ICMOBT 2009 – Oral Program

Sunday 13 December		
4.00-6.00pm	Registration	
5.45 pm	**OPENING REMARKS**	
6.00 pm	**K1** - **Biological materials: A materials science approach** M. A. Meyers[1]*, J. McKittrick[1], P.-Y. Chen[1], Y. Seki[1], A. Y. M. Lin[1], Y. S. Lin[1,2] et al; *[1]University of California- San Diego, USA, [2]San Diego State University, USA*	
6.40 pm	**K2** - **A biomimetic approach to fibrous tissue engineering: Scaffold design, modeling, and construct evaluation** R. Mauck; *University of Pennsylvania, USA*	
7.20–8.30 pm	Drinks reception/posters	
Monday 14 December		
08.00am	**K3 - Challenges for dental all-ceramics and fibre-reinforced composites** M. Behr; *University Medical Center Regensburg, Germany*	
	Session 1 – Challenges of dental ceramics and fibre-reinforced composites	**Session 2 – Soft tissues 1**
08.40am	**O1 Simulation of masticatory load scenarios on dental reconstructions** M. Rosentritt*, M. Behr; *University Medical Center Regensburg, Germany*	**O5 Development of residual strains in tendons after non-destructive overloading** E. Yamamoto*, D. Kajiwara; *Kinki University, Japan*
09.00 am	**O2 Modelling of in situ polymerization of fibre reinforced root canal posts** A. Tezvergil-Mutluay*, P.K. Vallittu; *University of Turku, Finland*	**O6 Residual strength after partial fatigue damage in healing ligaments** G.M. Thornton*, S.J. Bailey; *University of Calgary, Canada*
09.20 am	**O3 Use of 3D μCT scans and 3D FEA in analyzing biomechanics of multiteeth fixed partial dentures** J. Jancar*[1], Z. Sedivy[2], J. Pencik[1]; [1]*Brno University of Technology, Czech Republic, [2]ADM, Czech Republic*	**O7 Calculation of strain distributions within tissues using confocal microscope images** H.R.C. Screen*[1], S. L. Evans[2]; *[1]Queen Mary University of London, UK, [2]Cardiff University, UK*
09.40 am	**O4 Chances and perspectives of magnetic resonance imaging for diagnostic appraisal in orthodontics** P. Proff*[1], M. Behr[1], O. Tymofiyeva[2]; [1]*University Regensburg, Germany, [2]University Würzburg, Germany*	**O8 Comparison between porcine and human liver tissues: Microstructure and failure properties** A. Brunon*, K. Bruyere Garnier, M. Coret; *Universite de Lyon, France*
10.00 am	Coffee break	
	Session 3 – Tribology	**Session 4 - Soft tissues 2**
10.50 am	**O9 Tracing prosthetic polymer wear with radioisotopes** J.A. Warner*, L.G. Gladkiss, H. Timmers; *University of New South Wales at the Australian Defence Force Academy, Australia*	**O16 A stochastic finite element study of the wrinkling behaviour of skin** G. Limbert; University of Southampton, UK
11.10 am	**O10 Development of a modified pin-on-plate test to measure friction and wear of articular cartilage repair materials** P. Twigg*, A. Pattinson; *University of Bradford, UK*	**O17 A system based experimental approach to tactile friction** M.A. Masen; *University of Twente, Netherlands*
11.30 am	**O11 Lubrication properties of simulated synovial fluid constituents in metal-on-metal tests** A. Mavraki, P. C. Cann*; *Imperial College London, UK*	**O18 The role of soft tissues in hip fractures** S.L. Evans*[1], G. Gaudilliere[2]; *[1]Cardiff University, UK, [2]ISIFC, Universite de Franche Comte, France*
11.50 am	**O12 In-situ micro-structural alterations in metal-on-metal total disc replacement** R. Pourzal*[1], T. Uth[2], B. Gleising[1], R. Seeger[1], M.A. Wimmer[2], A. Fischer[1]; *[1]University of Duisburg-Essen, Germany, [2]Rush University Medical Center, USA*	**O19 Contact behaviour and deformation of plantar tissue** S. Derler; *Empa - Swiss Federal Laboratories for Materials Testing and Research, Switzerland*
12.10pm	**O13 Liposomes as potential biolubricant additives for combating osteoarthritis in human synovial**	**O20 Biomimetic approaches of haptic touch** H. Zahouani*, R. Vargiolu, G. Boyer, C. Pailler-

	joints G. Verberne[1], A. Schroeder[2], G. Halperin[1], Y. Barenholz[2], I. Etsion*[1]; *[1]Technion, Israel, [2]Hebrew University, Israel*	Mattei; *University of Lyon, France*
12.30 pm	**O14 A study on the mechanical self adapting ability of lubricated biological joint surfaces** R.L. Jackson III*[1,2], R.L. Jackson[2], R. Hanson[1]; *[1]Auburn University, USA, [2]Gulf-To-Bay Medical Clinic, USA*	**O21 Mechanical properties assessment of human skin using tension test** G. Boyer*[1,2], J. Molimard[1,3], H. Zahouani[1], M. Pericoi[2], S. Avril[4]; *[1]LTDS UMR5513, France, [2]PERITESCO, France, [3]Centre SMS Ecole des Mines de Saint-Etienne, France, [4]Center for Health Engineering, France*
12.50 pm	**O15 Characterisation of the friction of the human finger pad** M.J. Adams*[1], S.M. Pasumarty[2], S.A. Johnson[2], S.A. Watson[2]; *[1]The University of Birmingham, UK, [2]Unilever R&D Port Sunlight, UK*	**O22 Generalized modeling of passive, active and damage behavior of soft biological tissues** M. Itskov*, A.E. Ehret; *RWTH Aachen University, Germany*
1.10pm	*Break for afternoon*	
5.30 pm	**Buffet dinner**	
6.30pm	**PLENARY PRESENTATION - Stiffness and toughness of biological materials** J. Vincent; *University of Bath, UK*	
	Session 5 – Natural materials	**Session 6 – Biomimetics and ceramics**
7.10 pm	**O23 Beak and feather as tooth and nail** S.G. Bodde*, Y. Seki, M.A. Meyers, J. McKittrick; *University of California, San Diego, USA*	**O28 Nature-inspired hybrid structural materials** R.O. Ritchie*[1,2], A.P. Tomsia[2], E. Saiz[2], M.E. Launey[2], D.H. Alsem[2], E. Munch[2]; *[1]University of California Berkeley, USA, [2]Lawrence Berkeley National Laboratory, USA*
7.30 pm	**O24 Extremal stiffness of crustacean cuticle through hierarchical optimization: Theory and experiments** D. Raabe*, S. Nikolov, M. Petrov, et al; *Max-Planck-Instit fuer Eisenforschung, Germany*	**O29 Synthesis of bio-inspired composites** G.A. Hirata[1], S.P. Diaz[1], P.-Y. Chen[2], M.A. Meyers[2], J. McKittrick*[2]; *[1]Universidad Nacional Autónoma de México, Mexico, [2]University of California, San Diego, USA*
7.50 pm	**O25 Quantitative evaluation of toughening mechanisms by organic matrix in abalone nacre** H. Kakisawa*[1], R. Inoue[2], E. Seguchi[2], Y. Kagawa[3]; *[1]National Institute for Materials Science, Japan, [2]Tokyo University of Science, Japan, [3]The University of Tokyo, Japan*	**O30 Influence of silicon carbide layers on the mechanical behavior of silicon-alloyed isotropic pyrolytic carbon** J. Redmond; *Medtronic, USA*
8.10 pm	**O26 Variations in the constructional morphology of crustacean skeletal elements at different hierarchical levels** H. Fabritius*[1], S. Hild[2], S. Nikolov[3], A. Ziegler[4], D. Raabe[1], M. Friák[1], et al; *[1]Max-Planck-Institut für Eisenforschung GmbH, Germany, [2]Johannes Kepler University Linz, Austria, [3]Bulgarian Academy of Sciences, Bulgaria, [4]University of Ulm, Germany*	**O31 Antibacterial glass polyalkenoate cement coatings: An evaluation of their adhesive nature** A. Coughlan*[1,2], M. Towler[1,2]; *[1]University Of Limerick, Ireland, [2]Alfred University, USA*
8.30pm	**O27 Why is horn so tough?** E. Evdokimenko, L. Tombolato, J. Curiel, P.-Y. Chen*, J. McKittrick; *University of California, San Diego, USA*	**O32 Fracture toughness of a Ca-Sr-Zn-Si glass polyalkenoate cement for skeletal applications** M. Towler[1], A. Wren*[2]; *[1]University of Limerick, Ireland, [2]University of Alfred, USA*
8.50-9.30 pm	Posters	
	Tuesday 15 December	
08.00 am	**K4** - **Cellular mechanisms of mechanosensing in bone** C.R. Jacobs; *Columbia University, USA*	
	Session 7 - Bone cells	**Session 8 - Soft tissues 3**
08.40 am	**O33 Ruptured cell processes across cracks in bone: A possible cellular transducer?** C. Dooley*[1], L. Mulcahy[1,2], P. Tisbo[1], G. Duffy[2], T.C. Lee[2,1], D. Taylor[1]; *[1]Trinity College Dublin, Ireland, [2]Royal College of Surgeons in Ireland, Ireland*	**O37 Mechanical response and onset of damage in articular cartilage: A combined experimental and numerical investigation** *M.A. Accardi*, P.M. Cann, D. Dini; Imperial College London, UK*

09.00 am	**O34 Analysis of matrix calcification and change in the matrix viscoelasticity by osteoblasts cultured in agarose gel matrix** Y. Hanazaki*, K. Furusawa, A. Fukui, N. Sasaki; *Hokkaido University, Japan*	**O38 State of stress and deformation of human head during extremal loading** J. Jira*[1], J. Jirova[1], J. Kunecky[1], O. Jirousek[2], M. Micka[2]; *[1]Czech Technical University in Prague, Czech Republic, [2]Institute of Theoretical and Applied Mechanics v.v.i. ASCR, Czech Republic*
09.20 am	**O35 Coefficients for theory of adaptive elasticity and its use in the FEA of remodeling processes in biological tissues** R. Magatin*, J. Ye, Z. Jin; *The University of Leeds, UK*	**O39 Dynamic compression response of brain tissues** F. Pervin*, W. Chen; *Purdue University, USA*
09.40 am	**O36 Analysis of cortical bone remodeling under mechanical stimulus by means of a bone cell population dynamics model** Y. Wang*, Q.-H. Qin; *The Australian National University, Australia*	**O40 Elastin fatigue and tethering issues within the arterial wall** S. Hodis*, M. Zamir; *The University of Western Ontario, Canada*
10.00 am	Coffee break	
10.30 am	**K5 – Molecular mechanics of muscle elasticity** K. Schulten; *University of Illinois, USA*	
	Session 9 – Multiscale modelling of tissue mechanical properties 1	**Session 10 - Polymers and composites**
11.10 am	**O41 Alpha-helical protein networks are self protective and flaw tolerant** M. J. Buehler; *Massachusetts Institute of Technology, USA*	**O47 Plasma-mediated immobilisation of recombinant human tropoelastin dramatically enhances vascular biocompatibility of metal: Implications for coronary stents** A. Waterhouse[1], S.G. Wise[1], Y. Yin[1], M.M. Bilek[1], M.K.C. Ng[2], A.S. Weiss*[1]; *[1]University of Sydney, Australia, [2]Royal Prince Alfred Hospital, Australia*
11.30 am	**O42 Multiscale computational methods for modeling biomaterials** J.W. Chu; *University of California, Berkeley, USA*	**O48 Extracting properties from variable-thickness tensile specimens: A contact lens study** C.R. Horst*, M.A. McDonald, G.W. Brodland, L.W. Jones; *University of Waterloo, Canada*
11.50pm	**O43 The origin of nucleotide-dependent properties in the actin filament: A multiscale study** J. Pfaendtner; *The University of Washington, USA*	**O49 Viscoelastic response of collagen nanocomposites** J. Jancar*[1], E. Jancarova[1], J. Zidek[1], A. Necas[2]; *[1]Brno University of Technology, Czech Republic, [2]Veterinary and Pharmaceutical University, Czech Republic*
12.10 pm	**O44 Revealing the design principles of high-performance biological composites using ab initio-based multiscale simulations in conjunction with homogenization theory** D. Raabe*[1,2], J. Neugebauer[1,2], S. Nikolov[1], M. Friak[1], et al; *[1]Bulgarian Academy of Sciences, Bulgaria, [2]Max-Planck Institut, Germany*	**O50 Micromechanisms of fracture and fatigue in resin based dental composites** J.J. Kruzic*[1], M.B. Shah[1], J.L. Ferracane[2]; *[1]Oregon State University, USA, [2]Oregon Health & Science University, USA*
12.30 pm	**O45 Multiscale simulations of soft contact and adhesion of stem cells** S. Li*, X. Zeng; *University of California, Berkeley, USA*	**O51 Evaluation of novel hybrid organic-inorganic nanocomposites for dental biomaterials** X. Wu*, Y. Sun, W. Xie; *Harbin Institute of Technology, China*
12.50 pm	**O46 Multiscale mechanics of biopolymer gels** E.A. Sander*, M.F. Hadi, V.K. Lai, V.H. Barocas; *University of Minnesota, USA*	
1.10 pm	*Break for afternoon*	
5.30 pm	**Buffet dinner –**	
6.30 pm	**K6 - The tribology of total hip arthroplasty and hip resurfacings - Appearing similar but being different** A. Fischer; *University of Duisburg-Essen, Germany*	
	Session 11 - Metals 1	**Session 12 - Multiscale modelling of tissue mechanical properties 2**
7.10 pm	**O52 Magnesium-alloy: A novel approach to biodegradable implants**	**O56 Multiscale modeling of the human aortic valve: Linking single cells to whole organ**

	C. Castellani[1], R. Lindtner[1], E.K. Tschegg2, S.E. Stanzl-Tschegg[3], V. Doblhoff-Dier*[2], A. Weinberg[1] et al; *[1]Medical University Graz, Austria, [2]Technical University Vienna, Austria, [3]University of Natural Resources and Applied Life Sciences, Austria*	M.R.K. Mofrad*, *University of California, Berkeley, USA*
7.30 pm	**O53 Continuum damage model for biodegradable magnesium alloy stent** D. Gastaldi*, V. Sassi, G. Vimercati, M. Vedani, F. Migliavacca, L. Petrini; *Politecnico di Milano, Italy,*	**O57 Structure-property linkages in biological materials and biomaterials with hierarchical structures** U.G.K. Wegst; *Drexel University, USA*
7.50 pm	**O54 A novel production route for porous titanium coatings on metallic substrates with bioactive top coating** A. Braem*, T. Mattheys, B .Neirinck, J. Schrooten, O. Van der Biest, J. Vleugels; *KULeuven, Belgium*	**O58 Stress response and mechanics of biological cells** Y.Y. Biton*, S.A. Safran; *Weizmann Institute of Science, Israel*
8.10 pm	**O55 Fatigue behavior of ultrafine-grained NbZr in corrosive environments** F. Rubitschek*[1], T. Niendorf[1], H.J. Maier[1], I. Karaman[2]; *[1]University of Paderborn, Germany, [2]Texas A&M University, USA*	**O59 Modeling the anisotropic deformation response of hydroxyapatite nanocrystals** A. R. Zamiri, S. De**; Rensselaer Polytechnic Institute, USA*
8.30-9.30 pm	Posters and drinks reception	
Wednesday 16 December		
08.00 am	**K7 – Computational modeling of musculoskeletal soft tissues** J. Weiss; *University of Utah, USA*	
	Session 13 - Soft tissues 4	**Session 14 – Tissue engineering 1**
08.40 am	**O60 A model of growth and rupture of abdominal aortic aneurysm** K.Y. Volokh*[1], D.A. Vorp[2]; [1]*Technion, Israel, [2]University of Pittsburgh, USA*	**O65 Poly lactide-caprolactone copolymer-boron nitride nanotube: A novel polymer composite for biodegradable scaffold application** D. Lahiri*, S. Namin, T. Richard, A. Keshri, S.R. Bakshi, N. Tsukias, et al; *Florida International University, USA*
09.00 am	**O61 Age-related changes in the micromechanical properties of ovine aorta** R. Akhtar, C. Kridiotis, H.K. Graham, M.J. Sherratt*, A.W. Trafford, J.K. Cruickshank, et al; *The University of Manchester, UK*	**O66 High-porosity cross-linked elastin hydrogels** A.S. Weiss*, et al; *University of Sydney, Australia*
09.20 am	**O62 New biomechanical model of hysteresis in respiratory "pressure-volume" loop** P.M. Grinfeld[1], M.A. Grinfeld*[2]; *[1]Drexel University, USA, [2]The US Army Research Laboratory, USA*	**O67 Characterising a novel hydrogel fibre composite material for the tissue engineering of fibrous tissues** H.R.C. Screen*[1], D. Patel[1], V. Nguyen[2], S.R .Byers[2], S.J. Bryant[2]; *[1]Queen Mary University of London, UK, [2]University of Colorado, USA*
09.40 am	**O63 Evaluation of kinetic energy non lethal weapons :A biomechanical approach** A. Papy*[1], E. Lemaire[2]; *[1]Royal Military Academy, Belgium, [2]Université de Liège, Belgium*	**O68 Encapsulation of fibroblasts within biopolymer gels for ligament tissue engineering** A.M. Smith, N. Hunt, N. Mehrban, L.M. Grover*; *University of Birmingham, UK*
10.00 am	**O64 Mechanics of skin penetration by microneedles** R.B. Groves*, S.L. Evans, S. Coulman, J. Birchall; *Cardiff University, UK*	**O69 Mechanical, material and biological characterisation of novel collagen-hydroxyapatite scaffolds for bone tissue engineering** N.A. Plunkett[1,2], J.P. Gleeson*[1,2], F.J. O'Brien[1,2]; *[1]Royal College of Surgeons in Ireland, Ireland, [2]Trinity College Dublin, Ireland*
10.20 am		**O70 Mechanical testing of biodegradable foams designed for bone regeneration** S. Schwan*[1], F. Junghans[1], H. Nitsche[3], M. Hacker[2], M. Schulz-Siegmund[2], A.Heilmann[1] et al *[1]Fraunhofer Institute for Mechanics of Materials, Germany, [2]University of Leipzig, Germany, [3]University of Halle, Germany*
10.40 am	Coffee break	

11.10 am	**K8 - PEEK: A new frontier in structural biomaterials and bone scaffolds** S. Kurtz; *Exponent Inc., USA*	
	Session 15 – Polymers	**Session 16 - Teeth**
11.50 am	**O71 Mechanically active bioabsorbable shape-memory polymers** K. Paakinaho*[1], H. Heino[2], M. Kellomäki[1]; *[1]Tampere University of Technology, Finland, [2]Bioretec Ltd., Finland*	**O74 The role of prism decussation on crack growth resistance of human enamel** D. Bajaj*, D. Arola; *University of Maryland Baltimore Country, USA*
12.10 pm	**O72 Characterization of bio-doped polypyrrole films using atomic force microscopy** A. Gelmi*, M. Higgins, G. Wallace; *Intelligent Polymer Research Institute, Australia*	**O75 Accommodation of stress in human dentin and enamel: Crack growth vs elastic deformation** P. Panfilov*[1], D. Zaitsev[1], E. Akhidova[1], S. Grigoriev[2]; *[1]Ural State University, Russia, [2]Ural State Medical Academy, Russia*
12.30 pm	**O73 Oxidative stability of ultra-high molecular weight polyethylene (UHMWPE) doped with europium-stearate** L.A. Gallardo[1,2], M. Laurent[1], J. Kunze[3], J.J. Jacobs[1], M.A. Wimmer*[1,2]; *[1]Rush University Medical Center, USA, [2]University of Illinois at Chicago, USA, [3]Hamburg University of Technology, Germany*	**O76 Strain of cervical enamel in fracture test and finite element analysis** K.J. Chun*, O.S. Yoo; KITECH, Korea
12.50pm		**O77 Fracture behaviour of dental enamel** S. Bechtle*[1], S. Habelitz[2], A. Klocke[2], T. Fett[3], G.A. Schneider[1]; *[1]Hamburg University of Technology, Germany, [2]University of California, San Francisco, USA, [3]University of Karlsruhe (TH), Germany*
1.10 pm	Break for afternoon	
5.30 pm	**Buffet dinner** –	
6.30 pm	**K9 - Fracture in human cortical bone: Effect of orientation and fatigue induced microdamage** N. Fazzalari*[1,2], J. Codrington[1,2], J.S. Kuliwaba[1,2], C. Malec[1]; *[1]Bone and Joint Research Laboratory, Australia, [2]The University of Adelaide, Australia*	
	Session 17 – Bone 1	**Session 18 - Metals 2**
7.10 pm	**O78 On the orientation-dependent toughness of human cortical bone in the presence of realistically short cracks** R.O. Ritchie*[1,2], J.W. Ager III[2], K.J. Koester[2]; *[1]University of California Berkeley, USA, [2]Lawrence Berkeley National Laboratory, USA*	**O82 The dependence of fatigue behaviour on sample size for 316L stainless steel** M.S. Bruzzi*, E.W. Donnelly; *National University of Ireland, Ireland*
7.30 pm	**O79 Toughening mechanisms in antler: A new light on bone fracture** P.-Y. Chen*[1], M.E. Launey[2], R.M. Kulin[1], K.S. Vecchio[1], R.O. Ritchie[2,3], J. McKittrick[1], et al; *[1]University of California, San Diego, USA, [2]Lawrence Berkeley National Laboratory, USA, [3]University of California, Berkeley, USA*	**O83 High-efficient Ti and Zr based biomaterials modified by intensive plastic deformation and nitrogen ion implantation** A.V. Byeli*[1], A.G. Kononov[2], V.A. Kukareko[2]; *[1]Physical-Technical Institute, Belarus, [2]Joint Institute of Mechanical Engineering, Belarus*
7.50 pm	**O80 Investigation on micro-cracking behaviors of human femur cortical bone during radial fretting** Z.-B. Cai, M.-H. Zhu*, J. Liu, H.-M. Shen, Z.-R. Zhou; *Southwest Jiaotong University, China*	**O84 Estimation of the fatigue life of orthopaedic devices combining FEM analyses and multiaxial fatigue criteria** T. Villa*, D. Gastaldi, D. Carnelli, G. Pennati; *Politecnico di Milano, Italy*
8.10 pm	**O81 The propagation of macrocracks in ovine cortical bone** P. Mauer*[1,2], D. Taylor[2], F.J. O'Brien[1,2], T.C. Lee[1,2]; *[1]Royal College of Surgeons in Ireland, Ireland, [2]Trinity College Dublin, Ireland*	
8.30-9.30 pm	Posters and drinks reception	
Thursday 17 December		
08.00 am	**K10 - High-throughput poroelastic analysis for mapping tissue hydraulic permeability by nanoindentation** M.L. Oyen*, T.A.V. Shean, M. Galli; *University of Cambridge, UK*	
	Session 19 - Nanoindentation of biological tissues	**Session 20 – Molecules**

08.40 am	**O85 Advanced mechanical characterization of biomaterials** N. Randall, *CSM Instruments, USA*	**O90 Protein mechanics: From single molecules to biomaterials** H. Li; *University of British Columbia, Canada*
09.00 am	**O86 Overcoming the challenges of nanoindentation of compliant biomaterials using nano-JKR analysis** D.M. Ebenstein*[1], R. Stromberg[2], R. Nay[2], T.J. Wyrobek[2]; *[1]Bucknell University, USA, [2]Hysitron, Inc., USA*	**O91 Molecular and mesoscale mechanisms of osteogenesis imperfecta disease in collagen fibrils** M.J. Buehler*[1], S. Uzel[1], A. Gautieri[1,2], et al; *[1]Massachusetts Intitute of Technology, USA, [2]Politecnico di Milano, Italy*
09.20 am	**O87 A study on the dynamic behavior of articular cartilage using nanoindentation** O. Franke[1]*, M. Goeken[2], M. Meyers[3], K. Durst[2], A.M. Hodge[4] ; *[1]Massachusetts Institute of Technology, USA, [2]Friedrich-Alexander Universität Erlangen-Nürnberg,Germany, [3]University of California, San Diego, USA, [4]University of Southern California, USA*	**O92 Reduced molecular flexibility in the large arteries of diabetic rats** R. Akhtar, J.K. Cruickshank, N. Gardiner, B. Derby, M.J. Sherratt*; *The University of Manchester, UK*
09.40 am	**O88 Viscoelastic nanoindentation of mineralized tissues** V.L. Ferguson; *University of Colorado, USA*	**O93 Tensile mechanical properties of individual human collagen fibrils** R.B. Svensson*[1], S.P. Magnusson[1], P. Hansen[1], T. Hassenkam[2]; *[1]Bispebjerg Hospital, Denmark, [2] University of Copenhagen, Denmark*
10.00 am	**O89 Nanoindentation of biological materials – Moving towards more realistic testing** M.E. Dickinson; *University of Auckland, New Zealand*	**O94 Flexibility of polymerized, human cardiac α-tropomyosin measured by atomic force microscopy** C. Loong*, A.K. Takeda, P.B. Chase; *Florida State University, USA*
10.20am	**Coffee Break**	
	Session 21 – Tissue engineering 2	**Session 22 – Bone 2**
10.50 am	**O95 The effects of stiffness and composition of a collagen-GAG scaffold on osteoblastic behaviour** C.M. Tierney*[1,2], F.J. O'Brien[1,2]; *[1]Royal College of Surgeons in Ireland, Ireland, [2]Trinity College Dublin, Ireland*	**O102 An internal locking plate to study intramembranous fracture healing in a mouse femur fracture model** T. Histing*[1], P. Garcia[1], R. Matthys[2], J.H. Holstein[1], M. Leidinger[1], T. Pohlemann[1], et al; *[1]University of Saarland, Germany, [2]AO Development Institute, Switzerland*
11.10 am	**O96 Mechanical behaviour of cartilaginous tissues engineered from mesenchymal stem cells isolated from different tissue sources** T. Vinardell, C.T. Buckley, D.J. Kelly*; *Trinity College Dublin, Ireland*	**O103 Mechanical property characterization of biodegradable magnesium-calcium alloy using quasi-static and dynamic compression tests** Y.B. Guo*, V.S. Brooks; *The University of Alabama, USA*
11.30 am	**O97 Charge enhances matrix synthesis by chondrocytes in dynamically stimulated hydrogel constructs** I. Villanueva, S. Gladem, J. Kessler, S.J. Bryant*; *University of Colorado, USA*	**O104 Predicting tissue forces during distraction osteogenesis** R.A MacInnes*[1], C.J Brown[1], P.R Hobson[1], A Taylor[2]; *[1]Brunel University, UK, [2]Finsbury Development Ltd, UK*
11.50 am	**O98 Influences of hydroxyapatite sol on cell-mediated collagen matrix contraction** Y. Liu*, D.J. Williams; *Loughborough University, UK*	**O105 In vivo gait analysis in a murine femur fracture model** T. Histing[1], A. Kristen*[1], C. Roth[1], J.H. Holstein[1], P. Garcia[1], R. Matthys[2] et al; *[1]Homburg/ Saar, Germany, [2]AO Development Institute, Switzerland*
12.10 pm	**O99 Study on viscoelastic behaviour and cell compatibility of collagen-based scaffold as a function of pH and UV-C doses** M. Achilli*, D. Mantovani; *Laval University, Canada*	**O106 Effect of torque on spinal growth asymmetry** R. Rizza*[1], X.C. Liu[2], J. Thometz[2], R. Lyon[2], C. Tassone[2]; *[1]Milwaukee School of Engineering, USA, [2]Medical College of Wisconsin, USA*
12.30 pm	**O100 A new method to assess collagen gels mechanical properties by tensile tests in an**	**O107 Individual hip endoprostheses with macroscopic elasticity adapted to bone**

	aqueous temperature-controlled environment S.M. Meghezi*, D.M. Mantovani; *Université Laval, Canada*	G. Hohenhoff*[1,2], H. Haferkamp[2], S. Dudziak[2], K. Nagel[1], A. Lutz[1], U. Nackenhorst[1]; *[1]Leibniz Universität Hannover, Germany, [2]Laser Zentrum Hannover e.V, Germany*
12.50 pm	**O101 Novel degradable elastomeric scaffold for tissue engineering** P.S. Luckman*[1,4], S.F. Clark[2,4], I. Blakey[3,4], J.J. Cooper-White[1,4]; *[1]Tissue Engineering and Microfluidics Group, Australia, [2]Centre for Research in Vascular Biology, Australia, [3]Centre for Magnetic Resonance, Australia, [4]Australian Institute of Bioengineering, Australia*	**O108 Analysis of anisotropic viscoelastoplastic properties of cortical bone tissues** A. A. Abdel-Wahab, V. V. Silberschmidt*; *Loughborough University, UK*
1.10pm		**O109 Microstructure characterization of biodegradable magnesium-calcium (Mg-Ca0.8) alloy with different etchants** Y.B. Guo*, V.S. Brooks; *The University of Alabama, USA*
1.10pm	**Lunch**	
	Session 23 – Tissue engineering and cells	**Session 24 - Bone 3**
2.10 pm	**O110 Mechanical stimulus in tissue engineering: The promise of a triaxial bioreactor** M .W. Naing, Y. Liu*, D.J. Williams; *Loughborough University, UK*	**O114 Delineating bone tissue mechanics during osteoporosis using QBEI** M. Brennan*[1], P.J. Thurner[1], F.J. O'Brien[3], L. McNamara[2]; *[1] University of Southampton, UK, [2] National University of Ireland, Ireland, [3]Royal College of Surgeons, Ireland*
2.30 pm	**O111 Stress relaxation microscopy and its application on living cells** S. Moreno-Flores*[1], R. Benitez[2], M.M. Vivanco[3], J.L.Toca-Herrera[1]; *[1]CIC BiomaGUNE, Spain, [2]Extremadura University, Spain, [3]CIC BioGUNE, Spain*	**O115 Elastic properties of bone collagen with and without mineral particles** N. Sasaki*, T. Nozoe, K. Furusawa, A. Fukui; *Hokkaido University, Japan*
2.50 pm	**O112 Evaluating the mechanical behavior of biological cell based on scanning probe indentation** G. Cao*, N. Chandral; *University of Nebraska-Lincoln, USA*	**O116 Correlation between microstructure and nanomechanical properties of lamellar bone** L. Cueru*[1], A.-M. Trunfio-Sfarghiu[1], Y. Bala[2], B. Depalle[2], Y. Berthier[1], H. Follet[2], et al; *[1]National Institute of Applied Sciences, France, [2]Laboratory INSERM U831 Osteoporosis and Bone Quality, France*
3.10 pm	**O113 An extended finite element /level-set formulation for the mechanics of cells on soft substrate** F.J. Vernerey*, M. Farsad; *University of Colorado, USA*	**O117 Peculiarities of the creep in human compact bone tissue** I. Knets*, V. Vitins, M. Dobelis, V. Filipenkovs, et al; *Riga Technical University, Latvia*
3.30 pm	**CLOSING COMMENTS**	