

# 11th International BMP Conference Program

## Wednesday, October 26th

12:00pm - 4:00pm **Registration – Poster Set Up**

4:00pm - 4:10pm **Welcome**  
**Vicki Rosen** (Harvard School of Dental Medicine, USA)

4:10pm - 5:55pm **Session 1 - Urist Lecture**  
 Introduction by Hari Reddi

**Aris Economides** (Regeneron, USA)  
*"Mutant ACVR1 causes FOP by perceiving Activin A as a BMP"*

6:30pm - 10:30pm **Opening Social Event**  
 Isabella Stewart Gardner Museum

## Thursday, October 27th

7:30am Continental Breakfast

8:00am - 10:15am **Session 2 - Skeletal Stem Cells**  
 Moderators: Karen Lyons, Aris Economides

### Invited Speakers:

**Michael Longaker** (Stanford, USA)

*"Skeletal stem cells"*

**Daniel Worthley** (University of Adelaide, Australia)

*"Gremlin 1 as a marker of connective tissue stem cells in development, disease and repair"*

**Amitabha Bandyopadhyay** (Indian Institute of Technology Kanpur, India)

*"BMP signaling in bone morphogenesis-uncovering the network"*

**Juan Hurler** (University of Cantabria, Spain)

*"Dissecting the pro-chondrogenic and pro-fibrogenic functions of BMPs during the formation of the digits in the embryonic limb"*

### Short talks:

**Valerie Salazar** (Harvard School of Dental Medicine, USA)

*"Developmental and inducible functions of the periosteum converge on Bmp2"*

**Diana Carlone** (Boston Children's Hospital, USA)

*"CXXC finger protein 1 inhibits BMP mediated Smad signaling in murine bone marrow stromal cells"*

**Benjamin Levi** (University of Michigan, USA)

*"Prevention of trauma-induced heterotopic ossification using a translational strategy to target BMP signaling"*

10:15am - 10:45am **BREAK**

10:45am - 1:00pm **Session 3 - Neural Pathways**  
 Moderators: Kristi Wharton, Yuji Mishina

### Invited Speakers:

**David Dietz** (University of Buffalo (SUNY), USA)

*"Molecular mechanism of drug-induced plasticity: a novel role for Activin signaling"*

**Ashley Webb** (Brown University, USA)

*"Elucidating the transcriptional networks that preserve neural stem cell homeostasis"*

**Heather Broihier** (Case Western Reserve University, USA)

*"Investigating functions of activity-dependent BMP signaling in synapse assembly and function"*

**Akiko Hata** (UCSF, USA)

*"Translational regulation of BMP receptor by Fragile X Mental Retardation Protein"*

### Short talks:

**Justin Fallon** (Brown University, USA)

*"MuSK is a BMP co-receptor that shapes BMP responses in muscle cells"*

**Mathieu Bartoletti** (Brown University, USA)

*"Motor neuron-glia interactions require distinct contribution from BMP ligands, Dpp and Gbb"*

1:00pm - 2:00pm

**Lunch & Poster Sessions** (Odd # posters judged)

2:00pm - 4:15pm

#### **Session 4 - Signaling Dynamics**

Moderators: Derek Brazil, Jay Groppe

##### **Invited Speakers:**

**Mary Mullins** (University of Pennsylvania School of Medicine, USA)

*"BMP heterodimer signaling mechanism"*

**Caroline Hill** (The Francis Crick Institute, United Kingdom)

*"Ligand-specific functions of Smad1/5 signalling"*

**Tom Thompson** (University of Cincinnati, USA)

*"Structural diversity of extracellular antagonists"*

**Thomas Mueller** (University of Wurzburg, Germany)

*"BMPs as interaction hubs: structural requirement and functional consequences"*

##### **Short talks:**

**Yaron Antebi** (Caltech, USA)

*"Programmable computation in the BMP signaling pathway"*

**Tessa Montague** (Harvard University, USA)

*"Vg1 forms heterodimers with Nodal to control early vertebrate embryogenesis"*

**Senem Aykul** (Michigan State University, USA)

*"Protein interaction analysis reveals how the homologous TGF $\beta$  family signaling-regulators Cripto-1 and Cryptic recognize ligands"*

4:15pm - 4:45pm

**BREAK**

4:45pm - 7:30pm

#### **Session 5 - Skeletal Development & Disease**

Moderators: Eileen Shore, Frank Luyten

##### **Invited Speakers:**

**Maurizio Pacifici** (The Children's Hospital of Philadelphia, USA)

*"Roles and mechanisms of BMP signaling in Hereditary Multiple Exostoses"*

**Gabriela C. Loots** (Lawrence Livermore National Laboratory, USA)

*"Mining the genomic landscape of skeletal disease for WNT-BMP crosstalk"*

**Fanxin Long** (Washington University in St. Louis, USA)

*"Role and mechanism of Bmp signaling in osteoblast-lineage cells"*

**Malcolm Whitman** (Harvard School of Dental Medicine, USA)

*"Regulation of VLK by BMP/TGF $\beta$  superfamily factors, the role of VLK in cartilage and bone development and substrates for VLK action"*

**Brendan Lee** (Baylor College of Medicine, USA)

*"TGF $\beta$  regulation of osteocyte differentiation in human and mouse skeletal dysplasias"*

##### **Short talk:**

**Terence Capellini** (Harvard University, USA)

*"The cis-regulatory architecture of Gdf5 and its roles in joint development and disease"*

## Friday, October 28th

7:30am Continental Breakfast

### 8:00am - 10:15am Session 6 - Signaling & Disease 1

Moderators: Paul Yu, Lynn Sakai

#### Invited Speakers:

**Nick Morrell** (University of Cambridge, United Kingdom)  
*"BMPRII as a therapeutic target in Pulmonary Arterial Hypertension"*

**Petra I. Knaus** (Freie Universitaet Berlin, Germany)  
*"BMP receptors regulating vascular integrity"*

**Alex Bullock** (University of Oxford, United Kingdom)  
*"Drug repurposing in the BMP pathway: a case study of FOP"*

**Rik Derynk** (UCSF, USA)  
*"Control of TGFβ Responsiveness"*

#### Short talks:

**Tetsuro Watabe** (Tokyo Medical and Dental University, Japan)  
*"Dual targeting of VEGF and BMP 9/10 impairs tumor growth via inhibition of angiogenesis"*

**Wei Li** (University of Cambridge, USA)  
*"BMP9 is down-regulated by inflammation and loss of BMP9 directly contributes to vascular leakage"*

**Sabine Bailly** (INSERM, France)  
*"Contribution of BMP9 to Pulmonary Arterial Hypertension"*

10:15am - 10:45am

### BREAK

### 10:45am - 1:00pm Session 7 - Stem Cells: Non Skeletal

Moderators: Joy Richman, John Wozney

#### Invited Speakers:

**Elaine Fuchs** (The Rockefeller University, USA)  
*"Skin stem cells: where they come from, how they make tissues and who controls their decisions"*

**Amy Wagers** (Harvard University, USA)  
*"GDF11 and myostatin in muscle aging"*

**Jonathan Epstein** (UPENN, USA)  
*"Coordinate regulation of Bmp and Wnt signaling in the stem cell niche"*

**An Zwijsen** (VIB and KU Leuven, Belgium)  
*"BMP-SMAD signalling output is highly regionalized in cardiovascular and lymphatic endothelial networks"*

#### Short talks:

**Joseph Zinski** (UPENN, USA)  
*"How the BMP antagonists shape the dynamic BMP gradient patterning the zebrafish gastrula"*

**Avik Choudhuri** (Harvard University, USA)  
*"Co-operation of BMP signaling and GATA factors mediated by specific cis-acting transcription factors define stages of human erythroid differentiation"*

1:00pm - 2:00pm

### Lunch & Poster Sessions (Even # posters judged)

### 2:00pm - 4:15pm Session 8 - Signaling & Development

Moderators: Mary Mullins, Peter ten Dijke

#### Invited Speakers:

**Craig Harrison** (Monash University, Australia)  
*"The BMP15/GDF9 heterodimer Cumulin enhances the acquisition of oocyte developmental competence"*

**Patricia Donahoe** (Massachusetts General Hospital, USA)  
*"Mullerian Inhibiting Substance: Its role in ovarian development and cancer"*

**Gopal Sapkota** (University of Dundee School of Life Sciences, United Kingdom)  
*"The role of Protein Associated With SMAD1 (PAWS1) in development, disease and signalling"*

**Michael O'Connor** (University of Minnesota, USA)  
*"TGFβ control of Drosophila metabolism, body size and aging"*

**Timothy Springer** (Harvard Medical School; Program in Cellular and Molecular Medicine, Boston Children's Hospital)  
*"A microglia context molecule for TGFβ required for maintenance of nervous system"*

#### Short talk:

**Kristy Townsend** (University of Maine, USA)  
*"Loss of BMP co-receptor hemojuvelin leads to increased brown adipogenesis in mice"*

4:15pm - 4:45pm

**BREAK**

4:45pm - 7:15pm

## **Session 9 - Signaling & Disease 2**

Moderators: Herb Lin, Caroline Hill

### **Invited Speakers:**

**Francesco Ramirez** (Mount Sinai, USA)

*"Multiple contributions of TGF $\beta$  signaling to organ-specific manifestations in Marfan syndrome"*

**Eileen Shore** (UPENN, USA)

*"ACVR1-mediated immune response and heterotopic ossification in Fibrodysplasia Ossificans Progressiva"*

**Takenobu Katagiri** (Saitama Medical University, Japan)

*"A tool desired for fibrodysplasia ossificans progressiva"*

**Andrew Hinck** (University of Pittsburgh School of Medicine, USA)

*"TGF $\beta$ 2 binds the betaglycan zona pellucida domain on the concave surface of the extended finger region and includes Glu99 as a key specificity determinant"*

**Jodie Babitt** (Massachusetts General Hospital Department of Medicine-Nephrology Division, USA)

*"BMP signaling in iron homeostasis regulation"*

**Saturday, October 29th**

7:30am

Continental Breakfast

8:00am - 10:15am

## **Session 10 - Muscle Dynamics**

Moderators: Tom Thompson, Malcolm Whitman

### **Invited Speakers:**

**Theresa Guise** (Indiana University, USA)

*"Role of TGF $\beta$  in the bone microenvironment: cancer and beyond"*

**Paul Gregorevic** (Baker IDI Heart & Diabetes Institute, Australia)

*"Exploring new roles for the TGF $\beta$  signaling network in skeletal muscle"*

**Roberta Sartori** (Baker IDI Heart & Diabetes Institute, Australia)

*"BMP axis in cancer cachexia"*

**David Glass** (Novartis, USA)

*"Signaling pathways regulating skeletal muscle mass and function"*

**Se-Jin Lee** (Johns Hopkins University, USA)

*"Myostatin: a molecular rheostat for muscle mass"*

### **Short talk:**

**Michelle Straub** (Scholar Rock, Inc, USA)

*"Blocking supracellular activation of myostatin is an innovative strategy for treating muscle wasting"*

10:15am - 10:45am

**BREAK**

10:45am - 1:00pm	<b>Session 11 - Tissue Homeostasis &amp; Disease</b> Moderators: An Zwijsen, Sabine Bailly  <b>Invited Speakers:</b> <b>Ralf Adams</b> (Max Planck Institute for Molecular Biomedicine, Germany) <i>"Blood vessel growth and function in the skeletal system"</i> <b>Katja Brueckner</b> (UCSF, USA) <i>"BMP-induced epithelial plasticity – insights from a Drosophila model"</i> <b>Laurent Kodjabachian</b> (Institut de Biologie du Développement de Marseille, France) <i>"BMPs and mucociliary epithelium construction"</i> <b>Peter ten Dijke</b> (Leiden University Medical Center, Netherlands) <i>"BMP signaling in breast cancer"</i> <b>Kohei Miyazono</b> (Univ of Tokyo, Japan) <i>"Differentiation and apoptosis of glioma-initiating cells by the BMP-ALK-2 pathway"</i>
1:00pm - 2:00pm	<b>Lunch &amp; Poster Sessions</b>
2:00pm - 4:00pm	<b>Session 12 - Bone Formation &amp; Repair</b> Moderators: Kuber Sampath, Slobodan Vukicevic  <b>Invited Speakers:</b> <b>Anna Spagnoli</b> (Rush University, USA) <i>"BMP2 and fracture repair: a lesson for understanding mesenchymal stromal cell function"</i> <b>Di Chen</b> (Rush University) <i>"Cross-talk between <math>\beta</math>-catenin and BMP signaling during skeletal development"</i> <b>Xu Cao</b> (Johns Hopkins University, USA) <i>"TGF<math>\beta</math>/BMP signaling in MSC and skeletal homeostasis"</i> <b>Senyon Choe</b> (UCSD/Mogam Institute) <i>"BMP Chimeras and their clinical potentials"</i> <b>Frank Luyten</b> (University Hospitals KU Leuven, Belgium) <i>"Advanced Therapy Medicinal Products (ATMPs) combining BMPs and periosteal derived cells for bone regeneration"</i>  <b>Short talks:</b> <b>Eric Vanderploeg</b> (Bioventus LLC, USA) <i>"Designer chimeric BMPs optimized for efficacy in humans"</i>
4:00pm - 4:30pm	<b>BREAK</b>
4:30pm - 5:30pm	<b>Session 13 - Cunningham Lecture</b> Introduction by Hari Reddi  <b>Karen Lyons</b> (UCLA, USA) <i>"In vivo studies of BMP/TGF<math>\beta</math> signaling during chondrogenesis"</i>
5:45pm	Busses Depart Martin Center for Boston Harbor Cruise
7:00pm - 10:00pm	<b>Social Event</b> Boston Harbor Cruise

9:30am Coffee Service

10:00am - 12:00pm

### Session 14 - Craniofacial Development

Moderators: Bjorn Olsen, Nicolai Miosge

#### Invited Speakers:

**Arkhat Abzhanov** (Imperial College London, United Kingdom)

"Developmental integration and evolution of the avian face"

**Yang Chai** (USC, USA)

"BMP signaling regulates stem cell fate during the dental crown-root transition"

**Joy Richman** (University of British Columbia, Canada)

"BMP signaling in craniofacial skeletal patterning"

**Yuji Mishina** (University of Michigan, USA)

"Enhanced BMP signaling in neural crest cells leads to Craniosynostosis"

#### Short talks:

**Stephen E. Harris** (UTHSCSA, USA)

"Lineage tracing in the absence of the endogenous Bmp2 gene and genomic mapping of enhancers, super-enhancers, and enhancer RNAs regulated by the endogenous Bmp2 gene in periodontal and bone marrow osteoprogenitors"

**Edward Anderson** (Brown University, USA)

"Alternative processing of the Drosophila BMP 5/6/7/8 Gbb is required for signaling activity and activation of specific type II receptors during development"

**Daniel Graf** (University of Alberta, Canada)

"Bmp2 regulates epithelial-mesenchymal interactions at the initiation stage of tooth mineralization"

12:00pm - 1:00pm

### SNACK BREAK

1:00pm - 2:30pm

### Session 15 - Signaling & Disease 3

Moderators: Takenobu Katagiri, Petra Knaus

#### Invited Speakers:

**Thomas Pap** (University Hospital Muenster, Institute of Experimental Musculoskeletal Medicine, Germany)

"Regulation of inflammatory bone destruction by the TGF $\beta$  family member Myostatin (GDF8)"

**Jay Groppe** (Texas A&M College of Dentistry, USA)

"Mechanisms of perturbation and inhibition of the regulated type I receptor kinases of the TGF $\beta$  superfamily"

**Slovodan Vukicevic** (University of Zagreb, Croatia)

"Osteogrow - A BMP6 containing bone graft substitute"

**Liliana Attisano** (University of Toronto-Biochemistry, Canada)

"Modulation of TGF $\beta$  signaling by the Hippo pathway"

#### Short talk:

**Ivo Dumic-Cule** (University of Zagreb, Croatia)

"BMP1-3 inhibition improves heart function following acute myocardial infarction"

2:30pm - 2:45pm

### Closing Remarks