

# 5<sup>TH</sup> ISMST-BASIC RESEARCH MEETING

"Physical Tissue Stimulation: a path to self-healing"

Centro Congressi  
Via Gobetti 101  
inside the CNR Research Area Campus  
40129 Bologna | Italy

June 28<sup>th</sup> – 29<sup>th</sup>, 2018



Ludwig Boltzmann Institute  
Experimental and Clinical Traumatology



Austrian Cluster for Tissue  
Regeneration



MEDIZINISCHE  
UNIVERSITÄT  
INNSBRUCK



Istituto Nazionale Biodivulso Beni  
I.N.B.B.  
CNR-IZO Interreg-Innsbruck

Interreg   
Austria-Czech Republic  
European Regional Development Fund



WELCOME



Rhythmic oscillatory patterns permeate the entire universe and sustain cellular dynamics at biological level. Our cells are sensitive to physical stimulation and can be exposed to physical energies to afford efficient rescue of damaged organs. Seeing stem cell biology with the eyes of Physics may help developing a Regenerative/Precision medicine afforded through the stimulation of the natural ability of tissues for self-healing.

It is my great pleasure to invite you to Bologna next June to discuss these fascinating issues at a high level interdisciplinary platform.

**Carlo Ventura, M.D., Ph.D.**

Full Professor of Molecular Biology,  
University of Bologna,  
Italy



# Thursday, June 28<sup>th</sup> 2018

8:00 - 9:00	Registration
9:00 - 9:20	Welcome
9:20 - 10:30	Endogenous mechanotransduction
10:30 - 11:00	<b>Coffee break</b>
11:00 - 12:50	Nanomechanics, mechanical vibration
12:50 - 13:00	Discussion
13:00 - 14:15	<b>Lunch</b>
14:15 - 16:10	Extracorporeal shockwave therapy (ESWT)
16:10 - 16:45	<b>Coffee break</b>
16:45 - 18:00	Photobiomodulation/Light therapy
18:00 - 19:00	<b>Get together</b>
20:00	<b>Come Together Dinner</b>

# Friday, June 29<sup>th</sup> 2018

9:00 - 10:25	Low intensity pulsed ultrasound (LIPUS) and Vibration therapy
10:25 - 11:00	<b>Coffee break</b>
11:00 - 12:15	Electromagnetic Transduction therapy (EMTT)
12:15 - 13:00	<b>Concluding discussion</b>



Thursday, June 28<sup>th</sup>

2018

08:00 - 09:00

Registration

09:00 - 09:20

**Welcome**

Carlo Ventura, Heinz Redl, Wolfgang Schaden

09:20 - 10:20

**Endogenous mechanotransduction**

Chair: Heinz Redl/Carlo Ventura

10:20 - 10:30

**Endogenous mechanotransduction (50'+10')**

Giancarlo Forte

International Clinical Research Center (FNUSA-ICRC), St. Anne's University Hospital, Brno, Czech Republic

10:30 - 11:00

**Science visualization of the inner cell (10')**

Martina R. Fröschl

Science Visualization Lab at the Department of Digital Art at the University of Applied Arts Vienna

11:00 - 13:00

**Coffee break**

**Nanomechanics, mechanical vibration**

Chair: Carlo Ventura

11:00 - 11:35

**Vibrational signatures in stem cell dynamics and reprogramming (30'+5')**

Carlo Ventura, University of Bologna, Italy

with a note by Marco Tausel (MultiPhysiXLab) on the use of hyper spectral imaging in detecting defined vibrational patterns in stem cell fate

11:35 - 12:00

**MechanoBiology in dynamical cellular systems (20'+5')**

James Gimzewski, University of California Los Angeles, USA

12:00 - 12:25

**Merging of modulating machines and tissue regeneration: when novel paths in AI and cybersecurity are needed (20'+5')**

Chuck Brooks, Elpis Eremo Inc., California, USA

12:25 - 12:50

**The coming medical revolution. Surviving death (20'+5')**

James Ryan, Elpis Eremo Inc., California, USA

12:50 - 13:00

Discussion

13:00 - 14:15

**Lunch**

Thursday, June 28<sup>th</sup>

2018

THURSDAY, JUNE 28<sup>TH</sup>

<b>14:15 - 16:10</b>	<b>Extracorporeal Shockwave Therapy (ESWT)</b> Chair: Carlos Leal/Heinz Redl
<b>14:15 - 14:35</b>	<b>Overview on ESWT (15'+5')</b> Wolfgang Schaden, AUVA Trauma Center Vienna/Meidling, Austria
<b>14:35 - 14:50</b>	<b>Physical characterization of shockwave therapy (10'+5')</b> Cyrill Slezak, Utah Valley University, Utah, USA
<b>14:50 - 15:15</b>	<b>Working Mechanism of ESWT (Heart and Spine Indications) (20'+5')</b> Johannes Holfeld, Medical University of Innsbruck, Innsbruck, Austria
<b>15:15 - 15:40</b>	<b>Working Mechanism of ESWT (Skin Indications) (20'+5')</b> Rainer Mittermayr, AUVA Trauma Center Vienna/Meidling, Austria
<b>15:40 - 15:55</b>	<b>ESWT for Peripheral Nerve Regeneration (10'+5')</b> David Hercher, MSc, Ludwig Boltzmann Institute for Experimental and Clinical Traumatology, Vienna, Austria
<b>15:55 - 16:10</b>	<b>Effects of ESWT on Macrophages (10'+5')</b> Cristina d' Agostino, ESW Therapy & Research Center, Humanitas Research Hospital, Rozzano, Milan, Italy
<b>16:10 - 16:45</b>	<b>Coffee break</b>
<b>16:45 - 18:00</b>	<b>Photobiomodulation /Light therapy</b> Chair: Heinz Redl/Peter Dungal
<b>16:45 - 17:20</b>	<b>Photobiomodulation and the Brain: Mechanisms and Applications (35'+5')</b> Michael Hamblin, Harvard Medical School, Massachusetts, USA Massachusetts General Hospital, Massachusetts, USA
<b>17:20 - 17:40</b>	<b>Effects of photobiomodulation on angiogenesis in vitro and in vivo (15'+5')</b> Peter Dungal, Ludwig Boltzmann Institute for Experimental and Clinical Traumatology, Vienna, Austria
<b>17:40 - 18:00</b>	<b>Photobiomodulation in the clinics (15'+5')</b> Kurt Schicho, Medical University of Vienna, Vienna, Austria
<b>18:00 - 19:00</b>	<b>Get Together</b>
<b>20:00</b>	<b>Come Together Dinner</b>

09:00 - 10:30	<p><b>Low intensity pulsed ultrasound (LIPUS) and Vibration therapy</b> Chair: Rainer Mittermayr/Heinz Redl</p>
09:00 - 09:35	<p><b>Ultrasound for biomedical applications: direct and indirect effects (30'+5')</b> Leonardo Ricotti Sant'Anna School of Advanced Studies, Pisa, Italy</p>
09:35 - 10:10	<p><b>Personalised medicine and vibration therapy: Computer modelling of mechanical and molecular regulation of bone remodeling (30'+5')</b> Patrik Christen, ETH Zurich, Switzerland</p>
10:10 - 10:25	<p><b>Synergistic antifungal activity of amphotericin b, essential oils and low frequency ultrasound on mucormycosis causing fungi (10'+5')</b> Karaleen Anderson Physics, Utah Valley University, Orem, Utah</p>
10:25 - 11:00	<p><b>Coffee break</b></p>
11:00 - 12:15	<p><b>Electromagnetic Transduction therapy (EMTT)</b> Chair: Ludger Gerdesmeyer/Martin Ringeisen</p>
11:00 - 11:25	<p><b>Physical Principles of EMTT (20'+5')</b> Rafael Storz Storz Medical AG, Tägerwilen, Switzerland</p>
11:25 - 11:55	<p><b>Biological Working Mechanism and Basic Research (25'+5')</b> Ludger Gerdesmeyer University of Schleswig-Holstein, Kiel, Germany</p>
11:55 - 12:15	<p><b>EMTT in bone pathologies - initial results (15'+5')</b> Martin Ringeisen Orthopaedic Medical Center Dr. Ringeisen, Augsburg, Germany</p>
12:15 - 13:00	<p><b>Concluding discussion</b> Detect similarities and synergies; formation of interdisciplinary research groups to compare the working mechanism of the different technologies.</p>

# General information

## Location

### Centro Congressi

Via Gobetti 101, inside the CNR Research Area Campus  
40129 Bologna / Italy

You can easily reach the conference center by car, from the main motorways, by plane (CNR is just a 10-minute taxi journey from Bologna airport), or, if you arrive by train, from the Central Railway Station with bus no. 87.

## Accommodation

We recommend the following hotel in proximity to the congress location. It is 2.3 km (about 7 minutes by car or taxi) away from the conference venue.

### Best Western City Hotel

Via Ambrogio Magenda 10  
40128 Bologna, Italy

Please make the reservations directly at the Hotel.

## Registration

If you want to register for the 5th Basic Research Meeting in Bologna, Italy, please send an email to Ms Catherine Auersperg at [shockwavetherapy@ismst.com](mailto:shockwavetherapy@ismst.com).

The BRM registration fee is 150,00 €

## Contact

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# 5<sup>TH</sup> ISMST-BASIC RESEARCH MEETING

“Physical Tissue Stimulation: a path to self-healing”

## The ISMST- Basic Research Meeting is organized in cooperation with:

University of Bologna, Italy

Austrian Workers' Compensation Board (AUVA)

Medical University of Innsbruck, Austria

Ludwig Boltzmann Institute for Experimental and  
Clinical Traumatology in the AUVA research center, Vienna, Austria

Austrian Cluster for Tissue Regeneration, Vienna, Austria

National Institute of Biostructure and Biosystems  
(Istituto Nazionale di Biostrutture e Biosistemi (INBB), Rome, Italy

ATCZ133 Competence Center MechanoBiology A, CZ

