

**P022** Coupling of DNA replication and translation: new hints from genomic context analysis in archaea

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Gene clusters conserved between distantly related species are likely biologically relevant and may be used to infer functional linking between the encoded proteins. We have recently examined the genomic neighbourhood of all archaeal DNA replication genes in order to identify conserved genomic associations. We have noticed that the gene encoding Gins15 is contiguous to the gene for the small subunit of the DNA primase (PriS) and/or to the gene for PCNA in almost all archaeal genomes suggesting that these proteins interact at the replication fork. Other gene associations suggest putative crosstalk between DNA replication, transcription, and DNA repair. Unexpectedly, this focused approach allows us to detect a widely conserved gene cluster that has escaped previous multiple genome alignment studies. This cluster comprises the genes for Gins15, PriS, and PCNA and four genes encoding proteins involved in translation or ribosome biogenesis (L44E, S27E, aIF-2 $\alpha$ , and Nop10). These seven genes are conserved in Archaea and Eucarya, but absent from Bacteria. Interestingly, human homologues of L44E and S27E genes have been recently identified as oncogenes. We propose the existence of a mechanism coupling DNA replication to ribosome translation in Archaea and Eucarya that may be functionally analogous to the network regulating transcription, translation, and replication via (p)ppGpp in Bacteria.