

Title: Decoding Epigenetic Roadblocks in Cellular Reprogramming

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Abstract:

Onder Lab at Koç University investigates the chromatin-based mechanisms that define and restrict cellular plasticity during reprogramming and early human development. Our work integrates chemical biology, CRISPR-Cas9 functional genomics, and somatic cell reprogramming to systematically identify epigenetic barriers to induced pluripotent stem cell (iPSC) formation and naïve pluripotency acquisition. Through focused genetic and compound-based screens, we have uncovered key chromatin complexes—such as DOT1L, CBP/P300, BRD9 and USP22 as critical regulators maintaining somatic identity. Disruption or pharmacological inhibition of these chromatin writers, readers, and scaffold proteins markedly enhances reprogramming efficiency, revealing new molecular tools for engineering cell fate. In this talk I will present our recent findings and ongoing work on uncovering regulators of cell plasticity. Together, these studies illuminate how layered chromatin regulation safeguards cellular identity and provide strategies to overcome these constraints for regenerative and developmental applications.