Circulating microRNAs as prognostic therapy biomarkers in head and neck cancer patients.

The prediction of therapy response in head and neck squamous cell cancer (HNSCC) requires biomarkers, which are also a prerequisite for personalised therapy concepts. The current study aimed to identify therapy-responsive microRNAs (miRNAs) in the circulation that can serve as minimally invasive prognostic markers for HNSCC patients undergoing radiotherapy. We screened plasma miRNAs in a discovery cohort of HNSCC patients before therapy and after treatment. We further compared the plasma miRNAs of the patients to age- and sex-matched healthy controls. All miRNAs identified as biomarker candidates were then confirmed in an independent validation cohort of HNSCC patients and tested for correlation with the clinical outcome. We identified a signature of eight plasma miRNAs that differentiated significantly (P=0.003) between HNSCC patients and healthy donors. MiR-186-5p demonstrated the highest sensitivity and specificity to classify HNSCC patients and healthy individuals. All therapy-responsive and patient-specific miRNAs in plasma were also detectable in tumour tissues derived from the same patients. High expression of miR-142-3p, miR-186-5p, miR-195-5p, miR-374b-5p and miR-574-3p in the plasma correlated with worse prognosis. Circulating miR-142-3p, miR-186-5p, miR-195-5p,
miR-374b-5p and miR-574-3p represent the most promising markers for prognosis and therapy monitoring in the plasma of HNSCC patients. We found strong evidence that the circulating therapy-responsive miRNAs are tumour related and were able to validate them in an independent cohort of HNSCC patients.