

# Brassica repetitive elements

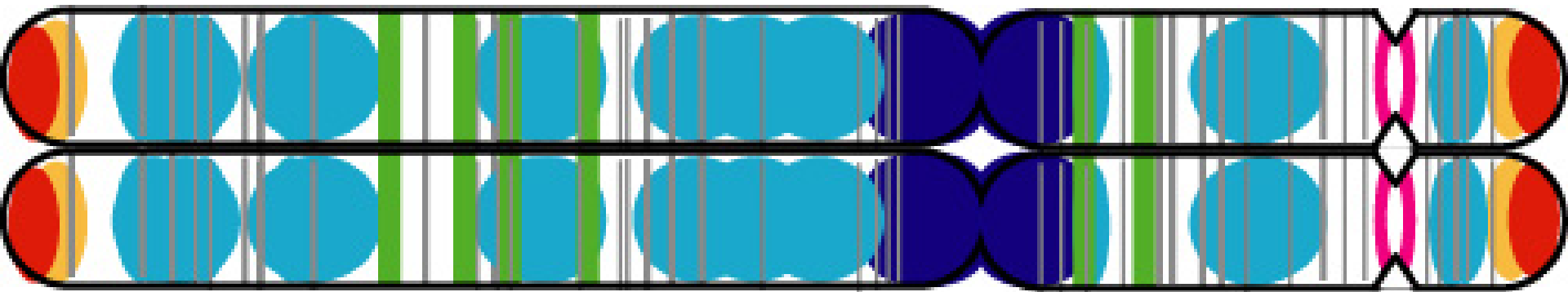
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John P. Bailey – Leicester

Faisal Nouroz  
Niaz Ali

# The Chromosome Model



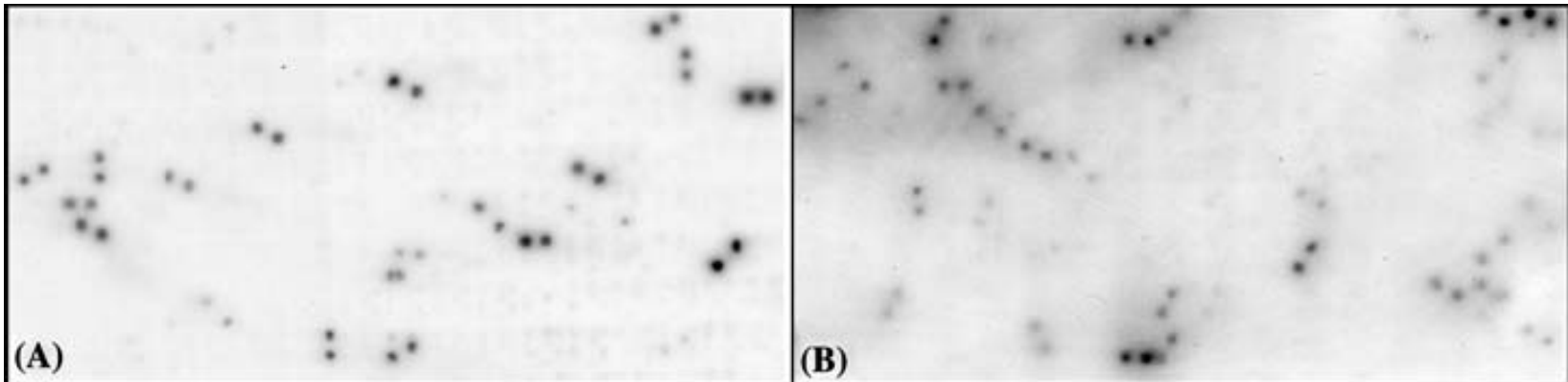
- Tandem repeats with known function
- Telomeric
  - Centromeric
  - rDNA
  - Intercalary tandem repeat families
  - Dispersed repeats including retroelements and SSRs
  - Genes and regulatory sequences

500 nm

- Schmidt & HH Trends Plant Sci

# *Brassica* retrotransposons

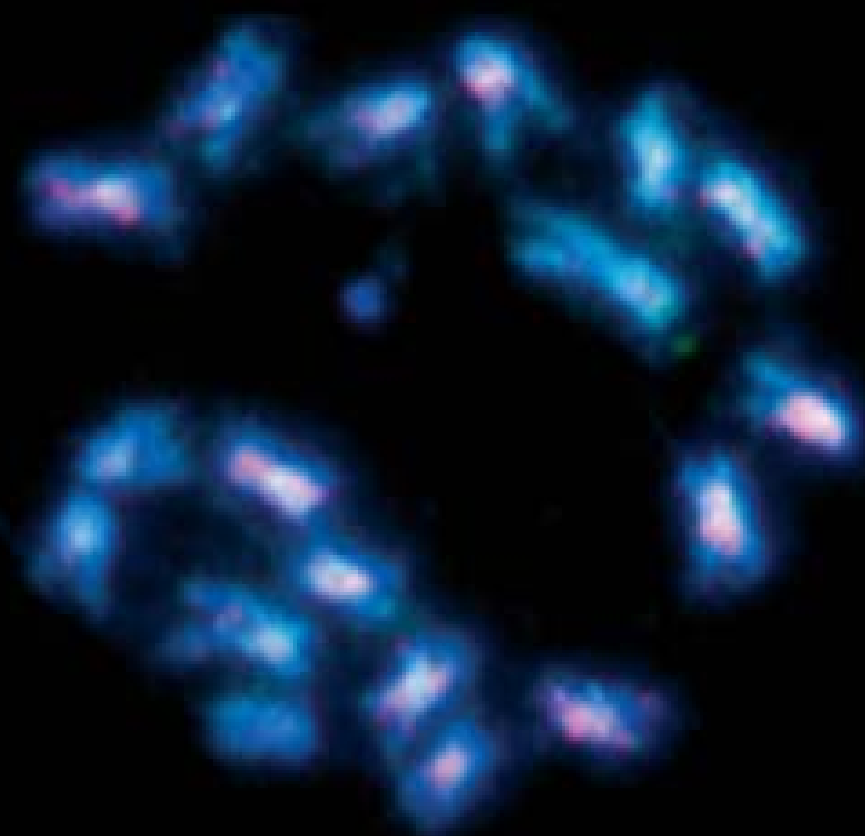
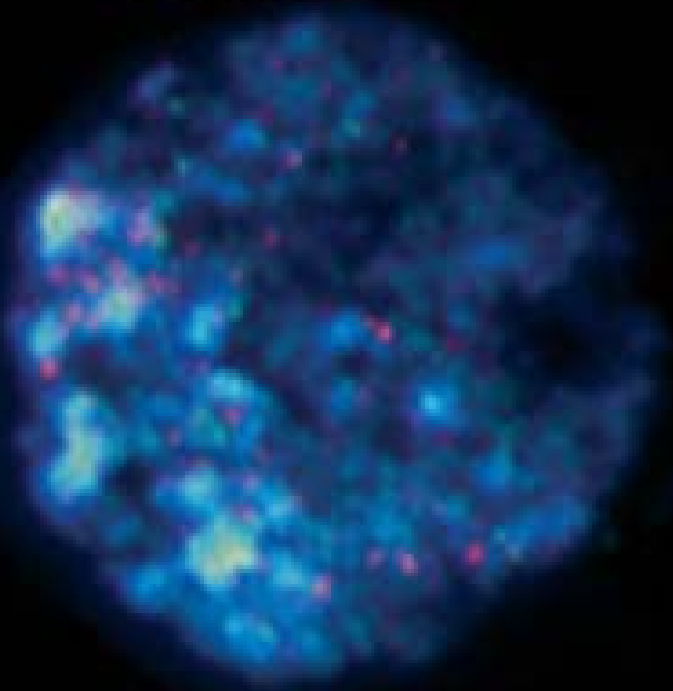
1088 BACs on the same high-density filter  
copia RT probe (18)      gypsy RT probe (25)



Minimal clustering within BACs, different retroelements have contrasting genomic distributions. Very few LINE elements; Total retroelements c. 15% of genome but diverse families of copia and gypsy each <1%. Analysis by BAC sequences, Genomic Survey Sequence (GSS), Southern and BAC filter hybridization, in situ hybridization

Alix et al. The genomic organization of retrotransposons in *Brassica oleracea*.  
Plant Molecular Biology 59: 839

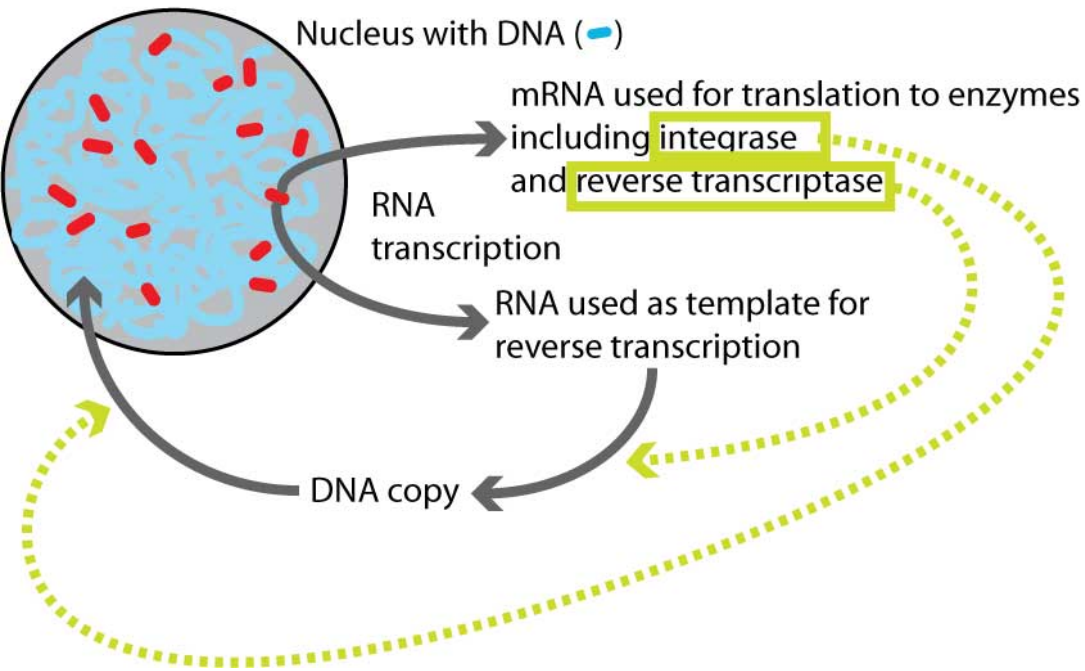
# PLANT MOLECULAR BIOLOGY



 International Society for  
Plant Molecular Biology  
 Springer

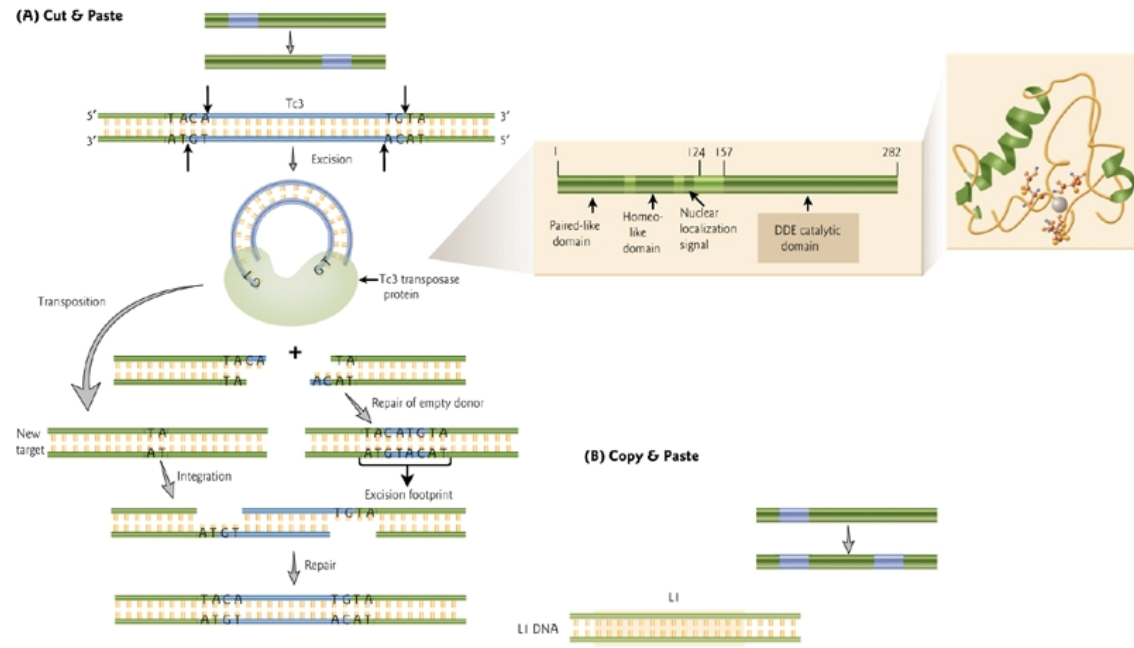
## Retroelements in Brassica

# Retrotransposons (-): The transposition cycle



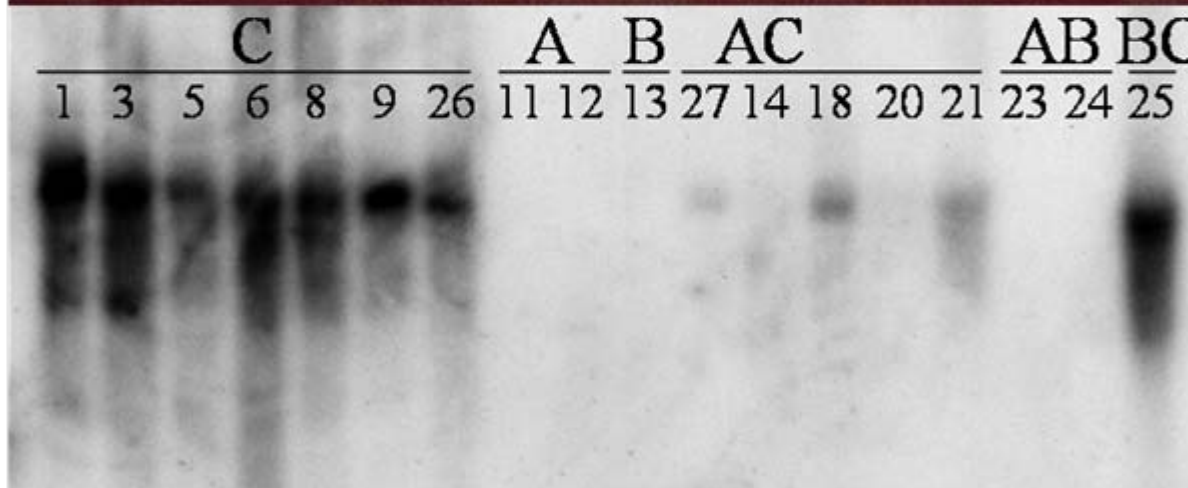
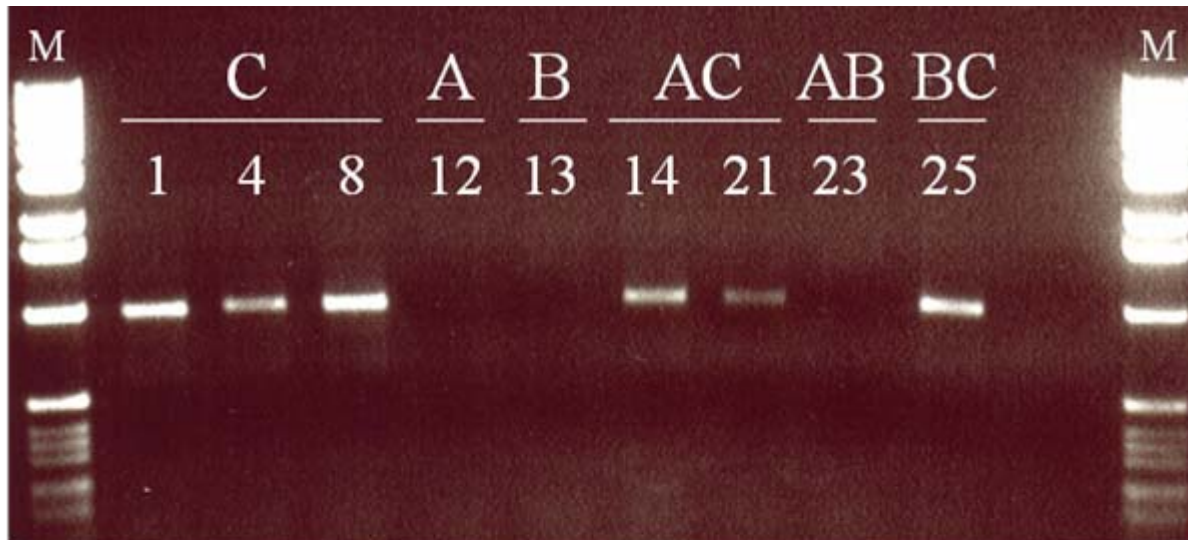
DNA transposons  
Class II transposable elements  
Cut-and-paste

Retrotransposons  
Class I transposable elements  
RNA intermediate



# Genome Specificity of a CACTA (*En/Spm*) Transposon

*B. napus* (AACC,  $2n=4x=38$ ) *B. oleracea* (CC,  $2n=2x=18$ ) *B. rapa* (AA,  $2n=2x=20$ )

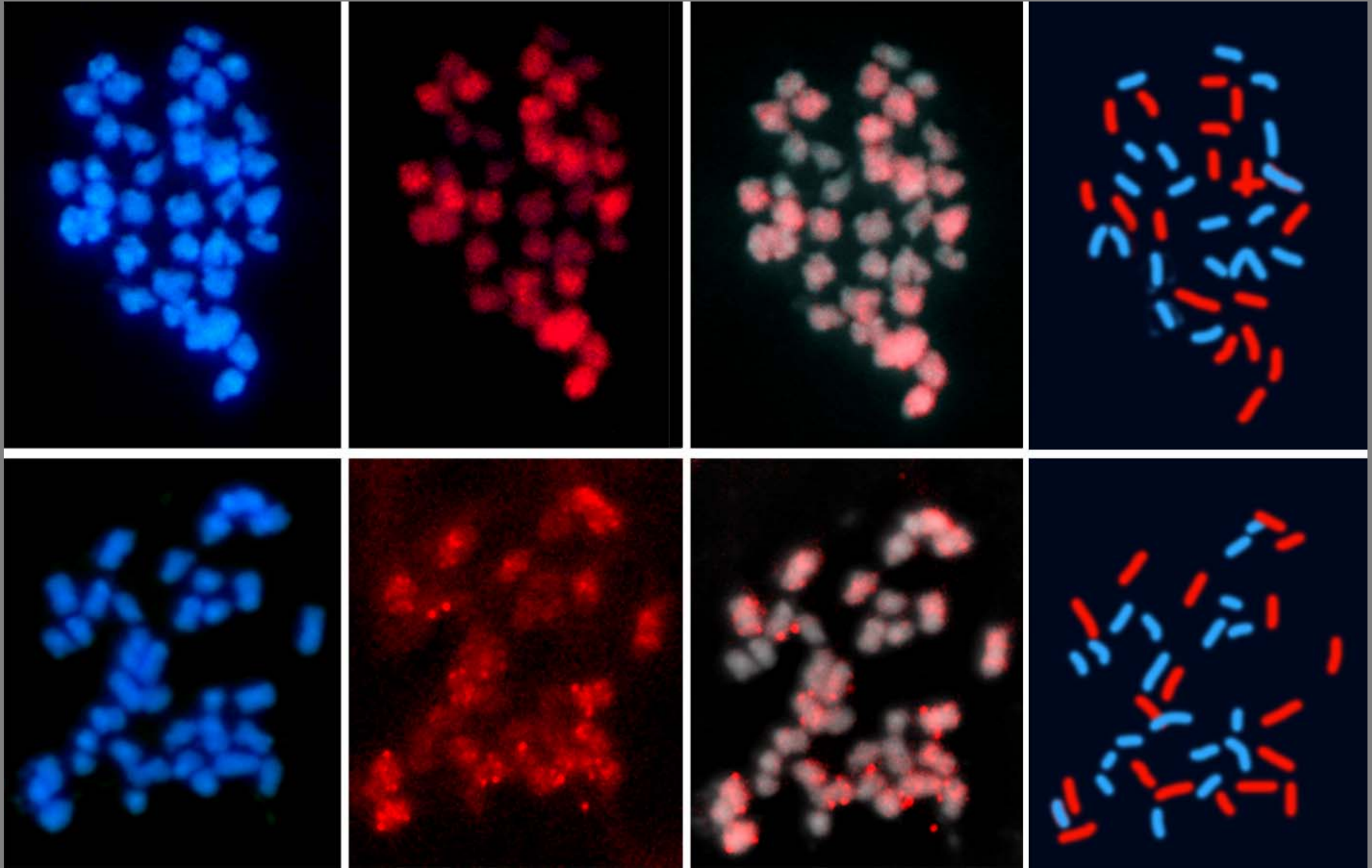


# Genome Specificity of a CACTA (*En/Spm*) Transposon

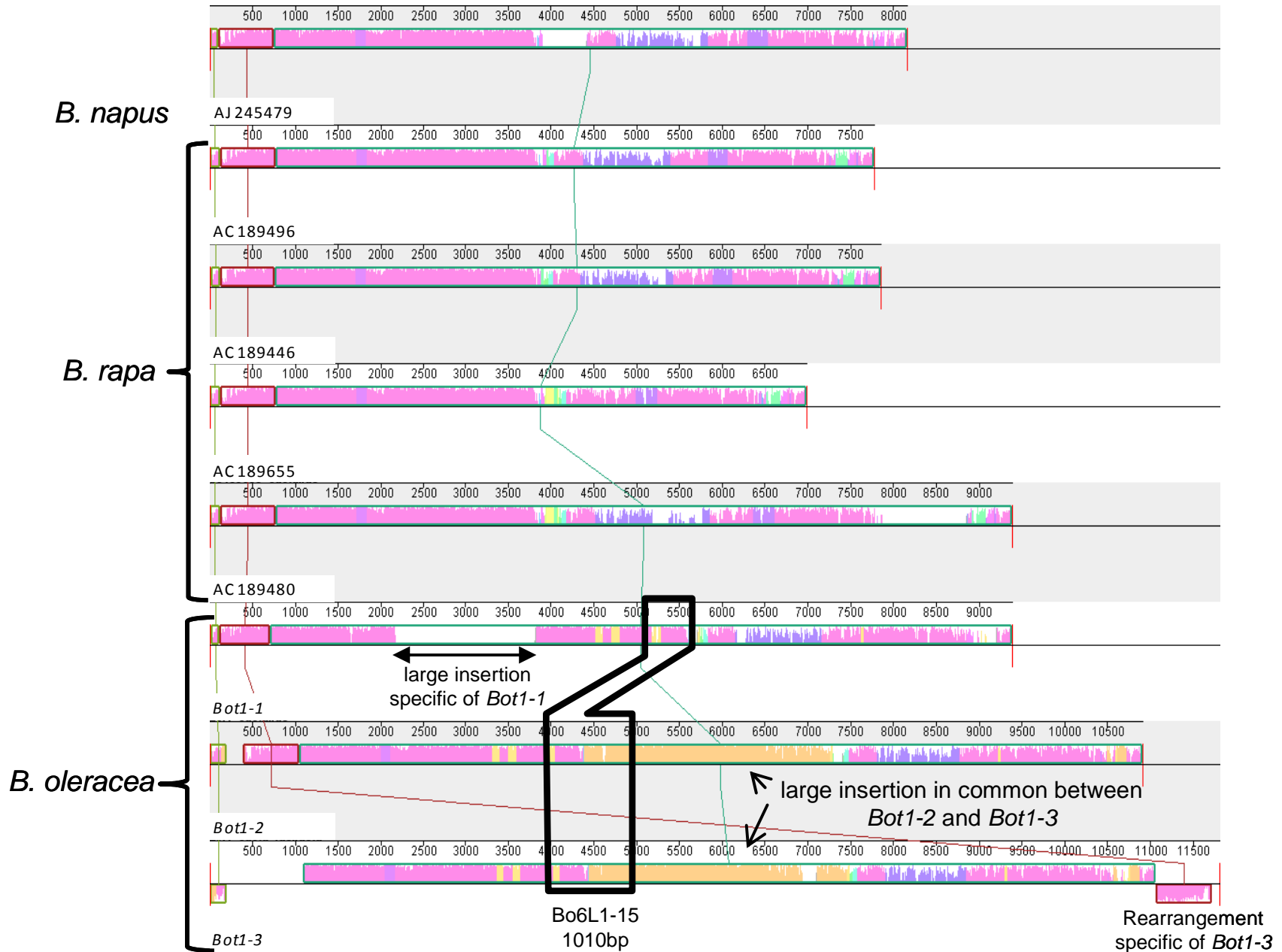
*B. napus* (AACCC,  $2n=4x=38$ ) – hybridized with C-genome CACTA element red

*B. oleracea* (CC,  $2n=2x=18$ )

*B. rapa* (AA,  $2n=2x=20$ )



# Genome Specificity of a CACTA (En/Spm) Transposon





# Genome Specificity of a CACTA (En/Spm) Transposon

- *Bot1* has encountered several rounds of amplification in the C (*B. oleracea*) genome only, playing a major role in the recent *B. rapa* and *B. oleracea* genome divergence
- *Bot1* carries a host S-locus associated *SLL3* gene copy; is the transposon associated with *SLL3* proliferation?

→ Transposons are a driver of genome and genome evolution