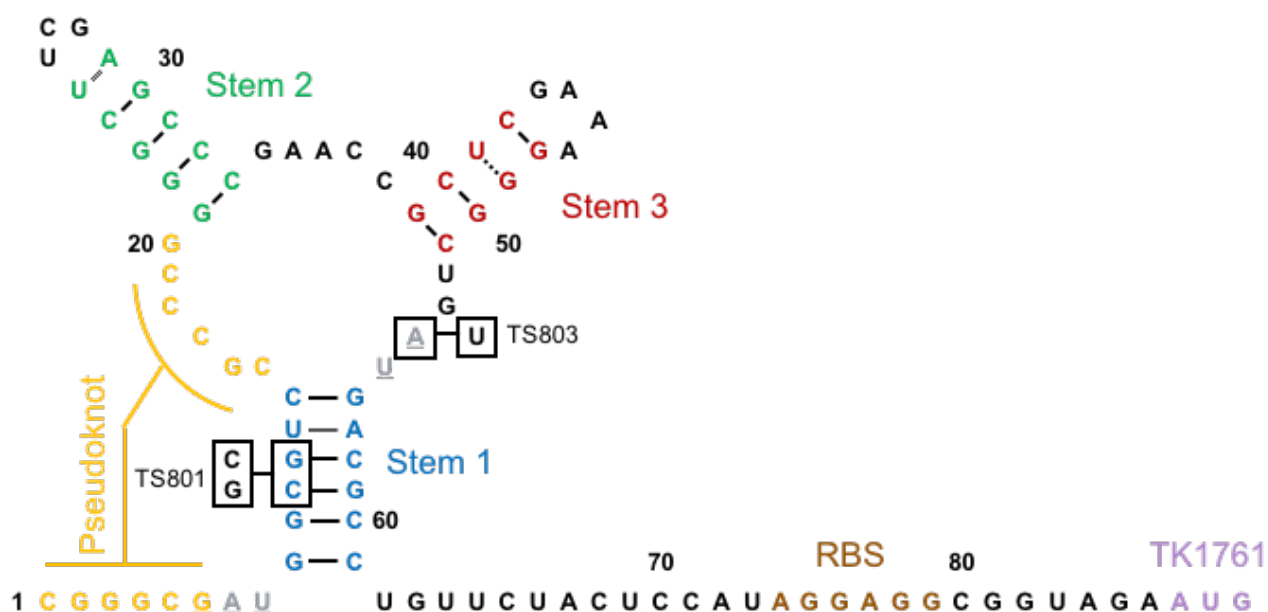


## Supplemental material

An archaeal, fluoride-responsive riboswitch provides an inducible expression system for hyperthermophiles

Tk AUUCAGCGCGGGCGGAUGGCGTCCGCCCGGGGCUUCGAGCCCGAACCGCUCGAAAGGGCUGAUGACGCCUGUUCUACUCC  
 Tp -----GGGCGGAUGAGGCCCGCCAA-ACUGC-----CCUGAAAGGGCUGAUGGC--C---UCUACUG--  
 \*\*\*\*\* \* \*\*\*\*\* \*\* \* \*\* \*\*\*\*\* \* \* \*\*\*\*\*

**Supplemental Figure 1** The Tk-FRR shares a conserved RNA sequence that in Thermotoga species functions as a fluoride-binding riboswitch. Corresponding stem loops are color coded. Bold, underlined residues are required for fluoride binding.



**Supplemental Figure 2** The sequence and one proposed secondary structure of the WT Tk-FRR. Lines connecting nucleotides indicates proposed base pairing. Sequence variants of the FRR incorporated into the genomes of TS801 and TS803 are indicated in boxes connected to the WT sequence. Underlined residues are important for fluoride binding. Structural elements are color coded as in Supplemental Figure 1.