Hypoxia-related microRNA-210 is a diagnostic marker for discriminating osteoblastoma and osteosarcoma

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 Osteoblastoma is a benign bone tumor that can often be difficult to distinguish from malignant osteosarcoma. Because misdiagnosis can result in unfavorable clinical outcomes, we have investigated microRNAs as potential diagnostic biomarkers for distinguishing between these two tumor types. Next generation RNA sequencing was used as an expression screen to evaluate >2,000 microRNAs present in tissue derived from rare formalin fixed paraffin embedded (FFPE) archival tumor specimens. MicroRNAs displaying the greatest ability to discriminate between these two tumors were validated on an independent tumor set, using qPCR assays. Initial screening by RNA-seq identified four microRNA biomarker candidates. Expression of three miRNAs (miR-451a, miR-144-3p, miR-486-5p)

was higher in osteoblastoma, while the miR-210 was elevated in osteosarcoma. Validation of these microRNAs on an independent data set of 22 tumor specimens