



Mayo School of Continuous Professional Development<sup>©</sup>

**8<sup>th</sup> Mayo Clinic Symposium on  
Tumor Microenvironment and Cancer Therapeutics:**  
*Role of precision medicine and targeted therapy in clinical practice*

**December 7-9, 2018  
Sawgrass Marriott Golf Resort and Spa  
Ponte Vedra Beach, Florida**

**Director:** Debabrata Mukhopadhyay, Ph.D.  
**Co- Directors:** Asher Chanan-Khan, M.D.  
Leslie Cooper, M.D.

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## Friday, December 7, 2018

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- 7:00 a.m. Continental Breakfast and Registration
- 8:00 a.m. Section I: Welcome and Introduction**  
*Asher Chanan-Khan, M.D., Mayo Clinic Jacksonville*
- 8:10 a.m. Pre-Plenary Assessment Utilizing Audience Response  
*Dev Mukhopadhyay, Ph.D., Mayo Clinic Jacksonville*
- 8:20 a.m. Joseph Austin McCartney and Ruth McCartney Hauck Named Visiting Professorship Lecture**  
*Chair: Robert C. Smallrdige, M.D, Deputy Director, Mayo Clinic Cancer Center.*
- 8:30 a.m. *Lesson learned from anti-PD-1/PD-L1 Cancer immunotherapy*  
*Lieping Chen M.D., Ph.D., Yale University*
- 8:55 a.m. Discussion
- 9:00 a.m. Section II: Vascular biology and cell signaling**  
*Chair: Gopal Kundu, National Center for Cell Science, Pune, India*
- 9:10 a.m. *Control of vascular permeability via beta1-integrin*  
*Pipsa Saharinen, Ph.D., Wihuri Research Institute and Biomedicum, Helsinki*
- 9:30 a.m. Discussion
- 9:35 a.m. *Angiopoietin/Tie signaling: Still an attractive therapeutic target?*  
*Hellmut Augustin, Ph.D., German Cancer Research Center, Heidelberg*
- 9:55 a.m. Discussion
- 10:00 a.m. Short Talk (From Abstract)  
*Aneel Paulus, M.D., Mayo Clinic Jacksonville*
- 10:10 a.m. Discussion
- 10:15 a.m. Coffee Break**
- 10:35 a.m. Section III: Microenvironment and diseases**  
*Chair: Resham Bhattacharya, Ph.D., University of Oklahoma*
- 10:45 a.m. *The role of endothelial cilia in brain vascular patterning in vertebrates.*  
*Ramani Ramchandran, Ph.D., Medical College of Wisconsin*
- 11:05 a.m. Discussion

- 11:10 a.m. *Circulating exosomes: A novel mechanism for the ischemic heart to recruit bone marrow cells*  
Gangjian Qin, MD, The University of Alabama at Birmingham
- 11:30 a.m. Discussion
- 11:35 a.m. *Angiopellosis: a "group ticket" for cancer metastasis?*  
Ke Cheng, Ph.D. North Carolina State University
- 11:55 a.m. Discussion
- 12:00 p.m. *Time-course of metabolic and soft tissue changes in pre-diagnostic pancreatic cancer*  
Suresh Chari M.D. Mayo Clinic Rochester
- 12:20 p.m. Discussion
- 12:25 p.m. Lunch**
- 1:20 p.m. Section IV: Molecular basis of vascular diseases**  
Chair: Ying Wang, M.D., Ph.D., Mayo Clinic Jacksonville
- 1:30 p.m. *Homeostasis of endothelial cell junctions in glioblastoma*  
Arie Horowitz, Sc.D., Thomas Jefferson University
- 1:50 p.m. Discussion
- 1:55 p.m. *Blood-brain barrier and tumor-immune interfaces*  
Calvin Kuo, M.D., Ph.D., Stanford University
- 2:15 p.m. Discussion
- 2:20 p.m. *Liver Kinase B1 in Tumor Angiogenesis*  
Ming-Hui Zou, MD PhD, Georgia State University
- 2:40 p.m. Discussion
- 2:45 p.m. *Evidence for biochemical barrier restoration: Topical solenopsin analogs improve inflammation and acanthosis in the KC-Tie2 mouse model of psoriasis*  
Jack Arbiser, M.D., Ph.D., Emory University School of Medicine
- 3:05 p.m. Discussion
- 3:10 p.m. Young Investigator Award (Short Talk): (From Abstract)  
Ling Wang, M.D., Ph.D., Medical College of Wisconsin
- 3:20 p.m. Discussion
- 3:25 p.m. Coffee Break**
- 3:50 p.m. Section V: Microenvironment and Cell Signaling**  
Chair: Derek Radisky, Ph.D., Mayo Clinic Jacksonville
- 4:00 p.m. *Protein Kinase Ciota: Oncogene and Therapeutic target*  
Alan Fields, Ph.D., Mayo Clinic Jacksonville

- 4:20 p.m. Discussion
- 4:25 p.m. *Inflammatory Mediators: Potential therapeutic targets in Pancreatic Cancer*  
*S. Perwez Hussain, Ph.D., National Cancer Institute, NIH*
- 4:45 p.m. Discussion
- 4:50 p.m. KLF4 Signaling in ADM and Angiogenesis in Pancreatic Cancer  
*Keping Xie, M.D., Ph.D., MD, Arizona State University*
- 5:10 p.m. Discussion
- 5:15 p.m. *Targeting the fibrotic microenvironment of pancreatic cancer*  
*Peter Storz, Ph.D., Mayo Clinic Jacksonville*
- 5:35 p.m. Discussion
- 5:40 p.m. Section VI: Poster Sessions/Reception**

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**Saturday, December 8, 2018**

- 7:00 a.m. Continental Breakfast and Registration
- 8:00 a.m. Section VII: Tumor Microenvironment crosstalk and cancer stemness in GBM**  
*Chair: Panagiotis Z. Anastasiadis, Ph.D., Mayo Clinic Jacksonville*
- 8:10 a.m. *The critical importance of the blood tumor barrier in glioma therapy*  
*Jann Sarkaria, M.D., Mayo Clinic Rochester*
- 8:30 a.m. Discussion
- 8:35 a.m. *Reconstructing tumor vessels for cancer therapy*  
*Gabriele Bergers, Ph.D., Leuven Center for Cancer Biology, Belgium*
- 8:55 a.m. Discussion
- 9:00 a.m. *Wnt/ $\beta$ -catenin signaling in epigenetic regulation of gliomagenesis*  
*Suyun Huang, M.D. Ph.D., Virginia Commonwealth University*
- 9:20 a.m. Discussion
- 9:25 a.m. *Partners in Crime: Brain Tumor Stem Cells and the Micoenvironment*  
*Jeremy Rich, M.D., University of California San Diego*
- 9:45 a.m. Discussion
- 9:50 a.m. *"Go and Grow" in Glioblastoma*  
*Steven Rosenfeld, M.D., Ph.D. Mayo Clinic Jacksonville*
- 10:10 a.m. Discussion

**10:15 a.m. Coffee Break**

**10:40 a.m. Section VIII:**

**Mayo Clinic-Karolinska Institutet Joint Workshop on Nanotechnology in Medicine**

***Supported by: The Swedish Foundation for International Cooperation in Research and Higher Education (STINT) Grant***

***Conveners: Bengt Fadeel, M.D., Ph.D. (KI) and Dev Mukhopadhyay, Ph.D. (Mayo)***

***Chairs: Bengt Fadeel, M.D., Ph.D. and Priyabrata Mukherjee, Ph.D.***

10:45 a.m. *Theranostic nanoparticles targeting both tumor and stromal cells for the treatment of drug resistant cancer*

*Lily Yang, M.D., Ph.D., Emory University*

11:05 a.m. Discussion

11:10 a.m. *Applications of Nanosensors to Understanding Biochemical Signaling Within the Human Body*

*Michael S. Strano, Ph.D., Massachusetts Institute of Technology*

11:30 a.m. Discussion

11:35 a.m. *Probing cellular processes using engineered nanoparticles.*

*Priyabrata Mukherjee, Ph.D., University of Oklahoma*

11:55 p.m. Discussion

**12:00 p.m. Lunch**

1:00 p.m. *From Nanosafety to Nanomedicine: Focus on carbon-based nanomaterials for cancer treatment*

*Bengt Fadeel, M.D., Ph.D. Karolinska Institutet, Sweden*

1:20 p.m. Discussion

1:25 p.m. *HURying for cancer therapy*

*Rajagopal Ramesh, Ph.D. University of Oklahoma*

1:45 p.m. Discussion

1:50 p.m. *Ultrasmall particle therapies and modulation of the tumor microenvironment*

*Michelle Bradbury M.D., Ph.D., Memorial Sloan Kettering*

2:10 p.m. Discussion

2:15 p.m. *Nanoparticles in radiation oncology – the road traveled, the road ahead*

*Sunil Krishnan, M.D. Ph.D. MD Anderson Cancer Center, TX*

2:35 p.m. Discussion

2:40 p.m. *Biological nanoparticles as therapeutic agents*

- 3:00 p.m. *Tushar Patel, M.D., Mayo Clinic Jacksonville*  
Discussion
- 3:05 p.m. **Young Investigator Talk**  
*Santanu Bhattacharya, Ph.D., Mayo Clinic Jacksonville*
- 3:20 p.m. **Young Investigator Talk**  
*Georgios A. Sotiriou, Dr. Sc., Karolinska Institutet, Sweden*
- 3:35 p.m. Coffee Break**
- 4:00 p.m. Section IX: Microenvironment and disease progression**  
*Chair: Nicole R. Murray, Ph.D. Mayo Clinic Jacksonville*
- 4:10 p.m. *Unexpected contribution of lymphatic vessels to promotion of distant metastatic tumor spread*  
*Michael Detmar, M.D., Swiss Federal Institute of Technology*
- 4:30 p.m. Discussion
- 4:35 p.m. *Mechanisms of lymphangiogenesis and lymphatic valve formation.*  
*Tsutomu Kume, Ph.D., Northwestern University*
- 4:55 p.m. Discussion
- 5:00 p.m. *Is WT1 gene a tumor suppressor or oncogene?*  
*Zigang Dong, M.D., Ph.D., The Hormel Institute, University of Minnesota*
- 5:20 p.m. Discussion
- 5:30 p.m. Section X: Poster Session and Reception**
- Supported by The Swedish Foundation for International Corporation in Research and Higher Education (STINT) Grant***
- 6:30 p.m. Section XI: Travel Scholarships/Oral Presentations and Dinner**
- Supported by The Swedish Foundation for International Corporation in Research and Higher Education (STINT) Grant***
- Chairs: Tushar C. Patel, M.B., Ch.B, Mayo Clinic Jacksonville,  
Leslie Cooper M.D., Mayo Clinic Jacksonville*

Travel Award Winners  
Young Faculty Scholarship Winners

**Sunday, December 9, 2018**

7:00 a.m. Continental Breakfast and Registration

**8:00 a.m. Section XII: Precision therapy targeting microenvironment and Clinical Outcomes**

*Chair: John A. Copland, Ph.D. Mayo Clinic Jacksonville*

8:10 a.m. *Disruption of the immunosuppressive microenvironment in Mantle cell lymphoma with Bromodomain inhibitors*

*Eduardo Sotomayor M.D., George Washington Cancer Center*

8:30 a.m. Discussion

8:35 a.m. *Precision therapy of angiocrine signaling: Epigenetic mechanisms regulate inflammatory chemokine expressions in alcoholic hepatitis*

*Vijay Shah, M.D., Mayo Clinic Rochester*

8:55 a.m. Discussion

9:00 a.m. *Antibody therapy in human myeloma: hints coming from basic science*

*Fabio Malavasi, M.D., University of Torino Medical School, Italy*

9:20 a.m. Discussion

9:25 a.m. *Complimentary targeting of the PTCL epigenome and immune micro environment*

*Owen A. O'Connor, M.D. New York University Cancer Institute*

9:45 a.m. Discussion

**9:50 a.m. Coffee Break**

10:15 a.m. *Vaccines for the treatment and prevention of cancer*

*Keith L. Knutson, Ph.D. Mayo Clinic Jacksonville*

10:35 a.m. Discussion

10:40 a.m. *Notch responsive miR-322/503 cluster regulates neovascularization through HIF-1 alpha signal*

*Yao Liang Tang, MD, PhD, Augusta University*

11:00 p.m. Discussion

**11:05 a.m. Section XIII:**

***Folkman Lectureship Forum***

***New Horizon of Cancer Research: from Biomarker Discovery to Therapy***

Moderators: *Jack Arbiser, M.D., Ph.D., Emory University School of Medicine*  
*Asher Chanan-Khan, M.D., Mayo Clinic Jacksonville*



*Panel members:*

*Kenichi Takeshita, M.D. Sorrento Therapeutics, Inc.*  
*Lieping Chen M.D., Ph.D., Yale University*  
*Stephen J. Noga M.D., Ph.D. Takeda, Pharmaceuticals*  
*Suresh Chari M.D. Mayo Clinic Rochester*

**Section XIV:**

**11:45 p.m.** Post-Plenary Assessment Utilizing Audience Response  
*Dev Mukhopadhyay, Ph.D., Mayo Clinic Jacksonville*

**11:55 p.m.** **Vote of Thanks**  
*Leslie Cooper M.D., Mayo Clinic Jacksonville*

**12:00 p.m.** **Adjourn.**

**Thank you for attendance!**

### ***Course Description***

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This symposium brings together basic scientists, clinical experts and industry partners in the field of tumor microenvironment, immune therapy, anti-angiogenesis and targeted therapy. Hence, this symposium will facilitate the exchange of ideas and new scientific direction involving basic biology and pathways that eventually lead to new individualize therapy for patients. Clinician scientists will present the results of ongoing clinical trials on targeted therapy including immune therapy, anti-angiogenic therapy and others. Novel genetic and imaging methods to assess alteration of tumor microenvironment for monitoring the effectiveness of therapeutic responses in the both pre-clinical and clinical trials will be discussed. Different clinical challenges and benefits of new therapeutic avenues including cardio-oncology will be presented. Overall, it is hoped that this symposium will assist in establishing strong collaborations among leading national, international, and Mayo Clinic experts in the field.

### ***Course Learning Objectives***

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Upon conclusion of this program, participants should be able to:

- Critically assess the role of tumor microenvironment and angiogenesis in different pathological situations.
- Analyze the molecular pathways in tumor stroma formation and immune-angiogenesis crosstalk.
- Identify the importance of tumor stroma formation in cancer progression and metastasis and based on that developing targeted therapy.
- Evaluate precision therapy based on genetic knowledge as a potential target for future cancer therapy.
- Application of nanomedicine for targeted drug delivery.
- Onco-cardiology
- Cardiovascular remodeling and role of immune cells in cardiac diseases.
- Building a collaborative platform where basic scientists and clinicians can interface.

### ***Intended Audience***

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- Clinicians involved in cancer-related practice or research
- Laboratory scientists
- Translational researchers
- Industry partners
- Graduate or medical students
- Postdoctoral fellows or residents
- Others with an interest or with backgrounds in Oncology, Cell biology, immunology and cancer immune therapy, cardiovascular biology and developmental biology, myeloma, cancer, angiogenesis and related clinical trials, lymph angiogenesis, extracellular matrix, and anti-angiogenic therapy in differential tumors.

### ***Continuing Education Credit***

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### ***CME Record of Attendance***

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MCSCPD will provide electronic Record of Attendance Certificates through the website and registration system. Paper certificates will no longer be provided.

Upon conclusion of the CME activity, and completion of any required course materials, you will be able to claim credits commensurate with your participation at the CME activity.

Directions will be provided on how to claim your credit and print a certificate. A copy of the record of attendance will remain available in your personal account and can be printed at any time.

The Record of Attendance can be used for requesting credits in accordance with state licensing boards, specialty societies, or other professional associations.

### ***CME Activity Evaluation***

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The faculty and overall course CME evaluations will be provided electronically through the website and registration system.

All attendees are invited to complete a Faculty Evaluation and an overall course CME activity evaluation. Course Directors use this feedback to maintain and improve the caliber of presentations in future courses. Your input is greatly appreciated. Thank you in advance for completing the evaluations.

Directions will be provided on where to complete these evaluations.

### ***Taping of Sessions***

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Audio or visual taping by participants is not permitted.

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*Steven Rosenfeld, M.D., Ph.D.*  
*Panagiotis Anastasiadis, Ph.D.*  
*Santanu Bhattacharya, Ph.D.*  
*Alan Fields, Ph.D.,*  
*Evette Radisky, Ph.D.*

### **Guest Faculty**

Jack Arbiser, M.D., Ph.D., Emory University, School of Medicine  
Hellmut Augustin, Ph.D., German Cancer Research Center and Heidelberg University  
Resham Bhattacharya, Ph.D., University of Oklahoma  
Lieping Chen M.D., Ph.D. , Yale University  
Pipsa Saharinen, Ph.D., Wihuri Research Institute and Biomedicum, Helsinki  
Gangjian Qin, MD, The University of Alabama at Birmingham  
Ke Cheng, Ph.D. North Carolina State University  
Arie Horowitz, Sc.D., Thomas Jefferson University  
Calvin Kuo, M.D., Ph.D., Stanford University  
Ming-Hui Zou, MD PhD, Georgia State University  
S. Perwez Hussain, Ph.D., National Cancer Institute, NIH  
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Owen A. O'Connor, M.D. New York University Cancer Institute  
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Kenichi Takeshita, M.D. Sorrento Therapeutics, Inc.  
Stephen J. Noga M.D., Ph.D. Takeda, Pharmaceuticals

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Listed below are individuals with control of the content of this program who have disclosed...

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Eduardo Sotomayor M.D.	Consultant: Astra-Zeneca, Kite, Bayer, Speaker's Baureau: Pharmacyclics, Seattle Genetics and Janssen
Lieping Chen, M.D., Ph.D.	Consultant: NextCure, Vcanbio, GenomicCare, Pfizer, Tayu Grant/Research support: NextCure
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