

Phylogenies of type II and type IB DNA topoisomerases

We have updated the phylogenies of type II and type IB DNA topoisomerases (for previous ones, see Forterre et al., *Biochimie*, 2007, Brochier-Armanet et al., *Biology Direct*, 2008). Our results suggest that eukaryotic type II could have originated from Large NucleoCytoplasmic DNA viruses (NCLDV). In the case of type IB DNA topoisomerases, we observed that some NCLDV encode the short form typical of bacteria, whereas others encode the long form typical of Archaea and Eukarya. The long form type IB enzymes from NCLDV branch between Thaumarchaea and Eukarya in our phylogenetic tree. This suggests that these TopoIB were recruited by NCLDV from proto-eukaryotes. Our analyses also reveal a strong evolutionary connection between NCLDV and some head and tailed bacteriophages (phages, Caudovirales).

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