

INTERACTIONS OF RRNA WITH AN ANCIENT PROTEIN FRAGMENT. K. A. Lanier¹ and L. D. Williams², ¹School of Chemistry and Biochemistry, Georgia Institute of Technology, 315 Ferst Dr., Atlanta, GA 30332, klanier@gatech.edu, loren.williams@chemistry.gatech.edu.

Introduction: We investigate folding fragments of ribosomal RNA (rRNA) with fragments of ribosomal protein (rProtein). Here we report that a 199-nucleotide fragment of Domain III of the 23S rRNA (Domain III^{core}) folds to the native state, indicated by the magnesium dependence of SHAPE probing. Isolated Domain III^{core} associates with rProtein uL23, its partner within the intact ribosome. rProtein uL23 forms a variety of complexes with Domain III and with Domain III^{core} rRNA. The complexes vary by stoichiometry (rRNA-protein_n, n=1,2,3,...) and are anti-cooperative. We cleave the non-canonical (in conformation) peptide tail (uL23^{peptide}) from the globular domain of rProtein uL23, and assay its ability to bind with Domain III and Domain III^{core}. uL23^{peptide} corresponds to the segment of rProtein uL23 that penetrates deep into core of the LSU, and interacts with Domain III^{core}. uL23^{peptide} forms 1:1 complexes with Domain III and with Domain III^{core} in the absence of Mg²⁺ ions (rRNA-peptide₁). In the presence of Mg²⁺ ions the complexes switch to 1:2 stoichiometry (rRNA-peptide₂). The 1:2 complexes appear to be cooperative. The results support our previous model in which rProteins are chimeras; the non-canonical tails are more ancient than the globular domains.

References: Use the brief numbered style common in many abstracts, e.g., [1], [2], etc. References should then appear in numerical order in the reference list, and should use the following abbreviated style:

[1] Kathryn A. Lanier¹, Shreyas S. Athavale¹, Eric Anderson¹, Poorna Roy¹, Dana M. Schneider¹, Chiaolong Hsiao¹, Anton S. Petrov¹, Jessica C. Bowman¹, Eric B. O'Neill¹, Chad R. Bernier¹, Nigistmariam Abdu-rahiman¹, Stephen C. Harvey^{1,2} Roger Wartell², and Loren Dean Williams^{1*} (2015) (submitted).