

# **Circulating MicroRNA Profiles as Potential Biomarkers for Differentiated Thyroid Cancer Recurrence**

## **Abstract**

### **Context**

Circulating microRNAs (miRNAs) are emerging biomarkers of thyroid cancer.

### **Objective**

This study sought to identify the profile of circulating miRNAs and its response to human recombinant TSH (rhTSH) in thyroid cancer patients with recurrent/persistent disease.

### **Methods**

We obtained serum samples from 30 patients with differentiated thyroid cancer, 14 with recurrent/persistent disease and 16 with complete remission. We used next-generation sequencing to define the miRnomes along with a comprehensive quantitative PCR (qPCR) validation using 2 different platforms. We made a transversal study by comparing serum miRNA profiles of patients with or without recurrent/persistent disease and a longitudinal study looking at differences before and after rhTSH stimulation. Selected miRNAs were then studied in human thyroid cancer cell lines TPC-1, FTC-133, and OCUT-2 in response to TSH stimulation.

### **Results**

We could not demonstrate any consistent differences in serum profiles of known miRNAs between patients with and without recurrent/persistent disease or before and after rhTSH stimulation. However, our sequencing data revealed 2 putative novel miRNAs that rise with rhTSH stimulation in the serums of patients with recurrent/persistent disease. We further confirmed by qPCR the upregulation of these putative miRNAs both in serums and in TSH-stimulated cells. We also show miRNAs that are good candidates for housekeeping genes in the serum of patients independently of the levels of TSH.

### **Conclusions**

The present study does not provide evidence that known miRNAs can be used as circulating markers for recurrence of thyroid cancer. However, we suggest that novel miRNA molecules may be related to thyroid cancer pathogenesis.