ON THE COVER. A close-up view of a chromosome with histones and DNA. Cover designed and created by Brianna Monroe, MS and Nicole Ethen, MS

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LETTER FROM THE CHAIR

“Scientific research is one of the most exciting and rewarding of occupations.”

-Fredrick Sanger

Welcome to Spring of 2021! There are moments during the deep-freeze of the quiet COVID winter when one could hardly imagine a warm breeze or the brown, brittle trees ever producing green leaves again, but they do, and they are right now. Spring always comes. Life pushes through. And it is in this simple, yet utterly mystifying power of biology that many of us were first intrigued and inspired to pursue a life in science and of discovery questioning why and how.

Fredrick Sanger, two-time Nobel Prize winner, ignited the field of biochemistry, molecular biology, and modern medicine as we know it when he was the first person to obtain protein, RNA and DNA sequences. Sanger won his first Nobel Prize in 1958 for his pioneering work on the structure and sequencing of protein and his second one in 1980 for the introduction of “dideoxy” chain-termination and the marvel of DNA sequencing. Without these two fundamental biochemical discoveries, we would not be where we are today. Sanger is said to have wanted to be a problem solver, I am sure he never imagined that his work and the work of many biochemists before and after him would be the springboard for the world to develop the critically important recombinant vaccine technology towards SARS-CoV-2. I wrote an Editorial about the impact of biochemistry in the time of corona about a year ago in May of 2020 (https://advances.sciencemag.org/content/6/23/eabc2800) which describes many of such findings and how they have and will save the world.

So, as you spend countless hours coming to the lab, sometimes seven days a week and working very hard towards the “why” and “how” questions you are trying to address, remember Sanger’s words that biochemistry and molecular genetics is indeed very exciting. You never know how your work may one day save the world as the work of many biochemists before you did today.

Below please find many of the great accomplishments of our BMG colleagues from the past 6 months.
GRANTS AND AWARDS

Feng Yue, Associate Professor – Yue Lab
Received an 8% score on an R01 grant from NHGRI: Computational methods to identify neo-TADs and enhancer-hijacking in rearranged genomes

Dan Foltz, Associate Professor – Foltz Lab
Received an NIH – The Common Fund 4D Nucleome grant in collaboration with Dr. Paul Kaufmann and Dr. Sui Huang
Title: “The role of the nucleolus in human genome organization in normal and disease states.”

Dan Foltz, Associate Professor – Foltz Lab
Issam Ben-Sahra, Co-PI – Ben-Sahra Lab
Received a 2% score on a new R01 grant at NIGMS
Title: Histone chaperone networks for new and evicted histones.

David Amici, Postdoctoral Fellow – Mendillo Lab
Awarded an NIH F30 (1F30CA264513-01): Elucidating the role of C16orf72 in the cellular stress response network

Roger Smith, MSTP Student - Mendillo Lab
Awarded as an ARCS Foundation Scholar (Achievement Rewards for College Scientists)

Marc Mendillo, Assistant Professor – Mendillo Lab
Received an ACS-IRG: C16orf72: Coordinates Stress Response Systems to Promote the Stress Resilience of Cancer

Marc Mendillo, Assistant Professor - Mendillo Lab
with co-PIs Dan Foltz, Associate Professor and Dileep Varma, Assistant Professor
Received an H Foundation Collaboration Award:
Identification of novel stress response pathways in cancer

DEPARTMENTAL NEWS

Sonia Brockway (PhD DGP) – Mendillo Lab
Quantitative and Multiplexed Chemical-Genetic Phenotyping Reveals the Architecture of the Proteostasis Network in Breast Cancer

Read more
NEW BMG MEMBERS

Li Lab

BRANDON CHO
Research Technician

Shilatifard Lab

ZACH DUMAR
Research Technician

BRIANNA MONROE
Medical Illustrator/Animator

Wang Lab

NATSUMI TSUBOYAMA
Research Technician
Visiting PhD student from University of Tokyo
PUBLICATIONS

**BEN-SAHRA LABORATORY**

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

Elodie Villa, Umakant Sahu, Brendan P. O’Hara, Eunus S. Ali, Kathryn A. Helmin, John M. Asara, Peng Gao, Benjamin D. Singer, Issam Ben-Sahra

Molecular Cell, 03/2021  
[Read more](#)

**NOTCH1-driven UBR7 stimulates nucleotide biosynthesis to promote T cell acute lymphoblastic leukemia.**


In collaboration with Issam Ben-Sahra, Assistant Professor and Panos Ntziachristos, Assistant Professor

Science Advances, 01/2021  
[Read more](#)

**FOLTZ LABORATORY**

**CENP-A overexpression promotes aneuploidy with karyotypic heterogeneity**


Journal of Cell Biology, 04/2021  
[Read more](#)

**NOTCH1-driven UBR7 stimulates nucleotide biosynthesis to promote T cell acute lymphoblastic leukemia.**


In collaboration with Issam Ben-Sahra, Assistant Professor and Panos Ntziachristos, Assistant Professor

Science Advances, 01/2021  
[Read more](#)

**KELLEHER LABORATORY**

**Decoding the protein composition of whole nucleosomes with Nuc-MS**


Nature Methods, 03/2021  
[Read more](#)  
[Video](#)
PUBLICATIONS, CONTINUED

LI LABORATORY

Elucidating the regulatory mechanism of Swi1 prion in global transcription and stress responses.
Du Z, Regan J, Bartom E, Wu WS, Zhang L, Goncharoff DK, Li L

Science Reports, 12/2020

Read more

MEEKS LABORATORY

Subtype-associated epigenomic landscape and 3D genome structure in bladder cancer
Tejaswi Iyyanki, Baozhen Zhang, Qixuan Wang, Ye Hou, Qiushi Jin, Jie Xu, Hongbo Yang, Tingting Liu, Xiaotao Wang, Fan Song, Yu Luan, Hironobu Yamashita, Ruby Chien, Huijue Lyu, Lijun Zhang, Lu Wang, Joshua Warrick, Jay D. Raman, Joshua J. Meeks, David J. DeGraff & Feng Yue

Genome Biology, 04/2021

Read more

MENDILLO LABORATORY

FIREWORKS: a bottom-up approach to integrative coessentiality network analysis.
Amici DR, Jackson JM, Truica MI, Smith RS, Abdulkadir SA, Mendillo ML.

Life Sciences Alliance, 12/2020

Read more

Quantitative and multiplexed chemical-genetic phenotyping in mammalian cells with QMAP-Seq.

Nature Communications, 11/2020

Read more

NZTIACHRISTOS LABORATORY

NOTCH1-driven UBR7 stimulates nucleotide biosynthesis to promote T cell acute lymphoblastic leukemia.

In collaboration with Issam Ben-Sahra, Assistant Professor and Panos Ntziachristos, Assistant Professor

Science Advances, 01/2021

Read more
Decoding the protein composition of whole nucleosomes with Nuc-MS
Nature Methods, 03/2021  
Read more

The roles of Polycomb repressive complexes in mammalian development and cancer.
Piunti A, Shilatifard A.
Nature Reviews Molecular and Cellular Biology, 03/2021  
Read more

Acute perturbation strategies in interrogating RNA polymerase II elongation factor function in gene expression.
Genes and Development, 02/2021  
Read more

Circuits between infected macrophages and T cells in SARS-CoV-2 pneumonia
Nature, 02/2021  
Read more

COMPASS and SWI/SNF complexes in development and disease.
Cenik BK, Shilatifard A.
Nature Reviews Genetics, 01/2021  
Read more
SHILATIFARD LABORATORY

Therapeutic targeting of transcriptional elongation in diffuse intrinsic pontine glioma

Neuro-oncology, 01/2021
Read more

Lung transplantation for patients with severe COVID-19

Science Translational Medicine, 12/2020
Read more

Reevaluating the roles of histone-modifying enzymes and their associated chromatin modifications in transcriptional regulation.
Morgan MAJ, Shilatifard A.

This article is featured on the cover of the journal
Nature Genetics, 12/2020
Read more

DOT1L-controlled cell-fate determination and transcription elongation are independent of H3K79 methylation.

Proceedings of the National Academy of Sciences, 11/2020
Read more

Shilatifard A.

Science Advances, 07/2020
Read more
PUBLICATIONS, CONTINUED

SHILATIFARD LABORATORY

The Human Integrator Complex Facilitates Transcriptional Elongation by Endonucleolytic Cleavage of Nascent Transcripts
Felipe Beckedorff, Ezra Blumenthal, Lucas Ferreira daSilva, Yuki Aoi, Pradeep Reddy Cingaram, Jingyin Yue, Anda Zhang, Sadat Dokaneheifard, Monica Guiselle Valencia, Gabriel Gaidosh, Ali Shilatifard, Ramin Shiekhattar

Cell Reports, 07/2020  
Read more

WANG LABORATORY

Subtype-associated epigenomic landscape and 3D genome structure in bladder cancer
Tejaswi Iyyanki, Baozhen Zhang, Qixuan Wang, Ye Hou, Qiushi Jin, Jie Xu, Hongbo Yang, Tingting Liu, Xiaotao Wang, Fan Song, Yu Luan, Hironobu Yamashita, Ruby Chien, Huijue Lyu, Lijun Zhang, Lu Wang, Joshua Warrick, Jay D. Raman, Joshua J. Meeks, David J. DeGraff & Feng Yue

Genome Biology, 04/2021  
Read more

A PRC2-independent function for EZH2 in regulating rRNA 2′-O methylation and IRES-dependent translation
Yang Yi, Yanqiang Li, Qingshu Meng, Qiaqia Li, Fuxi Li, Bing Lu, Jiangchuan Shen, Ladan Fazli, Dongyu Zhao, Chao Li, Weihua Jiang, Rui Wang, Qipeng Liu, Aileen Szczepanski, Qianru Li, Wei Qin, Adam B. Weiner, Tamara L. Lotan, Zhe Ji, Sundeep Kalantry, Lu Wang, Edward M. Schaeffer, Hengyao Niu, Xuesen Dong, Wei Zhao, Kaifu Chen & Qi Cao

Nature Cell Biology, 04/2021  
Read more

Emerging multifaceted roles of BAP1 complexes in biological processes
Aileen Patricia Szczepanski & Lu Wang

Cell Death Discovery, 01/2021  
Read more

DOT1L-controlled cell-fate determination and transcription elongation are independent of H3K79 methylation.

Proceedings of the National Academy of Sciences, 11/2020  
Read more
WANG LABORATORY

A small UTX stabilization domain of Trr is conserved within mammalian MLL3-4/COMPASS and is sufficient to rescue loss of viability in null animals.


Genes & Development, 10/2020

YUE LABORATORY

Subtype-associated epigenomic landscape and 3D genome structure in bladder cancer

Tejaswi Iyyanki, Baozhen Zhang, Qixuan Wang, Ye Hou, Qiushi Jin, Jie Xu, Hongbo Yang, Tingting Liu, Xiaotao Wang, Fan Song, Yu Luan, Hironobu Yamashita, Ruby Chien, Huijue Lyu, Lijun Zhang, Lu Wang, Joshua Warrick, Jay D. Raman, Joshua J. Meeks, David J. DeGraff & Feng Yue

Genome Biology, 04/2021

Dual targeting of MTOR as a novel therapeutic approach for high-risk B-cell acute lymphoblastic leukemia

Zheng Ge, Chunhua Song, Yali Ding, Bi-Hua Tan, Dhimant Desai, Arati Sharma, Raghavendra Gowda, Feng Yue, Suming Huang, Vladimir Spiegelman, Jonathon L. Payne, Mark E. Reeves, Soumya Iyer, Pavan Kumar Dhanyamraj, Yuka Imamura, Daniel Bogush, Yevgeniya Bamme, Yiping Yang, Mario Soliman, Shriya Kane, Elanora Dovat, Joseph Schramm, Tommy Hu, Mary McGrath, Zissis C. Chroneos, Kimberly J. Payne, Chandrika Gowda & Sinisa Dovat

Leukemia, 02/2021

Increased Incidence of IKZF1 deletions and IGH-CRLF2 translocations in B-ALL of Hispanic/Latino children-a novel health disparity


Leukemia, 02/2021

A map of cis-regulatory elements and 3D genome structures in zebrafish

Hongbo Yang, Yu Luan, Tingting Liu, Hyung Joo Lee, Li Fang, Yanlin Wang, Xiaotao Wang, Bo Zhang, Qiushi Jin, Khai Chung Ang, Xiaoyun Xing, Juan Wang, Jie Xu, Fan Song, Iyyanki Siriranga, Chachrit Khunrsiraksakul, Tarik Salameh, Daofeng Li, Mayank N. K. Choudhary, Jacek Topczewski, Kai Wang, Glenn S. Gerhard, Ross C. Hardison, Ting Wang, Keith C. Cheng & Feng Yue

Nature, 12/2020
DOT1L-controlled cell-fate determination and transcription elongation are independent of H3K79 methylation.


Proceedings of the National Academy of Sciences, 11/2020

IKAROS and CK2 regulate expression of BCL-XL and chemosensitivity in high-risk B-cell acute lymphoblastic leukemia

Chunhua Song, Zheng Ge, Yali Ding, Bi-Hua Tan, Dhimant Desai, Krishne Gowda, Shantu Amin, Raghavendra Gowda, Gavin P. Robertson, Feng Yue, Suming Huang, Vladimir Spiegelman, Jonathon L. Payne, Mark E. Reeves, Zafer Gurel, Soumya Iyer, Pavan Kumar Dhanyamraju, Meixian Xiang, Yuka Imamura Kawasawa, Nathalia M. Cury, José Andrés Yunes, Mary McGrath, Joe Schramm, Ruijun Su, Yiping Yang, Zhijun Zhao, Xiaoguang Lyu, Markus Muschen, Kimberly J. Payne, Chandrika Gowda, Sinisa Dovat

Blood, 09/2020