Protocol for washing and modifying QCM-D sensors Version 2

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Abstract

This protocol describes how to wash QCM-D sensors before usage and how to modify their surface using a composition of symmetric (poly)ethylene glycol (PEG) thiols consisting of 99% dS-PEG and 1% dS-PEG-biotin.

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Before start

Protocol

Step 1.
Prepare solutions of 2% SDS, 0.1% SDS and 0.1 M HCl.

Step 2.
Clean the gold-coated QCM-D sensors by hand with 2% SDS to mechanically remove contaminants. Be sure that the glove is wet all the time so it doesn't scratch the sensor!

Step 3.
Place the sensors in a stand and put them in a 0.1% SDS solution. Heat for 10 min at 80°C, then rinse the sensors with water.

Step 4.
Place the sensors in a 0.1 M HCl solution. Heat for 10 min at 80°C, then rinse the sensors with water several times to remove all HCl solution. Then blow the sensors dry under a flow of nitrogen.

Step 5.

Make an ethanolic solution with total concentration 10 mM of mixed PEG thiols (PEG and biotin-PEG thiols in a molar ratio of 99:1).

($M_{W,\ dS\text{-}PEG}$ = 386.5 Da and $M_{W,\ dS\text{-}PEG\text{-}biotin}$ = 788.0 Da)

Step 6.

Incubate the QCM-D sensors in the ethanolic PEG thiol solution for at least 16 hours at 4°C in darkness.

Step 7.
Rinse the sensors a couple of times with ethanol, then a couple of times with milli-Q water and lastly blow them dry with nitrogen. They may now be used or stored.

Warnings

If storing the modified sensors, be sure to keep them cold and in darkness!