ESB2025 ^{30th Congress of the European Society of Biomechanics AI IN BIOMECHANICS: OPPORTUNITIES AND CHALLENGES 6–9 July 2025, Zurich, Switzerland PROGRAMME OVERVIEW}

Sunday, 6 July 2025

8:00am – 5:00pm	ESB Hike Wildspitz
9:30am – 6:00pm	Registration
1:00pm – 3:00pm	PRE-COURSE: ARTIFICIAL INTELLIGENCE BASED SHAPE REPRESE Lecturers: Nazli Tümer, Morteza Homayounfar & Edwin Tay
1:30pm – 2:30pm	HUMAN MOVEMENT LABORATORY TOUR I Meeting point: ETH Zürich Main Hall (registration area, by the founta
2:00pm – 4:00pm	BIOMECHANICS DISCOVERY TOUR FOR CHILDREN Meeting point: ETH Zürich Main Hall (registration area, by the founta
3:00pm – 5:00pm	ZÜRICH OLD TOWN WALKING TOUR II Meeting Point: ETH Zürich Main Hall (registration area, by the fountai
3:30pm – 4:30pm	HUMAN MOVEMENT LABORATORY TOUR II Meeting point: ETH Zurich main entrance, (registration area, by the fo
3:30pm – 5:30pm	PRE-COURSE: DEEPLABCUT FOR MEASURING ANIMAL MOTION (<i>Lecturer: Mackenzie Mathis</i>
4:30pm – 5:30pm	HUMAN MOVEMENT LABORATORY TOUR III Meeting point: ETH Zürich Main Hall (registration area, by the founta
6:00pm – 7:30pm	WELCOME RECEPTION Location: ETH Zürich Main Hall
7:45pm – 9:45pm	INTERNATIONAL WOMEN IN BIOMECHANICS MEETING Meeting point: ETH Zürich Main entrance



ENTATION (Room E7)	PRE-COURSE: AUTOMATED MODEL DISCOVERY – A H Lecturers: Ellen Kuhl, Mathias Peirlinck, Skyler St. Pierre &
ain)	
ain)	ZÜRICH OLD TOWN WALKING TOUR I Meeting Point: ETH Zürich Main Hall (registration area, I
ain)	
ountain)	
(Room E33.5)	PRE-COURSE: THE HARD IN SOFT – IMAGE-BASED T (Room E7) <i>Lecturers: Marta Peña Fernández, Hari Arora & Uwe Wolft</i>
ain)	

Plenary sessions will take place in Audi Max with simultaneous live streaming to rooms F3, F5 and F7.

A HANDS-ON PROGRAMMING EXPERIENCE (Room E5) & Moritz Flaschel

, by the fountain)

TISSUE MECHANICS FROM HARD TO SOFT TISSUES

lfram

PRE-COURSE: USING THE AGENT-BASED MODELLING SOFTWARE BIODYNAMO FOR SIMULATIONS IN **BIOMECHANICS** (Room E5) Lecturers: Roman Bauer & Vasileios Vavourakis

www.esbiomech2025.

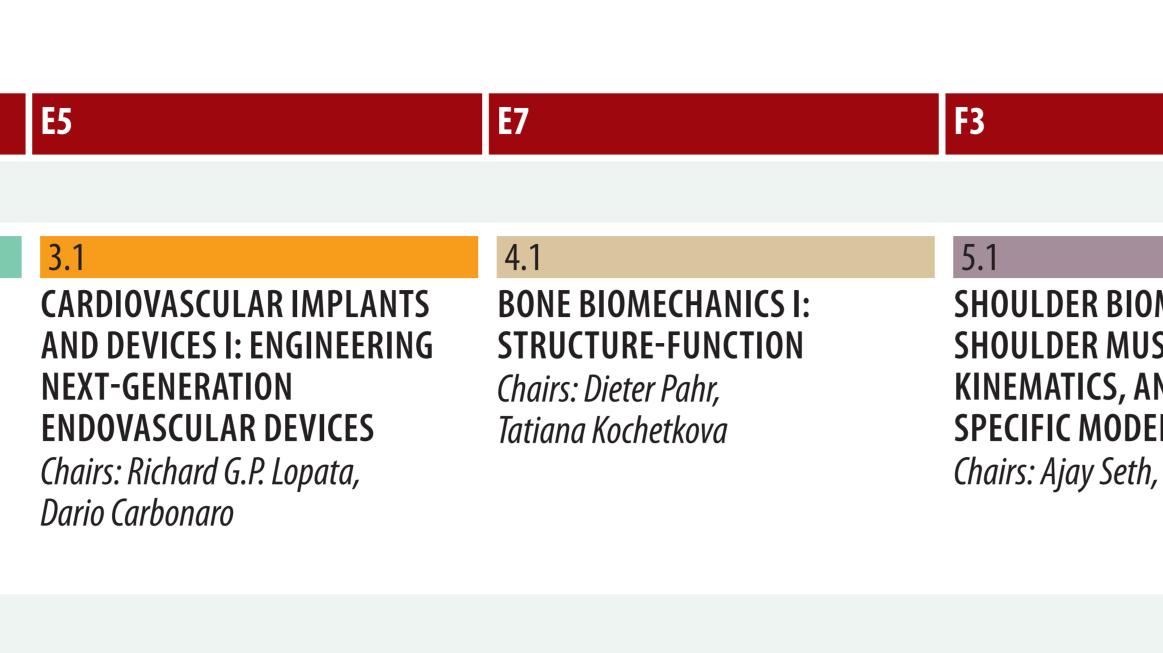
ESB2025 | 30th Congress of the European Society of Biomechanics AI IN BIOMECHANICS: OPPORTUNITIES AND CHALLENGES 6–9 July 2025, Zurich, Switzerland

PROGRAMME OVERVIEW

Monday, 7 July 2025

	Audi Max	E3	E5	
7:30am – 6:30pm	Registration			
8:30am – 9:55am	1.1 AI AND MACHINE LEARNING BIOMECHANICS I: CARDIOVASCULAR & ORGAN BIOMECHANICS Chair: Alberto Redaelli, Ugo Pelissier	2.1 CARDIOVASCULAR BIOMECHANICS I <i>Chairs: Umberto Morbiducci,</i> <i>Gil Marom</i>	3. CA AN NE EN Ch	
9:55am — 10:25am	Coffee break (Location: E, EO North	& South foyers)		
10:25am — 12:00pm	1.2 AI AND MACHINE LEARNING BIOMECHANICS II: AI IN REHABILITATION & HUMAN MOVEMENT Chairs: Chris Awai Easthope, Scott Delp	2.2 CARDIOVASCULAR BIOMECHANICS II Chairs: Sónia I.S. Pinto, Denisa Martonova	3. CA AN CO HE VA Ch Ale	
12:00pm — 1:00pm	Lunch break & Exhibition viewing (L MEET THE PI (Location: EO North &	-		
12:45pm — 1:30pm	POSTER SESSION A1 (Location: Foyer E North) POSTER SESSION B1 (Location: Foyer E South) POSTER SESSION C1 (Location: Foyer EO South) POSTER SESSION D1 (Location: Foyer F)			
1:30pm – 2:15pm <i>KEYNOTE TALK MOLLY STEVENS: DESIGNING BIOMATERIALS FO</i> <i>Chairs: Stephen Ferguson, Michele Conti</i>			GEN	
2:25pm – 3:25pm	ESB STUDENT AWARDS (Location: Audi Max)			
3:30pm – 4:00pm	Coffee break (Location: E, EO North	& South foyers)		
4:00pm – 5:25pm	1.3 MUSCULOSKELETAL BIOMECHANICS I: EXPERIMENTAL APPROACHES Chair: Heath Henninger, Mélody Labrune	2.3 CARDIOVASCULAR BIOMECHANICS III <i>Chairs: Estefania Peña,</i> <i>Valentina Mazzi</i>	3. CO CA AP MO CH	
5:30pm – 6:30pm	ESB DIVERSITY IN BIOMECHANICS (Location: Audi Max)			
6:45pm – 8:15pm	Networking with Swiss wine & cheese (Location: Dozentenfoyer, ETH Zurich			
7:00pm – 10:00pm	Student Evening (Location: VSETH B	uilding, Universitätstrasse 6, 8092 Zür	rich)	





3.2

CARDIOVASCULAR IMPLANTS AND DEVICES II: COMPUTATIONAL HEMODYNAMICS IN STENT AND VALVE ENGINEERING Chairs: Francesco Migliavacca, Alexandra Hauguel

4.2 BONE BIOMECHANICS II: WHOLE IMPLANTS AND BONE Chairs: Harry van Lenthe, Elham Alizadeh

5.2 VIVO / IN VITRO **TOWARDS IN SII** Chairs: Paulo Fern Mattia Sisella

OR REGENERATIVE MEDICINE AND SOFT ROBOTICS (Location: Audi Max)

3.3

COMPUTATIONAL METHODS FOR SPORTS BIOMECHANICS I: CARDIOVASCULAR **APPLICATIONS I: TISSUE MODELLING AND** CHARACTERIZATION Chair: Sandra Loerakker

4.3 STRATEGIES FOR STRENGTH, **CONTROL, AND INJURY** PREVENTION Chairs: Floren Colloud, Mark Sayers

5.3 **IMPLANTS AND DEVICES II: IN** SILICO STUDIES Chairs: Barbara Röhrnbauer, Edoardo Bori

TH Zurich Main Building)

		Plenary sessi	ions v
	F5	F7	G3
OMECHANICS I: JSCULATURE, AND SUBJECT ELLING h, Jeremy Genter	6.1 3D BIOPRINTING, ADDITIVE MANUFACTURING, AND SCAFFOLDS I: COMPUTATIONAL DESIGN AND MECHANICS OF 3D PRINTED SCAFFOLDS AND SOFT MATERIALS Chairs: Pasquale Vena, Edwin Tay	7.1 JOINT KINEMATICS & KINETICS I: METHODOLOGY Chairs: Ayman Assi, Zimi Sawacha	8.1 TIS Cha Eng
D DEVICES I: IN O AND PATHWAYS SILICO rnandes,	6.2 3D BIOPRINTING, ADDITIVE MANUFACTURING, AND SCAFFOLDS II: ADVANCED SCAFFOLD FABRICATION AND BIOPRINTING STRATEGIES FOR TISSUE ENGINEERING Chairs: Amir A. Zadpoor, Federica Buccino	7.2 REHABILITATION ENGINEERING, EXOSKELETONS, AND ASSISTIVE DEVICES I: BRAIN-IN-THE-LOOP & EXOSKELETONS Chair: Ning Lan, Daniel Baumgarter	8.2 SPI INT STI Cha Jéra

6.3

FRACTURE HEALING Chairs: Francisco Correia Marques, Sara Checa Esteban

7.3 **ANIMAL BIOMECHANICS** Chairs: Christian Peham, Robert Baines

European Society of Biomechanics

www.esbiomech2025.

s will take place in Audi Max with simultaneous live streaming to rooms F3, F5 and F7.

G5

ISSUE ENGINEERING *hairs: Philipp J. Thurner,* ng Kuan Moo

9.1 **SOFT TISSUE BIOMECHANICS I:** EXPERIMENTAL **CHARACTERISATION OF SOFT** TISSUES Chairs: Yohan Payan, *Ciara Brigit Durcan*

PINE BIOMECHANICS I: NTERVERTEBRAL DISC – **TRUCTURE & LOAD** hairs: Joachim Wilke, érôme Noailly

9.2 **BIOMEDICAL IMAGING I:** ADVANCED IMAGING TECHNIQUES Chairs: Dieter Pahr, Elis Newham

8.3 **CLINICAL AND TRANSLATIONAL BIOMECHANICS I** Chairs: Annegret Mündermann, Alison N. Agres

9.3

OCULAR BIOMECHANICS Chairs: Miguel Angel Ariza Gracia, Philippe Büchler **ESB2025** AI IN BIOMECHANICS: OPPORTUNITIES AND CHALLENGES 6–9 July 2025, Zurich, Switzerland

PROGRAMME OVERVIEW

Tuesday, 8 July 2025

	Audi Max	E3	
8:00am – 6:30pm	Registration		
8:30am – 9:55am	1.4 AI AND MACHINE LEARNING BIOMECHANICS III: EXPLAINABLE ML & SENSOR-DRIVEN MOTION ANALYSIS Chairs: Neil Cronin	2.4 REHABILITATION ENGINEERIN EXOSKELETONS, AND ASSISTIN DEVICES II: BIOMECHANICS, PROSTHETICS & ASSISTIVE DEVICES; Chairs: Marta C. Mora	
9:55am — 10:25am	Coffee break (Location: E, EO North 8	South foyers)	
10:25am — 12:00pm	1.5 AI AND MACHINE LEARNING BIOMECHANICS IV: JOINT, BONE & MUSCULOSKELETAL MODELLING; Chairs: Ilse Jonkers	2.5 MECHANOBIOLOGY I: CELL LEVEL <i>Chairs: Diana Massai, Costanza</i> <i>Giampietro</i>	
12:00pm – 1:00pm	Lunch break & Exhibition viewing (Location: E, EO North & South foye		
12:45pm — 1:30pm	POSTER SESSION A2 (Location: Foyer E North) POSTER SESSION B2 (Location: Foyer E South) POSTER SESSION C2 (Location: Foyer EO South) POSTER SESSION D2 (Location: Foyer F)		
1:30pm – 2:15pm	KEYNOTE TALK SCOTT DELP: FRONTIERS IN HUMAN PERFORMAN <i>Chairs: William R. Taylor, Esther Reina Romo</i>		
2:25pm – 3:25pm	1.6 DEBATE SESSION: ARTIFICIAL INTELLIGENCE WILL MAKE OBSOLETE THE USE OF PHYSICAL MODELLING IN BIOMECHANICS Chair: Ralph Müller World team: Mackenzie Mathis & Scott Delp ESB team: Enrico Dall'Ara & Aurélie Carlier	2.6 MECHANOBIOLOGY II: BONE MECHANOBIOLOGY <i>Chairs: Sara Checa Esteban,</i> <i>Andre P. G. Castro</i>	
3:30pm – 4:00pm	Coffee break (Location: E, EO North &	« South foyers)	
4:00pm – 4:50pm	HUISKES MEDAL AWARD (Location: Audi Max)		
4:55pm – 5:25pm	ESB AWARDS CEREMONY (Location: Audi Max)		
5:30pm – 6:30pm	ESB GENERAL ASSEMBLY (Location	: Audi Max) 🔳	
7:30pm – 11:30pm	ESB Congress dinner (Location: Lake	Side, Bellerivestrasse 170, 8008 Z	

					Plenary session	ons w
	E5	E7	F3	F5	F7	G3
	3.4	4.4	5.4	6.4	7.4 $CDODTC DIOMECHANICS III ELITE$	8.4
RING, TIVE , ra	<section-header></section-header>	<section-header></section-header>	MUSCULOSKELETAL MODELLING I: JOINT MECHANICS Chairs: Míriam Febrer-Nafría, Ning Guo	BONE BIOMECHANICS III: IMAGE-BASED FE Chairs: Peter Augat, Elizabeth A. Zimmermann	ANALYSIS <i>Chairs: Silvio R. Lorenzetti,</i> <i>Arielle Fischer</i>	MAI SCA MUI CHA BIO BON Chai

3.5 **COMPUTATIONAL METHODS FOR** CARDIOVASCULAR **APPLICATIONS II: PATIENT-SPECIFIC ANALYSES AND PROCEDURAL PLANNING** Chairs: Elie Hachem, Mirunalini Thirugnanasambandam

4.5 SOFT TISSUE BIOMECHANICS III: BIOMEDICAL IMAGING II: AI AND BONE BIOMECHANICS IV: NUMERICAL MODELLING OF SOFT TISSUE MECHANICS Chairs: Rosti Readioff, Lara Esquivel

5.5

MEDICAL IMAGE ANALYSIS Chairs: Kate Gerber, Matteo Vicini

oyers)

ANCE RESEARCH – INSIGHTS FROM BIOMECHANICAL SIMULATION AND MACHINE LEARNING (Location: Audi Max)

4.6 5.6 3.6 SOFT TISSUE BIOMECHANICS IV: MUSCULOSKEL ADVANCEMENTS IN SOFT TISSUE BIOMECHANICS IN II: MODEL PERS **BIOMECHANICS (CORPORATE** SESSION) HEALTH, DISEASE, AND CLINICAL FOR CLINICAL A APPLICATIONS; Chairs: Marlene Mengoni, Chairs: Hélène Fol Chairs: Yohan Payan, Zimi Sawacha Sophie Hutchinso Nolwenn Fougeron

)8 Zürich)

6.5 MICROSCALE Chairs: Philippe Zysset, Aurélie Levillain

7.5	8
KNEE BIOMECHANICS I:	S
BIOMECHANICAL TESTING	D
Chairs: Thomas M. Grupp,	Μ
Ariana Ortigas Vásquez	Cl

	6.6	7.6	8.
LETAL MODELLING SONALIZATION APPLICATION Follet, son	RESPIRATORY BIOMECHANICS I: MULTISCALE PERSPECTIVES ON RESPIRATORY BIOMECHANICS Chairs: Hari Arora, Mona Eskandari	KNEE BIOMECHANICS II: KINEMATICS & KINETICS <i>Chairs: Renate List, Barbara Postolka</i>	JO IN MI PA Cho Ari

www.esbiomech2025.

s will take place in Audi Max with simultaneous live streaming to rooms F3, F5 and F7.

G5

D BIOPRINTING, ADDITIVE ANUFACTURING, AND CAFFOLDS III: MECHANICS AND **NULTISCALE** HARACTERIZATION OF **SIOMIMETIC SCAFFOLDS FOR** SONE TISSUE ENGINEERING hair: Xiao-Hua Qin

9.4

MOVEMENT & POSTURE I: ASSESSMENT TECHNOLOGIES AND MOVEMENT ANALYSIS IN **REAL-WORLD CONTEXT;** Chairs: Sasa Cukovic, Brian Horsak

9.5

SPINE BIOMECHANICS II: SPINAL MOVEMENT & POSTURE II: DEFORMITY – ASSESSMENT & MODELLING

Chairs: Dominika Ignasiak, Thomas Slater

NEUROMECHANICS, MOTOR CONTROL AND REHABILITATION STRATEGIES Chairs: Carolin Curtze, Seyyed Hamed Hosseini Nasab

OINT KINEMATICS & KINETICS II: N THE SETTING OF MUSCULOSKELETAL PATHOLOGIES *Chairs: Lennart Scheys,* Ariana Ortigas Vásquez

9.6

REPRODUCTIVE, FETAL, AND NEONATAL BIOMECHANICS I: MULTISCALE MODELLING AND INTERVENTION IN MATERNAL-FETAL HEALTH Chairs: Marco Parente, Rita Moura

	ESB2025 AI IN BIOMECHANICS: OPPORTL 6–9 July 2025, Zuri	JNITIES AND CHALLENGES	AMME OVER		
		ay, 9 July 2025			
		Audi Max	E3		
	8:00am – 5:00pm	Registration			
	8:30am – 9:55am	1.7 CARDIOVASCULAR BIOMECHANICS V <i>Chairs: Dominik Obrist,</i> <i>Alexey Kamenskiy</i>	2.7 COMPUTATIONAL BIOLOGY I: COMPUTATIONAL BIOLOGY T ADVANCE CELL BIOMECHANI Chairs: Aurélie Carlier, MªAngeles Pérez Ansón		
	9:55am — 10:25am	Coffee break (Locations: E, EO North	& South foyers)		
10:25am — 12:00pm		1.8 COMPUTATIONAL METHODS FOR CARDIOVASCULAR APPLICATIONS III: CFD/FSI AND ARTERIES Chair: Philippe Meliga, Sjeng Quicken	2.8 MECHANOBIOLOGY III: MECHANOBIOLOGY IN CANCE RESEARCH Chair: Stefaan Verbruggen, Geo Duda		
	12:00pm – 1:10pm	Lunch break & Exhibition viewing (Locations: E, EO North & South for			
	1:10pm — 2:10pm	1.9 CARDIOVASCULAR BIOMECHANICS VI <i>Chairs: Michele Conti, Karol Calò</i>	2.9 COMPUTATIONAL BIOLOGY II COMPUTATIONAL BIOLOGY II CANCER APPLICATIONS Chair: Friederike Schulte		
	2:20pm – 3:05pm	KEYNOTE TALK MACKENZIE MATHIS: TOWARDS THE NEURAL BA <i>Chairs: Ralph Müller, Sandra Loerakker</i>			
	3:05pm – 3:30pm	Coffee break (Locations: E, EO North & South foyers)			
	3:30pm – 4:30pm	BEST DOCTORAL THESIS & EARLY <i>Chairs: Marlene Mengoni, Dieter Pahr,</i> BEST DOCTORAL THESIS AWARD: <i>Apeksha Shapeti, KU Leuven, Belgium</i> EARLY INVESTIGATOR AWARD: YA <i>Tommaso Ristori, Eindhoven Universi</i>	, <i>Michele Conti</i> FORCE-MEDIATED ANGIOGENE P/TAZ AS MECHANOSENSORY		
	4:30pm – 5:15pm	Closing ceremony (Location: Audi Ma	ax)		

VIEW

					Plenary	/ sessions w
	E5	E7	F3	F5	F7	G3
	3.7	4.7	5.7	6.7	7.7	8.7
TO NICS	MUSCULOSKELETAL BIOMECHANICS II: MODELLING & SIMULATIONS Chairs: Saulo Martelli, Maxence Lavaill	RESPIRATORY BIOMECHANICS II: MECHANICS-TO-MEDICINE: FROM CELLULAR INSIGHTS TO PREDICTIVE MODELS AND CLINICAL TRANSLATION Chairs: Mona Eskandari, Sam Bayat	MUSCULOSKELETAL MODELLING III: BONE & SPINE BIOMECHANICS Chairs: Ruth Wilcox, Aurélie Levillain	IMPLANTS AND DEVICES III: INNOVATIVE IMPLANT AND MEDICAL DEVICE DESIGN Chair: Bernardo Innocenti, Martina Colombo	KNEE BIOMECHANICS III: MODELLING <i>Chairs: Nico Verdonschot,</i> <i>Erin Teule</i>	3D I MA SCA IMP DEV OSS BIO Cha
	3.8	4.8	5.8	6.8	7.8	8.8
CER eorg	CARDIOVASCULAR IMPLANTS AND DEVICES III: VIRTUAL TOOLS FOR VASCULAR AND EXTRACORPOREAL THERAPIES Chairs: Wouter Huberts, Thibault Vervenne	AI AND MACHINE LEARNING BIOMECHANICS V: IMAGING, SPINE AND PERSONALIZED MODELS; Chairs: Lennart Scheys, Guo Lingzhong	SPINE BIOMECHANICS III: SPINAL DISORDERS BIOMECHANICS Chairs: Marwan El-Rich, Kati Nispel	BONE BIOMECHANICS V: NANOSCALE <i>Chair: Alessandra Carriero,</i> <i>Ludger Keilig</i>	HIP BIOMECHANICS <i>Chairs: Sophie Williams,</i> <i>Anitha Praveen</i>	BIO Chai Feih
foyers)						
	3.9	4.9	5.9	6.9	7.9	8.9
/ 11: / IN	MUSCULOSKELETAL / ORTHOPAEDIC INTERFACES Chairs: Alexandre Terrier, James Warren	IMPACT/INJURY BIOMECHANICS <i>Chair: Mark Robinson</i>	SPINE BIOMECHANICS IV: INTERVERTEBRAL DISC – BIOMECHANICS & DEGENERATION Chairs: Nicolas Newell,	OSTEOARTHRITIS <i>Chairs: Ilse Jonkers, Aapo Ristaniemi</i>	SKELETAL ADAPTATION <i>Chairs: Enrico Dall'Ara,</i> <i>Tatiana Kochetkova</i>	SHO GLE BIO ART Chai

Ann-Kathrin Dagmar Greiner-Perth

ASIS OF ADAPTIVE MOTOR CONTROL (Location: Audi Max)

tion: Audi Max) 🔳 🗨

IESIS: LINKING MECHANICAL MECHANISMS TO VASCULAR LESION GROWTH

Y REGULATORS OF BLOOD VESSEL FORMATION IN HEALTH AND DISEASE

BIOMATERIALS Chairs: Stephen Ferguson, eihu Zhao

European Society of Biomechanics

www.esbiomech2025.

s will take place in Audi Max with simultaneous live streaming to rooms F3, F5 and F7.

G5

3D BIOPRINTING, ADDITIVE MANUFACTURING, AND **SCAFFOLDS IV: 3D PRINTED MPLANTS AND FUNCTIONAL** DEVICES: FROM **OSSEOINTEGRATION TO** BIOMECHANICAL PERFORMANCE Chair: Nazli Tumer

9.7 **CLINICAL AND TRANSLATIONAL BIOMECHANICS II** Chairs: Alison Jones, Roberto Leonardo-Diaz

9.8

9.9

ON ORTHOREGENERATION AWARD Chairs: Marcy Zenobi-Wong, Matthias Steinwachs

SHOULDER BIOMECHANICS II: GLENOHUMERAL BIOMECHANICAL MODELS AND ARTHROPLASTY

Chairs: Clark Dickerson, Eva C. Herbst **TISSUES**

REPRODUCTIVE, FETAL, AND NEONATAL BIOMECHANICS II: MECHANOBIOLOGY OF FEMALE **REPRODUCTIVE AND PELVIC**

۲

Chairs: Marco Parente, Daniel Fidalgo