**Supplemental Figure Legends**

**Suppl. Table 1:** Molecular data associated with StanEx enhancer trap lines (**Figure 1)**. The data is also available in a searchable format at the StanEx online database http://stanex.stanford.edu/about/. The molecular insertion coordinate is defined as the first nucleotide 3’ to the insertion site on the genomic scaffold, *independent* of the direction of the *P*-element insertion. Sequences flanking 5’ and 3’ to the StanEx P-element are shown as 5’->3’ extensions of the sequence primer used, SP1 off the 5’, and Ulf / Berta off the 3’ end of the StanEx P-element, respectively (see Materials and Methods). All sequences deriving from the P-element are removed, and nt 1 corresponds to the first nucleotide matching the genomic scaffold of *Drosophila melanogaster*. Of note, 5’->3’ oriented P-elements (orientation relative to the genomic scaffold) generate sequences co-directional with the genomic scaffold (+) off their 3’ end, and anti-directional (-) off their 5’ end. The inverse is the case with P-elements oriented 3’-5’.

**Suppl. Table 2:** Molecular sequence of the 14 bp insertion site of 128 StanEx enhancer trap lines (**Figure 3A**). The sequences are oriented according to the strand of insertion. P-elements inserted in 5’->3’ direction are marked + and are co-directional with the genomic scaffold of the reference sequence. P-elements inserted in 3’->5’ direction are marked - and the reverse complement of the genomic scaffold sequence is used.

**Suppl. Table 3:** Chi-square *p*-values of position frequency matrices of StanEx enhancer traps (**Figure 3, Suppl. Table 3**) versus position frequency matrices of EPgy2, GT, SUPor-P, XP and GawB(+) enhancer traps as well as their agglomerate. Associated worksheets present primary sequence information and position frequency matrices of individual types of enhancer trap elements and is based on (Linheiro and Bergman, 2008).

**Suppl. Table 4:** Molecular data of the insertion site in the *NK7.1*/*Heatr2* locus at 3R:14,356,562 88B4-6 on chromosome III. Worksheets show (1) name and sequences of primer used to amplify genomic DNA from StanEx1 background, (2) genomic sequence according to the reference sequence in Flybase (Hoskins et al., 2015), (3) genomic sequence of StanEx1 background, (4) KP element sequences present in GenBank, (5) KP element sequence of the locus *NK7.1*/*Heatr2* locus at 3R:14,356,562 88B4-6, including genomic sequence 5’ (black) and 3’ (blue) to KP element, 8bp direct repeat (red) Exon (light/dark brown, grey)/Intron (black) structure of KP repressor encoded by KP element, KP repressor cDNA, amino-acid sequence of KP repressor protein translated from cDNA *in silico*, GenBank accession number MK510925 (6) Sequence data of SE enhancer trap lines inserted in 88B4-6, 3R:14,356,562 (**Figure 3C)**.