WEDNESDAY, JULY 24

12:00 – 18:00 Odyssey Room, Level 1
Congress Registration

THURSDAY, JULY 25, MORNING

06:30 – 08:00 Centennial Terrace, Level 3
Breakfast Buffet

07:00 – 18:00 Group Registration Desk, Level 1
Congress Registration

08:00 – 17:00 Centennial Ballroom C&D, Level 1
PS1 – Poster Session 1

08:00 – 08:15 Centennial Ballroom A&B, Level 1
W1 - Welcome to the Congress by the Chair of ISAN 2019
Kalyanam Shivkumar MD PhD Director, UCLA Cardiac Arrhythmia Center & EP Program, Los Angeles, CA, USA

08:15 – 09:00 Centennial Ballroom A&B, Level 1
PT001 - Plenary Talk: Autonomic Circuitry Redefined and Targeted for Neuromodulation
Speaker:
John Furness PhD FAA FAHMS Florey Institute, University of Melbourne, Victoria, Australia
Introduction by:
Yvette Taché, PhD, Co-Chair ISAN 2019 UCLA, Los Angeles, CA

09:00 – 09:20 Nutrition Hub, Level 1&2
Break

Concurrent Symposia Sessions

09:20 – 11:20 Centennial Ballroom A&B, Level 1
ST001 - Enteric Neural Circuitry in Mouse and Human Colon: The Changing Face of Morphology, Function and Therapeutic Leads
Chair: Marthe Howard, PhD University of Toledo Health Sciences Campus, Toledo, OH, USA
Speakers:
Marthe Howard PhD University of Toledo Health Sciences Campus, Toledo, OH, USA
ISAN19:003: Refining enteric neural circuitry by quantitative morphology, transcriptomics and function in mice
Brian Davis PhD University of Pittsburgh, Pittsburgh, PA, USA
Don’t believe everything you see: integration of colon extrinsic primary afferent information via spinal parasympathetic circuitry
Robert O Heuckeroth MD PhD The Children’s Hospital of Philadelphia, Philadelphia, PA, USA
*ISAN2019.005* Visualizing the human enteric nervous system in 3-dimensions: new ways to think about autonomic neuropathy

Poi-Qing Yuan PhD UCLA and VA Greater Los Angeles, Los Angeles, CA, USA
*Three-dimensional imaging and phenotype of intrinsic innervation of the human colon*

*11:20 – 11:40* **OP001 - Symposia-related Featured Abstracts – Oral Presentations**

Joseph F Margiotta PhD University of Toledo College of Medicine, Toledo, OH, USA
*ISAN19.019* Nicotinic acetylcholine receptors mediate and modulate cholinergic circuit activity in mouse myenteric ganglia

Aaron May-Zhang Vanderbilt University Medical Center, Nashville, TN, USA
*ISAN19.020* Identification of novel markers for enteric neurons in healthy human adults using RNA-sequencing

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09:20 – 11:20 Legacy Room A&B, Level 2

**ST002 - Into the Void: Autonomic Regulation of Urinary Continence and Micturition**

Chair: Peregrine Osborne PhD University of Melbourne, Victoria, Australia

Speakers:

Michelle Southard-Smith PhD Vanderbilt University Medical Center, Nashville, TN, USA
*Development of lower urinary tract autonomic innervation from sacral neural crest*

Janet Keast, PhD University of Melbourne, Victoria, Australia
*Visceral connectomes: spinal connectivity with lower urinary tract organs*

Sourish Mukhopadhyay, BS MS Scripps Research, La Jolla, CA, USA
*Brain control of voluntary voiding in the mouse*

Marcus Drake MA DM University of Bristol, UK
*How neural deficit relates to clinical dysfunction of the lower urinary tract*

*11:20 – 11:40*

**OP002 - Symposia-related Featured Abstracts – Oral Presentations**

Sevda C Aslan PhD University of Louisville, Louisville, KY, USA
*ISAN19.021* Normalization of blood pressure responses to bladder distension with epidural stimulation after spinal cord injury

Jaclyn Definis Drexel University College of Medicine, Philadelphia, PA, USA
*ISAN19.022* Stimulating spinal 5-HT2A receptors improves involuntary micturition reflex in rats with spinal cord transection

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09:20 – 11:20 Optimist Room A&B, Level 2

**ST003 - Autonomic Control of Inflammation - New Insights into Pathways and Mechanisms**

Chair:

Davide Martelli PhD University of Bologna, Bologna, Italy

Martin Stebbing PhD Florey Institute of Neuroscience and Mental Health, Victoria Australia

Speakers:

Paul O’Connor PhD Augusta University, Augusta, GA, USA
*Evidence oral ingestion of sodium bicarbonate activates the cholinergic anti-inflammatory pathway via the mesothelium*

Davide Martelli PhD University of Bologna, Bologna, Italy
*ISAN19.012: The splanchnic anti-inflammatory pathway: mapping its peripheral and central branches*

Colin Reardon PhD University of California Davis, Davis, CA, USA
*Neuro-immune communication in mesenteric lymph nodes*

Rainer Straub MD University Hospital, Regensburg, Germany
*The sympathetic regulation of the spleen in the middle of arthritis*
**11:20 – 11:30**

**OP003 - Symposia-related Featured Abstract – Oral Presentation**  
Alice E McGovern PhD University of Melbourne, Parkville, Victoria, Australia  
*ISAN9.023 Neuro-immune cross talk in influenza virus pathogenesis*

09:20 – 11:20 Laureate Room, Level 1  
**ST004 - The Neurobiology of Orthostatic Hypotension – A Clinical, Experimental and Preclinical Approach**  
Chair: Roy Freeman MD Harvard Medical School, Boston, MA, USA  
Speakers:  
- Roy Freeman MD Harvard Medical School, Boston, MA, USA  
  *Orthostatic hypotension - the clinical perspective*  
- J. Andrew Taylor PhD Spaulding Rehabilitation Hospital; CV Research Lab, Cambridge MA, USA  
  *Baroreflex dysfunction and blood pressure control - the human experimental perspective*  
- Can Ozan Tan PhD Harvard Medical School, Boston, MA, USA  
  *Cerebral blood flow and autonomic dysfunction – the human experimental perspective*  
- Mark Chapleau PhD University of Iowa, Iowa City, IA, USA  
  *Orthostatic hypotension – the preclinical perspective*  

**11:20 – 11:30**

**OP004 - Symposia-related Featured Abstracts – Oral Presentations**  
Matthew G Lloyd PhD University of Calgary, Calgary, Alberta, Canada  
*ISAN19.024 Norepinephrine transporter inhibition with atomoxetine: autonomic effects during orthostasis*

11:20 – 11:45 Nutrition Hubs, Level 1 & 2  
Break

11:45 – 13:00 Centennial Ballroom C&D, Level 1  
**PV001 - Poster Viewing**

11:45 – 13:00 Centennial Terrace, Level 3  
**Lunch Buffet**

**THURSDAY JULY 25, AFTERNOON**

13:00 – 13:45 Centennial Ballroom A&B, Level 1  
**PT002 - Plenary Talk: Autotoxicity: A New Paradigm to Explain Catecholaminergic Neurodegeneration in the Brain and Heart**  
Speaker: David Goldstein MD PhD Autonomic Medicine Section, CNP/DIR/NINDS, NIH, Bethesda MD, USA  
Introduction by:  
Kalyanam Shivkumar MD PhD, Chair ISAN 2019 Director, UCLA Cardiac Arrhythmia Center & EP Program, Los Angeles CA, USA

13:45 – 14:00 Nutrition Hubs, Level 1&2  
Break
Concurrent Symposia Sessions

14:00 – 16:00 Centennial Ballroom A&B, Level 1
**ST005 - Mechanisms of Sympathetic Neurovascular Function and Control During Pregnancy - A Growing Field of Interest**
Chair: **Craig Steinback PhD** University of Alberta, Edmonton Alberta, Canada
Speakers:
* Virginia Brooks PhD Oregon Health & Science University, Portland, OR, USA
  *Neurovascular regulation and control in animal models of healthy pregnancy*
* Qi Fu MD PhD University of Texas Southwestern, Dallas, TX, USA
  *Population differences in sympathetic regulation during human pregnancy*
* Frank Spradley PhD University of Mississippi Medical Center, Jackson, MS, USA
  *Mechanisms of altered adrenergic vascular control in models of preeclampsia*
* Craig Steinback PhD University of Alberta, Edmonton Alberta, Canada
  *Neurovascular regulation in complex human pregnancy*

16:00 – 16:20
**OP005 - Symposia-related Featured Abstracts – Oral Presentations**
* Paul Macey PhD UCLA, Los Angeles, CA
  *ISAN19.045 Sex differences in insular cortex gyri responses to a foot cold pressor*
* Laura M. Reyes Martinez MD PhD University of Alberta, Edmonton, Alberta, Canada
  *ISAN19.046 Sympathetic nervous system (re)activity in women with gestational diabetes*

14:00 – 16:00 Legacy Room A&B, Level 2
**ST006 - Neuron-Myocyte Interactions in Health and Disease**
Chair: **Beth Habecker PhD** OHSU School of Medicine, Portland, OR, USA
Speakers:
* David J. Paterson, DPhil Oxford University, Oxford, UK
  *Neuronal control of myocyte excitability in cardiovascular disease*
* Susan J. Birren PhD Brandeis University, Waltham, MA, USA
  *Development and function of the peripheral cardiac-sympathetic circuit*
* Johanna Montgomery PhD Department of Physiology, University of Auckland, Auckland, New Zealand
  *Plasticity in the intrinsic cardiac nervous system and its role in atrial fibrillation*

16:00 – 16:20
**OP006 - Symposia-related Featured Abstracts – Oral Presentations**
* Lily L. Cao MS University of Birmingham, Birmingham, UK
  *ISAN19.047 A fluorescent method to monitor norepinephrine transporter rate in murine heart and blood vessels*
* John D. Tompkins PhD UCLA, Los Angeles, CA, USA
  *ISAN19.048 Dysregulation of M-current at porcine intrinsic cardiac neurons after myocardial infarction*

14:00 – 16:00 Optimist Room A&B, Level 2
**ST007 - Autonomic Reflexes in Health and Disease: From Sensors to Circuits to Reflex**
Chairs:
* Mark W. Chapleau PhD University of Iowa, Iowa City, IA, USA
* Lucy Norcliffe-Kaufmann PhD NYU School of Medicine, New York, NY, USA
Speakers:
* Silvia Conde PhD CEDOC, NOVA Medical School, Lisbon, Portugal
  *Carotid body and insulin sensing: Implications for metabolic diseases*
Wei-Zheng Zeng PhD The Scripps Research Institute, La Jolla, CA, USA
Piezo channels mediate baroreceptor mechano-transduction and the baroreflex
Rui B. Chang PhD Yale University School of Medicine, New Haven, CT
Molecular and functional dissection of vagal heart-to-brain circuits
Robert A. Larson MS PhD University of Iowa Carver College of Medicine, Iowa City, IA, USA
Targeting cardiac sensory neurons and reflexes in hypertrophic cardiomyopathy

16:00 – 16:20

OP007 - Symposia-related Featured Abstracts – Oral Presentations
Ann-Katrin Grotle MS The University of Texas at Austin, Austin, TX, USA
ISAN19.049 Pressor response to intermittent contraction in type 1 diabetic rats: role of Piezo channels
John H. Schild PhD IUPUI, Indianapolis, IN, USA
ISAN19.050 Sexual dimorphism in the aortic baroreflex of rat

14:00 – 16:00 Laureate Room, Level 1

ST008 - Cardiac Electrophysiology – Neuromodulation and Beyond
Chairs:
Noel Boyle MD PhD UCLA, Los Angeles, CA, USA
Jeffrey Goldberger MD University of Miami, FL, USA
Speakers:
Kevin Monahan MD, Boston University, Boston, MA, USA
The role of pacing for sick sinus syndrome and vasovagal syncope
Michael Gold MD Medical University of South Carolina, Charleston, SC, USA
Implanted devices for heart failure
Gaetano DeFerrari MD University of Pavia, Pavia, Italy
Parasympathetic modulation for heart failure
Harikrishna Tandri MD Johns Hopkins University, Baltimore, MD, USA
Cardiac sympathectomy for management of ventricular arrhythmias
Jason Bradfield MD University of California, Los Angeles, CA, USA
Renal denervation for management of heart failure
Christian Meyer MD University of Hamburg, Hamburg, Germany
Catheter ablation of atrial fibrillation-new insights

16:00 – 16:20

OP008 - Symposia-related Featured Abstracts – Oral Presentations
Sahib S Khalsa Laureate Institute for Brain Research, Tulsa, OK, USA
ISAN19.051 Association between bilateral cardiac sympathetic denervation and mental health
Sebastian Stec MD PhD MediNice Research & Development Center, Jasionka-Rzeszów, Poland
ISAN19.052 Neuro-cardiac reflexes for catheter ablation and management of idiopathic premature ventricular complexes.

16:00 – 17:30 Centennial Ballroom C&D, Level 1
PV002 - Poster Viewing and Judging (judging from 16:30 – 17:30)

17:30 – 17:50 Centennial Ballroom A&B, Level 1
ISAN1 - ISAN Members’ Meeting
Chair: Bruno Bonaz MD PhD, President ISAN CHU Grenoble-Alpes, Grenoble, France

18:00 – 21:00 Centennial Terrace, Level 3
Congress Dinner (ticketed - $80 per person)
FRIDAY JULY 26, MORNING

06:30 – 08:00 Centennial Terrace, Level 3
Breakfast Buffet

07:00 – 18:00 Group Registration Desk, Level 1
Registration

08:00 – 17:00 Centennial Ballroom C&D, Level 1
PS2 – Poster Session 2

08:00 – 08:15 Centennial Ballroom A&B, Level 1
AW1 - Awards for Best Abstract Submissions
Yvette Taché PhD, Co-Chair ISAN 2019, UCLA, Los Angeles, CA, USA

08:15 – 09:00 Centennial Ballroom A&B, Level 1
PT003 - Plenary Talk: The Exercise Pressor Reflex in Health and Simulated Peripheral Artery Disease
Speaker: Marc Kaufman PhD Penn State College of Medicine, Hershey, PA, USA
Introduced by: Bill Farquhar PhD University of Delaware, Hershey, PA, USA

09:00 – 17:00 Pathways & Innovation Rooms, Level 1
SDR1 - SPARC Data Resource Center Hands on Experience

09:00 – 09:20 Nutrition Hubs, Level 1 & 2
Break

Concurrent Symposia Sessions

09:20 – 11:20 Laureate Room, Level 1
SF009 - Recent Advances in Exercise Pressor Reflex Function in Health and Disease
Chair: Marc Kaufman PhD Penn State Hershey Medical Center, Hershey, PA, USA
Speakers:
Bill Farquhar PhD University of Delaware, Newark, DE, USA
Exaggerated exercise pressor reflex function in hypertension and the role of dietary salt
Vaughan Macefield PhD University of Melbourne, Victoria, Australia
The contributions of central command and the metaboreflex to the sympathetic control of blood flow in contracting muscle
Audrey Stone PhD: University of Texas at Austin, Austin, TX, USA
Exercise pressor reflex function in diabetes
Donal O’Leary PhD Wayne State University, Detroit, MI, USA
Altered muscle metaboreflex-arterial baroreflex interaction in heart failure

11:20 – 11:30
OP009 - Symposia-related Featured Abstracts – Oral Presentations
Joyce S. Kim Penn State College of Medicine, Hershey, PA, USA
ISAN19.114 Redundancy of the ASIC channel in evoking the exercise pressor reflex.
09:20 – 11:20 Legacy Room A&B, Level 2

**SF010 - Multiple System Atrophy: A Disease Centrally Affecting the Autonomic Nervous System**

**Chairs:**
- **Eduardo E Benarroch MD** Mayo Clinic, Rochester, MN, USA
- **Ryuji Sakakibara MD PhD** Toho University Sakura Medical Center, Sakura, Japan

**Speakers:**
- **Ryuji Sakakibara MD PhD** Toho University Sakura Medical Center, Sakura, Japan

*Overview of multiple system atrophy*

**Eduardo E Benarroch MD** Mayo Clinic, Rochester, MN

*Autonomic pathology of multiple system atrophy*

**Horacio Kaufmann MD** New York University Langone Health, New York, NY, USA

*Autonomic cardiovascular disorder in multiple system atrophy*

**Tatsuya Yamamoto MD** Chiba University, Chiba, Japan

*Autonomic bladder disorder in multiple system atrophy*

11:20 – 11:40

**OP010 - Symposia-related Featured Abstracts – Oral Presentations**

**Parag Gad** UCLA, Los Angeles, CA, USA

*ISAN19.115 Transcutaneous neuromodulation of spinal cord restores bladder and bowel function after neurological dysfunction*

**Ruslan Pustovit PhD** The University of Melbourne, Melbourne, Victoria, Australia

*ISAN19.116 Lesion of the neurons of forebrain caused motor and colorectal deficit in a Parkinson’s Disease model*

09:20 – 11:20 Optimist Room A&B, Level 2

**SF011 - Autonomic Modulation of Cardiac Arrhythmias**

**Chair:** **Olujimi Ajijola MD PhD** UCLA, Los Angeles, CA, USA

**Speakers:**
- **Neil Herring MD DPhil** University of Oxford, Oxford, UK

*Role of sympathetic co-transmitters in cardiac disease and ventricular function*

- **Crystal Ripplinger PhD** UC Davis School of Medicine, Davis, CA, USA

*Sympathetic innervation and myocardial infarction*

- **Dominik Linz MD PhD** The University of Adelaide and Royal Adelaide Hospital, Adelaide, Australia

*Autonomic modulation for atrial fibrillation*

- **Stavros Stavrakis MD PhD** University of Oklahoma Health Sciences Center, Oklahoma City, OK, USA

*Tragus nerve stimulation for modulation of cardiac arrhythmias*

11:20 – 11:40

**OP011 - Symposia-related Featured Abstracts – Oral Presentations**

**Ronald M. Harper PhD** UCLA, Los Angeles, CA, USA

*ISAN19.117 Non-invasive neuromodulation to maintain blood pressure and respiration in sleep-disturbed breathing*

**Kevin Tran** David Geffen School of Medicine at UCLA, Los Angeles, CA, USA

*ISAN19.118 Outcomes of cardiac sympathetic denervation for ventricular tachycardia: impact of urgency at presentation*

09:20 – 11:20 Centennial Ballroom A&B, Level 1

**SF012 - SPARC Data Resource Center Portal Roll Out**

**Chair:** **Andrew Weitz PhD** National Institutes of Health, Bethesda, MD, USA

**Speakers:**

*Opening remarks*

**Andrew Weitz PhD**
**SPARC Portal: Building the first interactive collection of autonomic neuroscience resources**

Joost Wagenaar PhD Blackfynn, Philadelphia, PA, USA

Peter Hunter PhD University of Auckland, Auckland, New Zealand

Esra Neufeld PhD IT’IS Foundation, Zurich, Switzerland

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**The life cycle of a SPARC dataset: from bench to cloud**

Joost Wagenaar PhD Blackfynn, Philadelphia, PA, USA

Anita Bandrowski PhD University of California San Diego, La Jolla, CA, USA

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**Interactive maps provide a modern view into the autonomic nervous system**

Peter Hunter PhD University of Auckland, Auckland, New Zealand

Susan Tappan PhD MBF Bioscience, Williston, VT, USA

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**Leveraging SPARC data, models and maps for collaborative computational neuroscience**

Esra Neufeld PhD IT’IS Foundation, Zurich, Switzerland

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**Roundtable: What does the future look like for collaborative neuroscience and how is SPARC enabling the future?**

**Introductory speaker**

Maryann Martone PhD University of California San Diego, CA, USA

**Roundtable participants**

Maryann Martone PhD University of California San Diego, CA, USA

Andrew Weitz PhD National Institutes of Health, Bethesda, MD, USA

Joost Wagenaar PhD Blackfynn, Philadelphia, PA, USA

Peter Hunter PhD University of Auckland, Auckland, New Zealand

Esra Neufeld PhD IT’IS Foundation, Zurich, Switzerland

Anita Bandrowski PhD University of California San Diego, La Jolla, CA, USA

Bernard de Bono MD Auckland Bioengineering Institute, Auckland, New Zealand

Susan Tappan PhD MBF Bioscience, Williston, VT, USA

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11:20 – 11:45 Nutrition Hubs, Level 1 & 2

Break

11:45 – 13:00 Centennial Ballroom C&D, Level 1

**PV003 - Poster Viewing – Session I: Anatomical and Functional Characterization of Autonomic Neural Networks for Organ Control**

11:45 – 13:00 Centennial Terrace, Level 3

Lunch Buffet

11:45 – 12:45 Centennial Ballroom A&B, Level 1

**ISAN AGM and Elections**

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**FRIDAY JULY 26, AFTERNOON**

13:00 – 13:45 Centennial Ballroom A&B, Level 1

**PT004 - Plenary Talk: Neuromodulation Focused Therapeutics for Cardiac Disease: Structure/Function Foundations**

Speaker: Jeffrey Ardell PhD, Co-Chair ISAN 2019 UCLA Cardiac Arrhythmia Center, UCLA, Los Angeles CA, USA

Introduced by: Irving Zucker PhD University of Nebraska Medical Center, Omaha, NE, USA
13:45 – 14:00 Nutrition Hubs, Level 1 & 2

Break

**Concurrent Symposia Sessions**

14:00 – 16:00 Centennial Ballroom A&B, Level 1

**SF013 - Sympatho-Excitatory Afferent Reflexes in Cardiovascular Disease**

Chairs:
- **Marmar Vaseghi MD PhD** UCLA, Los Angeles, CA, USA
- **Irving Zucker PhD** University of Nebraska Medical Center, Omaha, NE, USA

Speakers:
- **Hanjun Wang MD** University of Nebraska Medical Center, Omaha, NE, USA
  *Cardiopulmonary spinal afferents; Their role in heart failure*
- **John Osborn PhD** University of Minnesota, Minneapolis, MN, USA
  *Renal afferents and inflammation in hypertension*
- **Rodrigo del Rio PhD** Pontificia Universidad Católica de Chile, Santiago, Chile
  *Chemoreception and sympathetic outflow in heart failure*
- **Gisele Lincevicius PhD** Heart Institute, Faculty of Medicine, University of Sao Paulo, Sao Paulo, Brazil
  *Carotid body recruitment in renovascular hypertension: role for renal afferents and mineralocorticoid receptors*

16:00 – 16:20

**OP012 - Symposia-related Featured Abstracts – Oral Presentations**

**Mariana Ruiz Lauar PhD** University of Minnesota, Minneapolis, MN, USA

*ISAN19.132 Effect of total and afferent renal denervation on neurogenic pressor activity and blood pressure in 2K1C model*

**Ibrahim M. Salman** Case Western Reserve University, Cleveland, OH, USA

*ISAN19.133 The contribution of renal nerves to modulation of cardio-respiratory function in Zucker fat rats*

14:00 – 16:00 Legacy Room A&B, Level 2

**SF014 - Preclinical and Clinical Advances in Parasympathetic Cholinergic Modulation for Treating Inflammatory and Metabolic Disorders**

Chairs:
- **Bruno Bonaz MD PhD** CHU Grenoble-Alpes, Grenoble, France
- **Valentin Pavlov PhD** Feinstein Institute for Medical Research, Manhasset, NY, USA

Speakers:
- **Valentin Pavlov PhD** Feinstein Institute for Medical Research, Manhasset, NY, USA
  *Recent insights into cholinergic regulation of inflammation and its clinical relevance in obesity-driven disorders*
- **Bruno Bonaz MD PhD** CHU Grenoble-Alpes, Grenoble, France
  *The vagus nerve at the interface of the brain-gut neuroimmune axis: clinical implications*
- **Cyndya Shibao MD** Vanderbilt University, Nashville, TN, USA
  *Novel findings in cholinergic modulation of oxidative stress in obese African Americans and its potential therapeutic use*
- **Hermona Soreq PhD** The Hebrew University of Jerusalem, Jerusalem, Israel
  *Carving the molecular landscape of cholinergic signalling in anxiety and metabolic stresses*

16:00 – 16:20

**OP013 - Symposia-related Featured Abstracts – Oral Presentations**

**Oliver C. Neely BA** University of Oxford, Oxford, UK

*ISAN19.134 Shift in monocyte-macrophage subtype proportions within rat stellate ganglia in hypertension*

**Ramya Vajapey MD** Cleveland Clinic Foundation, Cleveland, OH, USA

*ISAN19.135 Postural Tachycardia Syndrome (POTS) and ST segment changes*
14:00 – 16:00 Optimist Room A&B, Level 2

**SF015 - New Advances in Autonomic Nerve Targeting for Treatment of Immune, Metabolic and Renal Disease**
Chair: **Stephen Lewis PhD** Case Western Reserve University, Cleveland, OH, USA

Speakers:
- **Pankaj Jay Pasricha MD** Johns Hopkins University, Baltimore, USA
  
  *Greater splanchnic nerve modulation and its impact on metabolic syndrome animal models*

- **Philippe Blancou PhD** Institut de Pharmacologie Moléculaire et Cellulaire, Nice, France
  
  *Treating type 1 diabetes by pancreatic nerve electrostimulation*

- **Thomas Simon PhD** Institut de Pharmacologie Moléculaire et Cellulaire, Nice, France
  
  *Apical splenic nerve electrical stimulation discloses a novel T cell independent anti-inflammatory pathway*

- **Jacqueline Phillips DVM PhD** Macquarie University, Sydney, Australia
  
  *Modulation of reno-renal reflex and its potential impact on chronic kidney disease*

16:00 – 16:20

**OP014 - Symposia-related Featured Abstracts – Oral Presentations**

- **David R. Giovannucci PhD** University of Toledo College of Medicine, Toledo, OH, USA
  
  *ISAN19.136 A novel peripheral inhibitory pathway targeting salivary gland function*

- **Roman Tyshynsky** University of Minnesota, Minneapolis, MN, USA
  
  *ISAN19.137 Anatomical and Functional Mapping of the Renal Nerves*

14:00 – 16:00 Laureate Room, Level 1

**SF016 - Conceptualization to Commercialization for Neuromodulation IP**

Chairs:
- **Kalyanam Shivkumar MD PhD, Chair ISAN 2019** Director, UCLA Cardiac Arrhythmia Center and EP Program, Los Angeles, CA, USA

- **Emily Loughran MBA** Former Senior Director of Licensing and Strategic Alliances, UCLA, Los Angeles, CA, USA

Speakers:
- **Kathryn Zavala PhD** Medtech Innovator, Los Angeles, CA, USA

- **Raghuveer Mendu** NeuCures, Los Angeles, CA, USA

- **Emily Loughran MBA** Former Senior Director of Licensing and Strategic Alliances, UCLA, Los Angeles, CA, USA

16:00 – 17:00 Centennial Ballroom C&D, Level 1

**PV004 - Poster Viewing – Session II: Anatomical and Functional Characterization of Autonomic Neural Networks for Organ Control**

**FRIDAY JULY 26, EVENING**

17:15 – 18:00 Centennial Ballroom A&B, Level 1

**PT005 - SPARC Plenary Talk – Neuromodulation and Robustness to Perturbation of Rhythmic Circuit**

Speaker: **Eve Marder PhD** Professor of Biology, Brandeis University, Waltham, MA, USA

Introduction by: **Joseph Margiotta PhD** University of Toledo, OH, USA

18:00 – 19:00 Centennial Ballroom A&B, Level 1

**SPI1 - SPARC PI Meeting**

Chair: **Gene Civillico PhD NIH** SPARC Program Manager, NIH, Bethesda, MD, USA
SATURDAY JULY 27, MORNING

06:30 – 08:00 Centennial Terrace, Level 3
Breakfast Buffet

07:00 – 18:00 Group Registration Desk, Level 1
Congress Registration
08:00 – 17:00 Centennial Ballroom C&D, Level 1
PS3 – Poster Session 3

08:00 – 08:15 Centennial Ballroom A&B, Level 1
W2 - Welcome to Day 3
Chair: Gene Civillico PhD NIH SPARC Program Manager, NIH, Bethesda, MD, USA

08:15 – 10:15 Centennial Ballroom A&B, Level 1
SS017 - SPARC-ISAN Career Launcher Symposia
Chair: Gene Civillico, PhD NIH SPARC Program Manager, NIH, Bethesda, MD
Speakers:
Kristen Smith-Edwards, PhD University of Pittsburgh, Pittsburgh, PA, USA
*ISAN19.184* Mapping intrinsic and extrinsic enteric circuits using optogenetic tools in vivo and ex vivo
Hongrong Yang, PhD Northeastern University, Boston, MA, USA
*ISAN19.185* Optical nanosensor for imaging acetylcholine in the peripheral nervous system
Seoeun Lee, BS Columbia University, New York, NY, USA
*ISAN19.186* Neuroanatomical and molecular properties of stellate ganglion neurons that regulate brown adipose tissue
Yehe Liu, BS/MS Case Western Reserve University, Cleveland OH, USA
*ISAN19.187* Easier 3D Imaging
Maria Jantz, BS University of Pittsburgh, Pittsburgh, PA, USA
*ISAN19.188* Epidural spinal cord stimulation for selective activation of lower urinary tract nerves
Pradeep Rajendran, PhD UCLA, Los Angeles, CA, USA
*ISAN19.189* Identification of peripheral neural circuits regulating heart rate using optogenetic and viral vector strategies

10:15 – 17:00 Artistry, Imagination, Entrepreneur Rooms, Level 2
STS1 - SPARC Technology Showcase

10:15 – 17:00 Pathways & Innovation Rooms, Level 1
SDR2 - SPARC Data Resource Center Hands on Experience

10:15 – 10:40 Nutrition Hubs, Level 1 & 2
Break

Concurrent Symposia Sessions

10:40 – 11:40 Centennial Ballroom A&B, Level 1
SS018 - SPARC: Tools to Study and Modulate Autonomic Function – Session I
Chair: Michael Wolfson PhD NIH, Bethesda, MD, USA
Speakers:
Chris Towne PhD Circuit Therapeutics, Mountain View, CA, USA
*Transdermal Light-Activated Gene Therapy for Pain*
Tiago Costa PhD Columbia University, New York, NY, USA (Kenneth Shepard PhD, primary author)

ISAN19.191 2D ultrasound phased array in a single wearable chip for stimulation of peripheral nerves

Emily Gibson PhD University of Colorado, Denver, CO, USA (John Caldwell PhD, primary author)

ISAN19.192 Bidirectional minimally invasive optogenetic peripheral nerve interface

Larry Miller MD Feinstein Institute for Medical Research, Manhasset, NY, USA

ISAN19.193 The gastrointestinal tract as a window to the autonomic nervous system

10:40 – 11:40 Laureate Room, Level 1

SS019 - Structure-Function: Cardiorespiratory Control

Chair: Jeffrey Ardell PhD Co-Chair ISAN 2019 UCLA Cardiac Arrhythmia Center, UCLA, Los Angeles, CA, USA

Speakers:

Thomas Taylor-Clark PhD University of South Florida, Tampa, FL, USA

ISAN19.194 Mapping of vagal afferent subsets - peripheral terminals within the lungs and central terminals within the medulla

Xin Sun PhD UCSD, San Diego, CA, USA

ISAN19.195 Mapping of the neural circuits that control intrinsic lung function

Don Bolser PhD University of Florida, Gainesville, FL, USA

ISAN19.196 Network-scale interactions among neurons in the medulla: a substrate for autonomic control by reverberant circuits

Kendall Morris PhD University of South Florida, Tampa, FL, USA

ISAN19.197 Simulations and cluster analysis visualizations of respiratory neuronal discharge patterns

10:40 – 11:40 Optimist Room A&B, Level 2

SS020 - Peripheral Neuromodulation for Pain and Withdrawal

Chair: Nick Langhals PhD NIH SPARC Program, NIH Bethesda, MD, USA

Speakers:

Leonardo Kapural MD PhD Carolinas Pain Institute, Winston Salem, NC, USA

Spinal cord stimulation for abdominal visceral pain – clinical evidence

Teresa Pitts PhD University of Louisville, Louisville, KY, USA

Anatomical and functional underpinnings of sex-based differences in neuromodulatory therapies

Bin Feng PhD University of Connecticut, Hartford, CT, USA

Determine the topology and molecular profiles of nociceptive DRG neurons innervating the colon and rectum

10:40 – 11:40 Legacy Room A&B, Level 2

SS021 - Foundational Aspects for Peripheral Neuromodulation

Chair: Marmar Vaseghi, MD PhD UCLA, Los Angeles, CA, USA

Speakers:

Nicole Pelot BS Duke University, Durham, NC, USA

ISAN19.201 Modeling activation of autonomic nerves for analysis and design

Matthew Ward PhD Purdue University, West Lafayette, IN, USA (Terry Powley PhD, primary author)

ISAN19.202 A novel approach to decode and classify vagal nerve structure and function

Eric Musselman BS Duke University, Durham, NC, USA

ISAN19.203 Interspecies scaling of cervical vagus nerve stimulation parameters

Guillermo Monroy PhD FDA Silver Springs, MD, USA

ISAN19.204 Optical coherence tomography as a versatile tool to observe and quantify electrostimulation induced peripheral nerve injury

11:45 – 13:00 Centennial Ballroom C&D, Level 1

PV005 - Poster Viewing – Session I: Mapping and Neuromodulation Technologies, Models and Modeling
12:00 – 13:00 Centennial Terrace, Level 3
Lunch Buffet

SATURDAY JULY 27, AFTERNOON

Concurrent Symposia Sessions

13:00 – 14:00 Centennial Ballroom A&B, Level 1
SS022 - Structure-Function: Pelvic Neural Pathways and Urinary Control
Chair: Peregrine Osborne PhD University of Melbourne, Parkville, VIC Australia
Speakers:
Nicole Wiedmann PhD University of Melbourne, Parkville, VIC Australia (Peregrine Osborne PhD, primary author)
ISAN19.205 Mapping spinal cord neurons activated by voiding and electrical pelvic nerve stimulation in awake rats
Clara Huesing BS Pennington Biomedical Research Center, Baton, Rouge, LA USA
ISAN19.206 Pre- and postganglionic sympathetic tracing of inguinal white adipose tissue innervation in adult mice
Esther Ji MSD University of Melbourne, Parkville, VIC Australia (Janet Keast PhD, primary author)
ISAN19.207 Regional changes in sensory and autonomic innervation of the vasculature and epithelium of the female rat urethra
April Herrity DC PhD University of Louisville, Louisville, KY, USA
ISAN19.208 Targeting urinary continence with epidural stimulation after human spinal cord injury

13:00 – 14:00 Laureate Room, Level 1
SS023 - SPARC: Tools to Study and Modulate Autonomic Function – Session II
Chair: Felicia Qashu, PhD NIH Bethesda, MD, USA
Speakers:
Bhavesh Patel PhD California Medical Innovations Institute, San Diego, CA, USA
ISAN19.209 Fecobionics technology for mapping colorectal stress and deformation patterns
David Holder PhD University College London, London, UK
ISAN19.210 EIT imaging and selective neuromodulation in complex autonomic nerves with multielectrode cuff arrays
Junqizhuo BS Case Western Reserve University, Cleveland, OH, USA (Michael Jenkins PhD, primary author)
ISAN19.211 Infrared neuromodulation (IRN) in the peripheral nervous system
Bartek Rajwa PhD Purdue University, West Lafayette, IN, USA
ISAN19.212 Cloud-computing analytics for neurohistology: A Development A Spatial Statistical analysis workflow

13:00 – 14:00 Optimist Room A&B, Level 2
SS024 - Neuromodulation of GI Function and Anti-Inflammatory Effects
Chair: Charles Horn, PhD University of Pittsburgh, Pittsburgh, PA, USA
Speakers:
Martin Stebbing PhD Florey Institute, Parkville, VIC, Australia
ISAN19.213 Extrinsic afferent and efferent nerve responses to acute local inflammation in the rat ileum
Sophie Payne PhD Bionics Institute East Melbourne VIC Australia
ISAN19.214 Abdominal vagal nerve stimulation relieves inflammation of the rat small intestine
Kun-Han Lu BS Purdue University, West Lafayette, IN, USA
ISAN19.215 Differential effects of afferent and efferent vagus nerve stimulation on gastric motility assessed with magnetic resonance imaging
Jiande Chen PhD Johns Hopkins University, Baltimore, MD, USA
ISAN19.216 Improving gastric accommodation by spinal cord stimulation in canine

13:00 – 14:00 Legacy Room A&B, Level 2
SS025 - Structure-Function: Autonomic Control of Proximal Colon
Chair: Marthe Howard, PhD University of Toledo, Toledo, OH, USA
Speakers:
Catia Sternini MD UCLA, Los Angeles, CA, USA
ISAN19.217 Characterization of Enteric Neurons in Different Segments of the Porcine Colon
Dante Heredia BS University of Nevada, Reno, NV, USA
ISAN19.218 Genetically encoded tools for examining patterns of myenteric activity responsible for modulating the murine CMMC
Joel Bornstein PhD University of Melbourne, Parkville, VIC Australia
ISAN19.219 5-HT3 receptors mediate some fast excitatory synaptic potentials in myenteric neurons in mouse proximal colon

Concurrent Symposia Sessions

14:10 – 15:10 Centennial Ballroom A&B, Level 1
SS026 - Intrathoracic Autonomic Neural Networks and Cardiac Control
Chair: Colleen Clancy, PhD University of California Davis, Davis, CA, USA
Speakers:
John Tompkins PhD UCLA, Los Angeles, CA, USA
ISAN19.220 Structure and function of single cells from stellate and intrinsic cardiac ganglia
Mark Doyle PhD OHSU School of Medicine, Portland, OR, USA (Michael Andresen PhD, primary author)
ISAN19.221 Cardiac nerve synaptic events in mouse stellate ganglion suggests cholinergic collaterals.
Alison Moss BS Thomas Jefferson University, Philadelphia, PA, USA (Rajanikanth Vadigepalli PhD, primary author)
ISAN19.222 Discovering molecular phenotype gradients and markers within the Rat ICN
Guy Salama PhD University of Pittsburgh, Pittsburgh, PA, USA
ISAN19.223 Autonomic activity generates regional heterogeneities of CA2+ transients and alters Vm-Cai delays in ventricles

14:10 – 15:10 Laureate Room, Level 1
SS027 - SPARC: Tools to Study and Modulate Autonomic Function – Session III
Chair: Michael Jenkins PhD Case Western Reserve University, Cleveland, OH, USA
Speakers:
arah Stanley PhD Mount Sinai, New York, NY, USA
ISAN19.225 Tools for remote modulation of peripheral nerves innervating the pancreas
Joseph Canzano BS University of Florida, Gainesville, FL, USA
ISAN19.226 In vivo two-photon imaging of sympathetic and parasympathetic neuromodulation of pancreatic microvessels
Dennis Bourbeau PhD Cleveland FES Center, Cleveland, OH USA (Aref Smiley PhD, primary author)
ISAN19.227 Wireless real-time sensor platform for monitoring bowel state and function

14:10 – 15:10 Optimist Room A&B, Level 2
SS028 - Autonomic Control of Respiration Function
Chair: Don Bolser PhD University of Florida, Gainesville, FL, USA
Speakers:
Stephen Lewis PhD Case Western Reserve University, Cleveland, OH, USA
ISAN19.228 Ganglioglomerular nerve regulation of carotid body responses to hypoxic-gas challenge in juvenile rats
Leah Reznikov PhD University of Florida, Gainesville, FL, USA
ISAN19.229 Acute airway acidification modifies mucus secretion and transport properties
Gjinovefa Kola MD Case Western Reserve University, Cleveland, OH, USA (Stephen Lewis PhD, primary author)
ISAN19.230 Superior cervical ganglionectomy affects the brainstem cardiorespiratory network

Yee-Hsee Hsieh PhD Case Western Reserve University, Cleveland, OH, USA (Stephen Lewis PhD, primary author)

ISAN19.231 Cervical sympathetic chain stimulation on upper airway pressure is mediated by the internal carotid nerve

14:10 – 15:10 Legacy Room A&B, Level 2

SS029 - Enteric Neural Networks and Control of GI Function

Chair: John Furness, PhD FAA FAHMS Florey Institute, University of Melbourne, VIC, Australia

Speakers:
Simon Brookes PhD Flinders University, Adelaide, South Australia, Australia

ISAN19.232 Characterization of ascending interneuronal pathways in myenteric plexus of human colon

Joel Bornstein PhD University of Melbourne, Parkville, VIC, Australia

ISAN19.233 Computational models of synaptic interactions in enteric nervous system reveal anomalous inhibition from depolarizing synapses

Joel Bornstein PhD University of Melbourne, Parkville, VIC, Australia

ISAN19.234 Correlation of firing properties and function of myenteric neurons in mouse proximal colon: modeling differential expression of ion channels

Kun-Han Lu BS MS Purdue University, West Lafayette, IN, USA

ISAN19.235 Vagus nerve stimulation promotes gastric emptying by increasing pyloric opening measured with magnetic resonance imaging

15:10 – 15:40 Nutrition Hubs, Level 1 & 2

Break

15:30 – 17:00 Centennial Ballroom C&D, Level 1

PV006 - Poster Viewing – Session II: Mapping and Neuromodulation Technologies, Models and Modeling

17:15 – 17:30 Centennial Ballroom A&B, Level 1

CR1 - Closing Remarks ISAN-SPARC 2019

Speakers:
Gene Civillico PhD NIH SPARC Program Manager, NIH, Bethesda, MD, USA

Kalyanam Shivkumar MD PhD, Chair ISAN 2019, Director, UCLA Cardiac Arrhythmia Center & EP Program, Los Angeles, CA, USA