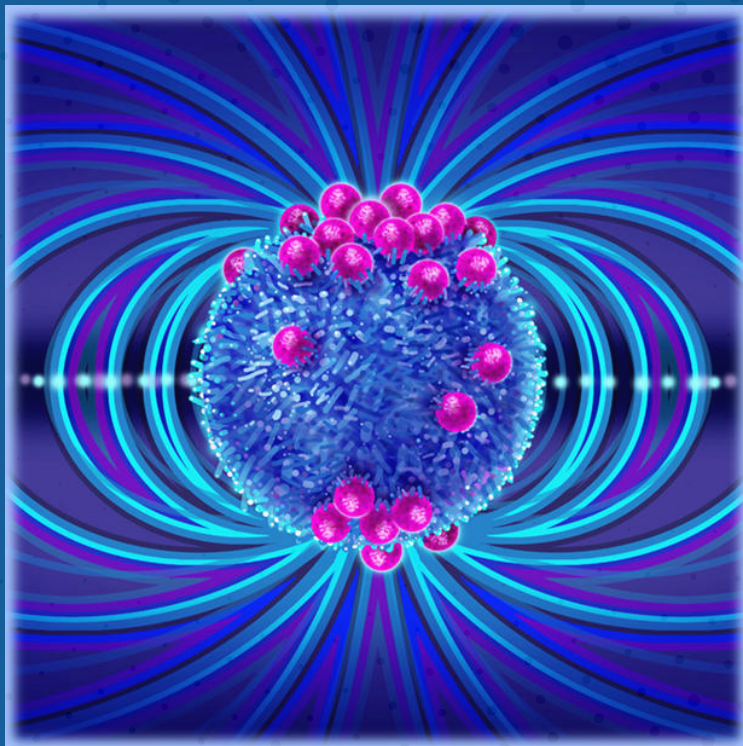# Advances in Immunoengineering: Fundamentals and Cutting Edge Advances

Tuesdays and Thursdays
January 4 - 27, 2022

INTERNET LIVE CONFERENCE

Presented by
The Johns Hopkins Translational ImmunoEngineering (JH-TIE) Center
An NIBIB National Center for Biomedical Imaging and Bioengineering
The Johns Hopkins Translational Tissue Engineering Center (TTEC)
The Johns Hopkins University Institute for NanoBioTechnology (INBT)

This activity has been approved for AMA PRA Category 1 Credits™.

JOHNS HOPKINS
MEDICINE

DESCRIPTION

The field of immunoengineering combines the diverse and complex fields of engineering and immunology and is transforming patient treatment in cancer, autoimmunity, regeneration, and transplantation.

There is a significant need for training of engineers in immunology and for training immunologists in quantitative engineering techniques.

Moreover, there is need to bridge basic immunological discoveries with advances in clinical application. This course will review the fundamentals of the immune system and its components, engineering strategies to modulate the immune system, and clinical applications to improve patient care and outcomes in the development of neoadjuvant immunotherapies, highlighting particular considerations for immunological mechanisms, clinical development, and pathologic response assessments.

WHO SHOULD ATTEND

The course is designed for graduate students, medical students, residents, and fellows in engineering, immunology, and related fields. Engineering and clinical faculty and members of industry will benefit from the course as well.

OBJECTIVES

After attending this activity, the learner will demonstrate the ability to:

- Review the fundamentals and recent discoveries in the function of the immune system.

- Identify engineering strategies to manipulate the immune system.

- Describe the clinical applications of immunoengineering.

ACCREDITATION STATEMENT

The Johns Hopkins University School of Medicine is accredited by the Accreditation Council for Continuing Medical Education (ACCME) to provide continuing medical education for physicians.

CREDIT DESIGNATION STATEMENT

The Johns Hopkins University School of Medicine designates this live activity for a maximum of 12 **AMA PRA Category 1 Credits**TM. Physicians should claim only the credit commensurate with the extent of their participation in the activity.

OTHER CREDITS

American Academy of Nurse Practitioners National Certification Program accepts *AMA PRA Category 1 Credit*™ from organizations accredited by the ACCME.

American Nurses Credentialing Center (ANCC) accepts *AMA PRA Category 1 Credit*™ from organizations accredited by the ACCME.

National Commission on Certification of Physician Assistants (NCCPA) PAs may claim a maximum of 12 Category 1 credits for completing this activity. NCCPA accepts *AMA PRA Category 1 Credit*TM from organizations accredited by ACCME or a recognized state medical society.

The Johns Hopkins University has approved this activity for 12 contact hours for non-physicians.

POLICY ON PRESENTER AND PROVIDER DISCLOSURE

It is the policy of the Johns Hopkins School of Medicine that the presenter and provider globally disclose conflicts of interest. The Johns Hopkins School of Medicine OCME has established policies that will identify and resolve conflicts of interest prior to this educational activity. Detailed disclosure will be made prior to presentation of the education.

JOHNS HOPKINS STATEMENT OF RESPONSIBILITY

The Johns Hopkins School of Medicine takes responsibility for the content, quality, and scientific integrity of this CME activity.

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DISCLAIMER STATEMENT

The opinions and recommendations expressed by faculty and other experts whose input is included in this program are their own. This enduring material is produced for educational purposes only. Use of Johns Hopkins School of Medicine name implies review of educational format design and approach. Please review the complete prescribing information of specific drugs or combination of drugs, including indications, contraindications, warnings and adverse effects before administering pharmacologic therapy to patients.

HARDWARE/SOFTWARE REQUIREMENTS

Internet connection.

GENERAL INFORMATION

FREE REGISTRATION

Registration Cutoff Date: December 30, 2021 | 5:00 p.m. ET

Register Online: hopkinscme.cloud-cme.com/default.aspx?P=5&EID=38555

Pre-registration is required by December 30, **2021.** On the day of, please log into the online platform by 3:45 p.m. ET to test your connection. Exclusive log-in details will be provided via email the week prior.

You will receive a confirmation by e-mail. If you have not received it by December 30, 2021, call (410) 502-9636 to confirm that you are registered. A transcript of attendance will be available upon attestation of your credit hours and submission of the post activity online evaluation.

The Johns Hopkins University reserves the right to cancel or postpone any activity due to unforeseen circumstances. Under such circumstances registrants will be notified as soon as possible.

LATE FEE AND REFUND POLICY
A $25 late fee applies to registrations received after 5:00 p.m. ET on December 30, 2021.

SYLLABUS
The syllabus will be accessible online and via your mobile device in the CloudCME App prior to the activity.

HOW TO OBTAIN CREDIT
Post activity, an online evaluation will be available to attendees to evaluate the activity and individual presentations and to identify future educational needs. Upon completion of the evaluation, the learner must attest to the number of hours in attendance. Credits earned will be added to the learner's transcript and immediately available for print. **The last day to access the evaluation and attest to your credits is March1**3**, 2022**

An outcome survey will be sent to all physician attendees within two months post activity to assist us in determining what impact this activity had on the learner's practice.

AMERICANS WITH DISABILITIES ACT
The Johns Hopkins School of Medicine fully complies with the legal requirements of the ADA and the rules and regulations thereof. *Please notify us if you have any special needs.*

TO REGISTER OR FOR FURTHER INFORMATION

Register Online: hopkinscme.cloud-cme.com/default.aspx?P=5&EID=38555

Register by Phone ....(410) 502-9636
Register by Fax ....(866) 510-7088
Confirmation/Certificates/Transcripts.........................(410) 502-9636
General Information ....(410) 955-2959
E-mail the Office of CME... cmenet@jhmi.edu

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CloudCME
Check out our mobile app CloudCME.
Organization Code: HopkinsCME

For website and CloudCME mobile app technical difficulties, email: cmetechsupport@jhmi.edu
For general information, please visit the activity webpage at: https://hopkinscme.cloud-cme.com/aph.aspx?P=5&EID=38555

Visit our JH-TIE website: https://jhtie.jhmi.edu/upcoming-training-sessions/

Tuesdays and Thursdays * January 4 - 27, 2022 * 4:00 - 5:30 p.m. ET

Week 1 – T-Cell Engineering and Immunometabolism

Tuesday, January 4, 2022	Thursday, January 6, 2022
Cassian Yee	Pedro Romero
Kellie N. Smith	Erika Pearce

Week 2 – Regenerative Immunology and T Cell Programming

Tuesday, January 11, 2022	Thursday, January 13, 2022
Stephen Badylak	Greg Delgoffe
Jennifer Elisseeff	Jonathan Schneck

Week 3 – Immunoengineering, Vaccine and Autoimmunity

Tuesday, January 18, 2022	Thursday, January 20, 2022
Matthias Stephan	Robert Seder
Ankur Singh	Pere Santamaria

Week 4 – Immunoengineering, Tissue Context, and Immunotherapies

Tuesday, January 25, 2022	Thursday, January 27, 2022
David Mooney	Donna Farber
Megan Sykes	John Wherry

Presentation titles and other details can be found on the JH-TIE website: https://jhtie.jhmi.edu/.
You will receive an email notification to complete the evaluation form and to attest to the number of hours in attendance. The Johns Hopkins School of Medicine takes responsibility for the content, quality and scientific integrity of this CME activity. This schedule is subject to change.

ACKNOWLEDGEMENT

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Program

Week 1: T Cell Engineering and Immunometabolism

Tuesday   1/4/2022 4:00 – 5:30 pm
Moderators: Jennifer Elisseeff, Natalie Livingston
Opening Remarks: Jennifer Elisseeff; Denis Wirtz

Cassian Yee   *The University of Texas MD Anderson Cancer Center, Department of Melanoma Medical Oncology, Division of Cancer Medicine, Department of Immunology; Solid Tumor Cell Therapy Program*
  T Cell Therapy of Cancer: The New Math

Kellie N. Smith   *Johns Hopkins University School of Medicine, Department of Oncology; Bloomberg~Kimmel Institute for Cancer Immunotherapy; Mark Center for Advanced Genomics and Imaging; Sidney Kimmel Comprehensive Cancer Center*
  Integrated multi-omics for tumor-reactive T cell profiling

Thursday   1/6/2022 4:00 – 5:30 pm
Moderators: Jonathan Schneck, Scott Wilson

Pedro Romero   *University of Lausanne, Department of Fundamental Oncology*
  Modulating antigen specific CD8 T cell differentiation for immunotherapy of cancer

Erika Pearce   *Johns Hopkins University, School of Medicine, Department of Oncology, Sidney Kimmel Comprehensive Cancer Center; Bloomberg School of Public Health, Department of Biochemistry and Molecular Biology*
  Mitochondrial shape shifting in the CD4+ T cell response

Week 2: Regenerative Immunology and T Cell Programing

Tuesday   1/11/2022 4:00 – 5:30 pm
Moderators: Hai-Quan Mao, Joseph Choy

Stephen Badylak   *University of Pittsburgh, Department of Surgery; McGowan Institute for Regenerative Medicine, Center for Pre-Clinical Tissue Engineering*
  Immunoengineering … Finally!

Jennifer Elisseeff   *Johns Hopkins University, Department of Biomedical Engineering, Translational Tissue Engineering Center*
  Immune changes with aging and implications for regenerative medicine

Thursday   1/13/2022 4:00 – 5:30 pm
Moderators: Jordan Green, Joel Sunshine

Greg Delgoffe   *University of Pittsburgh, Department of Immunology; Hillman Cancer Center*
  Metabolic reprogramming to improve T cell function

Jonathan Schneck   *Johns Hopkins University, Department of Pathology, Institute for Cell Engineering, Institute for NanoBioTechnology*
  Engineering Artificial Antigen Presenting Cells, aAPC, for Cancer Immunotherapy: From Bench to Bedside

Week 3: Immunotherapy, Vaccine, and Autoimmunity

Tuesday   1/18/2022   4:00 – 5:30 pm
Moderators: Jordan Green, Ariel Isser

Matthias Stephan   *University of Washington School of Medicine, Medical Oncology; Fred Hutchinson Cancer Research Center; University of Washington, Department of Bioengineering; The Paul G. Allen Frontiers Group*
Creating living drugs with synthetic compounds

Ankur Singh   *Georgia Institute of Technology, School of Mechanical Engineering; Georgia Institute of Technology & Emory Medicine, Department of Biomedical Engineering*
Decoding Immunity using Engineered Immune Organoids

Thursday   1/20/2022   4:00 – 5:30 pm
Moderators: Jonathan Schneck, Jamie Spangler

Robert Seder   *National Institutes of Health, National Institute of Allergy and Infectious Diseases, Vaccine Research Center, Cellular Immunology Section*
IV delivery of a nanoparticle neoantigen cancer vaccine generates effective antitumor immunity through CD8+ T cells and alteration of the tumor micro-environment

Pere Santamaria   *University of Calgary, Department of Microbiology, Immunology and Infectious Diseases, Snyder Institute for Chronic Diseases and Hotchkiss Brain Institute, Julia McFarlane Diabetes Research Centre; Institut d'Investigacions Biomèdiques August Pi i Sunyer*
In vivo re-programming of autoantigen-experienced T-follicular helper cells for the treatment of autoimmunity

Week 4: Immunoengineering, Tissue Context, and Immunotherapies

Tuesday   1/25/2022   4:00 – 5:30 pm
Moderators: Jennifer Elisseeff, Scott Wilson

David Mooney   *Harvard University, John A. Paulson School of Engineering and Applied Sciences, Wyss Institute for Biologically Inspired Engineering*
Biomaterials for T Cell Immunity

Megan Sykes   *Columbia University, Department of Microbiology & Immunology, Department of Surgical Sciences, Columbia Center for Translational Immunology*
Tracking the Human Alloresponse in Transplant Recipients

Thursday   1/27/2022   4:00 – 5:30 pm
Moderators: Hai-Quan Mao, Josh Doloff

Donna Farber   *Columbia University, Department of Microbiology & Immunology, Department of Surgical Sciences*

Localized adaptation and tissue residence of immune cells

John Wherry   *University of Pennsylvania, Department of Systems Pharmacology & Translational Therapeutics, Institute for Immunology, Abramson Cancer Center, Parker Institute for Cancer Immunotherapy*
Immunity to SARS-CoV-2 vaccination