Retrovirology



Poster presentation

Open Access

Flying non-LTR retrotransposons: DNA transposons as freely available "wings"?

Olga Novikova* and Alexander Blinov

Address: Institute of Cytology and Genetics SB RAS, Novosibirsk, Russia

* 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):P62 doi:10.1186/1742-4690-6-S2-P62

This abstract is available from: http://www.retrovirology.com/content/6/S2/P62

© 2009 Novikova and Blinov; licensee BioMed Central Ltd.

Horizontal transmission (HT) can be defined as the process by which genes move between reproductively isolated species. Many examples of HT of transposable elements have been identified in eukaryotes. The mechanisms of HT are still unknown since it is not possible experimentally to show how the HT can occur. The frequencies of HT events are not equal among diverse types of transposable elements. Majority cases of putative HT are known for DNA transposons and LTR retrotransposons. According to the rough estimation, approximately 96% of HT events described for *Drosophila* account for LTR retrotransposons and DNA transposons, and only 4% - for non-LTR retrotransposons [1]. It seems to be that HT of non-LTR retrotransposons is relatively rare event. Previously, we provided strong evidences for the recent horizontal transmission of CR1 non-LTR retrotransposons between silkmoth (Bombycidae) and large blue butterflies, genus Maculinea (Lycaenidae) [2]. The further investigations showed that the multiple HT events of DNA transposons took place between the same groups (Bombycidae and Lycaenidae) recently. At the same time, HTs among other groups of lepidopterans appeared to be relatively rare. Moreover, we identified number of chimeric DNA transposons in genomes of Bombyx and Maculinea which carry insertions of non-LTR retrotransposons (including CR1) and capable for transposition since insertions did not disrupt coding regions of DNA transposons. Thus we can suppose that non-LTR retrotransposons have ridden DNA transposons and used them as the "wings" for their transmission.

We also suppose that the features of life cycles of large blue butterflies and silkmoth played important roles in increasing of HT frequency. Large blue butterflies are living in ant nests during the third larvae stage where they are fed by ants or eat up ant's larvae. Silkmoth characterized by periodical massive outbreaks and can represent main course in ants menu during such years. The ant nest can be the crucial point of tangency between donor of chimeric DNA transposons (silkmoth) and recipient (common ancestor of large blue butterflies).

References

- Loreto EL, Carareto CM, Capy P: Revisiting horizontal transfer of transposable elements in Drosophila. Heredity 2008, 100:545-554.
- Novikova O, Sliwinska E, Fet V, Settele J, Blinov A, Woyciechowski M: CRI clade of non-LTR retrotransposons from Maculinea butterflies (Lepidoptera: Lycaenidae): evidence for recent horizontal transmission. BMC Evol Biol 2007, 7:93.