CECB Members

Steering Committee Members:

Mirit Aladjem, Ph.D. (Co-head)
Dr. Aladjem investigates genetic and epigenetic regulation of DNA replication in mammalian cells. Her laboratory examines mechanisms that transmit signals from the cell cycle regulatory network to chromatin to determine where and when DNA replication initiates during normal cell cycle progression and after exposure to anti-cancer drugs.

Munira Basrai, Ph.D.
Dr. Basrai has two research projects: 1) Molecular mechanisms of faithful chromosome transmission and cell cycle checkpoint control in S. cerevisiae and humans and 2) Functional genomics of previously unidentified small open reading frames (sORFs). Her current research efforts are focused on the structure of specialized centromeric chromatin and how it influences genome stability.

David Clark, Ph.D. (ex officio)
Dr. Clark's current work focuses on the roles of chromatin-remodeling machines in nucleosome positioning and gene activation.

Shiv Grewal, Ph.D.
Dr. Grewal investigates the epigenetic control of higher-order chromatin assembly in the S. pombe model system. He has shown that RNA interference (RNAi), whereby double-stranded RNAs silence cognate genes, plays a critical role in targeting of heterochromatin complexes to specific locations in the genome. Steering committee member's home page.

Gordon Hager, Ph.D.
Dr. Hager's interests lie in the role of chromatin structure in gene regulation, the mechanism of steroid receptor function, and the architecture of active genes in the interphase nucleus. His lab examines nuclear receptors as important models in understanding chromatin modification and restructuring. Steering committee member's home page.

Alexander Kelly, Ph.D.
The Kelly lab combines biochemical, biophysical and cell biological approaches to understand the signaling and feedback mechanisms that control chromosome function and segregation during mitosis.

Eros Lazzerini Denchi, Ph.D.
Dr. Lazzerini Denchi studies telomeres, the terminal structures that protect chromosomes' ends and play an essential role in maintaining genome integrity. The progressive loss of telomeres during cellular division plays a critical role in the onset of aging and cancer. Dr. Lazzerini Denchi aims to define the mechanisms that control telomere erosion and telomere extension and to understand how telomere loss contributes to genome instability in cancer. The lab uses genome-wide gene editing approaches to identify factors that play a role in telomere homeostasis and develops mouse models to investigate the role of telomere dysfunction in cancer.

David Levens, M.D., Ph.D.
Dr. Levens' lab studies the interrelationship between DNA topology, DNA conformation and gene expression. In particular we are focusing on a class of sequence specific, super-coil sensitive, single strand DNA binding transcription factors (FBP1, FBP2, FBP3, and FIR) that impose real-time regulation on c-myc and other genes. The supercoiling forces required for binding are generated by ongoing transcription and dynamically transmitted to susceptible sites within the genome.

Jadranka Loncarek, Ph.D.
Dr. Loncarek's research focuses on how centrosome biogenesis is controlled and coordinated with other cell cycle events in healthy and pathological conditions, and how centrosomes are organized in nanoscale resolution.

Shalini Oberdoerffer, Ph.D. (Co-head)
Dr. Oberdoerffer's research focuses on how DNA and RNA modifications expand the coding potential of the human genome through altering messenger RNA processing and function.

Shyam Sharan, Ph.D.
Dr. Sharan's research is directed towards understanding the role of breast cancer susceptibility genes BRCA1 and BRCA2 in maintaining the genomic integrity using mouse models.

Carl Wu, Ph.D. (Scientist Emeritus, ex officio)
Dr. Wu studies chromatin regulation of eukaryotic gene expression in the yeast, fly, and mouse model systems. His research focuses on how genes are dynamically unmasked by ATP-driven, multi-component chromatin remodeling enzymes, and the physiological significance of this process.

Members:

Sankar Adhya, Ph.D.
Dr. Adhya research interests include regulation of gene transcription, regulatory biology of bacteriophage, bacterial nucleoid and bacteriophage applications.
neuron-specific chromatin features enable neuronal function and how mutations in chromatin regulators lead to neurological disease.

Yawen Bai, Ph.D.
Dr. Bai's research uses biophysical techniques including NMR and amide hydrogen exchange to investigate the dynamic processes of nucleosome assembly/disassembly and structures of histone chaperones complexed with histones.

Lisa Boxer, Ph.D.
Dr. Boxer studies how neuron-specific chromatin features enable neuronal function and how mutations in chromatin regulators lead to neurological disease.

Michael Bustin, Ph.D.
Dr. Bustin's research focuses on the role of chromosomal proteins in chromatin function, gene expression, development and cancer. The current focus is on the cellular function of HMGN proteins.

Chonyi Chen, Ph.D.
Dr. Chen’s lab develops and applies single-cell assays and genomic technologies to study chromatin structure and gene expression in human cells, with a focus on genome-wide dynamics of chromatin and DNA topology.

Sheue-yann Cheng, Ph.D.
Dr. Cheng's work focuses on the understanding of molecular mechanisms of thyroid hormone receptor (TR) action. TRs are ligand-dependent transcription factors. She is interested in understanding how the gene regulating activity of TRs is modulated by nuclear coregulator proteins via modifying the chromatin structure.

Yamini Dalal, Ph.D.
Dr. Yamini Dalal studied DNA sequence effects on nucleosome positioning and linker histone H1 modulation of chromatin structure in vitro and in vivo in mouse during her graduate years at Purdue University in the laboratory of Dr. Arnold Stein. She then moved to the Fred Hutchinson Cancer Research Center to work with Dr. Steven Henikoff on the centromere-specific histone variant CenH3 and studied its influence on nucleosome and chromatin structure using Drosophila as a system. Her laboratory interests focus on understanding how chromatin structure influences epigenetic mechanisms involved in important biological functions.

Susan Gottesman, Ph.D.
Dr. Gottesman studies novel mechanisms for gene regulation and how these mechanisms contribute to global control circuits in the E. coli model system. Her current investigations focus on small regulatory RNAs and energy-dependent proteolysis. Steering committee member's home page.

Sridhar Hannenhalli, Ph.D.
Dr. Hannenhalli is a computational biologist with broad interests in gene regulatory mechanisms and evolution. His lab harnesses a variety of high-throughput omics data, including single cell data, to address fundamental biological questions pertaining to development and diseases, with a special emphasis on cancer.

Jing Huang, Ph.D.
Dr. Huang's laboratory focuses on studying how epigenetic events, in particular,methylation and demethylation, are involved in cancer and stem cell differentiation. They use histones, estrogen receptor and p53 as model proteins to study this question. The long-term goal is to identify therapeutic targets and to develop novel approaches to treat cancer stem cells, which are believed to confer chemo- and radio-therapy resistance for certain types of cancer.

Mikhail Kashlev, Ph.D.
Dr. Kashlev's research interests include: 1) identification of protein factors and mechanisms leading to establishment and maintenance of epigenetic modifications of genes in eukaryotes, 2) the study of TCR and transcription fidelity toward mammalian RNA polymerase II, and 3) understanding the basic mechanism of transcriptional pausing, arrest and termination using RNA polymerase from E. coli.

Ashish Lal, Ph.D.
Dr. Lal's current research is focused on investigating the function of specific cancer-associated microRNAs. He has developed a biochemical approach to identify microRNA targets and combines this strategy with systems biology to identify the pathways regulated by a miRNA. Parallel to studies on microRNA function, Dr. Lal's lab is also investigating the role of tumor suppressor proteins in microRNA biogenesis with special emphasis on P53.

Vladmir Larionov, Ph.D.
Dr. Larionov's research interests focus on the structure and function of the human centromere. They exploit Human Artificial Chromosomes HACs with synthetic alphoid DNA as a tool for functional and structural analyses of the human kinetochore.

Dan Larson, Ph.D.
Dr. Larson's laboratory investigates the mechanisms of gene regulation, starting from the behavior of individual macromolecules and proceeding to their regulation in cells and tissue. The laboratory utilizes a battery of biophysical and molecular approaches, including single-molecule microscopy, fluorescence fluctuation analysis, RNA visualization in fixed and living cells, and computational modeling of dynamic gene regulation. Currently, the lab focuses on the regulation and function of RNA in a cell-biological context, including transcription, splicing, and post-transcriptional processing.

Maxwell Lee, Ph.D.
Dr. Lee's research focuses on understanding the genetic and epigenetic mechanisms of cancer etiology using an integrative systems biology approach - "cancer genomics and epigenomics". We have been using gene chips to study genome-wide chromatin modification (ChIP-on-chip), human methylome characterization, and gene expression in both normal and cancer cells.
Michael Lichten, Ph.D.
Dr. Lichten studies the genetic recombination, DNA damage repair, and chromosome structure in S. cerevisiae, with a focus on events that occur during meiosis.

Yuichi Machida, Ph.D.
Dr. Machida studies DNA repair mechanisms and their roles in maintaining genomic stability. Current projects investigate proteases that promote DNA replication at DNA-protein crosslink (DPC) damage.

Jordan Meier, Ph.D.
Dr. Meier’s research focuses on the development of new inhibitors and profiling agents for studying the activity of chromatin-modifying enzymes, with a special interest in metabolic mechanisms of epigenetic regulation.

Paul Meltzer, M.D., Ph.D.
Dr. Meltzer's research interests are focused on the characterization of genetic alterations in cancer cells, the mechanisms that lead to their development and their effects on gene expression. To address these issues, Dr. Meltzer and colleagues utilize several genomic technologies, especially DNA microarray hybridization.

Tom Misteli, Ph.D.
Dr. Misteli uses molecular techniques in combination with live-cell microscopy to study gene expression in the intact nucleus of living cells. He has developed novel imaging techniques to explore gene and protein function at the molecular level in living cells and his laboratory is applying these methods to understand the contribution of genome organization to differentiation and disease.

Kathrin Muegge, M.D.
Dr. Muegge investigates the role of DNA methylation in gene regulation during mammalian development. She currently examines the role of the chromatin remodeling protein Lsh in genome wide distribution of cytosine methylation during stem cell differentiation.

Andre Nussenzweig, Ph.D.
Dr. Nussenzweig examines the mechanisms by which cells monitor and repair DNA double-strand breaks. His research goals are to: 1) elucidate the mechanisms by which oncogenic translocations form, 2) determine the influence of chromatin structure on the maintenance of genomic stability, and 3) decipher the complex interplay between DNA damage detection, signaling, and repair.

Sergio Ruiz Macias, Ph.D.
Dr. Ruiz Macias uses mouse and human embryonic stem cells as well as mouse embryos to study the mechanisms involved in cell fate decisions. He leverages the use of genome-wide profiling and gene editing technologies to get a better understanding on how cell plasticity is regulated.

Vassiliki Saloura, M.D., Ph.D.
Dr. Saloura’s work focuses on elucidating mechanisms through which protein methyltransferases and demethylases mediate oncogenesis, immune evasion, heterogeneity and therapy resistance in squamous cell carcinoma of the head and neck. Her goal is to develop a translational research program focusing on chromatin modulation of head and neck cancer and to introduce novel epigenetic therapeutic approaches for head and neck cancer patients with relevant molecular phenotypes.

Travis Stracker, Ph.D.
Dr. Stracker’s research focuses on understanding how cells respond to DNA damage and maintain chromosome stability. Work in the lab has elucidated distinct mechanisms by which the DNA damage response influences rare disease pathology, as well as identified exploitable vulnerabilities for cancer therapy.

David Takeda, M.D., Ph.D.
Dr. Takeda studies epigenetic reprogramming in the pathogenesis of genitourinary malignancies. He leverages novel epigenomic profiling methods in patient tumors together with genome editing technology in model systems to identify noncoding drivers of tumorigenesis and disease progression.

Chunzhang Yang, Ph.D.
Dr. Yang’s research focuses on the connection between cancer metabolic patterns and DNA repair pathways, with an emphasis on metabolism-associated epigenetic shifts and therapy resistant.

Victor Zhurkin, Ph.D.
Dr. Zhurkin uses computer techniques to study the sequence-dependent DNA deformability and its role in nucleosome positioning and formation of the higher-order chromatin structure.