Supplementary Information

A Multiplexed ion-exchange membrane-based miRNA (MIX.miR) detection platform for rapid diagnosis of myocardial infarction

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1. Integration board

The layout of the MIX.miR sensor integration board is shown in Figure S1.

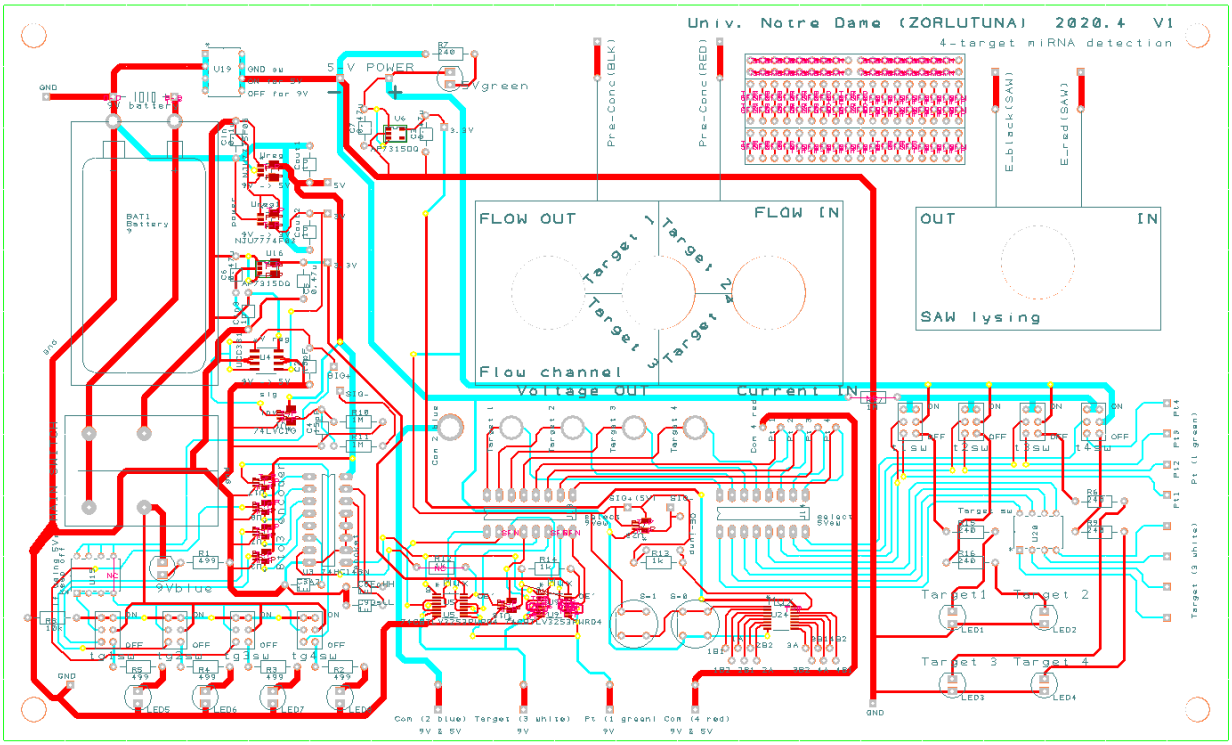

Figure S1. The layout design of the integration board.

2. miRNA isolation efficiency in PCR

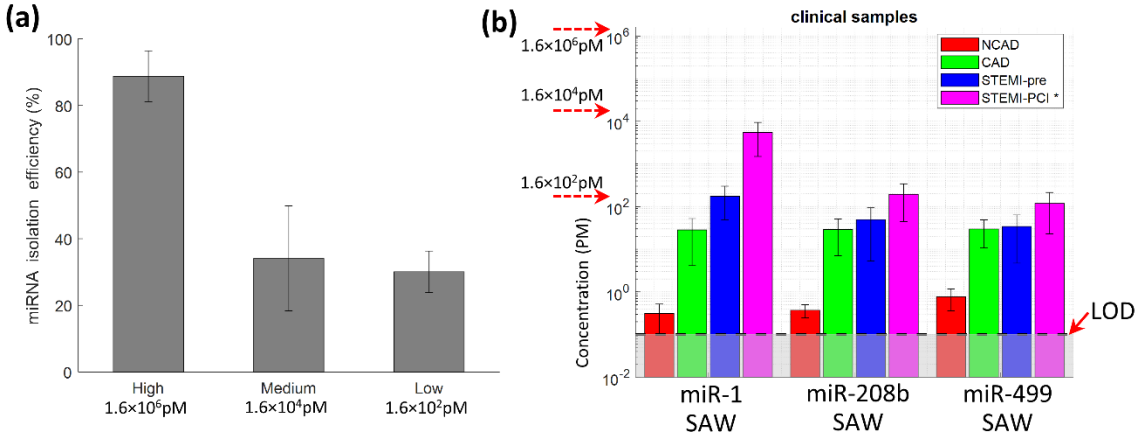

Figure S2. (a) The isolation efficiency of different concentrations of miRNA; (b) the isolation concentrations (high, medium, low) compared with the miRNA measurement by the MIX.miR sensors.

The efficiency was observed to be much higher (~88%) at high concentrations (1.6 μM) whereas at lower concentrations (16 nM and 160 pM) efficiency dropped to below 50% and 40%, respectively. Compared with the concentrations of miR-1, miR-208b and miR-499 measured by MIX.miR, the concentration of miR-1 is much higher than miR-208b and miR-499. For example, the highest miR-1 concentration in STEMI-PCI samples is within the 16nM range, while the highest miR-208b and miR-499 are within the 160pM range. During PCR, miR-208b and miR-499 will face a much higher loss than miR-1. Therefore, the miR-208b and miR-499 are not detectable by PCR. The MIX.miR doesn't require miRNA isolation during the experiments, which won't face the issue of miRNA loss.