Perspectives in isolation of microRNA from thyroid fine-needle aspiration: reply to the letter “Nucleic acid recovery from thyroid fine-needle cytology slides”

Efforts have been made to improve the isolation of nucleic acids from long-term preserved samples (1,2). This is a challenge when dealing with formalin-fixed/paraffin-embedded (FFPE) tissues and fine needle aspiration (FNA) samples from stained slides. In our recent study (3) using in-house protocols, we optimized the methods used for nucleic acid extraction, including co-extraction of RNA/DNA from thyroid FNA in stained slides samples and FFPE thyroid tissues by means of modifications of the standard TRIzol® reagent (Life Technologies, Carlsbad, CA, USA) protocol, making genetic and epigenetic studies possible using the same sample. In addition, the recovery of nucleic acid from the same thyroid FNA stained slides that had been previously analyzed by a cytopathologist enables an integrated diagnosis, as well as repeated FNAs, reducing the costs with cytopathology and molecular procedures.

Several studies have been published regarding the potential of microRNA (miRNA) as a molecular biomarker of thyroid cancer (5). miRNA are smaller (~19-22 bp) and more stable than messenger RNA (mRNA), so its detection and recovery are equally feasible, as objectively demonstrated by Saito and cols. In this context, we are honored to know that our article has stimulated Professor Kimura’s team to show their results in miRNA extraction from thyroid FNA stained slides. They were successful with the isolation of RNA from thyroid FNA stained slides and FFPE thyroid tissues by means of modifications of the standard TRIzol® reagent (Life Technologies, Carlsbad, CA, USA) protocol, making genetic and epigenetic studies possible using the same sample. In addition, the recovery of nucleic acid from the same thyroid FNA stained slides that had been previously analyzed by a cytopathologist enables an integrated diagnosis, as well as repeated FNAs, reducing the costs with cytopathology and molecular procedures.

In conclusion, miRNA isolation from thyroid FNA stained slides is another promising tool when investigating thyroid nodules, especially those with uncertain cytopathology results.

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