

# **Ribosome origins: the relative age of 23S rRNA Domains.**

Hury J, Nagaswamy U, Larios-Sanz M, Fox GE.

Department Biology and Biochemistry, University of Houston, Houston, TX 77204-5001, USA.

The modern ribosome and its component RNAs are quite large and it is likely that at an earlier time they were much smaller. Hence, not all regions of the modern ribosomal RNAs (rRNA) are likely to be equally old. In the work described here, it is hypothesized that the oldest regions of the RNAs will usually be highly integrated into the machinery. When this is the case, an examination of the interconnectivity between local RNA regions can provide insight to the relative age of the various regions. Herein, we describe an analysis of all known long-range RNA/RNA interactions within the 23S rRNA and between the 23S rRNA and the 16S rRNA in order to assess the interconnectivity between the usual Domains as defined by secondary structure. Domain V, which contains the peptidyl transferase center is centrally located, extensively connected, and therefore likely to be the oldest region. Domain IV and Domain II are extensively interconnected with both themselves and Domain V. A portion of Domain IV is also extensively connected with the 30S subunit and hence Domain IV may be older than Domain II. These results are consistent with other evidence relating to the relative age of RNA regions. Although the relative time of addition of the GTPase center can not be reliably deduced it is pointed out that the development of this may have dramatically affected the progenotes that preceded the last common ancestor.

PMID: 16972151 [PubMed - indexed for MEDLINE]