AO Foundation

European CELLS & MATERIALS

ECM X

STEM CELLS FOR MUSCULOSKELETAL REGENERATION

.....

June 29- July 1, 2009 | Convention Center,
Davos, Switzerland

.....

ECM WELCOMES YOU TO DAVOS

Dear colleagues

This international forum continues the ECM congress series held in Davos. The limited number of participants (150) brings together clinicians, biologists, engineers and material scientists to share knowledge in basic, translational and clinical research and developments in the large field of Musculoskeletal Trauma. The single session permits in depth multi-disciplinary set of discussions where everyone is welcome to discuss to move this research forwards.
Yours sincerely,

Prof R. Geoff Richards
Course Chairman

Prof Charlie W. Archer
Course Chairman

Prof Mauro Alini
Course Chairman

Conference Organizers

R. Geoff Richards - Editor-in-Chief ECM Journal
Director AO Research Institute Davos, ARI, AO Foundation, Davos, CH

Mauro Alini - Scientific Editor ECM Journal
Head of Tissue Engineering Program, ARI, AO Foundation, Davos, CH

Charlie W. Archer - Scientific Editor ECM Journal
Connective Tissue Biology Research Group, Cardiff Institute of Tissue Engineering & Repair, Cardiff University, Wales, GB

We thank the following Sponsors

Endorsements:

Registration & Conference dinner tickets ECM X

Sunday, June 28th 17.00-18.30h Registration and pick up of conference bags at the Convention Center

Conference Secretaries

Carla Escher

Sonia Wahl

AO Research Institute, Clavadelerstrasse 8, CH-7270 Davos Platz

Please contact Ms. Carla Escher for any information on ECM congresses
Tel: +41 81 414 2441 Fax: +41 81 414 2299
Email: carla.escher@aofoundation.org

IT Presentation Helper

Romeo Accola

All **invited talks** are 20 minutes (Max) (20-30 slides)
to allow 10 minutes discussion per talk
All **submitted talks** are 10 minutes (10-15 slides)
to allow 5 minutes discussion per talk
Chairpersons will cut people off who try to use this time for their talks!!

Scientific Program

Monday, June 29th

08:30 – 09:00 Welcome

08:30 – 08:40	Welcome Prof. RG Richards
08:40 – 08:50	AO Research Institute Davos Prof. RG Richards
08:50 – 09:00	Dr. Sandra Steiner (AO Foundation, Davos, Switzerland) Team up for Impact – The AO Exploratory Research Concept

Stem Cells: Introduction
Session 1 **Chair: Prof. Mauro Alini**

09:00 – 09:30	**Prof. Sir Martin Evans, 2007 Nobel Prize for Medicine (Cardiff, Wales)** Embryonic stem cells
09:30 – 10:00	**Dr. Stephen L. Minger (London, England)** Therapeutic and research potential of human stem cells
10:00 – 10:15	Skeletal muscle tissue engineering in patients with facial paralysis M Koning, MC Harmsen, RA Bank, PMN Werker
10:15 – 10:30	*In vivo* formation of bone tissue by adult human mesenchymal stem cells depends on the stage of *in vitro* chondrogenic differentiation C Scotti, A Papadimitropoulos, B Tonnarelli, A Scherberich, A Barbero, I Martin

10:30 – 11:00 Coffee Break

Stem Cells: The Niche
Session 2 **Chair: Prof. Charlie W. Archer**

11:00 – 11:30	**Prof. Malcolm Alison (London, England)** A methodological approach to tracing cell lineage in human tissues
11:30 – 11:45	Migratory chondrogenic progenitor cells from late stages of osteoarthritis exhibit gender differences S Koelling, J Kruegel, M Irmer, J Ragnar Path, B Sadowski, X Miro, C Bode, N Miosge
11:45 – 12:00	Optimising the niche for skeletal muscle tissue engineering; role of electrostimulation in 2D and 3D cultures MLP Langelaan, KJM Boonen, KY Rosaria-Chak, FPT Baaijens, MJ Post, DWJ van der Schaft
12:00 – 12:30	**Prof. Cosimo de Bari (Aberdeen, Scotland)** Mesenchymal stem cells find their niches in skeletal regenerative medicine

Free afternoon

Stem Cells: Tissue Regeneration
Session 3 Chair: Dr. Martin Stoddart

17:00 – 17:30 **Dr. Frank Barry (Galway, Ireland)**
Stem cell therapy for tissue repair: The stem cell-host interaction

17:30 – 18:00 **Dr. Martin Stoddart (Davos, Switzerland)**
Mimicking the in vivo biomechanical environment

18:00 – 18:15 Bone marrow derived mesenchymal progenitor cell therapy for tendon regeneration in a large animal natural disease model
NJ Young, J Dudhia, Y Kasashima, AE Goodship, RKW Smith

18:15 – 18:30 Equine cartilage repair: An *in vitro* comparison between articular cartilage progenitor cells and bone marrow derived stromal cells
HE McCarthy, J Bara, S Singhrao, C Archer

18:30 – 20:00 Poster session (Drinks & Snacks)

Tuesday, June 30th

Stem Cells: General Applications
Session 4 Chair: Prof. Thimios Mitsiadis

08:30 – 09:00 **Prof. Jennifer Elisseeff (Baltimore, USA)**
Adult and embryonic stem cells for skeletal reconstruction

09:00 – 09:30 **Prof. Takayuki Asahara (Tokay, Japan)**
Endothelial progenitor cells for organogenesis

09:30 – 09:45 Sonic hedgehog promotes angiogenesis and osteogenesis in a co-culture system consisting of primary osteoblasts and outgrowth endothelial cells
E Dohle, S Fuchs, B Pavic and CJ Kirkpatrick

09:45 – 10:00 *In vitro* vascularisation of collagen-GAG scaffolds using mesenchymal stem cells
GP Duffy, EM Byrne, TM McFadden, EM Farrell, FJ O'Brien

10:00 – 10:15 Enrichment of outgrowth endothelial cells from human peripheral blood by protocol modification
M Kolbe, S Fuchs, D Katerla, B Pavic, CJ Kirkpatrick

10:15 – 11:00 Coffee Break

Stem Cells: Bone
Session 5 **Chair: Dr. Sophie Verrier**

11:00 – 11:30	**Prof. Ranieri Cancedda (Genova, Italy)** *In vivo* recruitment of two "waves" of host's stem/progenitor cells by exogenous mesenchymal stem cells seeded onto porous ceramic scaffolds and role of endothelial progenitors in the new bone formation
11:30 – 12:00	**Prof. Chris Evans (Boston, USA)** In situ modification of progenitor cells for the expedited regeneration of skeletal tissues
12:00 – 12:15	Circulating mesenchymal stem cells in fracture patients HT Aro, JJ Alm, HM Koivu, TJ Heino, TA Hentunen
12:15 – 12:30	Engineering the induction of bone formation with transforming growth factor-β3 and responding myoblastic stem cells U Ripamonti, C Ferretti, L Blann, R Parak, L Renton, J Teare

Free afternoon

Stem Cells: Dental
Session 6 **Chair: PD Dr. med. Stefan Milz**

17:00 – 17:30	**Prof. Thimios Mitsiadis (Zurich, Switzerland)** Dental stem cells, dental pathology and regeneration
17:30 – 18:00	**Prof. Malcolm Alison (London, England)** Stem cells and cancer
18:00 – 18:15	A sight set on periodontitis: establishment of a periodontal progenitor cell line and its behaviour testing on dental materials D Docheva, D Padula, C Popov, P Weishaupt, H Clausen-Schaumann, M Schieker
18:15 – 18:30	Cell-free collagen-based scaffolds enhance healing over MSC-seeded *in vitro*-engineered bone tissue grafts FJ O'Brien, F Lyons, AA Al-Munajjed, S Kieran, M Toner, GP Duffy

18:30 – 20:00 Poster session (Drinks and Snacks)

Wednesday, July 1st

Stem Cells: Cartilage / Disc
Session 7 **Chair: Dr. Sibylle Grad**

08:30 – 09:00	**Prof. Brian Johnstone (Portland, USA)** Stem cells for cartilage regeneration
09:00 – 09:15	Towards *in vitro* generation of "intervertebral-disc-like" cells B Gantenbein-Ritter, L Benneker, M Alini, S Grad,
09:15 – 09:30	Isolation and characterization of cell subpopulation with stem cell properties in human and monkey intervertebral disc (IVD) SS Huang, KMC Cheung, D Long, HG Lin, DK Luk, D Chan, GQ Zhou
09:30 – 10:00	**Dr. med**. **Daisuke Sakai (Tokay, Japan)** Stem cells for intervertebral disc regeneration and basic study aimed for the identification of disc-progenitor cells and their niche
10:00 – 10:15	Endochondral bone formation by adult human mesenchymal stem cells E Farrell, SK Both, OP van der Jagt, W Koevoet, FJ O'Brien, H Weinans, J Jansen, GJVM van Osch

10:15 – 11:00 Coffee Break

Stem Cells: Regulation
Session 8 **Chair: Prof. Brian Johnstone**

11:00 – 11:30	**Prof. Lukas Sommer (Zurich, Switzerland)** Regulating osteoblast and chondrocyte formation from neural crest stem cells
11:30 – 11:45	Paracrine effect of transplanted rib chondrocyte spheroids on bone marrow derived stem cells K Gelse, M Brem, A Olk, F Hennig, B Swoboda
11:45 – 12:00	The effect of oxygen tension on the proliferation and differentiation of human mesenchymal stem cells G Pattappa, NC Jegard, DA Lee, JD de Bruijn
12:00 – 12:15	Mechanical load promotes chondrogenesis of human mesenchymal stem cells through the TGF-β pathway Z Li, SJ Yao, M Alini, M Stoddart
12:15 – 12:30	Temporal expression of FGF-Receptors in chondrogenesis of mesenchymal stem cells CA Hellingman, DA Frenz, GJVM van Osch
12.30 – 12.45	**Best student oral and poster prizes**
12.45 – 13.00	**Conference summary (Prof. C. W. Archer & Prof. M. Alini)**

Free Afternoon

18:00 Conference Dinner

Posters

1. Tendon-derived cells differentially modulate proliferation of mesenchymal progenitor cells from different sources
   H Abdulrazzak, J Dudhia, PD Clegg, RKW Smith
2. Fibrin as a substrate and carrier for human periosteum derived progenitor cells during osteogenic induction
   J Demol, J Eyckmans, J Schrooten, H Van Oosterwyck,
3. Derivation of autologous embryonic stem cell lines for stem cell therapy in an equine model of cartilage repair.
   JA Desmarais, SP Demers, J Suzuki Jr, S Laflamme, S Laverty, LC Smith
4. Stem cells for musculoskeletal regeneration.production of a cartilage-like tissue by coculturing human articular chondrocytes with human bone marrow MSC in a 3D system
   S Giovannini, J Diaz-Romero, T Aigner, P Mainil-Varlet, D Nesic
5. Minipig derived mesenchymal stem cells from bone marrow and adipose tissue: comparison of adipogenic, osteogenic and chondrogenic differentiation potential
   F Hildner, A Peterbauer, S Neussl, A Schultz, C Gabriel, H Redl, M van Griensven, S Wolbank
6. Development of stem cell carriers for bone regeneration
   QP Hou, A Spadaccino, O Hughes, DS Dauphin, BS Noble
7. Bone marrow concentrate – optimal for bone repair!
   M Jäger, M Herten, E Jelinek, U Fochtmann, J Fischer, R Krauspe
8. Mesoangioblast stem cells in regenerative therapies
   TQ Kajhøj, EM Füchtbauer, H Løvschall
9. Quantitative real-time PCR analysis for chondrogenic differentiation of human mesenchymal stem cell in alginate scaffolds
   T Kamarul, P Chong, L Selvaratnam, CC Tai, AA Abbas
10. Three-dimensional culture of rabbit bone marrow mesenchymal stem cells using microcarrier beads in spin culture
    T Kamarul, L Boo, L Selvaratnam, CC Tai
11. A comparative study using negative selection and standard methods for adult mesenchymal stem cells isolation
    T Kamarul, AS Wee, SY Lee, L Selvaratnam, AA Abbas
12. The effect of growth and differentiation factor 5 in tenogenic differentiation
    T Kamarul, SL Tan, L Selvaratnam, CC Tai
13. Regenerative properties of human embryonic stem cell-derived chondrogenic cells in an articular defect
    NS Khan, JL Tremoleda, S Riahi, B Lucendo, D Pier, O Hughes, V Mann, DS Dauphin, BS Noble
14. Effects of culture conditions on the proliferation and differentiation capacities of human fetal bone cells
    N Krattinger, LA Applegate, D Pioletti, J Caverzasio
15. The role of nidogen-1 and nidogen-2 in the pathogenesis of osteoarthritis
    J Kruegel, S Koelling, N Miosge
16. Chondrogenesis of human bone marrow mesenchymal stem cells is modulated by frequency and amplitude of dynamic compression and shear stress
    Z Li, SJ Yao, M Alini, M Stoddart

17. Three-dimensional inverse opal scaffolds for culture and differentiation of human mesenchymal stem cells
A McAlinden, SW Choi, J Xie, Y Du, S Ravindran, E DeLassus, A Gotimer, Y Xia
18. Towards an understanding of inter-patient variability in marrow progenitor populations
RM McCann, T Doyle, GR Jordan, SA Clarke
19. Expansion of stem/progenitor cells; the potential of small interfering RNA strategies
D McMullan, G Burke, SA Clarke, GR Jordan
20. PLLA and BMP-2 containing PLLA nanofiber scaffolds for growth and differentiation of hMSCs and bone regeneration
JRJ Paletta, A Greiner, HJ Wendorff, S Fuchs-Winkelmann, MD Schofer
21. An *in vitro* model of bone organ starting from progenitor cell populations
A Papadimitropoulos, A Mehrkens, N Theilgaard, A Scherberich, I Martin
22. BMP-7 and Mesenchymal stem cells promote allograft integration
M Pierini, C Di Bella, M Fini, B Dozza, T Frisoni, E Lucarelli, F Salamanna, M Sartori, D Donati
23. Enhancement of chondrogenesis of human bone marrow-derived mesenchymal stem cell by centrifugation or gluosamine sulfate
C Qu, H Kröger, MJ Lammi
24. The effect of dexamethasone and triiodthyronine on chondrogenically differentiated bovine mesenchymal stem cells
T Randau, K Ito, M Alini, M Stoddart
25. Functionalisation of PLLA nanofibers by collagen or collagen derived peptides - Effect on growth and differentiation of hMSCs
MD Schofer, A Greiner, HJ Wendorff, JRJ Paletta, S Fuchs-Winkelmann
26. Ultrastructural evidence for multi-lineage differentiation of human dental pulp stem cells
T Struys, W Martens, E Theunissen, E Wolfs, M Moreels, C Politis, I Lambrichts
27. Chondrogenesis of mesenchymal stem cells is differentially regulated by temporal application of dynamic compression
S Thorpe, CT Buckley, DJ Kelly
28. Functional properties of cartilaginous tissues generated from mesenchymal stem cells isolated from different tissue sources
T Vinardell, CT Buckley, DJ Kelly
29. Three-dimensional laminar flow dynamic culture of human adipose stem cells stimulates cell differentiation and extracellular matrix deposition
B Weyand, C Kasper, M Israelowitz, C Gilles, HP von Schroeder, K Reimers, PM Vogt
30. A sub-population of human articular cartilage cells display stem cell/progenitor characteristics
R Williams, K Richardson, SK Singhrao, RE Jones, DM Baird, L Nelson, H Lewis, S Roberts, J Dudhia, IM Khan, CW Archer
31. Articular cartilage-derived chondroprogenitors maintain telomere length through transient telomerase activation
JC Bishop, IM Khan, R Williams, CW.Archer