



Kierra Franklin

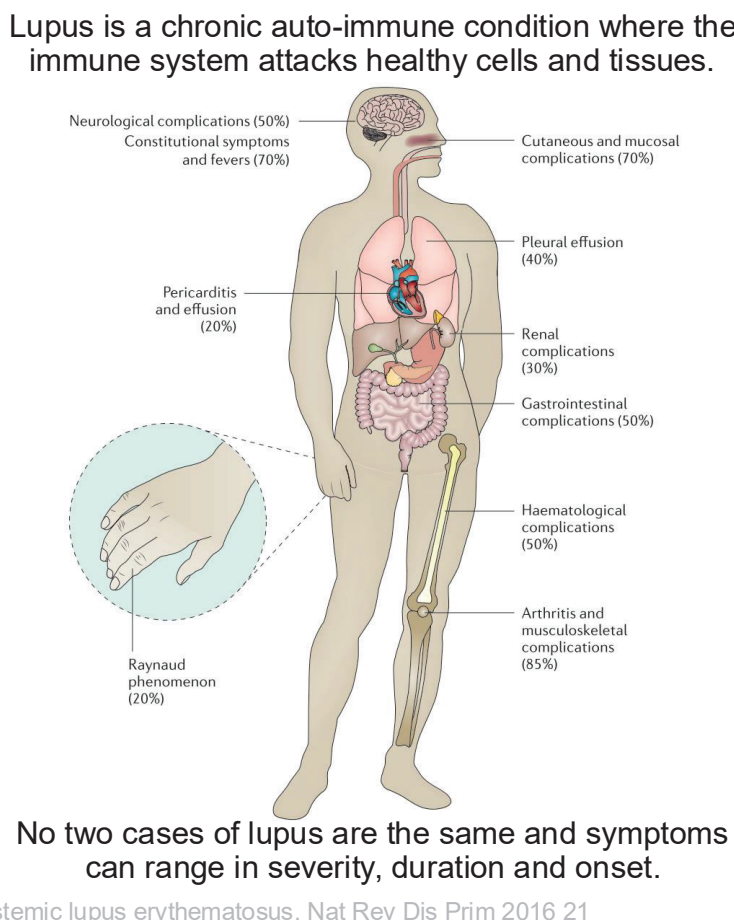
Burke Award
Ph.D. Candidate, Biomedical Engineering
Second Year ARCS Scholar



Determining the Impact of MeCP2 Imbalance in T cell Epigenetic Dysregulation

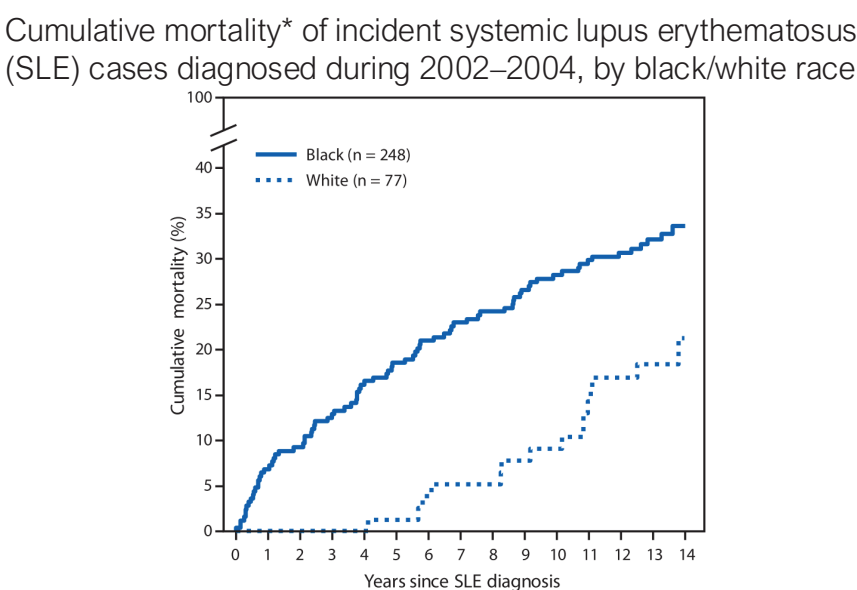
By investigating a key DNA methylation regulator, I will determine if their misregulation is sufficient to cause defective DNA methylation and dysfunctional helper T cells.

Systemic lupus erythematosus (SLE) or lupus is a chronic auto-immune condition where the immune system attacks healthy cells and tissues.



Kaul A, Gordon C, Crow MK, Tourna Z, Urowitz MB, Van Vollenhoven R, et al. Systemic lupus erythematosus. Nat Rev Dis Prim 2016 21

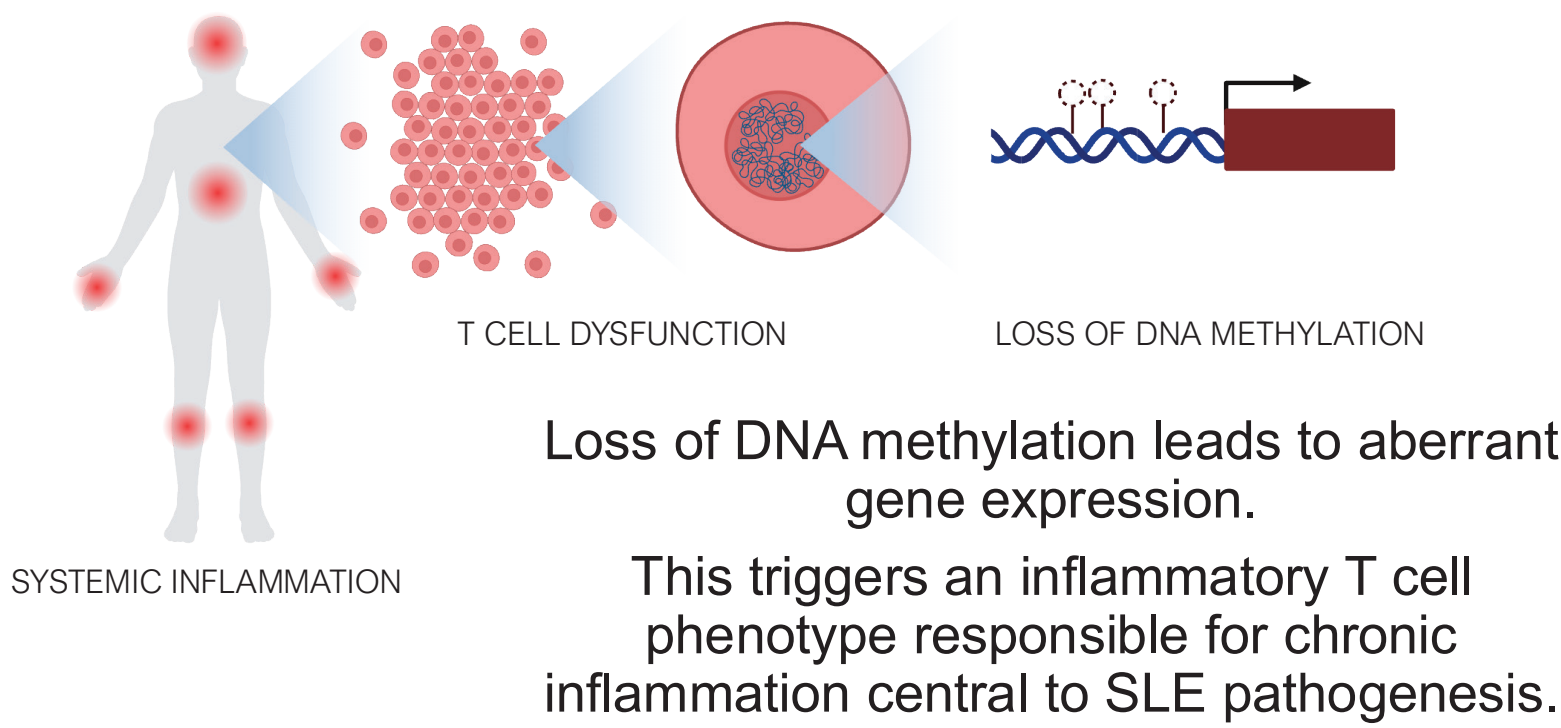
Lupus is among the leading causes of death in young females.



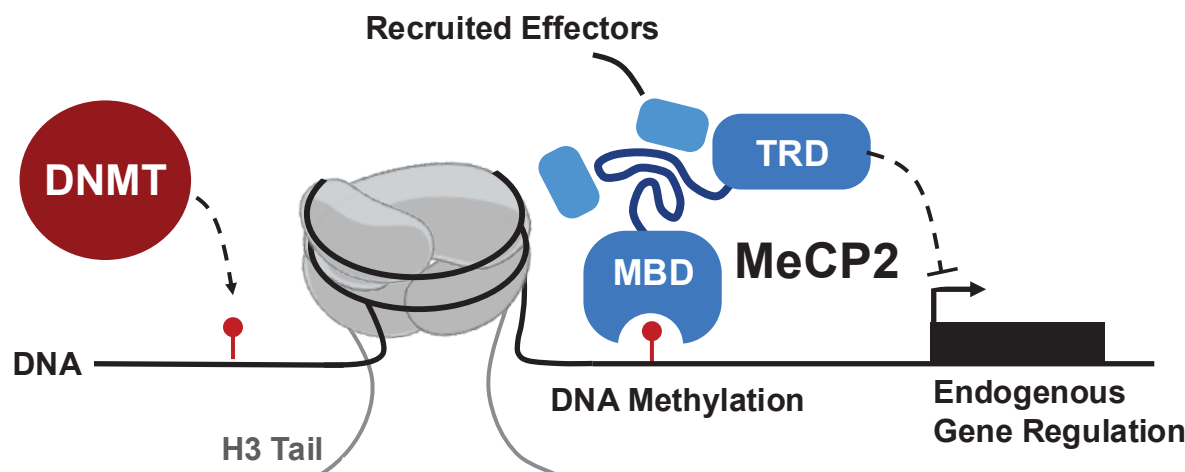
Lupus mortality rates remain high (10-15%) in minority women (45-64)

Lim SS, Helmick CG, Bao G, Hootman J, Bayakly R, Gordon C, et al. Racial Disparities in Mortality Associated with Systemic Lupus Erythematosus-Fulton and DeKalb Counties, Georgia, 2002-2016. <https://my.clevelandclinic.org/health/symptoms/23163-lupus-rash>

Epigenetic Dysregulation leads to Lupus Pathology



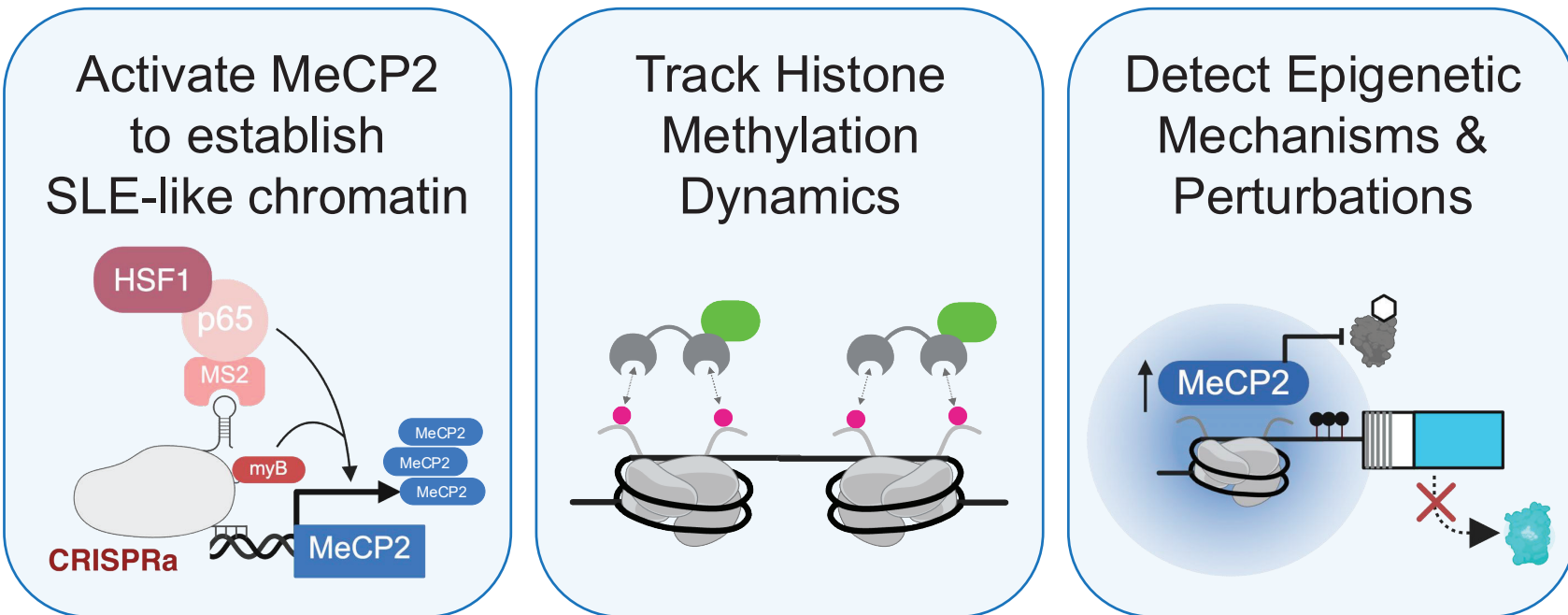
Methyl-CpG Binding Protein 2 (MeCP2) is a critical regulator of DNA Methylation



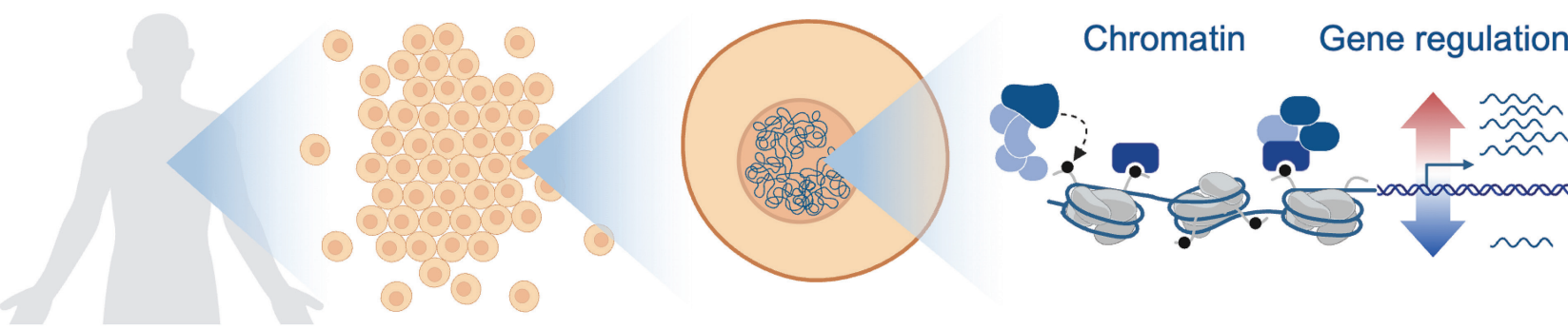
In normal T cells, MeCP2 helps maintain DNA methylation. An imbalance of MeCP2 may disrupt DNA methylation in Lupus T Cells.

INTRODUCTION	AIM 1	AIM 2	AIM 3	Summary	15
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Epigenetic Engineering to Understand MeCP2 Dysregulation in Lupus



Future Outlook



- Establish a causal link between MeCP2 and T cell dysfunction in lupus.
- Reveal epigenetic events that precede lupus flare and enlighten how we view disease activity.
- Better inform drug target development and treat lupus flares.

