

Small noncoding RNAs in cells transformed by human T-cell leukemia virus type 1: a role for a tRNA fragment as a primer for reverse transcriptase

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DESCRIPTION OF SUPPLEMENTAL MATERIAL

Table S1. Primers used in RT-PCR. Details for RT-PCR assays are provided in Materials and Methods.

Table S2. tRFs. The four libraries were analysed for reads with exact matches to 135 tRFs described by Lee et al. (2009) and for sequences with variations in the 5' and 3' ends (isoforms). The tRF-5 and tRF-3 isoforms were subjected to a BLAST search against the tRNA database after removing the 3'CCA triplet from the tRF-3 reads, and the tRF-1 isoforms were subjected to a BLAST search against the human genome. All listed isoforms yielded exact matches.

Table S3. tRNA genes able to produce tRF-3019. Shown are results of a BLAST search of the genomic tRNA database (<http://gtrnadb.ucsc.edu>) for human tRNA genes containing the sequence of tRF-3019 after removal of the 3'CCA. All listed genes yielded exact matches.

Supplemental Table 1. Primer sequences.

Primer	Sequence
U5-s	CTCGGAGCCAGCGACAGC
Gag-as	gaagcttGCCTAGGGAATAAAGGGGC
Tail-U5-s	agagcggattaacggcctaaCTCGGAGCCAGCGACAGC
Tail-s	agagcggattaacggcctaa
tRF-3019 RNA	AUCCCGGACGAGCCCCCA
tRF-3019 DNA	ATCCCGGACGAGCCCCCA
miR-150 RNA	UCUCCCAACCCUUGUACCAGUG
U5-as	TGTGTACTAAATTTCTCTCCTG
RT7-tRF-3019	aacgtattcaccgtgagtggTGGGGGC
Short-tRF-3019	cgtcagatgtccgagtagagATCCCGGACGAG
RT8-tRF-3003	aacgtattcaccgtgagtggTGGTGGAG
Short-tRF-3003	cgtcagatgtccgagtagagTCCCGGCACC
PCR-tRF-s	cgtcagatgtccgagtagag
PCR-tRF-as	aacgtattcaccgtgagtgg
tRNA-Pro-s	GGTCTAGGGGTATGATTCTCG
tRNA-Pro-as	GCTCGTCCGGGATTTGAACC
tRNA-Ala-s	GTGTAGCTCAGTGGTAGAGC
tRNA-Ala-as	TGGAGGTGCCGGGGATTG

Added tail sequences are indicated with lower case letters. Primer tRNA-Pro-as was described in **Imura Y, Shirai Y, Nojima T, Nakashima R, Yamagata H, Miyachi K, Yoshifuji H, Kawabata D, Ohmura K, Usui T, Fujii T, Mimori T.** 2012. NEFA/nucleobindin-2 is a target autoantigen of the anti-Wa antibody and is associated with transfer RNA. *Mod Rheumatol* **22**: 685-694. Primers were purchased from Sigma-Aldrich.

Supplemental Table 2. tRFs

	CD4	Stim. CD4	MT-2	C91PL	Total no. reads
tRF-1001	16	75	13	29	133
isoform a	41	46	7	19	113
isoform b	3	2	0	3	8
isoform c	0	1	0	1	2
tRF-1002	0	0	0	2	2
tRF-1003	0	2	0	4	6
isoform a	2	0	0	0	2
tRF-1004	0	0	0	3	3
isoform a	0	0	0	1	1
isoform b	0	0	0	2	2
tRF-1005	0	0	0	0	0
isoform a	0	0	1	1	2
tRF-1006	0	0	0	6	6
isoform a	0	0	0	2	2
tRF-1007	0	0	0	0	0
isoform a	0	0	0	2	2
tRF-1008	0	0	0	2	2
isoform a	0	0	0	1	1
isoform b	0	0	0	4	4
isoform c	0	0	0	1	1
tRF-1009	0	0	0	0	0
tRF-1010	0	0	1	3	4
isoform a	0	0	1	0	1
tRF-1011	0	0	0	0	0
tRF-1012	0	0	0	0	0
isoform a	0	0	0	4	4
tRF-1013	0	0	1	0	1

tRF-1014	tgactggacctttcttt	0	0	0	0	1	1	2
isoform a	tgactggacctttcttt	0	0	0	0	1	1	1
tRF-1015	ctgtgctccggagtacctcgttt	0	0	0	0	2	2	2
tRF-1016	gctgcatagcaagccttt	0	0	0	0	1	1	1
tRF-1017	ttgccatgttaacgttt	0	0	1	1	1	2	2
tRF-1018	ccgtgtttccccacgcttt	0	0	0	0	0	0	0
tRF-1019	tcgtggctactgtttt	0	0	0	0	0	0	0
tRF-1020	tgagagcgtcggtttt	0	0	0	0	1	1	1
tRF-1021	aagagagtcgcttttt	0	0	0	0	1	1	1
tRF-1022	ggaggggagaaggtttt	0	0	0	0	0	0	0
tRF-3001	atcccaccgctgccacca	11	57	2	11	11	81	102
isoform a	aatcccaccgctgccacca	1	4	0	0	0	5	5
isoform b	tcgaatcccaccgctgccacca	2	8	0	0	0	10	10
isoform c	gttcgaatcccaccgctgccacca	0	0	1	0	0	1	1
isoform d	tcccaccgctgccacca	0	1	0	4	4	5	5
tRF-3002	accctgctcgctgcgcca	16	39	1	9	9	65	74
isoform a	tcgaaccctgctcgctgcgcca	0	1	1	1	1	3	3
isoform b	ccctgctcgctgcgcca	0	2	0	4	4	6	6
tRF-3003	tccccggcacctccacca	31	120	7	37	37	195	214
isoform a	atccccggcacctccacca	1	9	0	0	0	10	10
isoform b	tcaatccccggcacctccacca	1	1	0	5	5	7	7
isoform c	tcgatccccggcacctccacca	0	1	0	1	1	2	2
tRF-3004	tccccggcatctccacca	21	49	5	83	83	158	185
isoform a	atccccggcatctccacca	1	6	0	0	0	7	7
isoform b	cgatccccggcatctccacca	0	0	0	1	1	1	1
isoform c	tcgatccccggcatctccacca	6	6	0	6	6	18	18
isoform d	tcaatccccggcatctccacca	0	0	0	1	1	1	1
tRF-3005	atcctgcccgactacgcca	21	69	10	8	8	108	141
isoform a	aatcctgcccgactacgcca	0	0	1	0	0	1	1

isoform b	gaatcctgcccactacgcca	0	0	3	0	0	3	0	3
isoform c	tcgaatcctgcccactacgcca	7	5	2	7	0	2	7	21
isoform d	gttcgaatcctgcccactacgcca	0	0	1	0	0	1	0	1
isoform e	tcctgcccactacgcca	0	3	0	4	0	0	4	7
tRF-3006	tcgattccccggcccactacgcca	0	11	0	15	0	0	15	26
tRF-3007	tcgattccccggcccactacgcca	1	13	1	8	0	1	8	23
tRF-3008	gtcccaccagagtcgcca	2	19	0	3	0	0	3	24
isoform a	agtcccaccagagtcgcca	0	4	0	2	0	0	2	6
tRF-3009	acccactcctggtacca	6	24	1	29	0	1	29	60
isoform a	aacccactcctggtacca	0	1	0	0	0	0	0	1
isoform b	tcgaacccactcctggtacca	0	2	0	1	0	0	1	3
isoform c	ccccactcctggtacca	0	1	0	0	0	0	0	1
tRF-3010	gtcccttcgtggtcgcca	3	8	1	2	0	1	2	14
isoform a	agtccttcgtggtcgcca	3	7	5	1	0	5	1	16
isoform b	gagtccttcgtggtcgcca	0	0	1	0	0	1	0	1
isoform c	tcgagtccttcgtggtcgcca	2	0	2	0	0	2	0	4
tRF-3011	aaccgggcggaaacacca	1	0	0	5	0	0	5	6
isoform a	tcgaaacccgggcggaaacacca	2	1	1	1	0	1	1	5
isoform b	accgggcggaaacacca	0	0	2	8	0	2	8	10
isoform c	ccgggcggaaacacca	0	0	0	1	0	0	1	1
tRF-3012	agtccttcctggtcgcca	1	14	4	2	0	4	2	21
isoform a	gagtccttcctggtcgcca	0	0	1	0	0	1	0	1
isoform b	cgagtccttcctggtcgcca	0	1	1	0	0	1	0	2
isoform c	tcgagtccttcctggtcgcca	0	1	0	0	0	0	0	1
isoform d	gtcccatctgggtcgcca	0	1	0	1	0	0	1	2
tRF-3013	tcgagcccacccaggacgcca	0	2	0	2	0	0	2	4
tRF-3014	gtcctgcccgggtcgcca	6	11	1	1	0	1	1	19
isoform a	agtcctgcccgggtcgcca	3	1	0	0	0	0	0	4
isoform b	cgagtcctgcccgggtcgcca	0	1	0	0	0	0	0	1

isoform c	tcgagtcctgccgggtcgcca	2	0	0	0	1	3
tRF-3015	tcaagtcctgttcggggcgcca	1	2	0	0	0	3
tRF-3016	tcgaatcccactcctgacacca	2	5	1	1	6	14
isoform a	atcgaatcccactcctgacacca	0	1	0	0	0	1
isoform b	cgaatcccactcctgacacca	0	1	0	0	0	1
isoform c	atcccactcctgacacca	1	20	1	1	14	36
isoform d	tcccactcctgacacca	0	0	0	0	4	4
tRF-3017	tcgaatcccactcctcgcgcca	2	5	0	0	4	11
tRF-3018	tcgattcccggccaatgacacca	9	29	0	0	13	51
tRF-3019	atcccggacgagccccca	12	63	3	3	24	102
isoform a	aatcccggacgagccccca	0	5	0	0	2	7
isoform b	tcaaatcccggacgagccccca	0	0	0	0	2	2
isoform c	ttcaaatcccggacgagccccca	0	0	0	0	1	1
isoform d	tcccggacgagccccca	0	3	0	0	7	10
tRF-3020	atcccaccagagtcgcca	0	60	1	1	15	76
isoform a	aatcccaccagagtcgcca	0	1	0	0	3	4
isoform b	tcgaatcccaccagagtcgcca	0	1	0	0	0	1
isoform c	tcccaccagagtcgcca	0	3	0	0	1	4
tRF-3021	accccacttctggtacca	0	11	0	0	5	16
tRF-3022	atcccaccactgccacca	0	3	0	0	3	6
tRF-3023	tgcccgcgcatcctccacca	5	47	2	2	2	56
isoform a	atgcccgcatecctccacca	6	8	3	3	0	17
isoform b	tcgatgcccgcatecctccacca	2	2	0	0	0	4
isoform c	gcccgcatecctccacca	0	0	0	0	7	7
tRF-3024	tcgatccccggcatctcca	0	0	0	0	0	0
isoform a	tcgatccccggcatctccacca	6	6	0	0	6	18
tRF-3025	tcgaatcccagtagagcctcca	0	1	1	1	0	2
tRF-3026	tcgaatcccacttctgacacca	0	4	1	1	4	9
tRF-3027	ccccggctcctccacca	0	3	0	0	0	3

tRF-3028	atcccttcgtaggtgcca	1	1	1	1	0	0	3	4
isoform a	tcgaatccccttcgtaggtgcca	0	1	0	0	0	0	1	
tRF-3029	tccccagtagcctccacca	0	16	2	62			80	89
isoform a	atccccagtagcctccacca	0	1	1	3			5	
isoform b	tcgatccccagtagcctccacca	0	1	1	2			4	
tRF-3030	atcacgtcggggtcacca	0	9	0	1			10	18
isoform a	caaatcacgtcggggtcacca	1	0	0	0			1	
isoform b	tcgaatcacgtcggggtcacca	1	0	0	0			1	
isoform c	tcacgtcggggtcacca	0	1	0	5			6	
tRF-3031	tcgactccccggtgtgggaacc	0	0	0	0			0	4
isoform a	tcgactccccggtgtgggaacc	2	0	0	2			4	
tRF-3032	atccccaccttcgtagcga	1	0	0	3			4	4
tRF-3033	tcgattccccgggcggcacc	1	2	0	2			5	5
tRF-3034	tccccgggttcggcacc	0	13	0	8			21	24
isoform a	atccccgggttcggcacc	0	1	0	1			2	
isoform b	cgatccccgggttcggcacc	1	0	0	0			1	
tRF-3035	atccccggacgagcccc	1	1	0	0			2	4
isoform a	tcaaatccccggacgagcccc	0	1	0	1			2	
tRF-3036	tccccgacacctccacca	0	1	0	2			3	3
tRF-3037	acccgtagcctccca	0	5	0	0			5	6
isoform a	tcgaacccccgtagcctccca	0	1	0	0			1	
tRF-3038	atccccaccgtagcacc	0	0	0	0			0	
tRF-3039	tcaaatccccggtagcctccca	0	1	0	0			1	1
tRF-3040	tcgaatccccaggggcctccca	2	1	0	1			4	4
tRF-3041	tcgaatccccagtagcagggcacc	0	1	0	0			1	1
tRF-3042	tccccgtagtagcagggcacc	0	2	0	4			6	6
tRF-3043	tccccagtagcctccacca	0	1	0	0			1	3
isoform a	atccccagtagcctccacca	0	1	0	1			2	
tRF-3044	tcgaatccttagtagcacc	0	1	0	0			1	1

tRF-3045	tcgatccccggcacctcca	0	0	0	0	0	0	0	0	2
isoform a	tcgatccccggcacctcca	0	1	0	0	1	0	0	0	2
tRF-3046	tcgattccagctcgaaggacca	0	0	0	0	0	0	0	0	0
tRF-3047	acccactctcggtagca	0	0	0	0	0	0	0	0	0
tRF-3048	agtcaccacctgggtagca	0	1	0	0	1	0	0	1	8
isoform a	cgagtcccacctgggtagca	0	1	0	0	0	0	0	0	1
isoform b	gtcccacctgggtagca	0	0	0	0	0	0	0	5	5
tRF-3049	tcgaaaccatcctctgtagca	0	1	0	0	0	0	0	0	2
isoform a	atcgaaaccatcctctgtagca	0	0	1	0	1	0	0	0	1
tRF-3050	atcctgctcacagcgcca	0	2	3	3	3	0	0	0	14
isoform a	tcctgctcacagcgcca	0	0	0	0	6	0	0	0	6
tRF-3051	gtcacgtcgggtagca	0	3	1	0	0	0	0	0	4
isoform a	agtcacgtcgggtagca	0	1	0	0	0	0	0	0	1
isoform b	tcaagtcacgtcgggtagca	4	1	0	0	0	0	0	0	5
tRF-3052	tcgatccccgtacgggtagca	0	0	0	0	0	0	0	0	0
tRF-3053	tcgattccccgacgggtagca	0	2	0	2	2	0	0	0	4
tRF-3054	atcccaccctcgtcgcca	0	3	0	0	0	0	0	0	3
tRF-3055	actcccggtgtgggtagca	0	0	0	0	3	0	0	0	3
isoform a	tcgactccccggtgtgggtagca	2	0	0	0	2	0	0	0	4
isoform b	ctcccggtgtgggtagca	2	12	0	0	3	0	0	0	17
tRF-3056	gagcctcacacgggtagca	0	0	0	0	0	0	0	0	0
tRF-3057	tcgattccggctcgaaggtagca	0	2	1	0	0	0	0	0	3
tRF-3058	tcgattccccggccaatgcacc	0	0	0	0	0	0	0	0	0
tRF-3059	tcgaatcacgtcgggtagca	1	0	0	0	0	0	0	0	1
tRF-3060	tcgaatcccagcaggcctcca	0	0	0	0	0	0	0	0	0
tRF-3061	tcgactcctggctggctcgcc	0	0	0	0	0	0	0	0	0
isoform a	tcgactcctggctggctcgcca	0	1	0	0	1	0	0	0	2
tRF-3062	tccccggcggaacaccca	0	0	0	0	0	0	0	0	3
isoform a	tcgatccccggcggaacaccca	0	1	0	0	0	0	0	0	4

tRF-3063	accgggcagaaagcacca	0	0	0	0	0	0	0	0
tRF-3064	atccctccgtgggttacca	0	2	0	0	6	9	8	0
isoform a	tcgatccctccgtggttacca	0	1	0	0	0	1	1	0
tRF-3065	gtccctgtccaggcgcca	0	0	0	0	0	0	0	0
tRF-3066	tctcgctgggcctcca	0	1	0	0	0	1	1	0
tRF-3067	tcgaaaccgggcggaacacc	0	0	0	0	0	5	0	0
isoform a	tcgaaaccgggcggaacacca	2	1	1	1	1	5	5	0
tRF-3068	tcctcacacggggcacca	3	5	0	0	0	9	8	0
isoform a	tcgatcctcacacggggcacca	0	1	0	0	0	1	1	0
tRF-3069	tcgactcctggctggctcgcca	0	1	0	0	1	2	2	0
tRF-3070	tcgagccccagtggaaccacca	0	0	0	0	0	0	0	0
tRF-3071	tcgactcccgggatggaaacca	0	0	0	0	0	0	0	0
tRF-3072	tcaaatctcggtggaacctcca	1	0	0	0	0	1	1	0
tRF-3073	tcgaatcctgctcacagcgcca	0	0	0	0	0	0	0	0
tRF-3074	agtcaccacccgggtacca	0	0	0	0	2	2	2	0
tRF-3075	atctcggtagggacctcca	1	2	0	0	1	10	4	0
isoform a	tcaaatctcggtagggacctcca	0	2	0	0	1	3	3	0
isoform b	tctcggtagggacctcca	0	0	0	0	3	3	3	0
tRF-3076	ggtcacctgtccaggcgcca	0	0	0	0	0	0	0	0
tRF-3077	tccccggcacctccacc	0	0	0	0	0	2	0	0
isoform a	atccccggcacctccacc	0	1	0	0	0	1	1	0
isoform b	aatccccggcacctccacc	1	0	0	0	0	1	1	0
tRF-5001	gacgagtgggcccgagtgg	0	1	3	2	2	23	6	0
isoform a	gacgagtgggcccgagtggttaa	0	1	5	0	0	6	6	0
isoform b	gacgagtgggcccgagtggttaag	0	0	9	0	0	9	9	0
isoform c	gacgagtgggcccgagtggttaagg	0	0	2	0	0	2	2	0
tRF-5002	tcctcctgggtctagtggtta	0	1	4	0	0	37	5	0
isoform a	tcctcctgggtctagtggttag	0	0	11	0	0	11	11	0
isoform b	tcctcctgggtctagtggttagg	0	0	16	0	0	16	16	0

tRF-5012	gccccgatagctcagtcg	0	0	0	0	0	0	0	0	4
isoform a	gccccgatagctcagtcgg	0	1	0	0	2				3
isoform b	gccccgatagctcagtcggtag	0	0	1	0	0				1
tRF-5013	gtcaggatggcccagcggctc	0	0	0	0	0				1
isoform a	gtcaggatggcccagcggctct	0	0	0	0	1				1
tRF-5014	gctgtgatggccgagtg	0	0	0	0	0				0
tRF-5015	gtagtcgtggccgagtggtta	0	0	0	0	0				7
isoform a	gtagtcgtggccgagtggttaa	0	0	1	0	0				1
isoform b	gtagtcgtggccgagtggttaag	0	0	3	1					4
isoform c	gtagtcgtggccgagtggttaagg	0	0	2	0					2
tRF-5016	accaggatggcccagtggtta	0	0	0	0	0				1
isoform a	ccaggatggcccagtggttaag	0	0	1	0					1
tRF-5017	gtcacggtggccgagtg	0	0	1	0					3
isoform a	gtcacggtggccgagtggttaa	0	0	1	0					1
isoform b	gtcacggtggccgagtggttaag	0	0	1	0					1
tRF-5018	gggccagtgccgcaatgg	0	0	1	0					1
tRF-5019	gcagcgatggccgagtg	0	0	0	2					2
tRF-5020	tccctggtggtctagtggtta	0	0	2	1					3
tRF-5021	tcccacatggtctagcggtagg	0	0	0	0					0
tRF-5022	gtttccgtagtgtagtggtta	0	0	0	0					1
isoform a	gtttccgtagtgtagtggttatca	0	0	1	0					1
tRF-5023	ggtagtggtggccgagcggctc	0	0	0	0					0
tRF-5024	gccccgtagctcagtcg	0	0	0	0					0
tRF-5025	ggcgcggtggccaaagtgg	0	0	0	0					2
isoform a	ggcgcggtggccaaagtggta	1	0	0	0					1
isoform b	ggcgcggtggccaaagtggtaagg	0	0	1	0					1
tRF-5026	gcctgggtagctcagtcgg	0	0	0	0					1
isoform a	gcctgggtagctcagtcgg	0	0	0	1					1
tRF-5027	accagaatggccgagtggttaa	0	0	0	0					0

tRF-5028	agcagagtggcgagcgga	0	0	0	0	0	0	0	0	0
tRF-5029	gtcaggatggccgagtggtc	0	0	0	0	0	0	0	0	1
isoform a	gtcaggatggccgagtggtctaag	0	0	0	1	0	0	0	0	1
tRF-5030	gccgtgacgtatagtggtta	0	0	0	0	0	0	0	0	0
tRF-5031	tcctcgttagtatagtg	0	0	0	0	0	0	0	0	8
isoform a	tcctcgttagtatagtg	1	1	0	0	0	0	0	0	2
isoform b	tcctcgttagtatagtggt	0	0	0	0	0	4	0	0	4
isoform c	tcctcgttagtatagtggtgagt	0	0	0	1	0	0	0	0	1
isoform d	tcctcgttagtatagtggtgagta	0	0	0	0	0	1	0	0	1
tRF-5032	gacctcgtggcgcaatgg	0	1	0	0	3	0	0	0	4
tRF-5033	gccccgatgacccctcagtg	0	0	0	0	0	0	0	0	1
isoform a	gccccgatgacccctcagtggt	0	0	0	0	1	0	0	0	1
tRF-5034	tcccatatggtctagcgggta	0	0	0	0	0	0	0	0	0
tRF-5035	gggggtatagctcagtg	0	0	0	0	0	0	0	0	0
tRF-5036	accgggatggccgagtggtta	0	0	0	0	0	0	0	0	0
Cand5	gccccgggcctatcctagaa	0	1	0	0	1	0	0	0	2
isoform a	gccccgggcctatcctagaaa	0	0	0	0	2	0	0	0	2
Cand10	catgtcccctgttcgggcgcca	0	0	0	0	0	0	0	0	0
isoform a	tcatgtcccctgttcgggcgcca	0	0	0	1	0	0	0	0	1
Cand27	ctcctggctggctcgcca	1	4	0	0	1	0	0	0	6
isoform a	tcgactcctggctggctcgcca	0	1	0	0	1	0	0	0	2
isoform b	actcctggctggctcgcca	0	0	0	0	1	0	0	0	1
Cand33	cgtttccccggcccatgcacca	0	17	0	0	10	0	0	0	27
Cand42	acatgggtggttcagtggtaga	0	0	0	0	0	0	0	0	0
isoform a	catgggtggttcagtggtaga	0	0	0	0	1	0	0	0	1
isoform b	catgggtggttcagtggtagaattc	0	0	0	1	0	0	0	0	1
		293	1065	244	673	2275	673	2275	2232	2232

Supplemental Table 3. tRNA genes able to produce tRF-3019

BLAST search

Genomic tRNA database (<http://gtrnadb.ucsc.edu>)

Query: atccccggacgagccc (tRF-3019 lacking 3'CCA)

chr14.trna3-ProTGG (20171005-20171076) Pro (TGG) 72 bp
chr11.trna12-ProTGG (75624588-75624517) Pro (TGG) 72 bp
chr5.trna14-ProTGG (180548531-180548460) Pro (TGG) 72 bp
chr16.trna8-ProTGG (3178095-3178166) Pro (TGG) 72 bp
chr16.trna3-ProTGG (3148924-3148995) Pro (TGG) 72 bp
chr16.trna28-ProTGG (3174205-3174134) Pro (TGG) 72 bp
chr14.trna6-ProTGG (20222015-20222086) Pro (TGG) 72 bp
chr17.trna37-ProCGG (8066947-8066876) Pro (CGG) 72 bp
chr16.trna6-ProCGG (3162050-3162121) Pro (CGG) 72 bp
chr1.trna52-ProCGG (165950586-165950657) Pro (CGG) 72 bp
chr6.trna30-ProCGG (27167500-27167571) Pro (CGG) 72 bp
chr16.trna4-ProAGG (3150387-3150481) Pro (AGG) 95 bp
chr16.trna11-ProAGG (3181990-3182061) Pro (AGG) 72 bp
chr7.trna2-ProAGG (128210740-128210811) Pro (AGG) 72 bp
chr6.trna12-ProAGG (26663477-26663548) Pro (AGG) 72 bp
chr16.trna9-ProAGG (3179635-3179706) Pro (AGG) 72 bp
chr16.trna29-ProAGG (3172707-3172636) Pro (AGG) 72 bp
chr14.trna23-ProAGG (20147406-20147335) Pro (AGG) 72 bp
chr14.trna22-ProAGG (20151471-20151400) Pro (AGG) 72 bp
chr11.trna9-ProAGG (75624205-75624276) Pro (AGG) 72 bp
chr1.trna65-ProAGG (165951420-165951349) Pro (AGG) 72 bp