Retrovirology

BioMed Central

Invited speaker presentation

Host support of Ty3 retrotransposition in *Saccharomyces cerevisiae*

Suzanne Sandmeyer*, Virginia Bilanchone, Nadia Beliakova-Bethell, Kristina Christiansen and Kim Nguyen

Address: Department of Biological Chemistry, School of Medicine, University of California, Irvine, California 92697, USA
* Corresponding author

from Frontiers of Retrovirology: Complex retroviruses, retroelements and their hosts
Montpellier, France. 21-23 September 2009

Published: 24 September 2009

Retrovirology 2009, **6**(Suppl 2):I17 doi:10.1186/1742-4690-6-S2-I17

This abstract is available from: http://www.retrovirology.com/content/6/S2/I17

Ty3 is a *Saccharomyces cereviae* LTR retrotransposon. The structure of Ty3 is similar to that of a simple retrovirus. It is 5.4 kb in length and encodes overlapping *GAG3* and *POL3* reading frames flanked by 340 bp long terminal repeats. Expression of Ty3 results in production of Gag3 and Gag3-Pol3 polyproteins which assemble together with genomic RNA into in association with P-body proteins. VLPs are also associated with these clusters. The nucleo-capsid domain of Ty3 Gag3 is required in trans for recruitment of Ty3 RNA into P bodies. The untranslated regions of Ty3 RNA are sufficient in cis for recruitment of RNA to P bodies, but the *GAG3-POL3* coding domain of the RNA can also confer association with P body proteins. In contrast, only the untranslated sequences confer packaging of a mini-Ty3 transcript. Upon assembly, Gag3 is processed into capsid, spacer, and nucleocapsid. Gag3-Pol3 is processed into those proteins and protease, junction, reverse transcriptase, and integrase. We propose that P-body proteins promote Ty3 VLP assembly and a mass spectrometry approach is being taken to further define the components of these dynamic complexes. However, in spite of genetic evidence that P-body proteins play a positive role in Ty3 production, these intracellular foci may also act as host traps to down-regulate transposition. Ty3-P body clusters become perinuclear over time and are physically associated with nuclear pores. A specific class of FG nucleoporins are required for Ty3 nuclear entry.