

74th Annual Meeting and Symposium of the Society of General Physiologists
Ion Channels & Transporters in Immunity, Inflammation and Antitumor Immunity

Marine Biological Laboratory, Woods Hole, Massachusetts, USA
September 22 – 26, 2021

Organizer: Stefan Feske (New York University, USA)
Co-organizer: Bimal Desai (University of Virginia, USA)

WEDNESDAY, SEPTEMBER 22

16:00 – 21:00 Registration and Room Assignments (Swope Center, 1st Floor)

17:30 – 18:50 Buffet Dinner (all meals in Swope Center, Dining Room)

OPENING REMARKS and KEYNOTE ADDRESS - FRIENDS OF PHYSIOLOGY LECTURE

19:00 – 19:20 Welcome and Opening Remarks
 Crina Nimigean, President, Society of General Physiologists
 Stefan Feske, Conference Organizer

19:20 – 19:30 Introduction by Richard S. Lewis (Stanford University, USA)

19:30 – 20:30 * Michael Cahalan (University of California, Irvine, USA)
 Ion Channels in T Lymphocytes: A Single Cell Approach to Immunology

21:00 - 23:00 MIXER (Swope Center, Meigs Room)

** indicates virtual presentation*

THURSDAY, SEPTEMBER 23

7:00 – 8:00 Breakfast (Swope Center, Dining Room)

SESSION 1: ION CHANNELS & TRANSPORTERS (ICTs) IN LYMPHOCYTES

Chair: Stefan Feske (New York University, USA), co: Axel Conception

8:00 – 8:25 * Andreas Guse (University of Hamburg, Germany)
 NAADP and Ca²⁺ Signaling in T Cells

- 8:25 - 8:50 * Bebhinn Treanor (University of Toronto, Canada)
TRPM7 and Other Ion Channels in B Cell Function
- 8:50 - 9:15 Mohamed Trebak (University of Pittsburg, USA)
CRAC Channels in B cells
- 9:15 – 9:40 Yousang Gwack (University of California, Los Angeles, USA)
NKD2 Regulates ORAI1 Trafficking and CRAC Channel Function
- 9:40 – 10:00 * DATA BLITZ SESSION 1
- Bjoern-Philipp Diercks, University Medical Center Hamburg, Germany
P2X4 and P2X7 are essential players in basal T cell activity and Ca²⁺ signaling milliseconds after T cell activation
 - Trisha Mahtani, University of Toronto, Canada
The Ion Channel TRPV5 regulates B cell activation and signaling
 - Gary Mo, University of Illinois, Chicago, USA
Inflammatory IL-1 β release from Gasdermin D pores is dynamically regulated by calcium-phosphoinositide signaling
 - Roland Immler, Ludwig-Maximilians University Munich, Germany
The voltage-gated potassium channel KV1.3 regulates neutrophil recruitment during inflammation
- 10:00 - 10:30 BREAK

SESSION 2: ICTs IN INNATE IMMUNITY 1

Chair: Murali Prakriya (Northwestern University, USA), co-chair: Catherine Doyle

- 10:30 – 10:55 * Longfei Wang (Harvard Medical School, USA) – VIRTUAL
TRPM2, Linking Oxidative Stress and Ca²⁺ Permeation to NLRP3 Inflammasome Activation
- 10:55 – 11:20 Bimal Desai (University of Virginia, USA)
Mitochondrial Ca²⁺ Signaling in Cell Intrinsic Immune Responses
- 11:25 – 11:40 Donald Gill (Penn State University, USA)
Orai Channel C-terminal Peptides – Calcium Signal Suppression and Potential for Immunomodulation
- 11:40 – 11:55 Axel Concepcion (New York University, USA)
The Volume Regulated Anion Channel LRRC8C Suppresses T Cell Function by Regulating Cyclic Dinucleotide Transport and STING-p53 Signaling
- 11:55 – 12:15 DATA BLITZ SESSION 2
- Jananie Rockwood, Wright State University, USA
TRPM7 inactivation and the role of pH in phagocytic activity of murine macrophages
 - Sonal Srikanth, University of California, Los Angeles, USA
ORAI1 establishes resistance to SARS-CoV-2 infection by regulating tonic type I interferon signaling
 - Anthony Tao, New York University, USA
Transcriptomic and forward genetic screens to elucidate the role of ion channels and transporters in B cells
 - Marta Stremaska, University of Virginia, USA
Targeting the ion channel TRPM7 promotes the thymic development of regulatory T cells by promoting IL-2 signaling

- 12:30 – 14:00 LUNCH (Swope Center, Dining Room)
- 14:00 – 15:00 **ROUND TABLE 1**
Career Development and Increasing Diversity
Available to on-site attendees only
- 15:00 – 17:00 **POSTER SESSION 1** (in person)
Authors at posters for discussion with attendees
- 17:00 – 18:30 DINNER (Swope Center, Dining Room)

SESSION 3: NOVEL STRUCTURES OF ICTs IN IMMUNE CELLS

Chair: Crina Nimigean (Cornell University, USA), co-chair: Marta Stremeska

- 19:00 – 19:10 Announcement of awards
- 19:10 – 19:35 **Excelsior Award Lecture:**
 Angel Solis (Gettysburg College, USA)
 Mechanosensation by PIEZO1 Is Essential for Innate Immunity
- 19:40 – 20:05 Xiaowei Hou (Memorial Sloan Kettering Cancer Center, USA)
 Structural Studies Reveal Insights into CRAC Channel Activation
- 20:05 – 20:30 Stephen Long (Memorial Sloan Kettering Cancer Center, USA)
 The mitochondrial calcium uniporter: pore structure and regulation by MICU1/MICU2
- 20:30 – 21:00 * Juan Du (Van Andel Institute, USA)
 Ligand Recognition and Gating Mechanism of Temperature Sensitive TRPM Channels
- 21:00 – 23:00 MIXER (Swope Center, Meigs Room)
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FRIDAY, SEPTEMBER 24

- 7:00 – 8:00 BREAKFAST (Swope Center, Dining Room)

SESSION 4: ICTs IN LYMPHOCYTES AND ANTITUMOR IMMUNITY

Chair: Richard Lewis (Stanford University, USA), co-chair: Phil Seegren

- 8:15 – 8:45 * Laura Conforti (University of Cincinnati, USA)
 Potassium channel role in anti-tumor immunity
- 8:45 – 9:15 * Yubin Zhou (Texas A&M University, USA)
 Synthetic Biology Approaches to Regulate T Cell Mediated Immunity to Cancer
- 9:15 – 9:35 Emily Liman (University of Southern California, USA)
 Otopetrin Proton Channels: What, Where, Why and How
- 9:35 – 10:00 Stefan Feske (New York University, USA)

Regulation of immune cell function by ion channels

10:00 – 10:30 BREAK

SESSION 5: ICTs IN INNATE IMMUNITY 2

Chair: Santiago Partida-Sanchez (Nationwide Children's Hospital, USA), co-chair: Liwei Wang

10:30 – 10:55 Shang Ma (University of California, San Diego, USA)

Under-appreciated Role of Mechanotransduction in Vivo

10:55 – 11:20 Regina Clemens (Washington University, USA)

Membrane potential modulates neutrophil calcium signaling in development and inflammation

11:20 – 11:45 * Paula Nunes-Hasler (University of Geneva, Switzerland)

Calcium-dependent and independent roles of phagosomal membrane contact sites

11:45 – 12:10 * Christian Grimm (Ludwig Maximilians University, Germany)

Endolysosomal TRP Channels and TPCs in Immune Cell Function and Disease

12:10 – 12:30 * DATA BLITZ SESSION 3

- Laura Marongiu, University of Milan, Italy
Inositol 1,4,5-trisphosphate 3-kinase B promotes Ca^{2+} mobilization and the inflammatory activity of dendritic cells.
- Feng Gu, University Medical Center Hamburg, Germany
NAADP forming enzyme in T cells
- Dalia Alansary, Saarland University, Germany
Role of purinergic signaling in regulating IL-1 α mediated inflammation in chronic kidney disease
- Ehud Ohana, Ben Gurion University, Israel
A succinate transport pathway delivers succinate to macrophages thus perpetuating their pro-inflammatory metabolic state

12:30 – 14:00 LUNCH

14:00 – 15:00 **ROUND TABLE 2**

Ion Channels & Transporters as Drug Targets in Immunity and Inflammation

Available to on-site attendees only

15:00 – 17:00 * **POSTER SESSION 2 (virtual on REMO)**

Authors at Posters for discussion with attendees

17:00 – 18:30 DINNER

SESSION 6: CELL BIOLOGICAL ASPECTS OF ICTS IN IMMUNE CELLS

Chair: Andrea Fleig (University of Hawaii, USA), co-chair: Anthony Tao

19:00 – 19:30	* Sergio Grinstein (University of Toronto, Canada) Lipid Regulation of Monovalent Channels in Immune Surveillance
19:30 – 20:00	Christine Beeton (Baylor College of Medicine, USA) Interplay Between KCa1.1 and Cav1.2 Channels in Synovial Fibroblasts in Rheumatoid Arthritis
20:00 – 20:15	Santiago Partida-Sanchez (Nationwide Children's Hospital, USA) TRPM2 During The Inflammatory Response of Phagocytic Cells: Friend or Foe
20:15 – 20:30	Jonathan Soboloff (Temple University, USA) Suppression of Ca ²⁺ Signals by EGR4 controls Th1 differentiation and anti-cancer immunity <i>in vivo</i>
20:30 – 20:45	* Wendy Liu (University of California, Irvine, USA) Mechanically Activated Ion Channel Piezo1 Modulates Macrophage Polarization and Stiffness Sensing
20:45 – 21:00	* Yoshifumi Okochi (Osaka University, Japan) Method of measuring the membrane potential of phagosomes by optical imaging
21:00 – 23:00	MIXER

SATURDAY, SEPTEMBER 25

7:00 – 8:00 BREAKFAST

SESSION 7: PATHOPHYSIOLOGICAL ROLES OF ICTs IN INFLAMMATION

Chair: Jorge Contreras (University of California, Davis, USA), co-chair: Lucile Noyer

8:00 - 8:30	Jorge Contreras (University of California, Davis, USA) Pannexin-1 Channels Promote Neuroinflammation After Brain Trauma
8:30 - 9:00	Murali Prakriya (Northwestern University, USA) Microglial CRAC channels and Neuroinflammation
9:00 - 9:30	* Kodi Ravichandran (University of Virginia, USA) Solute Carrier Proteins in Macrophages Enable Efferocytosis by Promoting Glucose Uptake and Lactate Release
9:30 – 10:00	* Susanna Zierler (University of Linz, Austria) Enzyme-coupled TRP Channels and endolysosomal TPCs in Immune Homeostasis
10:00 – 10:30	BREAK

SESSION 8: MODULATION OF IMMUNE CELL FUNCTION BY ICTs

Chair: Christine Beeton (Baylor College of Medicine, USA), co-chair: Wenlei Ye

10:30 - 11:00	Isaac Chiu (Harvard Medical School, USA) Ion Channels Regulating Neural-Immune Interactions in Host Defense and Immunity
11:00 - 11:30	* Asrar Malik (University of Illinois Chicago, USA) The TWIK2 Potassium Efflux Channel in Macrophages Mediates NLRP3 Inflammasome-induced Inflammation
11:30 - 12:00	* Lingyin Li (Stanford University, USA) cGAMP as an immunotransmitter and its transporters
12:00 – 13:00	LUNCH

Free afternoon Harbor cruises (No charge. Sign-up sheet at registration table).

SESSION 9: ION CHANNELS AS DRUG TARGETS IN IMMUNE DISEASES

Chair: Bimal Desai, PhD (University of Virginia, USA), co-chair: Gaetan Barbet

17:00 – 17:30	* Anant Parekh (University of Oxford, UK) CRAC Channels in Mast Cell Function and Allergy
17:30 - 17:45	Olga Gulyaeva (University of California, San Francisco, USA) Illuminating Dark and Druggable Genome
17:45 - 18:15	Andrea Fleig (University of Hawaii, USA) Targeting TRP Channels for Immune Modulation
18:15 - 18:45	Ken Stauderman (CalciMedica Inc, USA) CRAC Channels as Targets for Drug Discovery and Development
18:50 - 19:00	Stefan Feske & Bimal Desai Closing Remarks
19:00 - 20:00	Reception (Meigs Room)
20:00 - 23:00	Lobster Dinner/Clambake and Mixer

SUNDAY, SEPTEMBER 26

7:00 – 8:30	Breakfast
10:00	Checkout