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# "Long noncoding RNA: transcription noise or biological modulator ? A view from studies in embryonic stem cells"


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**Wednesday, June 25, 11:00 a.m.**
**The Donnelly Centre, Yip / Friesen Red Seminar Room,**
**160 College Street, Toronto**


**Abstract:** Pervasive transcription in mammalian genome produces thousands of long noncoding RNA (lncRNA) transcripts. It has been hypothesized that lncRNAs as versatile modulators regulate diverse aspects of biology. However, their biological significance remains skeptical due to concerns of subtle phenotypic differences caused by technical variation of knockdown. Despite a clear need to completely inactivate lncRNA function, targeted deletion of lncRNAs is still lacking in culture. Here, we systematically deleted multiple lncRNA loci (up to 217 kb) in embryonic stem cells (ESCs) by CRISPR/Cas9 system. Homozygous deletion mutants could be generated with high efficiency (up to 19%) in a short period of time (< 2 weeks). We have further characterized a lncRNA located ~40 kb from an ultraconserved, developmentally regulated gene cluster. We propose this lncRNA functions in cis to regulate its neighboring gene transcription and in trans to orchestrate ESC differentiation. Despite recent burst of interest in lncRNAs, our knowledge is still limited to a handful of them. Thousands of lncRNAs await for functional characterization. While focusing on biology of individual lncRNA genes, we have tried to categorize lncRNA and reveal their function in groups. I will talk about our recent progress on one lncRNA catalogue in regulating transcription and developmental processes.


**Biography:** Prof Shen received her PhD from University of Michigan and was a post-doc fellow at Dana-Farber (with S. Orkin). She is also an Assistant Investigator at the Tsinghua-Beijing Universities Joint Center for Life Sciences.

**Host: Zhaolei Zhang**