

INTRODUCTION

The American system for federal support of scientific research and innovation is part of the bedrock of our society. Tracing its roots back more than a century, the American research enterprise has advanced human health, stimulated economic growth, and enriched the human experience in ways that were previously unimaginable. This amazing, multi-generational endeavor was built from thousands of individuals and research teams who dedicated their professional lives to the greater good.

The first half of 2025 has been a moment of uncertainty for scientists and researchers supported by federal agencies. Questions surrounding how much fiscal support federally-funded research will have going forward remain open. That uncertainty is balanced against our knowledge that rigorous science can change lives for the better.

Our work continues and there is much to celebrate. I am grateful for the unfaltering commitment, intelligence, and creativity found in our Center.

Cheers,



Robert L. Eoff, PhD
Professor & Vice Chair of
Biochemistry & Molecular Biology
CMIC Director



OUR MISSION

Cancer affects the health of millions of Americans. Studying molecular mechanisms that endow cells with malignant properties is an essential component of advancing pre-clinical studies and a key part of efforts to improve patient outcomes. The purpose of this NIH COBRE grant is to establish the CMIC at the UAMS. The mission of the CMIC is to study molecular features and functional properties of biomolecules that drive cancer. The unifying theme of research among Center members is the coupling of structural biology and high-resolution imaging with precise, quantitative analysis of biochemical and cellular processes to understand how molecular interactions govern the initiation, progression and treatment of cancer. Our long-term goal is to leverage faculty mentoring, strategic recruitment, and cutting-edge core resources to develop a critical mass of investigators that will support a self-sustaining center in which research advances our knowledge of cancer through precise and comprehensive analyses of molecular events that impact malignant pathogenesis.

PLEASE CITE Grant P20 GM152281 if you receive COBRE support or use CMIC core services/instrumentation.

CENTER NEWS & UPDATES



• **Welcome Kahla Robinson!** We are excited to welcome Kahla Robinson to the CMIC Administrative Core. Kahla will continue her role in the Biochemistry Department while also bringing her exceptional skills to the role of Program Manager for the CMIC, assisting Veronica Overton with administration of COBRE-related activities. Welcome Kahla!

• **New funding for CMIC Pilot Project Awardee Dr. Samantha Kendrick.** Dr. Samantha Kendrick received a new American Cancer Society: Catalyst Award (CAT-24-1374686-01-CAT) entitled “Impact of DNA topology on facilitating mutational events in lymphoma”. Well done and congratulations Dr. Kendrick!

• **New CMIC Pilot Project awardees announced.** Two new 1-year, \$75K Pilot Project awardees were selected. Dr. Alicia Byrd’s proposal entitled “Effect of HELB molecular interactions on the G1-S transition” will study how protein-protein interactions facilitates formation of pre-initiation complexes and cell cycle progression, a fundamental biological process in mammalian cells that is dysregulated in cancer. Dr. Mokarram Hossain’s proposal entitled “Optimizing neutrophil engagers for solid tumor immunotherapy” will pursue development of a novel biologic-based therapy to improve recognition of immunologically “cold” tumors. Congratulations Dr. Byrd and Dr. Hossain! And welcome to the CMIC family!

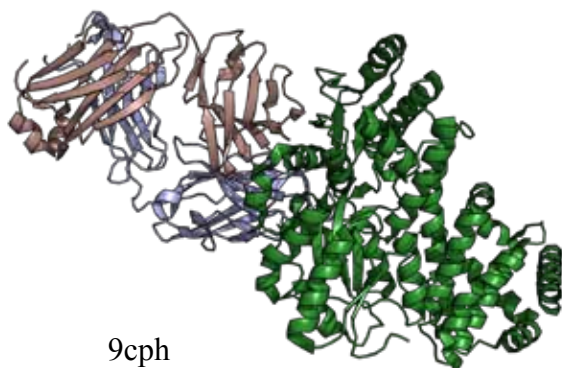
• **Spring Advisory Committee (AC) meeting a success.** The CMIC held a virtual meeting with the AC on Wednesday, March 26th. Thank you to everyone who participated!

• **Guest speakers at the CMIC Monthly Meetings in May and June.** On May 21st, the CMIC hosted Dr. Julie Gunderson, an Associate Professor in the Physics Department at Hendrix College. Dr. Gunderson’s teaching skills and research acumen were on full display as she gave a primer on single-molecule FRET and talked about her ongoing research projects. At the June meeting, Dr. Paul Prather (UAMS) will give a talk entitled “Upholding integrity and credibility in scientific communication”. Come join us on the 18th for Dr. Prather’s seminar.

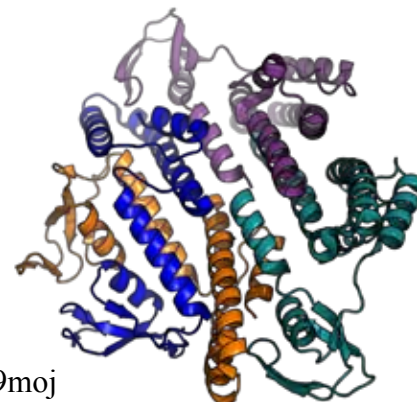
• **SAVE THE DATE!** We will have our in-person AC meeting on September 18th and 19th. Please save the date and contact Dr. Eoff or Veronica with any questions.

CENTER NEWS & UPDATES (CONT.)

New structures! The Moldoveanu lab reported four new BAK-related structures (9cpe, 9cpn, 9cpf, and 9cph; three X-ray structures and one Cryo-EM structure), and the Enemark lab reported a new structure of the tetrameric GINS complex (9moj). Please read their new publications (cited below) to learn more about how these new structures inform our understanding of processes impacting cancer.



9cph



9moj

RECENT PUBLICATIONS

(Center publications from February 2025-May 2025)

Srivastava S, Sekar G, Ojoawo A, Aggarwal A, **Ferreira E**, Uchikawa E, Yang M, Grace CR, **Dey R**, Lin Y-L, Guibao CD, Jayaraman S, Mukherjee S, Kossiakov AA, Dong B, Myasnikov A, and **Moldoveanu T** (2025) "Structural basis of BAK sequestration by MCL-1 in apoptosis" *Mol Cell*, 85: 1606-1623.e10. (PMCID: PMC12086701).

Shankar S and **Enemark EJ** (2025) "Structure of the *Saccharolobus solfataricus* GINS tetramer" *Acta Crystallogr F Struct Biol Commun*, 81: 207-215 (PMCID: PMC12035558).

Osei B, **May BH**, **Beard JS**, **Thompson MD**, Alkam D, Zafar MK, Bergstrom E, Byrum SD, **Enemark EJ**, **West KL**, and **Byrd AK** (2025) "Rare SNP in the HELB gene interferes with RPA interaction and cellular function of HELB" *NAR Mol Med*, 2:ugaf019 (PMCID: PMC12147029).

Center members are listed in bold

THE STRUCTURE OF DETERMINATION

Art, in all its forms, has enriched the human experience in ways that are both commonplace and profound. In some ways, the emotional response to artistic and musical endeavors is a counter to the cold, clear logic of the scientific method. An appreciation of any art form arguably relies more on subjective interpretation, rather than truths sought through the lens of objectivity. Not to say that there are no rules for artists and creativity is banned for scientists, but generally speaking, bending or breaking the "rules" in art is not quite the same as misinterpreting the laws of nature. Indeed, the structure inherent to many artistic pieces is undoubtedly what makes them impactful to our primate brains. A great example of structure giving life to beautiful art can be found in the works of Johann Sebastian Bach.

J.S. Bach is considered by many musicians to be one of, if not the greatest contrapuntist in history. That is to say that he was a master of the counterpoint technique. As related to music theory, Merriam-Webster defines counterpoint as "one or more independent melodies added above or below a given melody." One of the cool things about counterpoint is that a composer can combine independent musical voices, often with varying rhythm or shape, into something that fits together into a greater voice while retaining the linearity or overall feel of the piece.

Counterpoint is something we do every day in science. We use orthogonal approaches to reinforce and build upon results to strengthen confidence in our conclusions. We assemble research teams that include voices from multiple disciplines. We engage in vigorous, often cacophonous, debating to build models out of multi-lab, multi-generational data. Yet, the end product is a cohesive research article, a new therapeutic, or a beautiful addition to our collective understanding of the universe. In the same way that musical counterpoint has a mathematical basis, scientific contrapuntists use their knowledge of the field and logical extrapolations of reproducible findings to design studies that produce polyphonic insights into the natural world. So, as you design your next study or write your next grant, take a lesson from Bach – a guy who once had to walk 400 kilometers to his next gig – add some new voices to your work and see if it doesn't create something even greater.