Kristy R. Stengel, Ph.D.

Positions:
Assistant Professor, Department of Cell Biology
Member, Ruth L. and David S. Gottesman Institute for Stem Cell and Regenerative Medicine Research (Einstein Stem Cell Institute)

Research interests:

Research Interests: Deregulation of gene expression is a hallmark of cancer. One common way this occurs is through mutation, amplification/deletion, or translocation of sequence-specific transcription factors, known as “master” transcription factors. These are transcription factors that are critical regulators of normal tissue homeostasis, carefully balancing lineage choice and “stemness” gene expression programs. We are interested in how disruption of these factors in cancer results in an expansion of more stem-like cellular pools to promote tumor development. To this end, we utilize CRISPR-Cas9 genome editing to integrate a variety of tags into endogenous transcription factor loci. This includes degron tags, which allow rapid protein degradation to identify the direct targets of oncogenic transcription factor activity. In addition, we integrate epitope tags to allow affinity purification and identification of associated protein complexes by mass spectrometry, as well as tags that allow the imaging of transcription factors in live cells. These tools allow us to precisely define the gene networks regulated by these oncogenic transcription factors and to define the mechanisms by which they regulate gene expression. The ultimate goal is to use this information to identify novel therapeutic targets for transcription factor mutated malignancies.

Recent publications (selected):

1. Layden HM, Eleuteri NA, Hiebert SW, Stengel KR. (2021) A protocol for rapid degradation of endogenous transcription factors in mammalian cells and identification of direct regulatory targets. STAR Protoc. 2(2): 100530. PMID: 34041503.

2. Stengel KR*, Ellis JD, Spielman C, Bomber M, Hiebert SW*. (2021) Definition of a Small Core Transcriptional Circuit Regulated by AML1-ETO. Mol. Cell. 81(3): 530-545. PMID: 33382982 *corresponding author

3. Stengel KR*, Bhaskara S, Wang J, Liu Q, Ellis JD, Sampathi S, Hiebert SW*. (2019) Histone Deacetylase 3 controls a transcriptional network required for B cell maturation. Nucleic Acids Res. 47(20): 10612-10627. PMID: 31586401 *corresponding author

4. Stengel KR, Barnett K, Wang J, Liu Q, Hodges E, Hiebert SW, Bhaskara S (2017).The deacetylase activity of histone deacetylase 3 is required for productive VDJ recombination and B cell development. PNAS. 114(32):8608-8613. PMID: 28739911.

5. Summers AR*, Fischer MA*, Stengel KR*, Zhao Y, Kaiser JF, Wells CE, Hunt A, Bhaskara S, Luzwick JW, Cortez D, Hiebert SW (2013). HDAC3 is essential for DNA replication in hematopoietic progenitor cells. JCI. 123(7):3112-23. PMID: 23921131 *equal contribution