

ISMCS 2017

International Society for Mechanical Circulatory Support 24+1= 25th Anniversary Scientific Congress

Congress Title and Theme: Limitations, Controversies and Gaps in Mechanical Circulatory Support: Pathways to Solutions

D²I² = Define, Dissect, Ideate, Innovate

Sunday October 15, 2017

- 9 – noon Executive Board Meeting – *Rincon Room*
1 PM – 5PM General Board Meeting - *Rincon Room*
1 PM – 5 PM Meeting Setup/Registration – *East and West Foyer*

Monday October 16, 2017

7:00 – 12:00 Congress Registration – *East and West Foyer*

7:30 – 12:00 Young Investigators Pre-Symposium

Chairs: K. Ammann, *USA*; S. Gregory, *Australia*; T. Kaufmann, *Germany*; V. Merkle, *USA*; T. Siess, *Germany/USA*, T. Tsukiya, *Japan*

Young Investigator Presentations:

7:30 – 7:40 **OxLDL Increases Susceptibility to Shear-Mediated Platelet Activation (77)**
Shirzad Shir, *University of Arizona, Tucson, AZ USA*

7:40 – 7:50 **Elevated Shear Associated with Mechanical Circulatory Support Devices Alters Membrane Fluidity and Lipid Composition in Exposed Platelets (118)**
Alice Sweedo, *University of Arizona, Tucson, AZ USA*

7:50 – 8:00 **Shear-Mediated Platelet Activation is Associated with Increased NOX4 Expression and Reactive Oxygen Species Generation (92)**
Michael Dicaro, *University of Arizona, Tucson, AZ USA*

8:00 – 8:10 **Target-Specific Electrospinning: A Tissue Engineering Fabrication Technique for Creating Scaffolds Promoting Differential Vascular Cell Adhesion (119)**
Daniel Palomares, *University of Arizona, Tucson, AZ USA*

8:10 – 8:20 **Filling the Gap: The Relative Contribution of Proliferation vs Migration in Vascular Wound Healing (139)**
Kaitlyn Ammann, *University of Arizona, Tucson, AZ USA*

8:20 – 8:30 **Galvanotaxis: An Electroceutical Strategy for Improved Endothelialization of Cardiovascular Devices (115)**
Kaitlyn Ammann, *University of Arizona, Tucson, AZ USA*

8:30 – 8:40 **The Importance of Angle: Effect of Aorta - VAD Outflow Graft Anastomosis Angle on Platelet Activation (120)**

Ryan Walk, University of Arizona, Tucson, AZ USA

8:40 – 8:50 In-Vitro Assessment of a Novel Polymeric Valve for Transcatheter Aortic Valve Replacement (87)

Oren Rotman/Jawaad Sheriff, *Stony Brook University, Stony Brook, NY USA*

8:50 – 9:00 Platelet Activity State Assay of A Heartmate II Patient With Recurrent Thrombosis (133)

P. Tran, *University of Arizona, Tucson, AZ USA*

9:00 - 9:05 Acoustic Activation of Platelets: A Mechanism of Mechanical Platelet Activation – Relevant to VADs and Sleep-Disordered Breathing? (Mini-Abs) (141)

C. Jerman, *College of Medicine, University of Arizona, Tucson, AZ USA*

9:05 – 9:15 The Six-Minute Walk Test Revisited: Stretchable Electronic Wearables Yield Motion Signatures of Heart Failure Patients (135)

M. Mazumder, *University of Arizona, Tucson, AZ USA*

9:15 – 9:25 3D Printing for Pre-Procedural Planning of Ventricular Assist Device Placement in Adults With Congenital Heart Disease (134)

K. Farooqi, *Columbia University, New York, NY USA*

9:25 – 9:35 Development of an Open-Source Research Platform to promote International Collaboration within the International Society for Mechanical Circulatory Support (74)

Jo Pauls, *ICETLAB, University of Queensland, Brisbane, Australia*

9:35 – 9:45 Break

9:45 – 10:00 Growing an Investigative and Translational Career – S. Gregory, ICETLAB, University of Queensland, Brisbane, Australia

10:00 – 10:15 Opportunities/Career Paths for Young Engineers – V. Merkle, University of Arizona, Tucson, AZ USA

10:15 – 10:30 Unmet Needs, Opportunities, and Innovation – M. Slepian, University of Arizona, Tucson, AZ USA

10:30 – 10:45 Engineering and Medicine – Insights for Career Development from Industry and Academia: Mid-Career Perspectives – J. Barton, University of Arizona, Tucson, AZ USA

10:45 – 11:00 Academic Medicine and Research and the Clinical-Industry Interface “The Longview” – H. Eisen, Drexel University, Philadelphia, PA USA

11:00 – 11:15 A Career in Surgery, MCS, Insights for the Next generation – O. Howard “Bud” Frazier, Baylor/Texas Heart Institute, Houston, Texas USA

11:15 – 11:30 Going to the Dark Side: Pivoting from Academia to Industry – Bruce R. Rosengard, Johnson and Johnson Medical Devices, Boston, MA

11:30 – 11:45 Panel Discussion/Town Hall

11:45 Break

12:00 - 12:45 Opening Ceremony

Moderators: *M. Ono (J) – President, M. Slepian (USA) – Conference Chair*

Welcome – M. Ono

Conference Strategy, Tactics and Details – M. Slepian

Limitations, Controversies and Gaps Theme

Innovation Methodology – approach to the meeting. – the “meeting mindset”

Writing Goal and other features

Dean’s Welcome – Charles Cairns MD– Dean, University of Arizona College of Medicine

12:45 – 1:15 KEYNOTE 1 LECTURE Where is Advanced HF today and MCS?

Jeff Teuteberg – *Stanford University, Stanford, CA USA*

1:15 - 2:25 Scientific Session I

Controversy/Gap I - Advanced HF Issues /Patient selection

Moderators: *A. El Banayosy (USA), S. Halleran (USA) and M. Ono (Japan)*

1:15 – 1:30 Stepwise technology progression or definitive pump therapy – EP + PUMP vs PUMP?
S. Halleran, Integris Health, Oklahoma City, OK USA

1:30 – 1:45 Technology advancement in cardiac resynchronization therapy for patients progressing to end-stage heart failure – *P. Ryu, Abbott, Burlington, MA USA*

1:45 – 2:00 Patient selection/Issue of the Less Sick Patient – INTERMACS IV-VII
D. Horstmanshof, Integris Health, Oklahoma City, OK USA

2:00 – 2:15 HF Assessment and Scoring Systems

Moderators: *A. El Banayosy (USA), M. Slepian (USA) and N. Uriel (USA)*

2:00 -2:15 HF and MCS Assessment and Scoring Systems – *A. El Banayosy, Integris Health, Oklahoma City, OK USA*

Rapid Fire Abs

The Utility of Controlling Nutritional Status Score as A Prognostic Index In Patients With Left Ventricular Assist Device (25)

Akihito Saito, University of Tokyo, Japan

2:20 – 2:30 **Panel discussion** – *E. Birks, H. Eisen, M. Hatano, U. Jorde, P. LePrince, B. Meyns, E. Rame, N. Sweitzer*

2:30 – 2:45 **Coffee Break/Exhibits**

2:45 – 3:55 Helmut Reul Young Investigator Awards

Moderators: *H. Schima (Austria) and M. Slepian (USA)*

Platelet Lysis, Hemolysis, and Thrombin Generation under Ventricular Assist Device-Associated Hypershear Conditions (85)

Jawaad Sheriff, Stony Brook University, Stony Brook, NY USA

Normoxic But Not Hypoxic Extracorporeal Circulatory Support of The Fetus In An Artificial Womb Allows Normal Cardiac Development (95)

Carlo Bartoli, University of Pennsylvania, Philadelphia, PA USA

Update on Ghost Cells: From a Validated Principle to an Applicable Measurement Technique (111)
Malte Schops, *Aachen University, Aachen, Germany*

Coaxial Electrospun Scaffolds Seeded with Adipose-Derived Stem Cells for Cardiovascular Applications (123)
Valerie Merkle, *University of Arizona, Tucson, Arizona USA*

Development and *In-Vivo* Testing of a Novel Passive Right Heart Assist System (28)
Tim Kaufmann, *Enmodes GmbH, Aachen, Germany*

Microfluidic Devices For Evaluating VAD-Specific Anti-Thrombotic Drug Efficacy Under Shear (36)
Annalisa Dimasi, *Politecnico di Milano, Milan, Italy*

Procoagulant Surface Exposure: A Promising “Early Bird” Marker of Shear-Mediated Platelet Activation Induced by Mechanical Circulatory Support (113)
Yana Roka-Moiia, *University of Arizona, Tucson, Arizona USA*

3:55 – 4:05 The Honorable Jonathan Rothschild, Mayor of Tucson
– *City Welcome and Opportunities*

4:05 – 4:30 KEYNOTE 2 LECTURE MCS of the Future – Biological Approaches
Doris Taylor, *Texas Heart Institute, Houston, Texas USA*

4:30 – 4:40 Coffee Break/Exhibits

4:40 – 5:40 *Scientific Session II*

Controversy/Gap Issue II - Acute Support – Intermacs I

Temp Support to VAD vs. Direct VAD? Criteria to go from Acute to Long Term VAD?

Moderators: P. LePrince (F), S. Nathan (USA), and A. Shiose (Japan) Add B. Meyns/Aly El Banayosy

4:40 – 4:45 Framing the Issues/Key Questions - A. El Banayosy, *Integrus Health, Oklahoma City, OK USA*

4:45 – 5:00 Clinical Perspective I – B. Meyns, *University Hospitals Leuven, Belgium*

5:00 – 5:15 Clinical Perspective II – P. LePrince, *H Pitié Salpêtrière, Paris, France* **WEB VIDEO**

5:15 – 5:30 Engineering Response – T. Siess – *Abiomed, Danvers, MA USA*

5:30 – 5:40 **Panel Discussion** C. Bermudez, A. El Banayosy, M. Hatano, B. Meyns, S. Nathan,
E. Rame, T. Siess, K. Toda

5:40 – 7:00 *Scientific Session III*

Bleeding and Hemolysis

Moderators: A. Redaelli (Italy), M. Slepian (USA) and G. Wieselthaler (USA)

5:40 – 5:55 Bleeding – The range of mechanisms – Carlo Bartoli, *University of Pennsylvania, Philadelphia, PA USA*

5:55 – 6:10 Bleeding and Angiogenesis – N. Uriel, *University of Chicago, Chicago, IL USA*

6:10 - 6:25 Hemolysis – U. Jorde/O. Saeed, *Montefiore Medical Center, New York, NY USA*

6:25 – 7:00 *Rapid Fire Abs*

Aspirin is associated with bleeding but does not modulate platelet function in patients with continuous-flow Left Ventricular Assist Device (69)

Federico Pappalardo, *Universita Vita Salute, Milan, Italy*

Significance of Cerebral Microbleeds in Patients with Continuous-flow LVAD (83)

Koichi Toda, *Osaka University, Sumiyoshi-Ku, Osaka, Japan*

Shear-Responsive Blood Coagulation Factors Related to Inhibition of Thrombosis (91)

Osamu Maruyama, *AIST, Ibaraki Japan*

Intensity of Hemolysis is Associated with Ischemic Stroke during Venous Arterial Extracorporeal Membrane Oxygenation Support (40)

Omar Saeed, *Montefiore Medical Center, New York, NY USA*

Energy-based Hemolysis Model on a Continuous Flow Pump using Large Eddy Simulation (45)

Choon-sik Jun, *Penn State College of Medicine, State College, PA USA*

A New Hemolysis Prediction Model in Turbulent Blood Flow Based on Energy Dissipation around Cells (54)

Jinjing Ji, *Tsinghua University, Beijing, China*

Large eddy simulation and hemolysis estimation of the FDA blood pump (108)

Peng Wu, *Soochow University, Suzhou City, China*

Soccer Game – Scrimmage with University of Arizona Soccer – “under the lights” at William David Sitton Field at University of Arizona Campus (Bus departs at 5:15pm for players)

7:00 Mixer/Hors d’oeuvres – Bill’s Grill Patio - Loews Ventana Canyon Resort

TUESDAY October 17, 2017

7:00 – 8:00 Sunrise Mini-Symposia – Surgical Issues

Moderators: D. Bull (USA), J. Long (USA), and S. Silvestry (USA)

7:00 – 7:10 Less-invasive approaches – G. Wieselthaler, *UCSF, San Francisco, CA USA*

7:10 – 7:20 Robotics – Z. Khalpey, *University of Arizona, Tucson, Arizona USA*

7:20 – 7:30 Valve considerations – Aortic, Mitral Tricuspid – W. Dembitsky, *Sharp, San Diego, CA USA*

7:30 – 7:40 Alternative Vascular Access for Acute MCS – A. Kaki, *Wayne State, Detroit, MI*

7:40 – 7:50 Message from Surgeon to Engineers – S. Silvestry, *Florida Hospital, Orlando, FL USA*

7:50 – 8:00 **Panel discussion:** D. Bull, W. Dembitsky, J. Long, B. Meyns, A. Kaki, Z. Khalpey, S. Silvestry, G. Wieselthaler

8 AM – 12 noon Nursing/VAD Coordinator Symposium

(K. Nelson (USA) and D. Christensen (USA)) – Parallel Session – Santa Rita Room

8:00 – 10:00 Scientific Session IV Acute/Short Term Support – Catheter vs Pumps – Efficacy/AEs

Issues: Catheters - Hemolysis, No RH support, Limited flow; Pumps - LV unloading, tubing, access

Moderators: C. Bermudez (USA), B. Meyns (Belgium) and S. Nathan (USA)

8:00 – 8:15 Catheter support – S. Nathan, *University of Chicago, Chicago, IL USA*

8:15 – 8:25 Engineering perspective I – comments on catheters - P. Muller – *PHP, Abbott*

8:25 – 8:35 Engineering perspective II – comments on catheters - T. Siess, *Abiomed*

8:35 – 8:50 Pumps/ECMO – C. Bermudez, *University of Pennsylvania, Philadelphia, PA USA*
9:00 – 9:10 Engineering Insights - Pumps – B. Sivaraman, *Abbott*
9:10 – 9:20 Vascular Access Management of Acute Support – A. Kaki, *Wayne State, Detroit, MI*
9:20 - 9:30 **Panel Discussion:** A. El Banayosy, S. Nathan, Z. Khalpey, T. Siess, M. Sherwood,
A. Shiose, B. Sivaraman

9:20 – 10 AM Rapid Fire abstracts

The Comparison of Bridge to Bridge Strategy Using Paracorporeal VAD with Primary Continuous-flow LVAD Implantation (14)

Daisuke Nitta, *University of Tokyo, Tokyo Japan*

Partial versus full cavopulmonary support for the acute failing Fontan circulation in sheep (41)

Van Puyvelde, *University Hospitals Leuven, Lueven, Belgium*

Development of accurate quantification method of aortic insufficiency during LVAD by thermodilution technique (53)

Daichi Akiyama, *National Cerebral and Cardiovascular Center Research Institute, Osaka, Japan*

Effect of discharge angle on the pump properties of a monopivot centrifugal blood pump (52)

Daiki Goto, *Yokohama National University, Yokohama, Japan*

Initial bench top and animal testing with the pediatric TORVAD confirms low-shear pumping and synchronization (48)

Erik Larson, *Windmill Cardiovascular Systems, Inc., Austin, TX USA*

9:45 MODERATED POSTER Session 1 – Ballroom A

Moderators: S. Airhart, K. Fukamachi, D. Horstmanshof, A. Sweedo

10:00 – 10:15 Coffee Break/Exhibits

10:15 – 10:45 KEYNOTE 3 Durable MCS - Methods of Propulsion/Pump Design –

R. Wampler, *Oregon Health and Sciences University, Portland, OR USA*

10:45 - 12:15 Scientific Session V Engineering, Biology and Medicine of Pump Flow

Issues: Best Propulsion Means, Stick with Continuous Flow vs Pulsatile, CF vs Centrifugal, Alternatives

Moderators: T. Masuzawa (Japan), M. Slaughter (USA) and U. Steinseifer (Germany)

10:45 – 11:00 Consequences of continuous flow – N. Moazami, *NYU, New York, NY USA*

11:00 – 11:15 Hemorheology of Blood Flow – U. Steinseifer, *RWTH Aachen University, Aachen, Germany*

11:15 – 11:30 Hemodynamics of MCS – D. Burkhoff, *Columbia University, New York, NY USA*

11:30 – 12:15 Rapid Fire Abstracts

The generic, parameterized model of the left ventricle – A novel approach to simulating the flow in individual hearts (4)

Kristen Hugenroth, *Aachen University, Aachen, Germany*

The risk of left ventricular thrombosis with speed modulated rotary blood pump (8)

Sam Liao, *The Prince Charles, Hospital, Chermside, Australia*

Fluid dynamics quantification in blood-processing devices through 4D-flow MR imaging (34)

Alberto Redaelli, *Politecnico di Milano, Milan, Italy*

Synchronous counterpulse support preserves aortic valve flow and maintains Frank-Starling autoregulation (37)

Jeff Gohean, *Windmill Cardiovascular Systems, Austin, TX USA*

Automatic response of pulsatile circulatory assist using heart rate, rhythm, and differential pump pressure (49)

Richard Smalling, *University of Texas Health Science Center at Houston, Houston, TX USA*

A novel toroidal-flow LVAD demonstrates significantly improved hemocompatibility versus the heartmate ii: implications for the design of next-generation LVADS (94)

Carlo Bartoli, *University of Pennsylvania, Philadelphia, PA USA*

Low velocity areas in the left ventricle during mechanical circulatory support (102)

Phillipp Aigner, *Medical University of Vienna, Vienna, Austria*

12:15 – 1:15 Lunch Symposium

Part 1. HeartWare/Medtronic – “Integration of Technologies; Medtronic MCS and Cardiac Rhythm Management” - Daniel Tamez, *Medtronic*

Part 2 Medical Device Translation – Now and In the Future – Getting Products to Market, Bruce R. Rosengard, *Johnson and Johnson Medical Devices, Boston, MA*

Part 3. How Does MCS Grow (Appropriately) with a Hesitant Cardiology Community

E. Birks, J. Cook, M. Hatano, D. Horstmannshof, U. Jorde, J. Long, E. Rame, B. Meyns, Y. Pya, M. Slaughter, G. Wieselthaler, *M. Slepian as facilitator*

1:30 – 5:10 MCS Academy – “Basics and the Latest – Building and Enhancing an MCS Program” – Parallel Session – see separate sheet

1:15 – 3:00 Scientific Session VI Modeling in MCS Design – Better Systems, Pumps, and Blood

Issues: Abnormal Flows, Shear Stress loads

Moderators: D. Bluestein (USA), K. Bourque (USA), and E. Taskin (USA)

1:15 – 1:30 Virchow’s Triad, MCS and Device Thrombogenicity Emulation (DTE) – M. Slepian, *University of Arizona, Tucson, AZ USA*

1:30 – 1:45 DTE expanded and Multiscale Modeling – D. Bluestein, *Stony Brook University, Stony Brook, NY USA*

1:45 – 1:55 CFD evaluation of LVAD inflow positioning- *E Taskin, Medtronic, Miami Lakes USA*

1:55 - 2:10 Modeling of Oxygenators/Fiber-based Devices – A. Redaelli, *Politecnico di Milano, Milan, Italy*

2:10 – 2:25 New Pump Design via Modeling – T. Kaufmann, *Enmodes GmbH, Aachen, Germany*

2:25 – 2:40 Modeling and Device Regulation – T. Morrison, *FDA, Silver Spring, MD USA*

2:40 – 2:50 **Panel discussion:** T. Masuzawa, M. Slepian, A. Redaelli, T. Kaufmann, T. Siess

2:50 – 3:30 Rapid Fire Abstracts

Using Computational Fluid Dynamics to Gain Insight into Impeller Refinements that Can Reduce the Potential for Thrombus Formation (35)

Mark Goodin, *SimuTech Group, Northglenn, CO USA*

Development of a Validated CFD Model for Centrifugal Rotary Blood Pumps (44)

Clayton Semenzin, *Prince Charles Hospital, Queensland, Australia*

Evaluation of turbulent flow in a rotary blood pump with a validated, hybrid computational fluid dynamics model (63)

Jinjing Ji, *Tsinghua University, Beijing, China*

Static and dynamic characterization of four rotary blood pumps (67)

Stefan Boes, *Group Zurich, Zurich, Switzerland*

In Vivo Validation of the Device Thrombogenicity Emulation Methodology (88)

Chiu, Wei-Che, *Stony Brook University, Stony Brook, NY USA*

Can we predict and mitigate post-implant thrombotic risk in patients with Left Ventricular Assist Device? (70)

Federico Pappalardo, *Universita Vita Salute, Milan, Italy*

3:15 MODERATED POSTER Session 2 – Ballroom A

Moderators: C. Bermudez, M. Ono, D. Timms, S. Zawada

3:30 – 3:45 Coffee Break/Exhibits

3:45 – 5:00 Scientific Session VII The Land of the RV

Moderators: *W. Dembitsky (USA), B. Meyns (Belgium), M. Sherwood (USA)*

3:15 – 3:30 RV Failure - Who will Get it – E. Rame, *U of Pennsylvania, Philadelphia, PA USA*

3:30 – 3:40 RV Failure – Where are we? M. Sherwood, *Baylor-Dallas, Dallas, Texas USA*

3:40 – 3:55 Look at in the mirror - Not who will get it Who will recover? – S. Silvestry, *Florida Hospital, Orlando, FL USA*

3:55 – 4:05 RV Failure - Acute support – N. Kapur, *Tufts, Boston, MA USA*

4:05 - 4:15 RV Pumps – Jim Long/Ryan Stanfield, *Integrus Health, Oklahoma City, OK USA*

4:15 – 5:00 Scientific Session VIII MCS Around the World

Moderator: *P. LePrince (France), J. Long (USA) and C. Sivathasan (S) Add B. Meyns*

4:15 – 4:25 EuroMACS/IMACS – *P. LePrince/B. Meyns; P. Mohacsi – (via Video TBD)*

4:25 – 4:35 MCS in Turkey – S. Küçükakso

4:35 – 4:45 MCS SE Asia/Singapore – C. Sivathasan

4:45 – 4:55 J-MACS in Japan – M. Ono

4:55 – 5:05 MCS in India – J. Long

5:05 – 6:00 ISRBP General Assembly

6:00 – 7:00 Pre-Dinner Break

7:00 – 9:30 Gala Dinner, Program and Entertainment – Loews Kiva Ballroom

Special Dinner Speakers:

1. Jeff Goldberg PhD – Dean College of Engineering – University of Arizona, “*Medicine and Engineering*”

2. Robert C. Robbins MD – President, University of Arizona, Former CEO Texas Med Center and Chief of CT Surgery – Stanford – “*Health, Heart Failure and Innovation for the Future.*”

Entertainment Program – University of Arizona String Quartet; Mariachi and Native American Dance – Viva Dance Ensemble

WEDNESDAY October 18, 2017

7:00 – 8:00 Sunrise Session – New Pumps and Technologies

Moderators: *M. Ono (Japan), R. Smith (USA) and U. Steinsheffer (Germany)*

Development of an Implantable Ultracompact Fully Magnetically Suspended Centrifugal Blood Pump

Frank Lin, *CH Biomedical, Torrance CA USA*

CCF TAH

Kiyotaka Fukamachi, *The Cleveland Clinic Foundation, Cleveland, Ohio USA*

SynCardia 50

SynCardia Systems, Tucson, Arizona USA

RealHeart

Ina Laura Pieper, *Scandinavian Real Heart AB, Västerås, Sweden*

CoreWave

Carl Botterbusch, *CorWave, Paris, France*

Reinheart

Uli Steinsheffer, *RWTH Aachen University, Aachen, Germany*

TorVad (Windmill)

Jeff Gohean, *Windmill Cardiovascular Systems, Austin, TX USA*

EvaHeart

Tadashi Motomura, *Evaheart Inc., Houston, TX USA*

BerlinHeart

Robert Kroschwitz, *Berlin Heart Inc., The Woodlands, TX USA*

Procyrion

Jace Heuring, *Procyrion, Houston, TX USA*

A novel ECC System for ECLS and ECMO applications (103)

Oliver Marseille, *Hemovent GmbH, Aachen, Germany*

8:00 – 10:00 Scientific Session IX Physiologic Control

Moderators: *T. Masuzawa (Japan), F. Moscato (Austria), and M. Slaughter (USA)*

- 8:00 – 8:15 Do we need them? – M. Slaughter, *University of Louisville, Louisville, KY USA*
- 8:15 – 8:25 What can we learn from the data that exists already – F. Moscato, *Medical University of Vienna, Vienna, Austria*
- 8:25 – 8:35 How to design systems – H. Schima, *Medical University of Vienna, Vienna, Austria*
- 8:35 – 8:45 New sensors – T. Siess, *Abiomed, Abiomed, Danvers, MA USA*
- 8:45 – 8:55 Potential of Dynamic H/Q for Next Generation Closed Loop Control- C. Reyes, *Medtronic, Miami Lakes, USA*
- 8:55 – 9:05 New Sensors/Monitoring – F. Pagani, *University of Michigan, Ann Arbor, MI USA*
- 9:05 – 9:15 **Panel discussion:** J. Cysyk, L. Klein, F. Moscato, H. Schima, T. Siess, M. Slaughter
- 9:15 -10:00 **Rapid Fire Abstracts**

Development of a cannula tip with integrated volume sensor for control of continuous flow left ventricular assist devices (3)

Joshua Cysyk, *Penn State College of Medicine, State College, PA*

A multi-objective physiological control system for left ventricular assist devices (17)

Anastasios Petrou, *Group Zurich, Zurich, Germany*

Electrocardiogram-Synchronized Rotational Speed Modulation System can reduce the recirculation due to aortic insufficiency in LVAD support (19)

Kei Iizuka, *National Cerebral and Cardiovascular Center Research Institute, Osaka, Japan*

Going Beyond the Heart! Importance of Analyzing HVAD Logfiles for Patient Management (30)

Liviu Klein, *University of California, San Francisco, CA*

Numerical Comparison of Inflow Cannulation Site with a Pulsatile Rotary Blood Pump: Cardiorespiratory Effect during Rest and Exercise (58)

Eric Wu, *ICETLAB, Queensland, Australia*

Suction prevalence and related arrhythmia in left ventricular assist device recipients (62)

Christoph Gross, *Medical University of Vienna, Vienna, Austria*

Alarm Algorithms for Early Detection of Pump Thrombosis (104)

Martin Maw, *University of Vienna, Vienna Austria*

Evaluation of Periodic VAD-Speed changes on Intraventricular Flow Dynamics Using Numerical Simulation (121)

Moigan Ghodrati, *University of Vienna, Vienna, Austria*

9:45 MODERATED POSTER Session 3 – Ballroom A

Moderators: R. Avery, K. Breathett, R. Smith, P. Tran

10 – 10:15 Coffee Break/Exhibits

10:15 – 10:30 Special Lecture Arrhythmias in Patients with LVADs: ICDs, CRTs, and All That... Alan Cheng, *Medtronic, Mounds View, MN USA*

10:30 – 11:00 KEYNOTE 4 Adverse Events: What do they really mean?? Establishing Standards and Developing Testing Modalities (15 min)

Robert Kormos, *University of Pittsburgh, Pittsburgh, PA USA*

Moderators and Discussants (15 min): J. Kirklin *University of Alabama, Birmingham, AL USA*
(will also provide an Intermacs update)

J. Long *Integrus Health, Oklahoma City, OK USA*

11:00 – 12:15 Scientific Session X Peripherals and Monitoring

Moderator: S. Airhart (USA), M. Ono (Japan) and H. Schima (Austria)

11:00 – 11:15 Clinical Limitations – T. Elliott, *Medstar, Washington, DC USA*

11:00 – 11:15 Remote monitoring/Bluetooth – J. Sims, *Medtronic, Framingham MA USA*

11:15 – 11:30 Batteries and Power – E. Takeuchi, *Stony Brook University, Stony Brook, NY USA*

11:30 – 11:45 Web interactive systems – D. Christensen, *Innovative Program Solutions, Pine Grove PA USA*

11:45 – 12:15 **Rapid Fire Abstracts**

Wireless Power System for Fully Implanted LVAD (11)

Greg Aber, *EverHeart Systems, Webster, Texas USA*

What precipitates driveline infection? (5)

Cumara Sivathasan, *National Heart Center, Singapore*

High Efficiency Fully Implanted LVAS (10)

Greg Aber, *EverHeart Systems, Webster, Texas USA*

Advanced Machine Learning Techniques for Sound Wave Analysis Can Identify Ventricular Assist Device Thrombosis (32)

Liviu Klein, *UCSF, San Francisco, CA USA*

Daily-activity of patients after left ventricular assist device implantation and during hospital readmissions (61)

Cristoph Gross, *Medical University of Vienna, Vienna Austria*

12:15 – 1:15 Lunch Symposium

Part 1. Abbott Technology Update – K. Bourque, Abbott, Burlington MA USA

Part 2. Brief Lunch Talk “MCS – Clinical Reality – Now and the Future - O. Howard “Bud” Frazier - Baylor/Texas Heart Institute, Houston, Texas USA

Part 3. Transplantation in the World of Enhanced MCS Use – UNOS and the Future of the Adult Heart Allocation System in the United States – J. Copeland, W. Dembitsky, A. El Banayosy, S. Hankins, Z. Khalpey, J. Long, M. Sherwood, N. Sweitzer, G. Wieselthaler

1:15 -3:00 Scientific Session XI Thrombosis, Shear and Pulsatility

Moderators: D. Bluestein (USA), T. Siess (Germany/USA) and V. Turitto (USA)

1:15 – 1:30 Shear-Mediated Platelet Activation/Anti-thrombotics – Evolving Mechanisms
M. Slepian, *University of Arizona, Tucson, AZ USA*

1:30 – 1:40 Can we build devices without shear – K. Bourque, *Abbott, Burlington, MA USA*

1:40 – 2:10 Can we invoke real pulsatility – J. Cysyk, *Penn State, Hershey PA USA*

2:10 – 2:25 **Panel discussion:** J. Cysyk, J. Long, O. Maruyama, J. Sheriff, G. Wieselthaler

2:25 – 3:00 **Rapid Fire Abstracts**

In vitro characterization of endothelial cell-platelet pro-thrombotic interaction mechanisms associated with left ventricular assist device therapy (68)

Alice Apostoli/Annalisa Dimasi, *Politecnico di Milano, Milan, Italy*

Effects of a Left Ventricular Assist Device on Endothelial Function: Comparison between LVAD models (18)

Aya Watanabe, *University of Tokyo, Tokyo, Japan*

Sensorless Detection of Thrombus Using Real-Time Viscosity Measurement in a Magnetically-Levitated Rotary Blood Pump (22)

Takuro Maruyama

CorWave LVAD Magnetic and Hydraulic Efficiency Study (56)

Pier Paolo Monticone, *CorWave SA, Paris, France*

CorWave LVAD Optical Visualization (57)

Pier Paolo Monticone, *CorWave SA, Paris France*

2:45 MODERATED POSTER Session 4 – Ballroom A

Moderators: S. Hankins, C. Sivathanan, U. Steinseifer, P. Tran

3:00 – 3:15 Coffee Break/Exhibits

3:15- 3:45 Scientific Session XII Myocardial Recovery, Tissue Engineering and Biomaterials

Moderators: M. Slepian (USA) and Z. Khalpey (USA)

3:15 – 3:30 Myocardial Recovery – Emma Birks, *University of Louisville, Louisville, KY USA*

3:30 – 3:45 Electrospinning and Microfibers – Utility for MCS systems - V. Merkle, *University of Arizona, Tucson, AZ USA*

Rapid Fire Abstracts

Induced Pluripotent Stem Cell Derived Cardiomyocyte Tissue Engineered Graft Improves Left Ventricular Function and Electro-Mechanical Coupling in Rats with Heart Failure (124)

Jordan Lancaster, *University of Arizona, Tucson, AZ USA*

Ascending aortic dimension is a useful predictor for left ventricular assist device explantation (15)

Masaki Tsuji, *University of Tokyo, Tokyo, Japan*

3:45 – 4:45 Scientific Session XIII The Total Artificial Heart

Moderators: F. Arabia (USA) and D. Timms (Austria)

3:45 – 4:00 Emerging Clinical Role of the TAH – F. Arabia, *Cedars-Sinai, Los Angeles CA USA*

4:00 – 4:15 TAH vs Bi VAD – J. Copeland, *University of Arizona (Prof. Emeritus), Tucson, AZ USA*

4:15 – 4:30 New TAH Designs – D. Timms, *BiVACOR, Houston, Texas USA*

4:30 - 4:45 **Rapid Fire Abstracts**

Progress in the Development of a Continuous Patient Monitor for the Cleveland Clinic Continuous Flow Total Artificial Heart (46)

Barry Kuban, *Cleveland Clinic, Cleveland, OH USA*

TEG Platelet Mapping (TEG PM) Guided Management of Patients with Total Artificial Heart (TAH) (112)

Oksana Volod, *Cedars-Sinai, Los Angeles, CA*

4:45 – 5:45 Scientific Session XIII Pumps – Present and Future

Moderators: J. Copeland (USA), R. Smith (USA) and T. Yamane (Japan)

Rapid Fire Abstracts

In vivo preclinical biocompatibility evaluation of CH-ventricular assist device with totally magnetic suspension rotor in a sheep model (16)

Haibo Chen, *State Key Laboratory of Cardiovascular Disease, National Center for Cardiovascular Disease, Peking Union Medical College, Beijing, China*

Preclinical evaluation of an extracorporeal ventricular assist device with the Hydrodynamically levitated centrifugal pump (42)

Tomonori Tsukiya, *National Cerebral and Cardiovascular Research Center, Osaka, Japan*

Multi-Variable Evaluation of Hydraulic Performance in a Minimally Invasive, Partial Support LVAD (43)

Peter Smith, *Texas Heart Institute, University of Houston, TX USA*

Development of an Implantable Ultracompact Fully Magnetically Suspended Centrifugal Blood Pump (66)

Frank Lin, *CH Biomedical, Zurich, Switzerland*

First Laboratory Prototype of a Seal-less Rotary Piston Blood Pump (107)

Johannes Wappenschmidt, *Aachen University, Aachen Germany*

5:45 – 6:15 Innovation Challenge/Hackathon “Results” Presentation

6:15 – 6:30 Closing Remarks