

DEVELOPMENTAL BIOLOGY IN ORTHOPAEDICS

American Academy of Orthopaedic Surgeons® 2006 Research Symposium
 Renaissance Toronto Hotel – Downtown / 1 Blue Jays Way, Toronto, ON M5V 1J4
 October 26 – 28, 2006

SYMPOSIUM AGENDA

WEDNESDAY, OCTOBER 25, 2006

3:00–7:00 PM	Registration/Check-In <i>Please check in to receive your name badge and calling card. Faculty should bring their PowerPoint presentations in an electronic format (CD or USB Drive). The AAOS Staff will load PowerPoint presentations to a PC or Mac laptop.</i>	Room 237
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THURSDAY, OCTOBER 26, 2006

7:15 – 8:30 AM	Registration/Check-In/AAOS AM Office Hours	Room 237
7:15–7:45 AM	Session Moderator/ Chair Meeting <i>Mandatory for all session moderators and symposium chairs.</i>	Aurora Room (TBD)
8:00–8:30 AM	Continental Breakfast <i>An informal continental breakfast will be served in the general session room.</i>	Northern Lights Ballroom
8:30–8:45 AM	Symposium Introduction and Welcome Benjamin Alman, MD and William A. Horton, MD	

SESSION I: EARLY DEVELOPMENT AND SOMITOGENESIS

MODERATOR: JANET ROSSANT, PHD

8:45 –8:50 AM	Session / Speaker Introductions Janet Rossant, PhD	Northern Lights Ballroom
8:50–9:05 AM	1) Establishment of the Segmental Pattern of the Spine Olivier Pourquié, PhD	
9:05–9:20 AM	2) Mouse Models of Congenital Scoliosis-Phenotype Driven Screens Janet Rossant, PhD	
9:20–9:35 AM	3) Role of N-Myc in Limb and Cranial Development Peter J. Hurlin, PhD	
9:35–9:50 AM	4) Notch signaling in vertebral segmentation Kenro Kusumi, PhD	
9:50–10:05 AM	5) Cellular and Molecular Analysis of Developmental and Regenerative Skeletogenesis Rocky S. Tuan, PhD	
10:05 – 10:20 AM	Question and Answer Session Panel	
10:20–10:35 AM	BREAK	

SESSION II: LIMB PATTERNING

MODERATOR: ROCKY TUAN, PHD

10:35–10:40 AM	Session / Speaker Introductions Rocky Tuan, PhD	Northern Lights Ballroom
10:40–10:55 AM	6) Zebrafish As A Model For Bone Growth Cristofre C. Martin, PhD	
10:55–11:10 AM	7) Perichondrial Regulation of Limb Outgrowth Jill A. Helms, PhD	
11:10–11:25 AM	8) Limb BMP Signaling is Regulated at Multiple Levels by HOXA13 H. Scott Stadler, PhD	
11:25–11:40AM	9) Transcriptional Control of Chondrocyte and Osteoblast Differentiation by Sox9 Benoit deCrombrughe, MD	
11:40–11:55 AM	Question and Answer Session Panel	
12:00 – 1:00 PM	LUNCHEON	Aurora Room

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SESSION IIIA: CHONDROCYTE, JOINT AND GROWTH PLATE DEVELOPMENT AND PATHOLOGY

MODERATOR: REGIS J. O'KEEFE, MD, PhD

1:10–1:15PM	Session / Speaker Introductions Regis J. O'Keefe, MD, PhD	Northern Lights Ballroom
1:15–1:30 PM	10) Growth Factors and Cartilage Regis J. O'Keefe, MD, PhD	Northern Lights Ballroom
1:30–1:45PM	11) Cell Biology of Joint Development Maurizio Pacifici, PhD	
1:45–2:00 PM	12) Molecular Control of Chondrocyte Differentiation Andrea Vortkamp, PhD	
2:00–2:15 PM	13) Genetics of Osteoarthritis William Cole, MBBS, MSc, PhD	
2:15–2:30 PM	14) Deciphering the function of Wnt inducible signaling protein 3 (WISP3) in cartilage Matthew L. Warman, MD	
2:30–2:45PM	15) Cytokines in RA or OA Steven R. Goldring, MD	
2:45–3:00 PM	16) Cartilage Imaging Martha L. Gray, PhD	
3:00–3:15 PM	17) Lack of Endochondral Ossification in the Site-1 Protease Knockout Mouse Linda J. Sandell, PhD	
3:15–3:30 PM	18) Retinoid Signaling in Skeletal Development T. Michael Underhill, BSc, PhD	
3:30–3:45 PM	Question and Answer Session Panel	
3:45–4:00 PM	BREAK	

SESSION IIIB: CHONDROCYTE, JOINT AND GROWTH PLATE DEVELOPMENT AND PATHOLOGY

MODERATOR: BENJAMIN ALMAN, MD

4:00–4:05 PM	Session / Speaker Introductions Benjamin Alman, MD	Northern Lights Ballroom	
4:05–4:20 PM	19) Signaling Centers in Joint Development and Disease Frank P. Luyten, MD		
4:20–4:35 PM	20) Bone Morphogenetic Signaling Pathways in the Growth Plate Karen M. Lyons, PhD		
4:35–4:50 PM	21) Interactions of Chondrocytes and Osteoblasts during Endochondral Bone Formation Ung-Il Chung, MD, PhD		
4:50–5:05 PM	22) Development and Sarcomas Richard Terek, MD		
5:05–5:20 PM	23) Mechanisms of Thyroid Hormone Action in the Growth Plate Robert Tracy Ballock, MD		
5:20–5:35 PM	24) The Effects of Mechanical Stress on Chondrocyte Function Joseph A. Buckwalter, MS, MD		
5:35–5:50 PM	25) Growth Plate Proteoglycans/Perlecan John R. Hassell, PhD		
5:50–6:05 PM	26) Chondrocyte Hypertrophy and Matrix Proteolysis A. Robin Poole, PhD, DSc		
6:05–6:20 PM	27) Wnt Signaling in Joint Development Yingzi Yang, PhD		
6:20–6:35 PM	Question and Answer Session Panel		
7:00–8:30 PM	OPENING DINNER RECEPTION		Arriba Room

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FRIDAY, OCTOBER 27, 2006

7:15–8:15 AM	AAOS Office Hours	Room 237
7:30–8:00 AM	Continental Breakfast <i>An informal continental breakfast will be served in the general session room.</i>	Northern Lights Ballroom
SESSION IIIc: CHONDROCYTE, JOINT AND GROWTH PLATE DEVELOPMENT AND PATHOLOGY		
MODERATOR: WILLIAM A. HORTON, MD		
8:00–8:05 AM	Session / Speaker Introductions William A. Horton, MD	Northern Lights Ballroom
8:05–8:20 AM	28) Growth Plate Vasculature Cornelia E. Farnum, DVM, PhD	Northern Lights Ballroom
8:20–8:35 AM	29) Genetic Regulation of Chondrocyte Differentiation Brendan Lee, MD, PhD	
8:35–8:50 AM	30) Sox5 and Sox6 in Growth Plate Formation Véronique Lefebvre, PhD	
8:50–9:05 AM	31) PTHrP/Ihh in Growth Plate Regulation Henry Morris Kronenberg, MD	
9:05–9:20 AM	32) Hif-1 Alpha Regulates Differentiation of the Limb Bud Mesenchyme and Joint Development Ernestina Schipani, MD, PhD	
9:20–9:35 AM	33) TGF-β Regulation of Skeletal Development Rosa Serra, PhD	
9:35–9:50 AM	34) FGFR Pathways in Chondrogenesis Avner Yayon, MD, PhD	
9:50–10:05 AM	35) Animal Models for Inflammatory Arthritis Paul H. Wooley, PhD	
10:05–10:20 AM	Question and Answer Session Panel	
10:20–10:35 AM	BREAK	
SESSION IVA: OSTEOCYTE OSTEOCLAST DEVELOPMENT AND PATHOLOGY		
MODERATOR: JANE E. AUBIN, PHD		
10:35–10:40 AM	Session / Speaker Introductions Jane E. Aubin, PhD	Northern Lights Ballroom
10:40–10:55 AM	36) Osteoblast Cell Biology Jane E. Aubin, PhD	
10:55–11:10 AM	37) Bone Development and Osteoporosis Marc D. Grynblas, PhD	
11:10–11:25 AM	38) Development and Osteonecrosis of the Femoral Head Harry K. W. Kim, MD, MSC, FRCSC	
11:25–11:40 AM	39) Vitamin D Metabolism in Growth Plate René St-Arnaud, PhD	
11:40–11:55 AM	40) Angiogenesis in Skeletal Regeneration: The Model of Distraction Osteogenesis Thomas A. Einhorn, MD	
11:55 AM–12:10 PM	Question and Answer Session Panel	
12:15–1:05 PM	LUNCHEON	Aurora Room

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SESSION IVB: OSTEOCYTE OSTEOCLAST DEVELOPMENT AND PATHOLOGY

MODERATOR: JANE LIAN, PHD

1:10–1:15 PM	Session / Speaker Introductions Jane Lian, PhD	Northern Lights Ballroom
1:15–1:30 PM	41) Mesenchymal Stem Cells in Osteogenesis Arnold Caplan, MD	
1:30–1:45 PM	42) Roles of Rac1 and PI3K/AKT Pathways in Growth Plate Chondrocyte Proliferation and Endochondral Ossification Frank Beier, PhD	
1:45–2:00 PM	43) Gene Therapy to Enhance Bone Repair Jay R. Lieberman, MD	
2:00–2:15 PM	44) Transcriptional Control of Osteoblast Phenotype Development Jane B. Lian, PhD	
2:15–2:30 PM	45) Angiogenesis During Distraction Osteogenesis Louis C. Gerstenfeld, PhD	
2:30–2:45 PM	BREAK	Northern Lights Ballroom
2:45–3:00 PM	46) FGF Regulation of Growth Plate Development David M. Ornitz, MD, PhD	
3:00–3:15 PM	47) The Osteocyte is a Dynamic Mechanosensory Cell Lynda F. Bonewald, PhD	
3:15–3:30 PM	48) Stem Cells in Cancer Peter Dirks, MD, PhD	
3:30–3:45 PM	49) Developmental Processes in Cancer Metastasis Denis Clohisy, MD	
3:45–4:15 PM	Question and Answer Session Panel	
4:15–7:00 PM	BREAK	CN Tower Horizon Café 301 Front St. West Toronto, Ontario M5V 2T6
7:00–8:30 PM	Dinner Reception NOTE: Please check in at the 360 Restaurant reservation desk. You will be directed to the correct elevators to the Horizon Café.	

SATURDAY, OCTOBER 28, 2006

NOTE: Room Check-Out is 12:00 PM

You may check-out in the morning before the meeting using the touch screen in your room and check your luggage, or you may check-out immediately following the meeting.

7:45–8:30 AM	AAOS Office Hours	Room 237
8:00–8:30 AM	Continental Breakfast <i>An informal continental breakfast will be served in the general session room.</i>	Northern Lights Ballroom

SESSION V: MUSCLE / TENDON / LIGAMENT DEVELOPMENT AND PATHOLOGY

MODERATOR: JOHNNY HUARD, PHD

8:30–8:35 AM	Morning Welcome / Session & Speaker Introductions Johnny Huard, PhD	Northern Lights Ballroom
8:35–8:50 AM	50) Ligament and Tendon Maturation: Where Biology and Biomechanics Intersect David Hart, PhD	
8:50–9:05 AM	51) Tendon Structure and Function in Mice Lacking Interleukins & ECMs Louis J. Soslowsky, MD	
9:05–9:20 AM	52) Recent Progress in Flexor Tendon Healing Richard H. Gelberman, MD	

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9:20–9:35 AM	53) Regulation of Growth Factors by Fibrillin Microfibrils Lynn Y. Sakai, PhD	
9:35–9:50 AM	BREAK	
9:50–10:05 AM	54) Transcriptional Regulation of Tendon Development Ronen Schweitzer, PhD	Northern Lights Ballroom
10:05–10:20 AM	55) Tissue Engineering Based on Muscle-Derived Stem Cells: Potential Applications for Tissue Regeneration Johnny Huard, PhD	
10:20–10:35 AM	Question and Answer Session Panel	
10:35–11:35 AM	Discussion on Future Research Directions Symposium Summary and Conclusions Benjamin Alman, MD and William A. Horton, MD	

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Invited Guests:

- **David G. Baer, PhD**, Soft Tissue Trauma Program Manager, U.S. Army Institute of Surgical Research
- **Stephen Katz, MD, PhD**, Director, National Institute of Arthritis, Musculoskeletal & Skin Diseases, National Institutes of Health
- **James Panagis, MD, MPH**, Director, Orthopaedic Program, National Institute of Arthritis, Musculoskeletal & Skin Diseases, National Institutes of Health
- **Bernadette Tyree, PhD**, Director, Cartilage & Connective Tissue Program, National Institute of Arthritis & Musculoskeletal & Skin Diseases, National Institutes of Health
- **Fei Wang, PhD**, Program Director, Musculoskeletal Development and Regenerative Medicine, Musculoskeletal Diseases Branch, National Institute of Arthritis, Musculoskeletal and Skin Diseases, National Institutes of Health

Young Investigators:

- **Mohana Amirtharajah**, University of Iowa
- **Richard Schneider**, University of California at San Francisco, Department of Orthopaedic Surgery
- **Mike Sun**, SUNY Upstate Medical University, Department of Orthopaedic Surgery
- **Veronica Ulici**, University of Western Ontario, CIHR Group in Skeletal Development and Remodeling
- **Xibian Wang**, National Institutes of Health