A tRNA-like structure from a linear plasmid of the fungus *Ascobolus immersus*

Frank Kempken

Lehrstuhl für Allgemeine Botanik, Ruhr-Universität Bochum, Postfach 10 21 48, 4630 Bochum 1, FRG
Submitted July 7, 1989

Linear plasmids are widely distributed among eukaryotes (1). With respect to structure and replication these plasmids resemble viral remnants rather than true plasmids (2,3). DNA sequence analysis of the linear plasmid pAI2 from *Ascobolus immersus* revealed that one strand of this plasmid may encode a tRNA like structure (fig. 1). This tRNA structure may bind to the RNA encoded by the opposite strand. Since plasmid pAI2 was found in one strain of *A.immersus* only it seems unlikely that it encodes an essential tRNA as in the case of the maize 2.3 kb plasmid (4). However a comparable tRNA molecule (fig. 2) is functional in *Neurospora crassa* (5).

In contrast several lines of evidence suggest that this structure may be a remainder of a former viral element: (a) Many viruses encode tRNA like structures at their termini (6). (b) ORF1 of pAI2 probably encode a DNA-polymerase (2). In addition the polypeptid derived from this ORF shows weak homology to reverse transcriptases, similar to those of retroviruses (7). (c) The mRNAs of retroviruses and retrotransposons not only encode a reverse transcriptase but also have a tRNA binding site, necessary for binding of a tRNA, which act as a primer for reverse transcription of this mRNA (8). This is also true to pAI2: A mRNA encoding one strand including ORF1 also has a region complementary to the tRNA like structure.

![Fig. 1: tRNA like structure of *A.immersus*](image1)

![Fig. 2: mitochondrial tRNA molecule of *N.crassa*](image2)

**References:**