



Parathyroid Hormone or Dexamethasone show Effects on micro-RNA Expression Patterns Assessed by Second Generation Sequencing

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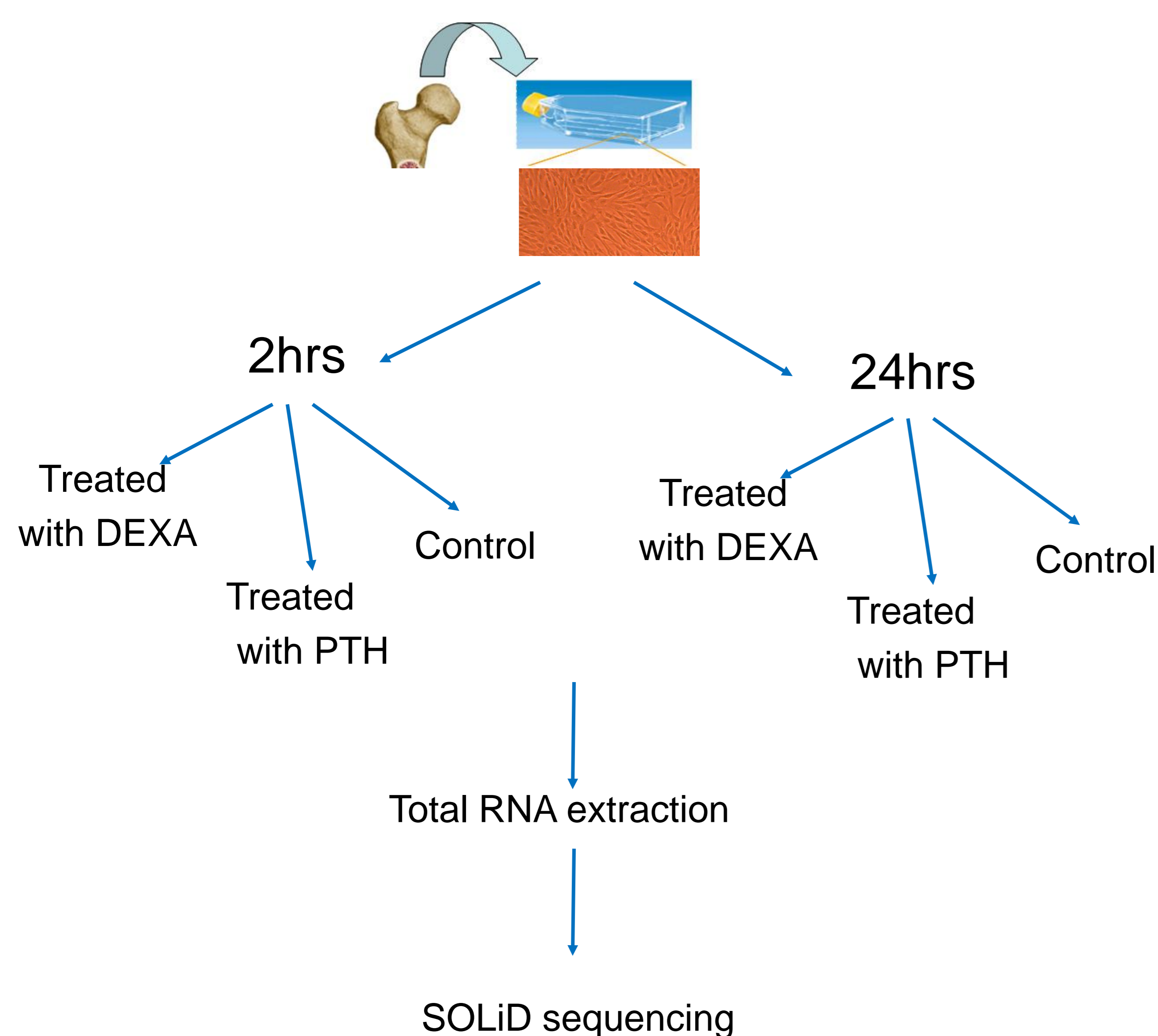
AIM

To study the effect of parathyroid hormone (PTH) and Dexamethasone (DEXA) on global miRNA expression in primary human bone (HOB) cells by second generation sequencing.

INTRODUCTION

Parathyroid hormone (PTH) generally has a positive effect and Dexamethasone (DEXA) a negative effect on bone formation. In the present project, we have investigated the impact of treatment of parathyroid hormone (PTH) and Dexamethasone (DEXA) on global miRNA expression in primary human bone (HOB) cells by second generation sequencing of small RNA. Micro-RNAs (miRNAs), small non-coding RNAs, identified as regulators in various biological processes, have been shown to be involved in human development and disease. By binding to complementary RNA strands, they efficiently affect mRNA levels and/or mRNA translation. We have previously used miRNA LNA arrays to assess global miRNA expression in human bone cells, and have identified approximately 90 miRNAs with significant expression levels, and have in addition identified a subset of miRNAs exhibiting interindividual and/or gender differences in expression. We have also shown significant correlations between miRNA and mRNA expression of genes involved in bone metabolism in human bone cells.

METHODS



RESULTS

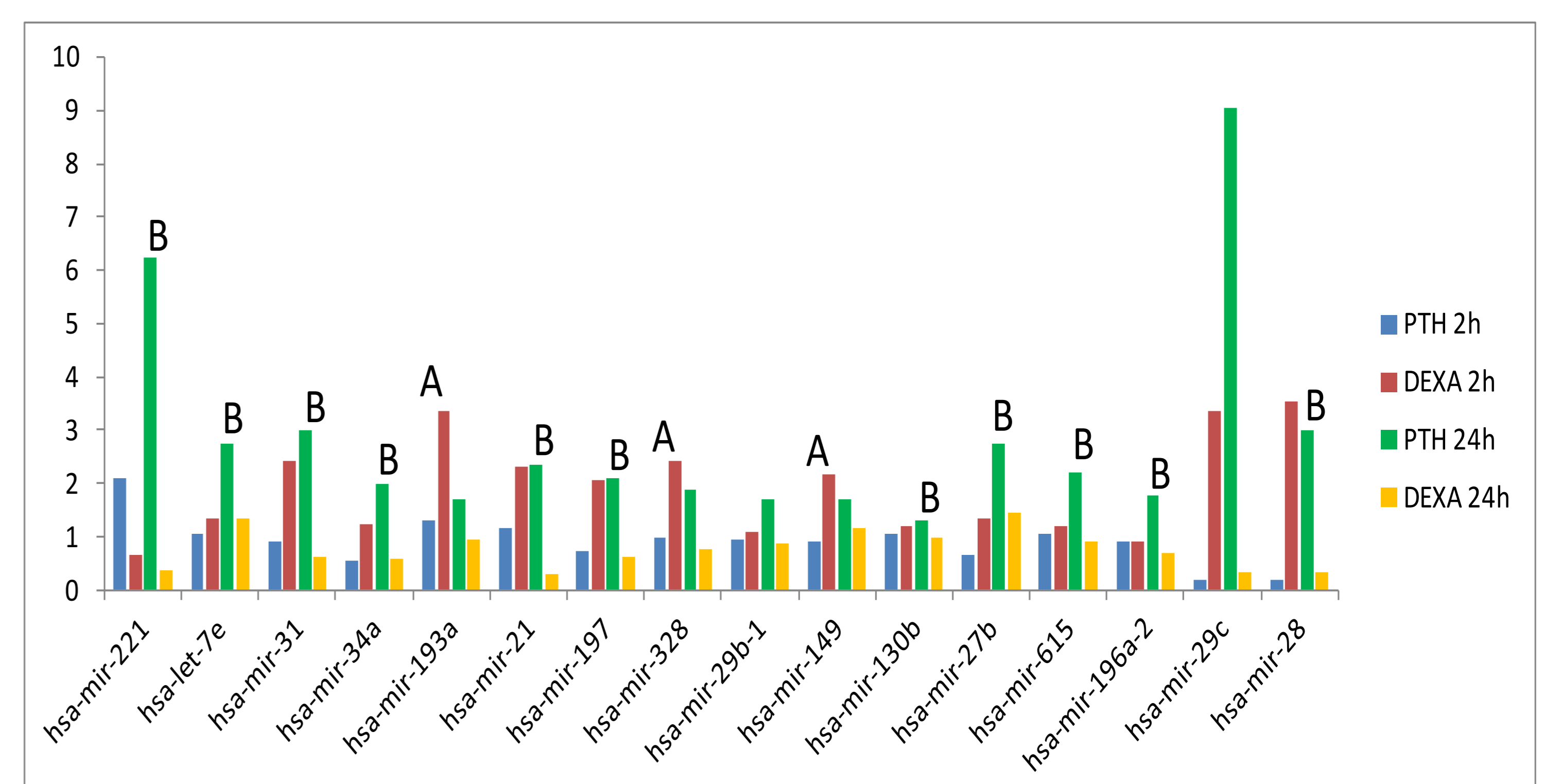


Fig.1. Profound differences in miRNA abundance assessed by deep sequencing of barcoded RNA in hOBs treated with agents known to affect bone metabolism (PTH or Dexamethasone) for 2 or 24 hours. Experiments were performed in triplicates. Expression levels are means relative to untreated control (control % * 100). Letters A and B denote significant differences between the two treatments for 2 hours (A) and 24 hours (B) at the $p < 0.05$ level by ANOVA.

CONCLUSIONS

- Expression data from second generation sequencing show a significant effect of treatment with PTH vs treatment with DEXA at 2 hours and even more pronounced at 24 hours on miRNA expression.
- These miRNAs in turn are correlated to expression levels of mRNAs known to affect bone metabolism, e.g. miR-197 targeting IGF and Wnt pathway members.

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Conflict of Interest- The authors declare that they have no conflict of interest.