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## **Broad existence of pluripotency factor regulated transcript isoforms with stage-specific alternative first exons (SAFE) in mouse embryonic stem cell**

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Transcripts with stage-specific alternative first exon (SAFE) usage involve in the regulation of many biological processes, yet their presence and functions in embryonic stem cells (ESCs) are still largely unknown. In this work, we identify 137 mESC SAFE isoforms of 128 genes expressed in both ESCs and somatic cells. Functional analysis revealed that most genes participated in the regulation of stem cell regulated functions. The promoter regions of SAFE isoforms exhibit enriched H3K4me3 and Pol II binding as well as higher DNase I sensitivity in mESCs but not in somatic cells. We found an enrichment of Oct4, Sox2 or Nanog binding sites at the promoter regions of SAFE isoforms and proved the transcription regulation of SAFE isoforms by these pluripotency factors experimentally. The expression of SAFE isoforms is activated during the reprogramming process of induced pluripotent stem (iPS) cells and dynamically regulated in early stage embryos or during cell differentiation indicating their functional importance in regulating pluripotency related cell features.

### **Biography**

Xiu-Jie Wang has completed her PhD from The Rockefeller University and started her lab at Institute of Genetics & Developmental Biology, Chinese Academy of Sciences from 2004 with an emphasis on non-coding RNA prediction and functional study as well as transcriptomic data analysis. Her group has published over 60 research papers on journals including Nature, Cell Stem Cell, Genes & Development, PNAS, Circulation Research, Genome Biology, etc. She has received multiple academic awards and been serving as an Editorial Board Member of RNA Biology, BMC Genomics and other journals.

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