Long Noncoding RNAs with snoRNA Ends

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We describe the discovery of sno-IncRNAs, a class of nuclear-enriched intron-derived long noncoding RNAs (IncRNAs) that are processed on both ends by the snoRNA machinery. During exonucleolytic trimming, the sequences between the snoRNAs are not degraded, leading to the accumulation of IncRNAs flanked by snoRNA sequences but lacking 5’ caps and 3’ poly(A) tails. Such RNAs are widely expressed in cells and tissues and can be produced by either box C/D or box H/ACA snoRNAs. Importantly, the genomic region encoding one abundant class of sno-IncRNAs (15q11-q13) is specifically deleted in Prader-Willi Syndrome (PWS). The PWS region sno-IncRNAs do not colocalize with nucleoli or Cajal bodies, but rather accumulate near their sites of synthesis. These sno-IncRNAs associate strongly with Fox family splicing regulators and alter patterns of splicing. These results thus implicate a previously unannotated class of IncRNAs in the molecular pathogenesis of PWS.

Molecular Cell 48, 219–230, October 26, 2012

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Le mercredi 12 décembre 2012, 11:30
Auditorium du St-Patrick