



this week's highlights



End game for tRNA

Transfer RNAs have a CCA sequence at their 3' end, which is not encoded in the tRNA gene. In most organisms a CCA-adding enzyme transfers the nucleotides to immature tRNA. This enzyme is a template-independent RNA polymerase; it somehow 'knows' which three nucleotides to add and knows to add only to tRNA. Various models have been proposed to explain how this intriguing enzyme might act, the first of them over 30 years ago, but none has given a complete picture. Based on crystal structures of enzyme-substrate complexes at three stages of nucleotide incorporation, Xiong and Steitz have now been able to infer the mechanism by which the *Archaeoglobus fulgidus* enzyme adds CCA. In a separate study Tomita et al. determine the crystal structure of the enzyme from *Aquifex aeolicus* bound to tRNA lacking the terminal adenosine and an incoming ATP analogue. Both teams find that a protein 'template' mimics the nucleotide template used by conventional polymerases.

articles

Mechanism of transfer RNA maturation by CCA-adding enzyme without using an oligonucleotide template

YONG XIONG & THOMAS A. STEITZ

Nature **430**, 640–645 (2004); doi:10.1038/nature02711[| Summary](#) | [Full Text \(HTML / PDF\)](#) |

letters to nature

Structural basis for template-independent RNA polymerization

KOZO TOMITA, SHUYA FUKAI, RYUICHIRO ISHITANI, TAKUYA UEDA, NONO TAKEUCHI, DMITRY G. VASSILYEV & OSAMU NUREKI

Nature **430**, 700–704 (2004); doi:10.1038/nature02712[| First Paragraph](#) | [Full Text \(HTML / PDF\)](#) |[5 August 2004 table of contents](#)