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Bionic Limb Reconstruction Symposium 2025

December 3-5, 2025

Medical University of Vienna, Austria



Scientific Program

WEDNESDAY, DECEMBER 3, 2025

09:00 – 09:15

Welcome: Where we are

Oskar C. Aszmann (Vienna, AT)

09:30 – 12:00



01 Live video feed from OR into lecture hall: Insertion of 4 leads into PM and LD for intuitive control of 6 DOF arm

Paul Cederna (Ann Arbor, US) Oskar C. Aszmann (Vienna, AT)

09:15 – 09:30

02 Presentation of the patient

Johanna Klepetko (Vienna, AT)

09:30 – 09:45

03 Presentation of motor matrix

Laura Ferrante (London, UK)

09:45 – 10:30



Live video feed from OR

10:30 – 10:45

04 Description of the leads and ESO – What to expect from this intervention

Alex Vaskov (Ann Arbor, US)

10:45 – 11:00

05 Clinically informed neural interfaces

Rylie Green (London, UK)

11:00 – 11:15

06 Challenges on stability of micromachined electrode arrays

Thomas Stieglitz (Freiburg, DE)

11:15 – 11:25

07 Stability of perineural interface over 10 years

Gregor Längle (Vienna, AT)

11:30 – 12:00



Live video feed from OR

12:00 – 13:00

Lunch break



13:00 – 13:15	08 Accessing the motor neuron pool for prosthetic control via signal decomposition <i>Dario Farina (London, UK)</i>
13:15 – 13:30	09 Accessing the motor neuron pool via implanted micro-electrode arrays after TMR <i>Laura Ferrante (London, UK)</i>
13:30 – 13:45	10 Accessing the motor neuron pool via peripheral nerve and LIFE electrodes <i>Jonathan Cheng (Dallas, US)</i>
13:45 – 14:00	11 Accessing the motor neuron pool via RPNI and intramuscular sensors <i>Paul Cederna (Ann Arbor, US)</i>
14:00 – 14:20	12 Interfacing with muscle via magnetomicrometry <i>Hugh Herr (Cambridge, US)</i>
14:20 – 15:00	13 Panel discussion: Benefits and pitfalls of each technique <i>Moderator: Vlad Tereshenko (Vienna, AT)</i>
15:00 – 15:30	Coffee break
15:30 – 17:30	Scientific paper session I <i>Chairs: Dario Farina (London, UK), Paul Cederna (Ann Arbor, US)</i>
6+3 min	14 Long term outcome data of implantable myoelectric sensors in two transradial amputees <i>Aidan Roche (London, UK)</i>
6+3 min	15 Long-term viability and physiologic signaling of the muscle cuff regenerative peripheral nerve interface for advanced exoskeleton control <i>Yucheng Tian (Ann Arbor, US)</i>



Bionic Limb Reconstruction Symposium 2025

6+3 min	16 Initial observations on myocontrol capacity of autologous muscle transfers <i>Ivan Vujaklija (Espoo, FI)</i>
6+3 min	17 From cortex to muscle: A mathematical model as the foundation for future research in neuroprosthetics <i>Isaac Gill (Sydney, AU)</i>
6+3 min	18 Simultaneous and proportional finger motion decoding using spatial features from high-density surface electromyography <i>Ricardo Gonçalves Molinari (Campinas, BR)</i>
6+3 min	19 Prediction of lower-limb joint kinematics using power spectral densities from surface electromyography <i>Joshua Colley (Leeds, UK)</i>
6+3 min	20 Towards a clinically viable, modular, dry, high-density interface for prosthetic myocontrol <i>Deborah Quadrelli (Genova, IT)</i>
6+3 min	21 Advancing prosthetic hand capabilities through biomimicry and neural interfaces <i>Mohammadi Haghani Dogaheh (Rasht, IR)</i>
6+3 min	22 Classification of mental tasks based on spinal motor neuron oscillations: A potential novel control paradigm <i>Patrick Ofner (Freiburg, DE)</i>
6+3 min	23 A surface drug delivery system reduces the foreign body reaction against intraneural electrodes <i>José Manuel Crueiras (Barcelona, ES)</i>



THURSDAY, DECEMBER 4, 2025

08:00 – 08:20

24 Indications of bionic reconstruction

Milomir Ninkovic (Munich, DE)

- What are the milestones of a successful limb salvage – when to turn to prosthetic alternatives
- Resection/replantation

08:20 – 09:20

25 Panel discussion of cases: Upper extremity

Moderator: Oskar C. Aszmann (Vienna, AT)

Milomir Ninkovic (Munich, DE)

Umraz Khan (Bristol, UK)

Paul Cederna (Ann Arbor, US),

Heinz Bürger (Klagenfurt am Wörthersee, AT)

09:20 – 10:15

26 Panel discussion of cases: Lower extremity

Moderator: Matthew Carty (Boston, US)

Oskar C. Aszmann (Vienna, AT)

Gerhard Hobusch (Vienna, AT)

Jennifer Ernst (Hannover, DE)

Umraz Khan (Bristol, UK)

10:15 – 10:45

Coffee break

10:45 – 11:05

27 Managing the afferent pathway

Stanisa Raspopovic (Vienna, AT)

11:05 – 11:20

28 The first human demonstration of the cutaneous mechanoneural interface

Hugh Herr (Cambridge, US)



Bionic Limb Reconstruction Symposium 2025

11:20 – 11:40	29 AMI – Upper and lower extremity <i>Matthew Carty (Boston, US)</i>
11:40 – 11:55	30 Targeted sensory reinnervation <i>Alexander Gardetto (Brixen, IT)</i>
11:55 – 12:05	31 EMG biofeedback to help motor learning <i>Anna Bösendorfer (Vienna, AT)</i>
12:05 – 12:15	32 Hybrid hand training with soft hand in stroke rehabilitation <i>Bernhard Fasching (Vienna, AT)</i>
12:15 – 12:25	33 Closed-loop haptic stimulation for stroke rehabilitation <i>Patrick Sagastegui, Jumpei Kashiwakura (London, UK)</i>
12:30 – 13:30	Lunch break
13:30 – 16:30	 Live video feed into lecture hall
13:30 – 18:30	34 Dissection course <i>Paul Cederna (Ann Arbor, US), Jennifer Ernst (Hannover, DE), Matthew Carty (Boston, US), Gerhard Hobusch (Vienna, AT), Alexander Gardetto (Brixen, IT), Oskar C. Aszmann (Vienna, AT)</i> • TMR/RPNI at various amputation levels • AMI (UE/LE) • TSR in transradial amputees
16:00 – 16:30	Coffee break



16:30 – 17:30

Scientific paper session II

*Chairs: Stanisa Raspopovic (Vienna, AT),
Levi Hargrove (Chicago, US)*

6+2 min

35 Reciprocal reflex connectivity of spinal motoneurons after transtibial AMI surgery

Luis Pardo (Hannover, DE)

6+2 min

36 Functional sensory restoration in intact peripheral nerves using the dermal cuff regenerative peripheral nerve interface (DC-RPNI) in a preclinical rodent model

Ahneesh Mohanti (Ann Arbor, US)

6+2 min

37 A conformable, meshed electrode array facilitates multi-channel sensorimotor signaling with the regenerative peripheral nerve interface

Zachary Bailey (London, UK)

6+2 min

38 Improvement of hand prosthesis function with vibrotactile feedback

Stephanie Schild (Vienna, AT)

6+2 min

39 Preliminary results of a multimodal bidirectional armband for sensing and feedback

Nicolò Boccardo (Genova, IT)

6+2 min

40 Exploring illusory phantom arm movements induced by cutaneous vibrations in the population with upper limb absence and its potential application as sensory feedback for prostheses

Ruth Leskovar (Portsmouth, UK)

6+2 min

41 Benchmarking optimisation strategies to improve selectivity in peripheral nerve stimulation for prosthetic feedback

Edward Turner (London, UK)

19:00

Heurigen evening at Fuhrgassl-Huber



Bionic Limb Reconstruction Symposium 2025

FRIDAY, DECEMBER 5, 2025

08:00 – 12:00	 42 Live video feed from OR (Transhumeral OI + TMR) <i>Rickard Brånemark (Mölndal, SE), Oskar C. Aszmann (Vienna, AT)</i>
08:00 – 08:05	Promotional video of Matas
08:05 – 08:20	43 eOPRA, endo-exo interfacing <i>Rickard Brånemark (Mölndal, SE)</i>
08:20 – 08:30	44 Introduction of patient II and presentation of OI registry <i>Anna Bösendorfer (Vienna, AT)</i>
08:30 – 08:45	45 The limits of upper-limb prosthesis control using conventional interface technology <i>Levi Hargrove (Chicago, US)</i>
08:45 – 09:00	46 Osseointegration and bionic reconstruction of lower extremity <i>Matthew Carty (Boston, US)</i>
09:00 – 09:10	47 Primary stability of osseointegrating implant system in transfemoral amputees <i>Gerhard Hobusch (Vienna, AT)</i>
09:10 – 09:45	 Live video feed from OR
09:45 – 10:00	48 Control of bionic legs after OPRA interfacing <i>Levi Hargrove (Chicago, US)</i>
10:00 – 10:15	49 Interfacing with prosthetic components <i>Stewe Jönsson (Gothenborg, SE)</i>
10:00 – 10:30	Coffee break
10:15 – 10:30	 Live video feed from OR during coffee break
10:30 – 11:00	50 Keynote lecture: Future of bionic reconstruction “Exploring the limits” <i>Hugh Herr (Cambridge, US)</i>



11:00 – 12:30

Scientific paper session III

*Chairs: Jacques Hacquebord (New York, US),
Aidan Roche (London, UK)*

6+3 min	51 Osseointegration and neurosurgical reconstruction in patients with amputations of the upper limb after military trauma <i>Mykhailo Rudas (Kiev, UA)</i>
6+3 min	52 Resection-replantation vs. bionic reconstruction to restore hand function <i>Clemens Gstöttner (Vienna, AT)</i>
6+3 min	53 Investigating the utility of prostheses for individuals with partial hand amputations <i>Jacques Hacquebord (New York, US)</i>
6+3 min	54 Primary targeted muscle reinnervation for oncologic hip disarticulation with prospective patient-reported pain outcome assessment – A case report <i>Eva Godina (Maastricht, NL)</i>
6+3 min	55 BADALnext: Development of an integral bionic prosthetic concept for osseointegration in the humerus <i>Thomas Mittlmeier (Rostock, DE)</i>
6+3 min	56 Mapping the distribution of motoneurons in the brachial plexus <i>Laurenz Pflaum (Vienna, AT)</i>
6+3 min	57 A plexus within the plexus: Microstructural fascicular architecture of the human C7 nerve root revealed by MicroCT <i>Florian Jaklin (Vienna, AT)</i>
6+3 min	58 An anatomically-informed data collection protocol to overcome data scarcity for targeted muscle reinnervation myoelectric control <i>Laura C. Petrich (Edmonton, CA)</i>



Bionic Limb Reconstruction Symposium 2025

6+3 min

59 Towards active leg prostheses: Estimating lower limb kinematics from sEMG

Daniel Höglinger (Tuebingen, DE)

6+3 min

60 Assessing the performance of the box and blocks test in a virtual environment

Jenevieve Surkin (Ann Arbor, US)

12:30 – 13:00

Patient presentation of implantable sensors and press conference

12:30 – 13:30

Lunch break

13:30 – 18:30



61 Dissection course (live video feed into lecture hall)

Rickard Brånemark (Mölndal, SE), Gerhard Hobusch (Vienna, AT), Oskar C. Aszmann (Vienna, AT), Jennifer Ernst (Hannover, DE), Matthew Carty (Boston, US)

- Osteotomies, Osseointegration (TH, TR, TT, TF, Thumb)
- Where and how do we implant sensors for each level

15:00 – 15:30

Coffee break

15:30 – 15:45

62 Prosthetic embodiment

Levi Hargrove (Chicago, US)

15:45 – 15:55

63 Body alchemy

Ana Rajevic (Cambridge, US)

15:55 – 16:10

64 Bionic identity

Cosima Prahm (Berlin, DE)



17:00 – 18:00

Scientific paper session IV

Chairs: Levi Hargrove (Chicago, US),

Cosima Prahm (Berlin, DE)

5+2 min

65 Benefits of antiresorptive therapy in osseointegration –
A case series

Gerhard Hobusch (Vienna, AT)

5+2 min

66 MyoOsu – Usability evaluation of a gamified, music-
based EMG interface for pre-prosthetic motor training
and pain modulation

Rodrigo Cerecero Curiel (Berlin, DE)

5+2 min

67 A rat model of brachial plexus injury for future upper
limb exoskeleton interfaces

Che-Hsiung Lee (Taoyuan, TW)

5+2 min

68 Pain and function in individuals with lower limb ampu-
tations: Exploring indications for nerve surgery to address
neuropathic pain

Jacques Hacquebord (New York, US)

5+2 min

69 CALA XR: From phantom limb visualization to immer-
sive virtual therapy in phantom limb pain

Michael Bressler (Berlin, DE)

5+2 min

70 Prosthesis use among individuals with limb loss follow-
ing TMR/RPNI for symptomatic neuromas: A scoping review

Jessica Saini (Toronto, CA)

5+2 min

71 Effectiveness of bionic limb reconstruction for improv-
ing quality of life and psychological outcomes after upper
limb amputation: A systematic review and meta-analysis

Omer Mohamed (London, UK)

18:00

Adjourn



Dissection Course Program

THURSDAY, DECEMBER 4, 2025

13:30 – 14:00

72 TMR glenohumeral (dissection and demonstration of pectoral nerves/TD nerve) supine position

TMR transhumeral (dissection of trifurcation of musculocutaneous nerve /lateral head of triceps) supine then prone position

TMR transradial (solutions for median /ulnar/radial nerve pain control)

Oskar C. Aszmann (Vienna, AT)

14:00 – 14:30

73 RPNI glenohumeral, transhumeral, transradial & lower extremity (pain control/prosthetic control)

Paul Cederna (Ann Arbor, US)

14:30 – 15:00

74 AMI (transhumeral /transfemoral /transtibial, transradial, hip disarticulation)

Matthew Carty (Boston, US), Jennifer Ernst (Hannover, DE), Gerhard Hobusch (Vienna, AT)

15:00 – 16:00

75 TSR in transradial Amputation

Alexander Gardetto (Brixen, IT)

16:00 – 18:30

Free dissection time

FRIDAY, DECEMBER 5, 2025

13:30 – 14:30

76 OI thumb, transhumeral

Rickard Brånemark (Mölndal, SE), Oskar C. Aszmann (Vienna, AT)

14:30 – 15:30

77 OI transtibial, transfemoral

Gerhard Hobusch (Vienna, AT), Jennifer Ernst (Hannover, DE)

15:30 – 18:30

Free dissection time