

**Fig. S1. Identification of piRNAs highly homologous with tRiMetF31.** (A) Homology between rno\_piR\_000194 and tRiMetF31. (B) Homology between hsa\_piR\_019752 and tRiMetF31.

**Fig. S2. 2DE/MALDI TOF analysis of differentially expressed genes.** Whole cellular lysates were prepared from stable breast cancer cell lines HCC1806/Dox(-), HCC1806/Dox(+), HCC1806/control shRNA, and HCC1806/tRNA<sub>i</sub><sup>Met</sup>-shRNA. 2DE/MALDI TOF analysis was done by Kendrick Laboratories (Kendrick Labs, Inc.) and the Protein Chemistry Core Facility (Columbia University).

**Fig. S3. Volcano plot of the significant relationship between log2-fold change and adjusted p-value.** TRNA<sub>i</sub><sup>Met</sup> fragment ts-63, significantly downregulated in breast cancer, is shown in red, while upregulated is shown in blue. Log2FC = -1.594, adj. p-value = 8.58E-25.

**A**

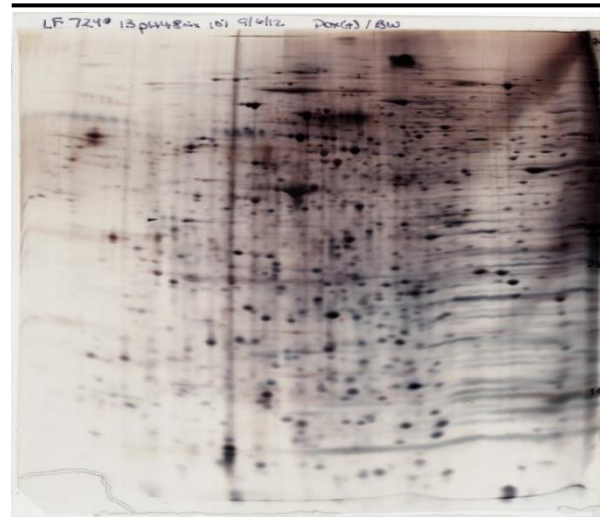
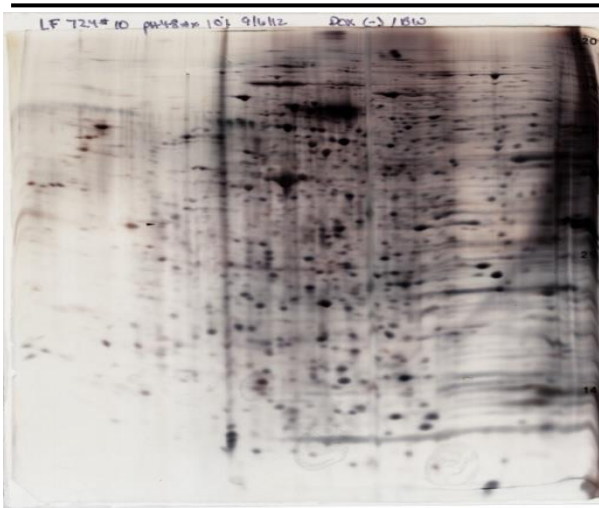
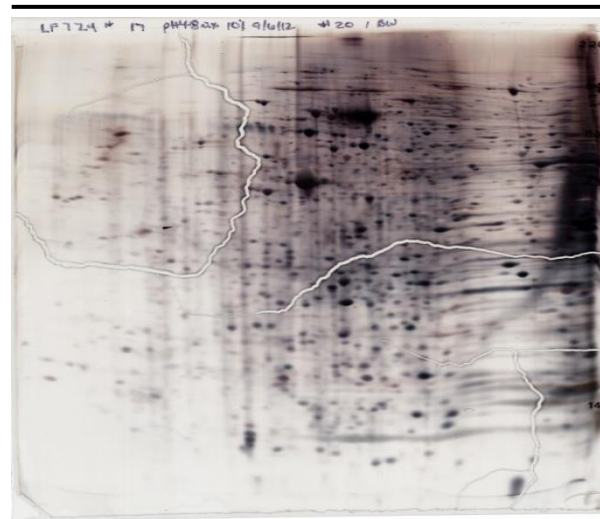
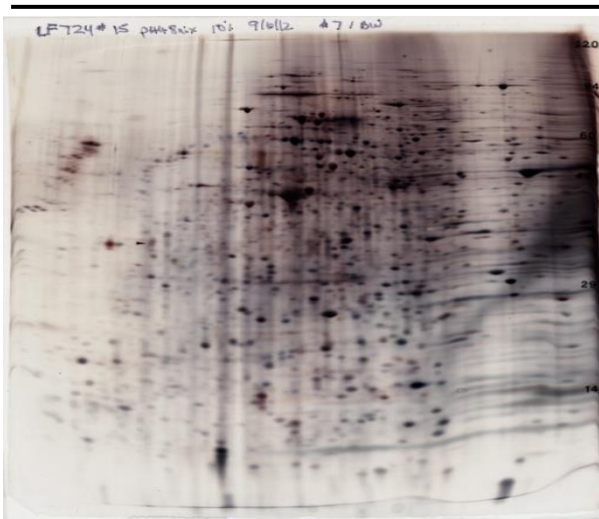
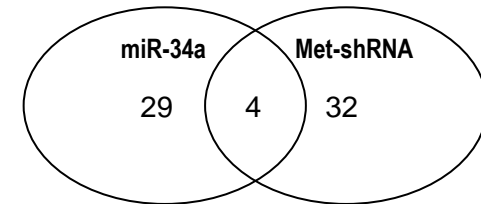
> Query (01-31) matches with [rno\\_piR\\_000194](#) (182749844-182749875)  
Length: 31 bases E-value: 2.5e-06

```
Query:          01 AGCAGAGTGGCGCAGCGGAAGCGTGCTGGGC 31
                |||
rno\_piR\_000194: 01 AGCAGAGTGGCGCAGCGGAAGCGTGCTGGGC 31
```

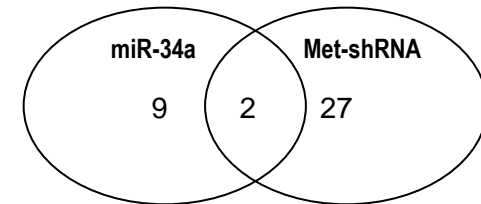
**B**

> Query (02-31) matches with [hsa\\_piR\\_019752](#) (27745665-27745696)  
Length: 31 bases E-value: 6.5e-06

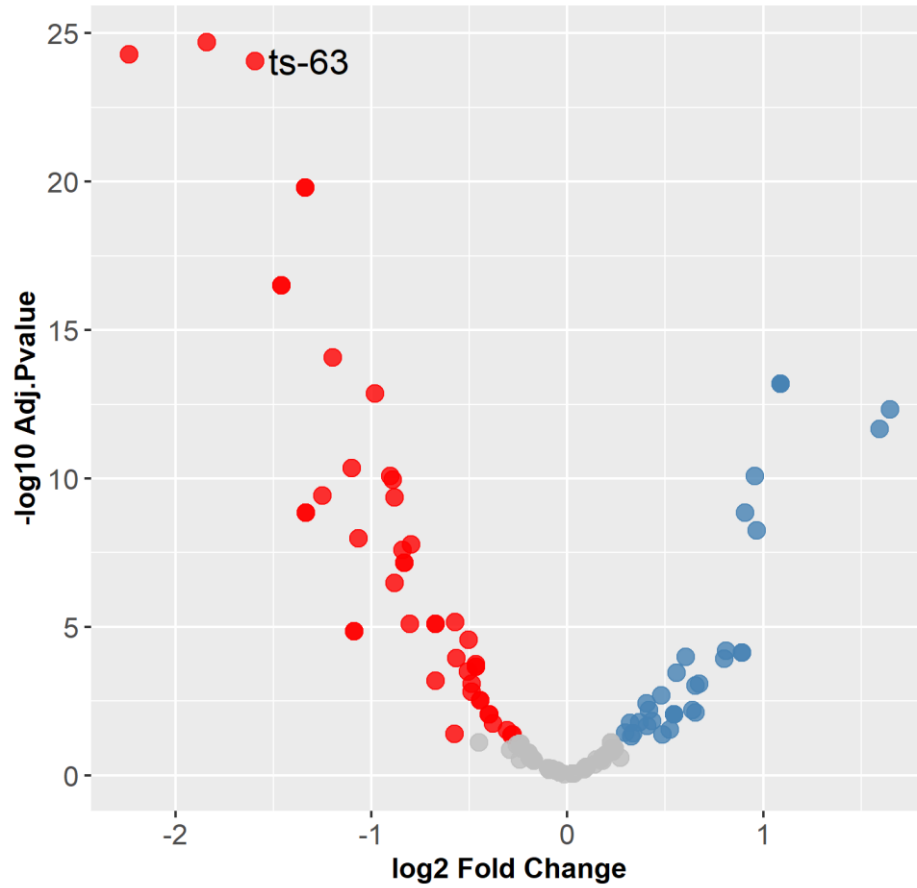
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                |||
hsa\_piR\_019752: 01 GCAGAGTGGCGCAGCGGAAGCGTGCTGGGC 30
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**A****Dox(-)****Dox(+)****Control shRNA****Met-shRNA****B****Differential spots/2DE**

Upregulated genes  
( $\geq 1.7$  or  $p < 0.05$ )



Downregulated genes  
( $\leq -1.7$  or  $p < 0.05$ )



**Table S1.** Expression of tRNA<sub>i</sub><sup>Met</sup>-derived fragments in breast cancer

Fragment	Fragment type	Aminoacids	Anticodons	Expression cell lines	Expression in TCGA
5P_tRNA-iMet-CAT-1-2	5' Leader	Met	CAT	MDA-MB-23; HS-578T	None in TCGA
<b>5P_tRNA-iMet-CAT-1-3</b>	<b>5' Leader</b>	<b>Met</b>	<b>CAT</b>	<b>MDA-MB-23; HS-578T; T-47D</b>	<b>Expressed in BRCA and other cancer types</b>
5P_tRNA-iMet-CAT-1-4	5' Leader	Met	CAT	MDA-MB-23	None in TCGA
5P_tRNA-iMet-CAT-1-8	5' Leader	Met	CAT	T47-D; MCF-7; MDA-MD-23	None in TCGA
5P_tRNA-Met-CAT-2-1	5' Leader	Met	CAT	T47-D; MDA-MB-23	None in TCGA
5P_tRNA-Met-CAT-3-2	5' Leader	Met	CAT	T47-D; MDA-MB-23	None in TCGA
5P_tRNA-Met-CAT-4-2	5' Leader	Met	CAT	MDA-MB-23; BT-549; HS-578T	None in TCGA
5P_tRNA-Met-CAT-7-1	5' Leader	Met	CAT	T47-D	None in TCGA
<b>ts-63</b>	<b>tsRNA</b>	<b>Met</b>	<b>CAT</b>	<b>T47-D; MCF-7; MDA-MD-23; BT-549; HS-578T</b>	<b>Expressed in BRCA and other cancer types</b>