One of Chicago’s many strengths is its rich cultural diversity. We are fortunate to live in a city where so many people from different walks of life come together.

But, with such diversity comes unique health needs and challenges. In this issue of Pathways to Discovery, we highlight the University of Chicago’s new Center for Asian Health Equity, a partnership between the University of Chicago Medicine and the Asian Health Coalition that aims to tackle health disparities in Chicago’s Asian-American communities.

The Center will address cultural, language and structural barriers that present hurdles for disease screening and care among vulnerable populations. It will also use data collected through extensive population-based research to dissect and breakdown these barriers. Dr. Karen Kim, who serves as director of our Office of Community Engagement and Cancer Disparities, will co-lead the Center, and has already conducted important research and outreach work in these target communities.

Also in this issue, we share some of the other ways in which our faculty and staff are engaging in the community and supporting partner organizations. We also highlight some of the impressive accomplishments of our faculty in the last six months, as well as the innovative, translational and clinical research advancements made within our labs. And, finally, you’ll find some examples of the important philanthropic efforts of our University of Chicago Cancer Research Foundation.

Regards,
Michelle M. Le Beau, PhD
Director, The University of Chicago Medicine Comprehensive Cancer Center; Arthur and Marian Edelstein Professor of Medicine

FROM THE DIRECTOR
Michelle M. Le Beau, PhD
Gut bacteria boost response to immunotherapy
Cancer immunotherapy has generated excitement in the cancer community recently, as drugs that alter immune pathways have demonstrated promising results, particularly in melanoma treatment. However, response to these therapies can vary dramatically from patient to patient, in part because of genetic and environmental factors that affect the immune system. There is a growing body of evidence indicating that the microbiome, the microorganisms that normally inhabit the intestinal tract, play a role in how the immune system works. The laboratory of Thomas Gajewski, MD, PhD, professor of pathology and medicine, in collaboration with Eugene Chang, MD, Martin Boyer Professor of Medicine, Maria-Luisa Alegre, MD, PhD, professor of medicine, and Lena Bahri, MD, PhD, professor of medicine, discovered that the composition of gut bacteria can actually amplify the body’s response to immunotherapy. Using a mouse model of melanoma, Gajewski’s team discovered that those enriched with a specific strain of bacteria called Bifidobacterium had a better response to anti-PD-L1 antibody immunotherapy (anti-PD-L1 antibody). Furthermore, oral administration of Bifidobacterium dramatically increased the anti-tumor immune response in the Brigham immunology system in response to anti-PD-L1 therapy. Taken together, these findings suggest that altering intestinal bacterial composition, through probiotics for example, may improve patient responses to immunotherapy. (Sivan, et al., Science 350:1084–9, 2015)

Cellular housekeeping controls breast cancer metastasis
Autophagy is a normal process by which old or damaged cellular components are degraded and recycled to maintain cell integrity and function. Previous studies have indicated that mitophagy, a specialized type of autophagy that regulates the turnover of the cell’s energy factories called mitochondria, can be both beneficial and harmful to cancer cells depending on the context and cancer type. Keymeulen, PhD, associate professor of the Ben May Department for Cancer Research, and a team including Gregory Karczmarski, PhD, professor of radiology, found that mitophagy slows down breast cancer growth and spread. Conversely, the lack of this housekeeping process makes breast tumors more aggressive. A specific protein, BNIP3, is responsible for targeting damaged mitochondria for degradation and its absence leads to the accumulation of unhealthy mitochondria within tumor cells. This triggers a series of events such that reactive oxygen species (ROS) build up, signaling an elevation in the expression of the HIF1α protein and driving tumor blood vessel growth and metastasis.

In support of these laboratory findings, triple-negative breast cancer patients whose tumors had high levels of HIF1α and low levels of BNIP3 experienced worse clinical outcomes than those patients with normal levels of BNIP3. This work not only supports the use of mitophagy as a biomarker that can predict metastasis risk, but also argues for the therapeutic potential of repairing dysfunctional mitochondria in cancer cells. (Chourasia, et al., EMBO Rep 16:1145–63, 2015)

Unique mutations underlie hereditary colorectal cancer risk in American families
Colorectal cancer incidence and mortality rates are highest in African Americans in the United States compared to other population groups, partially due to genetic factors unique to this population. A form of hereditary colorectal cancer called Lynch syndrome is caused by mutations in repair genes that encode proteins responsible for repairing damaged DNA. Sonia Kupfer, MD, assistant professor of medicine, and Olufunmilayo Olopade, MD, Walter L. Palmer Distinguished Service Professor of Medicine and Human Genetics, and colleagues compiled the largest African-American Lynch syndrome patient cohort through a collaboration between 13 United States referral centers and the Colon Cancer Family Registry. This rich dataset consisted of 51 African-American families and a total of 920 members with deleterious mutations in the Lynch syndrome genes. Analysis of these data revealed that the risk of colorectal cancer in African-American Lynch syndrome patients was similar to that of Americans of European descent. The profile of mutations observed in these patients, on the other hand, was different and even included some mutations that have not been reported before. The results of this study reinforces the importance of early testing and awareness among the African-American community for colorectal cancer risk and rare hereditary disorders like Lynch syndrome. (Guindalini et al., Gastroenterol 149:1446–53, 2015)

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MEMBER NEWS

1 David Meltzer, MD, PhD, professor of medicine, economics and the Harris School of Public Policy, was elected to membership in the National Academy of Medicine. He also serves as director of the Center for Health and the Social Sciences, chair of the Committee on Clinical and Translational Science, and director of the University of Chicago Urban Health Lab.

2 John Cunningham, MD, Donald N. Pritzker Professor and interim chair of the Department of Pediatrics at the University of Chicago, has been formally appointed chairman of the department.

3 Chuan He, PhD, John T. Wilson Distinguished Service Professor of Chemistry, Shohei Koide, PhD, professor of biochemistry and molecular biology, and Tao Pan, PhD, professor of biochemistry and molecular biology, were elected as fellows of the American Association for the Advancement of Science.

4 Samuel Volchenboum, MD, PhD, MS, was promoted from assistant to associate professor of pediatrics. Volchenboum is an expert in blood disorders and pediatric cancers, with a special interest in treating children with neuroblastoma. In addition, he is the director and associate chief research informatics officer for translational research at the Center for Research Informatics.

Raymond Moellering, PhD, assistant professor of chemistry, was awarded a V Scholar Award from the V Foundation for Cancer Research. The award will fund Moellering’s research proposal, “Synthetic DNA-binding Domains Targeting the Signature Oncogene cMYC.”

5 Maryellen Giger, PhD, A. N. Pritzker Professor of Radiology, was awarded a $2.5 million Quantitative Imaging Network grant from the National Cancer Institute. Other University of Chicago Medicine investigators on the project include Suzanne Conzen, MD, Hiroyuki Abe, MD, Gregory Karczmar, PhD, and Jeffrey Mueller, MD.

6 David Song, MD, MBA, Cynthia Chow Professor of Surgery, was elected president of The American Society of Plastic Surgeons (ASPS). His appointment was announced at the society’s October conference “Plastic Surgery: The Meeting.” The ASPS is the largest plastic surgery specialty organization in the world and represents the majority of all board-certified plastic surgeons in the United States.

ACS Making Strides Against Breast Cancer 5K Walk

UChicago Physician and Lymphoma Survivor Gives Back

Steven Montner, MD, associate professor of radiology, survived mantle cell lymphoma under the care of Justin Kline, MD, assistant professor of medicine. Experiencing the hospital from the patient’s point of view made him want to give back, and now he volunteers his time to help others battling the disease. Read more on the Science Life blog: http://sciencelife.uchospitals.edu/2015/09/16/uchicago-physician-and-lymphoma-survivor-gives-back/

Patient’s $3.5M Gift Creates Endowed Professorship for Leukemia Research at UChicago

Wendy Stock, MD, professor of medicine and director of the Leukemia Program (left), was the recipient of the Anjuli Seth Nayak Endowed Professorship in Leukemia through a generous $3.5 million donation by her former patient Anjuli Nayak, MD (right), a renowned allergist and immunologist, who received cancer treatment at the University of Chicago Medicine.

Geoffrey Greene, PhD, Virginia and D.K. Ludwig Professor, and Suzanne Conzen, MD, professor of medicine, joined a Comprehensive Cancer Center team at the American Cancer Society’s Making Strides Against Breast Cancer 5K walk on October 24.

Students Gain Research Experience Through Summer Programs

The Comprehensive Cancer Center is committed to training the cancer researchers and physicians of tomorrow. A team led by M. Eileen Dolan, PhD, professor of medicine and associate director for education, expanded the Continuing Umbrella of Research Experience (CURE) Program for high school and college students from underrepresented populations and started a new multi-institutional summer cancer research program for high school students called researchStart. Students presented their research findings to colleagues, mentors and other faculty at a symposium in August. Read more on the Science Life blog: http://sciencelife.uchospitals.edu/2015/09/24/gift-provides-a-start-in-cancer-research-for-illinois-brightest-high-school-students/
**2015 Grand Auction**

On November 14, The University of Chicago Cancer Research Foundation Women’s Board together with Hartmann’s of Copenhagen and Ralph Lauren hosted the 49th Annual Grand Auction Gala “The Breakthrough Ball” at the Four Seasons Hotel, Chicago. More than $1,125,000 was raised for the continued support of cancer research at the University of Chicago Medicine Comprehensive Cancer Center.

“The Breakthrough Ball” paid special tribute to the Ralph Lauren Corporation with the Partners in Discovery Award for their extreme generosity and commitment to the Comprehensive Cancer Center. Guests joined forces in helping support cancer research by bidding on silent and live auction items including exquisite diamond earrings from luxury jeweler, Hartmann’s; a shopping spree paired with tickets to attend the Ralph Lauren 2016 Fall Runway Show; along with other luxurious travel getaways and fine wine. The celebration continued as guests danced the night away to the melodies of the Becca Kauffman Orchestra.

To see photos from the event visit: [https://figphoto.pass.us/cancerball2015/](https://figphoto.pass.us/cancerball2015/)

**SAVE THE DATES!**

The University of Chicago Cancer Research Foundation presents a list of upcoming fundraising events:

**AUXILIARY BOARD**

- **All in for the Cure**
  - Saturday, March 12, 2016
  - Michigan Shores Club
  - Wilmette, IL

**ASSOCIATES BOARD**

- **Fund the Fight**
  - Saturday, April 16, 2016
  - Moonlight Studios
  - Chicago, IL

**WOMEN’S BOARD**

- **50th Annual Grand Auction**
  - Saturday, November 12, 2016
  - The Four Seasons Hotel
  - Chicago, IL

**FOR MORE INFORMATION:**

Please contact kcoady@bsd.uchicago.edu.