am**                    **Welcome to Day 2 – NIH staff**

### **KEYNOTE**

**10:35-11:05am**            *Limb regeneration using a regenerative engineering convergence approach*

Cato T. Laurencin, MD, PhD, University of Connecticut

### **Session 3: Supporting function in the proximal limb for amputees**

**11:10-11:25am**            *How does clinical decision-making pre-amputation affect functional outcomes?*

Christopher Attinger, MD, Georgetown Medstar

**11:25-11:40am**            *Challenges of proximal limb function in amputees: clinical support and secondary health issues*

Linda Resnik, PT, PhD, Brown University

**11:40-11:55am**            *Do amputation strategies affect functional potential in the proximal limb?*

Chris Dearth, PhD, DoD-VA Extremity Trauma & Amputation Center of

**11:55-12:10pm**            *Excellence Barriers to Realizing Potential of Prosthetic Devices*

Joan Sanders, PhD, University of Washington

**12:10-1:15pm**            **Panel Discussion**

*Maximizing function for amputees today*

#### **Panelists**

Chair: Sarah Greising, PhD, University of Minnesota

David L. Butler, PhD, University of Cincinnati

Alan R. Davis, PhD, Baylor College of Medicine

Yong Li, MD, PhD, Western Michigan University

**1:15-1:45pm**            **Lunch**

## **Session 4: Future directions**

### **1:45-2:45pm          Moderated Discussion**

- What can be achieved in the near term through collaborations between basic scientists and clinicians that could profoundly accelerate the pace of progress?
- Can biology inform better functioning of current prosthetics?
- Integrating the proximal limb with prosthetic devices to enhance motor function and sensation
- Focusing on appropriate pre-clinical mammalian models
- Identifying major research opportunities that could uniquely benefit the field

#### **Panelists**

Chairs: Thomas Rando, MD, PhD, Stanford University

Cliff Tabin, PhD, Harvard University

Lea Goentoro, PhD, Caltech

Virginia Byers Kraus, MD, PhD, Duke University

David Morgenroth, MD, University of Washington

Ken Muneoka, PhD, Texas A&M University

Buddy D. Ratner, PhD, University of Washington

### **2:45-3pm          Wrap Up – NIH Staff**