Biochemistry and Molecular Genetics

Chair Newsletter
Fall 2021

Northwestern Medicine®
Feinberg School of Medicine

Fall 2021

CONTENTS

ON THE COVER.
Nucleosome and DNA.
Cover design by Brianna Monroe, MS.

Northwestern University
Biochemistry & Molecular Genetics

LETTER FROM THE CHAIR

"Above all, don't fear difficult moments. The best comes from them."
-Rita Levi-Montalcini
1986 Nobel Prize

Rita Levi-Montalcini won the 1986 Nobel Prize in Physiology or Medicine jointly with colleague Stanley Cohen for the discovery of nerve growth factor.

Need I say more? Dr. Levi-Montalcini, in her quote above, reminds us not to shrink from difficult moments but to use them to grow stronger, and in academics, that can be related to improving professional communication, redesigning experiments, reaching out for help or new collaborations to address roadblocks, or the sometimes long and daunting experience of writing grants repeatedly until one is successful. Winston Churchill's words may be cliché, but they still ring true, "Never give up, never give up, never give up." As you will see here in the BMG Fall 2021 Newsletter, despite the challenges that continue to linger from 2020, the department continues to grow and to contribute significantly to our fields. We have welcomed four brilliant new faculty members, several faculty members have received generous grants, and published their notable work. Please take time to welcome the new BMG members and congratulate those on their recent accomplishments. I also wish to thank those of you who were able to join us at the Fall Retreat and especially those who presented. We are a growing and thriving department and each of your individual successes contribute to this success.

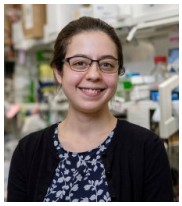
Ali Shilatifard
Professor and Chairman

Below please find many of the great accomplishments of our BMG colleagues from the past 8 months.

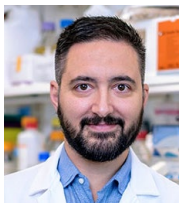
THE DEPARTMENT OF BIOCHEMISTRY AND MOLECULAR GENETICS FALL 2021

DEPARTMENT NEWS

We would like to extend our thanks and congratulations to the following BMG members who are moving on in their careers:



Ann Hogan, *PhD*- Foltz Lab
successfully defended her dissertation.

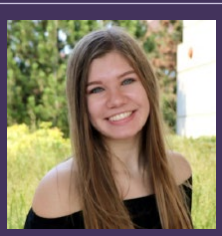


Andrea Piunti, *Postdoctoral Fellow*- Shilatifard Lab
has accepted a tenure track faculty position as an Assistant Professor at University of Chicago.

NEW HIRES

Eichner Lab

CAROLINE MCGUIRE
Research Technician



AMBRYN MEEHAN
Temp

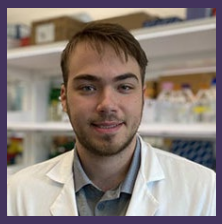
Foltz Lab

TIM DON MAGNO LOPEZ
Research Technician

PRANATHI VADLAMANI
DGP Graduate Student

Shilatifard Lab

SHEETAL GANESAN
Research Technician



BEN HOWARD
Research Technician

ERIN MCLAUGHLIN
Administrative Assistant

JACOB ZEIDNER
Research Technician

Singer Lab

CARLA REYES FLORES
DGP Graduate Student

Yue Lab

ZOE CHEN
Intern (MS in Biostatistics Student)

NEW FACULTY HIRES

DR. LILLIAN EICHNER

Assistant Professor of Biochemistry and Molecular Genetics

DR. RULI GAO

Assistant Professor of Biochemistry and Molecular Genetics

DR. SHANA KELLEY

Professor of Biomedical Engineering and Chemistry

DR. SHANNON LAUBERTH

Associate Professor of Biochemistry and Molecular Genetics

GRANTS AND AWARDS

Issam Ben-Sahra, *Assistant Professor*- Ben-Sahra Lab
has been awarded a NIH R01 grant for the "Control of RNA methylation by growth signals through the mTORC1 pathway"

Nav Chandel, *Professor of Medicine*- Chandel Lab
recognized as a highly cited researcher in 2021 by Clarivate. Recognized for exceptional research influence, demonstrated by the production of multiple highly-cited papers that rank in the top 1% by citations for field and year in the Web of Science

Jay Daniels, *G3 MD/PhD Student*- Choi Lab
receives the Ruth L. Kirschstein National Research Service Award (NRSA) F30 grant

Dan Foltz, *Associate Professor*- Foltz Lab
has been awarded the R01GM143638 grant Titled: "Histone chaperone networks for new and evicted histones" Issam Ben-Sahra, CoI

Pranathi Vadlamani, *DGP Graduate Student*- Foltz Lab
appointed to the Cell and Molecular Basis of Disease Training Grant

Elizabeth McNally, *Professor of Medicine*- McNally Lab
Elected to the National Academy of Medicine

Marc Mendillo, *Assistant Professor*- Mendillo Lab
has received the Department of Defense (DoD) Breast Cancer Research Program (BCRP) Breakthrough Award: "Leveraging Systematic Chemical-Genetic Profiling as a Path to Expand Precision Medicine in Breast Cancer"

David Amici, *G2 MD/PhD Student*- Mendillo Lab
has been awarded the NCI Ruth L. Kirchstein National Research service F30 grant

Luisa Morales-Nebreda, *Postdoctoral Fellow (now Instructor of Medicine)*- Mendillo Lab
has been awarded the K08 grant entitled "Mechanisms of regulatory T-cell mediated endothelial repair following viral pneumonia in aged hosts"

Ben Singer, *Assistant Professor*- Singer Lab
named the Lawrence Hicks Professor of Pulmonary Medicine

Ben Singer, *Assistant Professor*- Singer Lab
as Project Leader of Project 4, entitled "Epigenetic modifiers of regulatory T cell function following viral pneumonia has been awarded in their division's new P01 award from NHLBI, entitled "Mechanisms of recovery from viral pneumonia"

GRANTS AND AWARDS, CONT.

Feng Yue, *Associate Professor*- Yue Lab
has been awarded the WashU-Northwestern Genomic Variation and Function Data and Administrative Coordinating Center (MPI with Dr. Ting Wang from Washington University), 2021 NATIONAL HUMAN GENOME RESEARCH INSTITUTE, $1,010,610

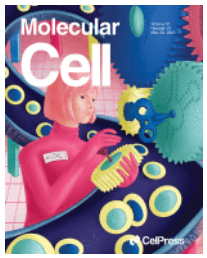
Feng Yue, *Associate Professor*- Yue Lab
will be serving as the co-chair for the Steering Committee of the IGVF consortium. In total, NIH awarded $185 million to 30 institutes to study how genetic variants can cause different types of human diseases

Feng Yue, *Associate Professor*- Yue Lab
has been appointed as a charter member for the NIH Genomics, Computational Biology and Technology Study Section for a three-years term

Feng Yue, *Associate Professor*- Yue Lab
Duane and Susan Burnham Professor of Molecular Medicine honored at Investiture Ceremony.

PUBLICATIONS

BEN-SAHRA LABORATORY



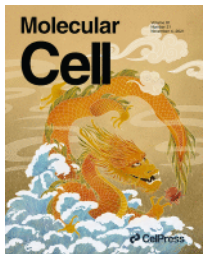
Villa E, Sahu U, O'Hara BP, Ali ES, Helmin KA, Asara JM, Gao P, Singer BD, Ben-Sahra I

mTORC1 stimulates cell growth through SAM synthesis and m6A mRNA-dependent control of protein synthesis

This article is feature on the cover of the journal

Molecular Cell, 05/2021 Read more

KELLEHER LABORATORY

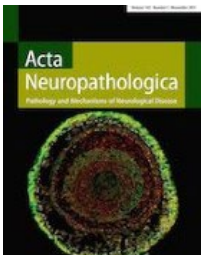


Aoi Y, Takahashi YH, Shah AP, Iwanaszko M, Rendleman EJ, Khan NH, Cho BK, Goo YA, Ganesan S, Kelleher NL, Shilatifard A

SPT5 stabilization of promoter-proximal RNA polymerase II

Molecular Cell, 11/2021 Read more

MENDILLO LABORATORY



Amici DR, Pinal-Fernandez I, Christopher-Stine L, Mammen AL, Mendillo ML

A network of core and subtype-specific gene expression programs in myositis

Acta Neuropathol, 11/2021 Read more

SHILATIFARD LABORATORY

Morgan MA, Popova IK, Vaidya A, Burg JM, Marunde MR, Rendleman EJ, Dumar ZJ, Watson R, Meiners MJ, Howard SA, Khalatyan N, Vaughan RM, Rothbart SB, Keogh MC, Shilatifard A

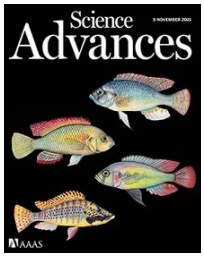
A trivalent nucleosome interaction by PHIP/BRWD2 is disrupted in neurodevelopmental disorders and cancer

Genes & Development, Accepted 11/2021 Read more

Hogan AK, Sathyan KM, Willis AB, Khurana S, Srivastava S, Zasadzińska E, Lee AS, Bailey AO, Gaynes MN, Huang J, Bodner J, Rosencrance CD, Wong KA, Morgan MA, Eagen KP, Shilatifard A, Foltz DR

UBR7 acts as a histone chaperone for post-nucleosomal histone H3

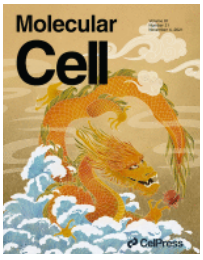
The EMBO Journal, 11/2021 Read more



Dasilva LF, Blumenthal E, Beckedorff F, Cingaram PR, Gomes Dos Santos H, Edupuganti RR, Zhang A, Dokaneheifard S, Aoi Y, Yue J, Kirstein N, Tayari MM, Shilatifard A, Shiekhattar R

Integrator enforces the fidelity of transcriptional termination at protein-coding genes

Science Advances, 11/2021 Read more



Aoi Y, Takahashi YH, Shah AP, Iwanaszko M, Rendleman EJ, Khan NH, Cho BK, Goo YA, Ganesan S, Kelleher NL, Shilatifard A

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Molecular Cell, 11/2021 Read more

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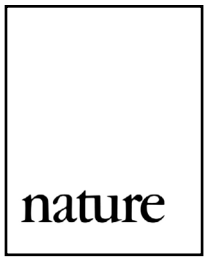


Pascual G, Domínguez D, Elosúa-Bayes M, Beckedorff F, Laudanna C, Bigas C, Douillet D, Greco C, Symeonidi A, Hernández I, Gil SR, Prats N, Bescós C, Shiekhattar R, Amit M, Heyn H, Shilatifard A, Benitah SA

Dietary palmitic acid promotes a prometastatic memory via Schwann cells

Nature, 11/2021

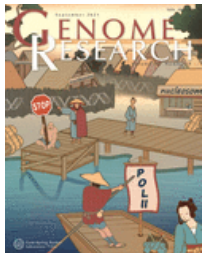
Read more

Gonzalez-Buendia E, Zhao J, Wang L, Mukherjee S, Zhang D, Arrieta VA, Feldstein E, Kane JR, Kang SJ, Lee-Chang C, Mahajan A, Chen L, Realubit R, Karan C, Magnuson L, Horbinski C, Marshall SA, Sarkaria JN, Mohyeldin A, Nakano I, Bansal M, James CD, Brat DJ, Ahmed A, Canoll P, Rabadan R, Shilatifard A, Sonabend AM

TOP2B Enzymatic Activity on Promoters and Introns Modulates Multiple Oncogenes in Human Gliomas

Clinical Cancer Research, 10/2021

Read more



Lai WKM, Mariani L, Rothschild G, Smith ER, Venters BJ, Blanda TR, Kuntala PK, Bocklund K, Mairose J, Dweikat SN, Mistretta K, Rossi MJ, James D, Anderson JT, Phanor SK, Zhang W, Zhao Z, Shah AP, Novitzky K, McAnarney E, Keogh MC, Shilatifard A, Basu U, Bulyk ML, Pugh BF.

A ChIP-exo screen of 887 Protein Capture Reagents Program transcription factor antibodies in human cells

Genome Research, 09/2021

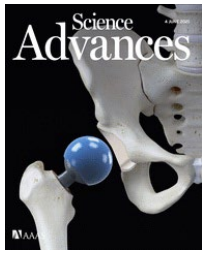
Read more

Katagi H, Takata N, Aoi Y, Zhang Y, Rendleman EJ, Blyth GT, Eckerdt FD, Tomita Y, Sasaki T, Saratsis AM, Kondo A, Goldman S, Becher OJ, Smith E, Zou L, Shilatifard A, Hashizume R

Therapeutic targeting of transcriptional elongation in diffuse intrinsic pontine glioma

Neuro-Oncology, 08/2021

Read more



Wang J, Huang TY, Hou Y, Bartom E, Lu X, Shilatifard A, Yue F, Saratsis A

Epigenomic landscape and 3D genome structure in pediatric high-grade glioma

Science Advances, 06/2021

Read more

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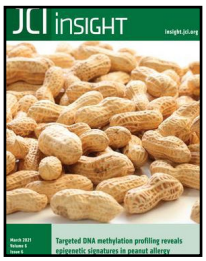

Kurihara C, Lecuona E, Wu Q, Yang W, Núñez-Santana FL, Akbarpour M, Liu X, Ren Z, Li W, Querrey M, Ravi S, Anderson ML, Cerier E, Sun H, Kelly ME, Abdala-Valencia H, Shilatifard A, Mohanakumar T, Budinger GRS, Kreisel D, Bharat A

Crosstalk between nonclassical monocytes and alveolar macrophages mediates transplant ischemia-reperfusion injury through classical monocyte recruitment

JCI Insight, 03/2021

Read more

Forte E, Ayaloglu Butun F, Marinaccio C, Schipma MJ, Piunti A, Schroeder MW, Kandpal M, Shilatifard A, Abecassis M, Hummel M

Epigenetic reprogramming of host and viral genes by Human Cytomegalovirus infection in Kasumi-3 myeloid progenitor cells at early times post-infection

J Virology, 03/2021

Read more

SINGER LABORATORY

Koch CM, Prigge AD, Anekalla KR, Shukla A, Do Umehara HC, Setar L, Chavez J, Abdala-Valencia H, Politanska Y, Markov NS, Hahn GR, Heald-Sargent T, Sanchez-Pinto LN, Muller WJ, Singer BD, Misharin AV, Ridge KM, Coates BM

Age-related Differences in the Nasal Mucosal Immune Response to SARS-CoV-2

American Journal of Respiratory Cell and Molecular Biology, 11/2021

Read more

Pickens CO, Gao CA, Cuttica MJ, Smith SB, Pesce LL, Grant RA, Kang M, Morales-Nebreda L, Bavishi AA, Arnold JM, Pawlowski A, Qi C, Budinger GRS, Singer BD, Wunderink RG; NU COVID Investigators

Bacterial Superinfection Pneumonia in Patients Mechanically Ventilated for COVID-19 Pneumonia

American Journal of Respiratory and Critical Care Medicine, 10/2021

Read more

Zhao Z, Szczepanski AP, Tsuboyama N, Abdala-Valencia H, Goo YA, Singer BD, Bartom ET, Yue F, Wang L

PAX9 Determines Epigenetic State Transition and Cell Fate in Cancer

Cancer Research, 09/2021

Read more

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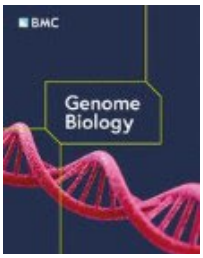

Alser M, Rotman J, Deshpande D, Taraszka K, Shi H, Baykal PI, Yang HT, Xue V, Knyazev S, Singer BD, Balliu B, Koslicki D, Skums P, Zelikovsky A, Alkan C, Mutlu O, Mangul S

Technology dictates algorithms: recent developments in read alignment

Genome Biology, 08/2021 Read more

Budinger GRS, Misharin AV, Ridge KM, Singer BD, Wunderink RG

Distinctive features of severe SARS-CoV-2 pneumonia

Journal of Clinical Investigation, 07/2021 Read more

Chotirmall SH, Leither LM, Çoruh B, Chan LLY, Joudi AM, Brown SM, Singer BD, Seam N

Update in COVID-19 2020

American Journal of Respiratory and Critical Care Medicine, 06/2021 Read more

Villa E, Sahu U, O'Hara BP, Ali ES, Helmin KA, Asara JM, Gao P, Singer BD, Ben-Sahra I

mTORC1 stimulates cell growth through SAM synthesis and m6A mRNA-dependent control of protein synthesis

This article is feature on the cover of the journal

Molecular Cell, 05/2021 Read more

WANG LABORATORY

Gonzalez-Buendia E, Zhao J, Wang L, Mukherjee S, Zhang D, Arrieta VA, Feldstein E, Kane JR, Kang SJ, Lee-Chang C, Mahajan A, Chen L, Realubit R, Karan C, Magnuson L, Horbinski C, Marshall SA, Sarkaria JN, Mohyeldin A, Nakano I, Bansal M, James CD, Brat DJ, Ahmed A, Canoll P, Rabadan R, Shilatifard A, Sonabend AM

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Clinical Cancer Research, 10/2021 Read more

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PAX9 Determines Epigenetic State Transition and Cell Fate in Cancer

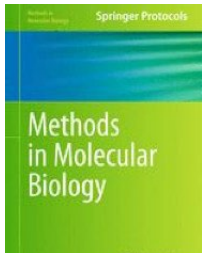
Cancer Research, 09/2021 Read more

Wang L, Birch NW, Zhao Z, Nestler CM, Kazmer A, Shilati A, Blake A, Ozark PA, Rendleman EJ, Zha D, Ryan CA, Morgan MA, Shilatifard A

Epigenetic targeted therapy of stabilized BAP1 in ASXL1 gain-of-function mutated leukemia

Nature Cancer, 05/2021 Read more

YUE LABORATORY



Song F, Xu J, Dixon J, Yue F

Analysis of Hi-C Data for Discovery of Structural Variations in Cancer

Print: Methods Molecular Biology, 2022 *Online: 08/2021* Read more

Zhang H, Song L, Wang X, Cheng H, Wang C, Meyer CA, Liu T, Tang M, Aluru S, Yue F, Liu XS, Li H

Fast alignment and preprocessing of chromatin profiles with Chromap

Nature Communications, 11/2021 Read more

Zhao Z, Szczepanski AP, Tsuboyama N, Abdala-Valencia H, Goo YA, Singer BD, Bartom ET, Yue F, Wang L

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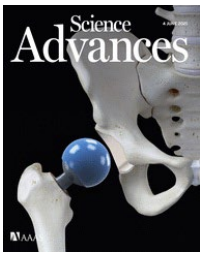
YUE LABORATORY



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Epigenomic landscape and 3D genome structure in pediatric high-grade glioma

Science Advances, 06/2021

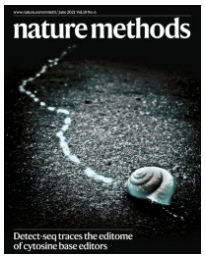
Read more

Strom AR, Biggs RJ, Banigan EJ, Wang X, Chiu K, Herman C, Collado J, Yue F, Ritland Politz JC, Tait LJ, Scalzo D, Telling A, Groudine M, Brangwynne CP, Marko JF, Stephens AD

HP1α is a chromatin crosslinker that controls nuclear and mitotic chromosome mechanics

Elife, 06/2021

Read more



Wang X, Xu J, Zhang B, Hou Y, Song F, Lyu H, Yue F

Genome-wide detection of enhancer-hijacking events from chromatin interaction data in rearranged genomes

Nature Methods, 06/2021

Read more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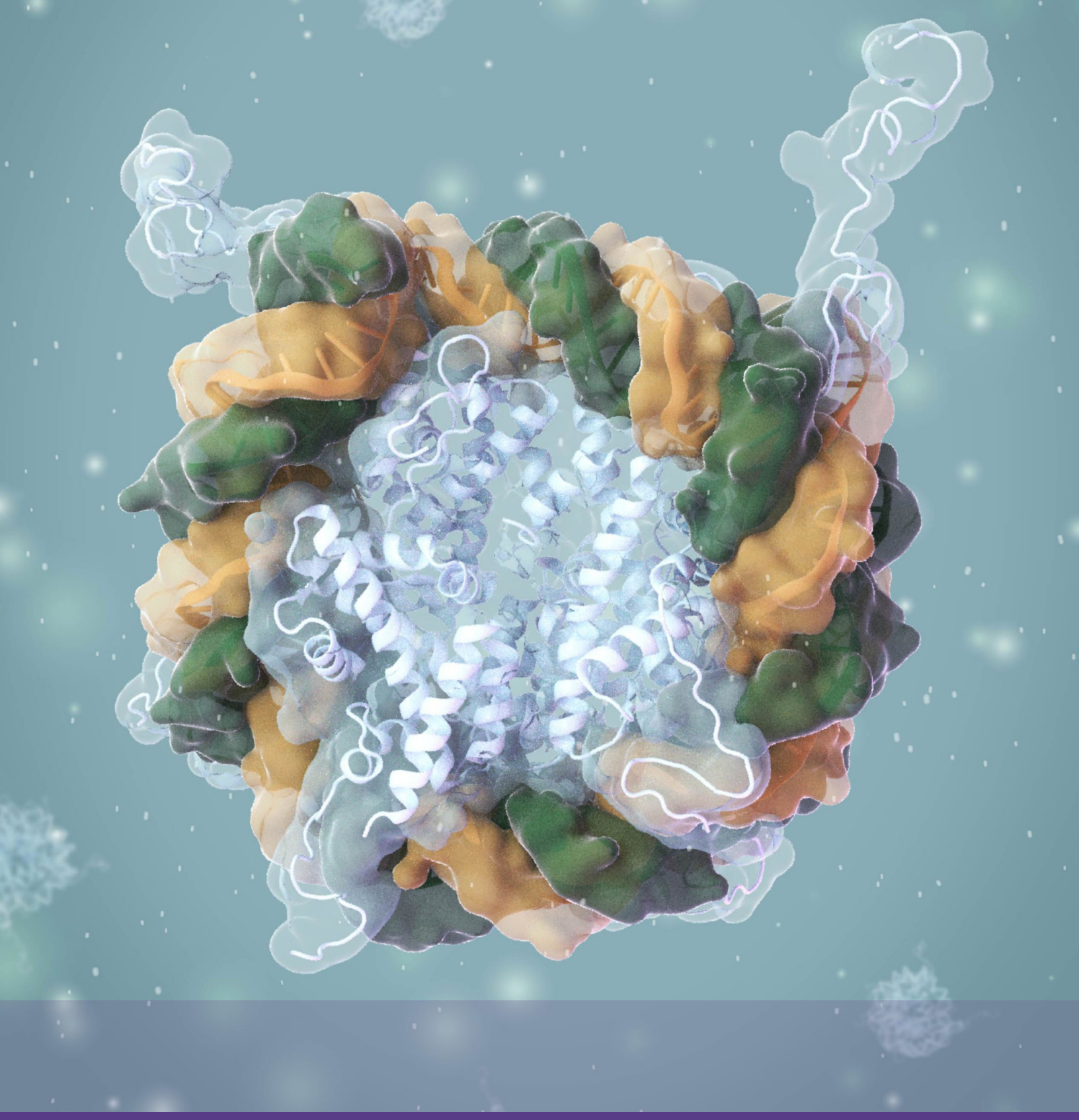
BMG Retreat 2021

BMG Holiday Luncheon



Department of Biochemistry and Molecular Genetics

Simpson Querrey Biomedical Research Center

303 East Superior Street
Simpson Querrey, 7th Floor
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