

microRNA (miRNA) INVOLVED IN NEUROPATHIC PAIN CAN BE RELIABLY MEASURED IN SALIVA

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Introduction

microRNA (miRNA) have been shown to be dysregulated in Neuropathic pain conditions such as diabetic painful neuropathy.

While invasive techniques such as blood samples are routinely used, the use of non-invasive techniques such as salivary samples for collecting and analysing miRNAs involved in neuropathic pain has been minimal.

Objective

The objective of this study was to determine if miRNAs involved in neuropathic pain can be measured reliably in salivary samples comprising of healthy European and Pacific population.

Methodology

This was an observational study.

Participants were recruited via advertisements on notice boards, social media, word of mouth, and pamphlets.

Saliva samples were collected from healthy European and Pacifica Participants.

Samples were stored in -80°C until analysis.

Analysis

Total RNA was extracted using miRNEasy kit (Qiagen) following manufacturer's protocol and the concentration was measured using Nanodrop (ThermoFisher).

Twenty nanogram of total RNA was then reverse transcribed, followed by amplification using specific primers against miR-16, -124, 132 and -134. miR-24 was used as the internal control.

Results

A total of 37 healthy participants (19 European and 18 Pacifica; age range: 22-57 years) were included in the study.

Results showed that four different miRNAs (miR-16, miR-124, miR-132 and miR-134) that have been demonstrated to be associated with neuropathic pain were expressed and reliably measured in all the salivary samples.

However, our study did not show any significant difference in the expression pattern of salivary miRNAs between European and Pacifica population (refer Figure 3).

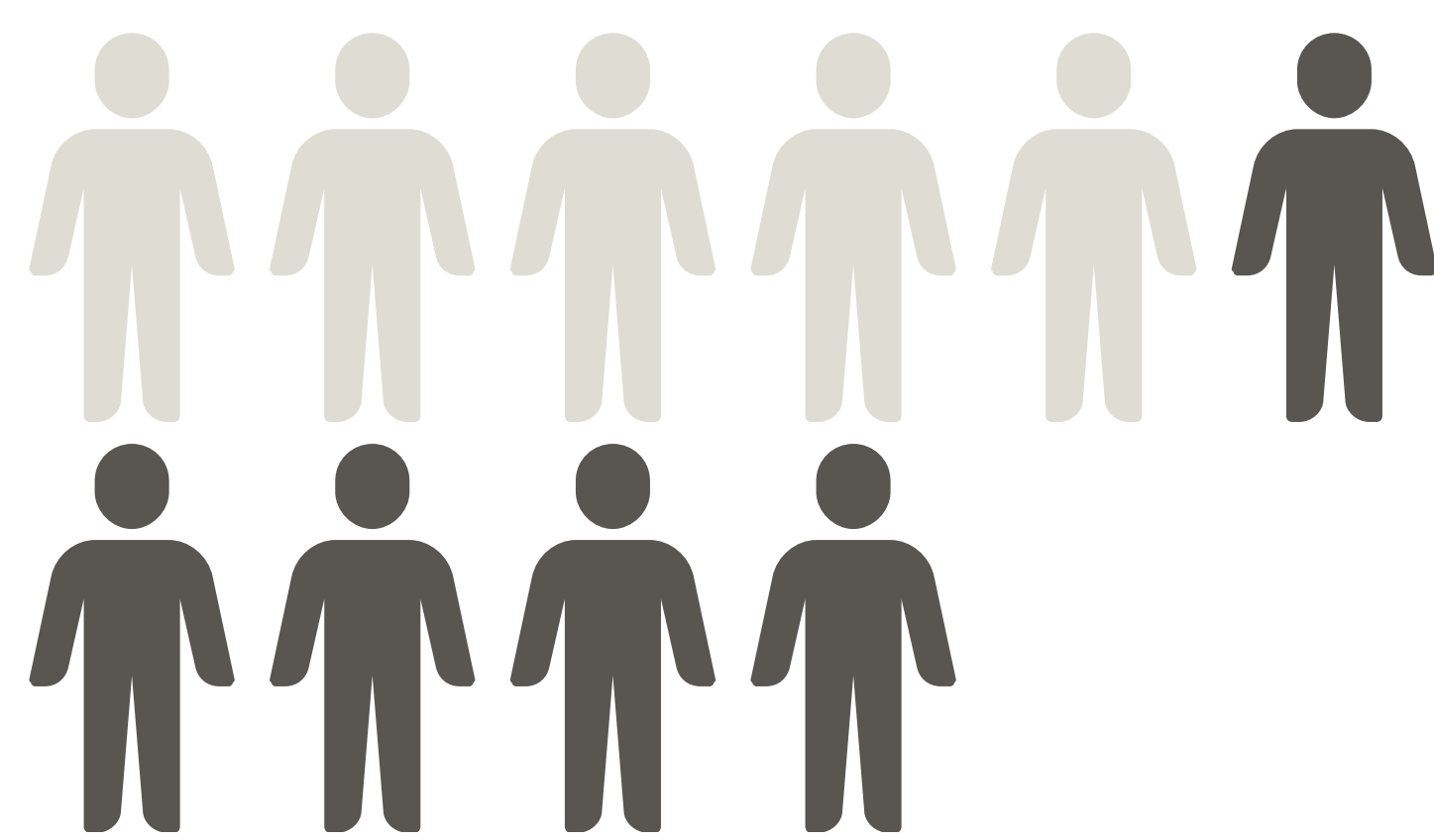


Figure 1: Total number of participants (37; 19 European and 18 Pacifica; age range:22-57 years)

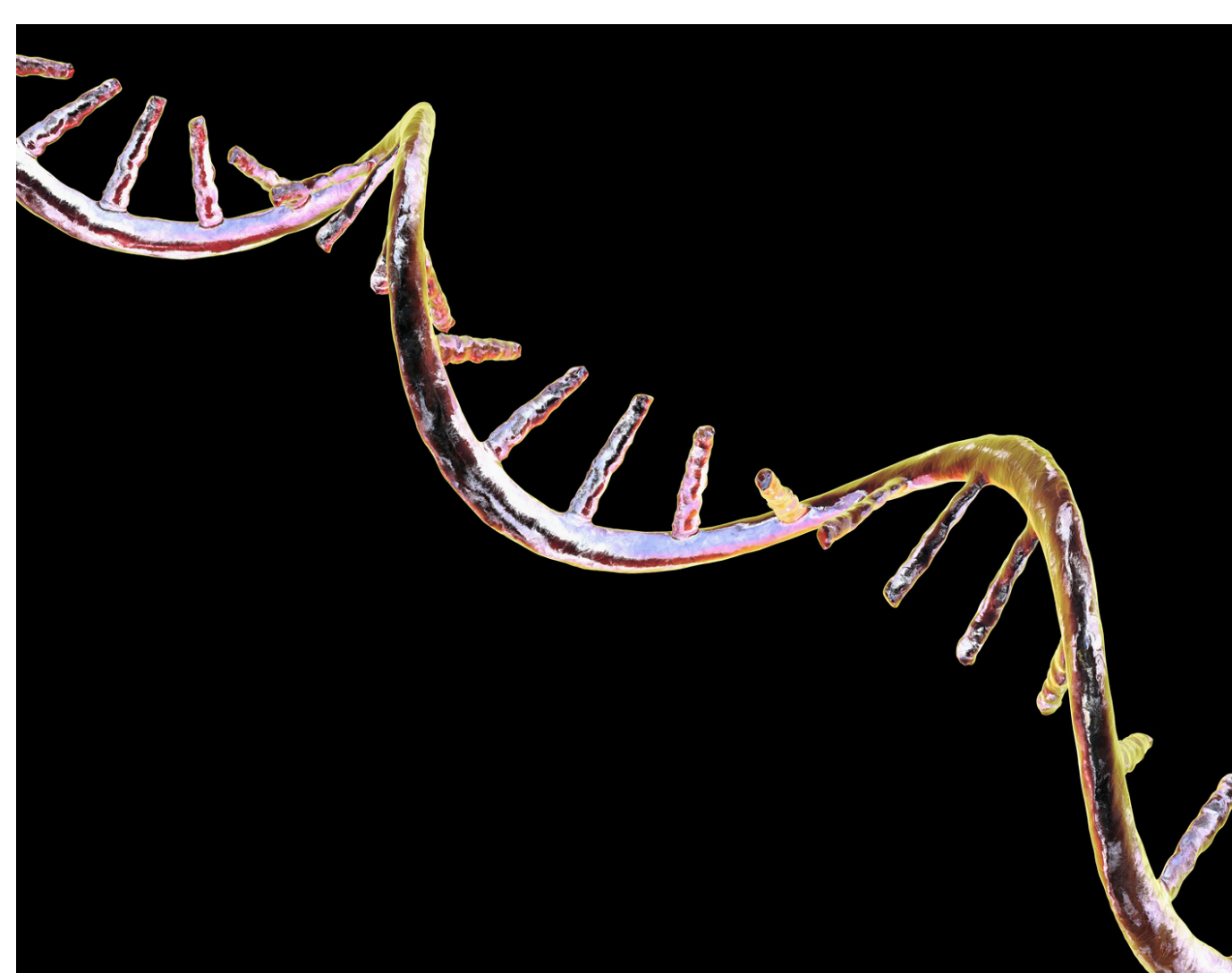


Figure 2: Four miRNAs (miR-16, miR-124, miR-132 and miR-134) involved in neuropathic pain can be measured reliably in saliva

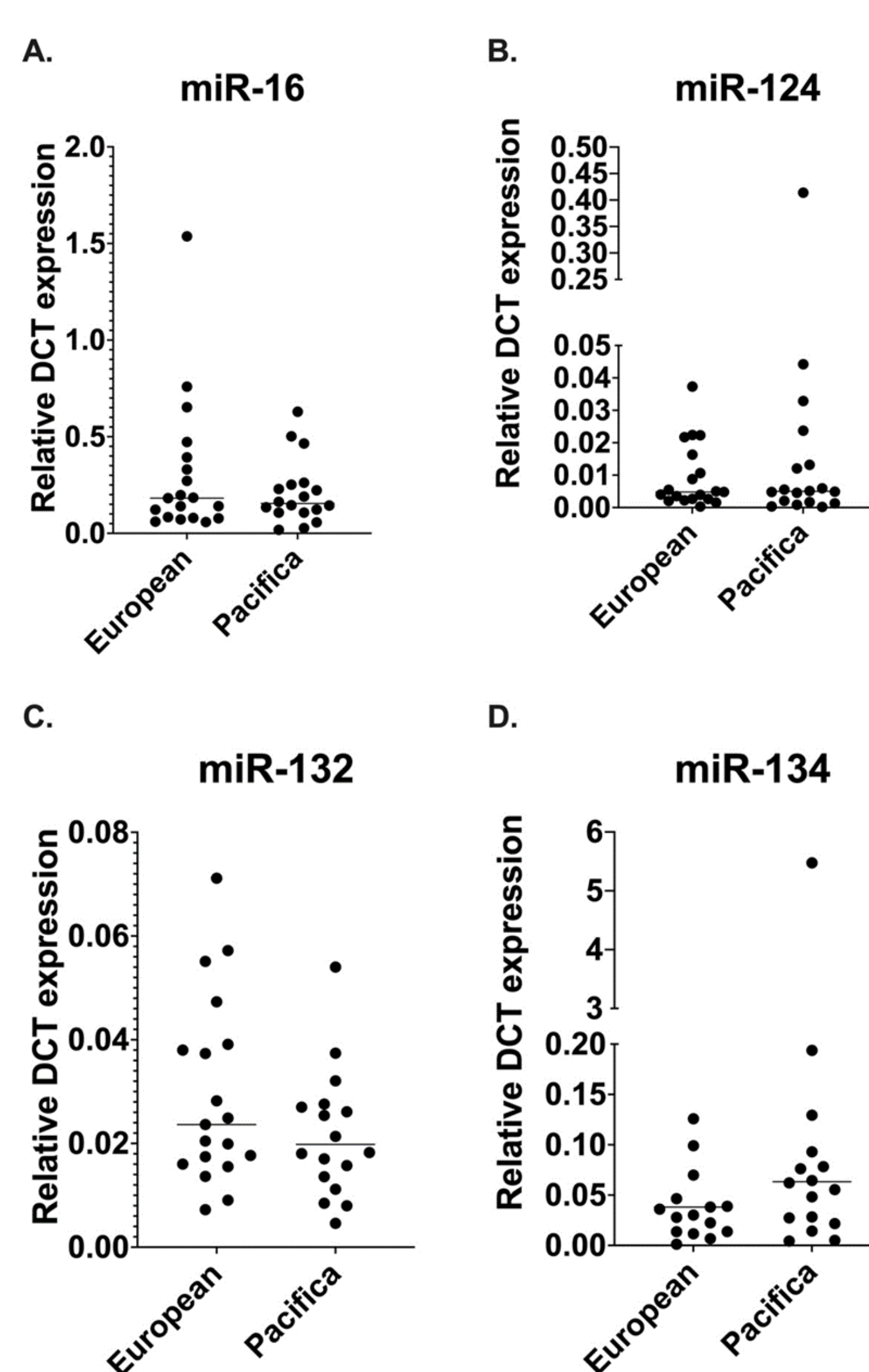


Figure 3: Quantitative scatter plots showing the expression levels of miR-16 (A), miR-124 (B), miR-132 (C), and miR-134 (D) in the saliva collected from healthy European (n=19) and Pacifica (n=18) participants. Comparisons between groups were calculated using the Mann-Whitney test.

Discussion

miRNAs such as miR-16, miR-124, miR-132 and miR-134 and have been shown to be dysfunctional in people with neuropathic pain. Hence our findings are of extreme importance.

miR-124 is involved in the regulation of inflammatory processes in neuropathic pain.. Evidence also demonstrates that miR-16 inhibits the expression of IL-1 β and TNF- α , suggesting that miR-16 is involved in regulating inflammation in neuropathic pain. In conclusion, our results show that salivary sample is a non-invasive and may be used as a reliable way to measure miRNAs involved in neuropathic pain.

References

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