

## **Controlling mammary genetic programs through transcription factor modules and epigenetic regulators**

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The mammary gland is a highly specialized organ producing milk during lactation. Development of mammary tissue can be divided into at least four phases, establishment of the ductal tree during puberty, formation of alveoli during pregnancy, lactation and tissue remodeling upon weaning. While proliferation of ductal epithelium is under the control of ovarian steroid hormones, establishment of alveolar epithelium during pregnancy is induced by prolactin through a set of transcription factors, including STAT5 and ELF5.

This lecture will focus on molecular mechanisms underlying the specification, proliferation and differentiation of mammary epithelium. It will cover (1) the role of the transcription factors STAT5 and NFIB in activating specific biological programs and (2) the impact of the histone methyltransferases EZH1 and EZH2 in controlling temporal differentiation and cell specification. The contributions of these key regulators were investigated using mouse genetics and large-scale genomics. Notably, STAT5 and NFIB synergistically control genetic programs during pregnancy and EZH2 modulates epithelial differentiation through operating access of transcription factors to mammary-specific genes. Lastly, the epigenetic regulators EZH1 and EZH2 are redundant actors in the specification of mammary epithelium.